APPENDIX A

Turning Movement Counts and Signal Timing Plans

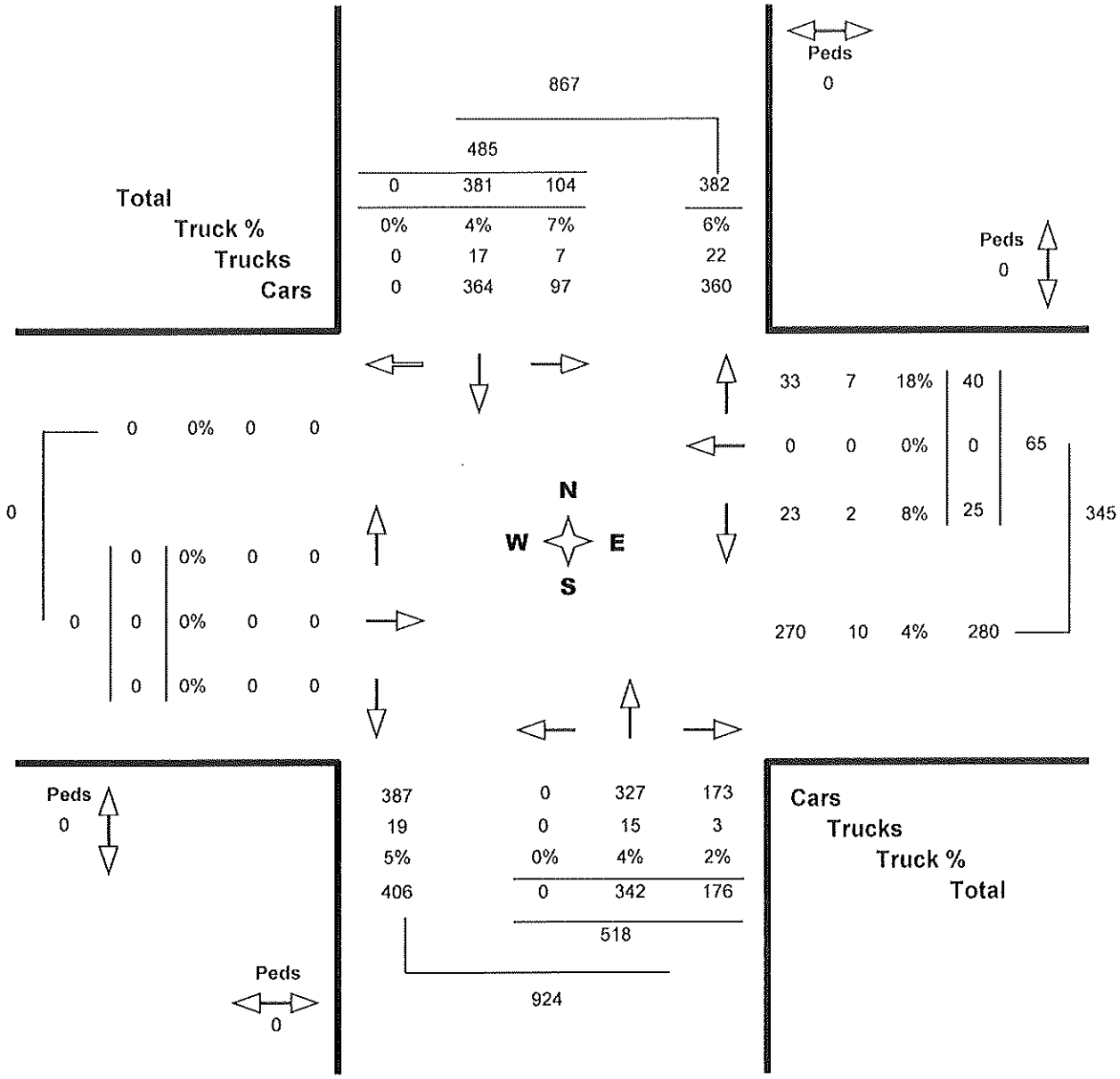
Turning Movements Report - AM Period

Location..... NINTH LINE @ Argentia Road

Municipality..... Mississauga

GeoID..... 343348

Count Date..... Thursday, 23 February, 2017 **Peak Hour.....** 07:45 AM —08:45 AM



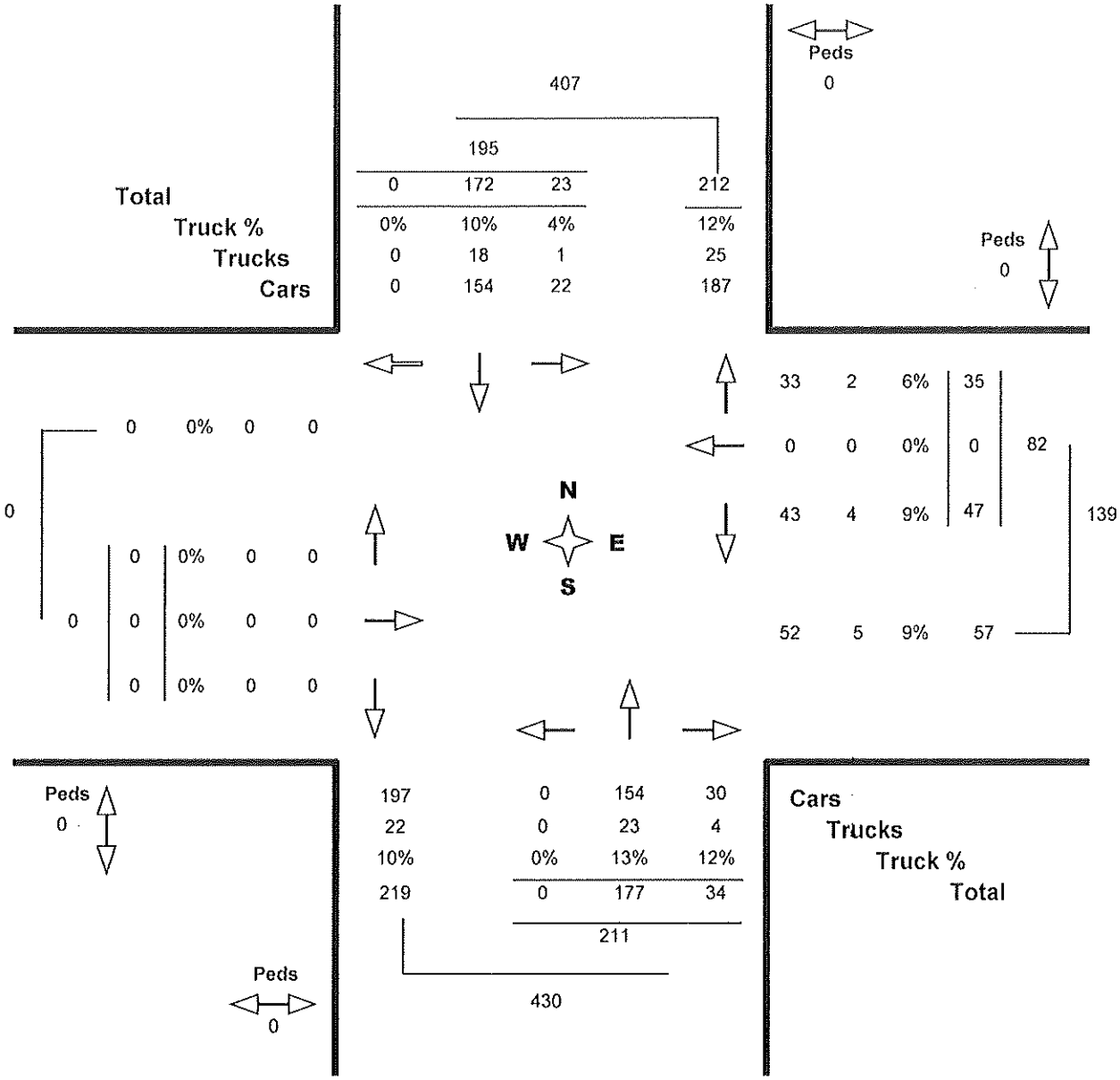
Turning Movements Report - MD Period

Location..... NINTH LINE @ Argentia Road

Municipality..... Mississauga

GeoID..... 343348

Count Date..... Thursday, 23 February, 2017 **Peak Hour.....** 01:00 PM —02:00 PM



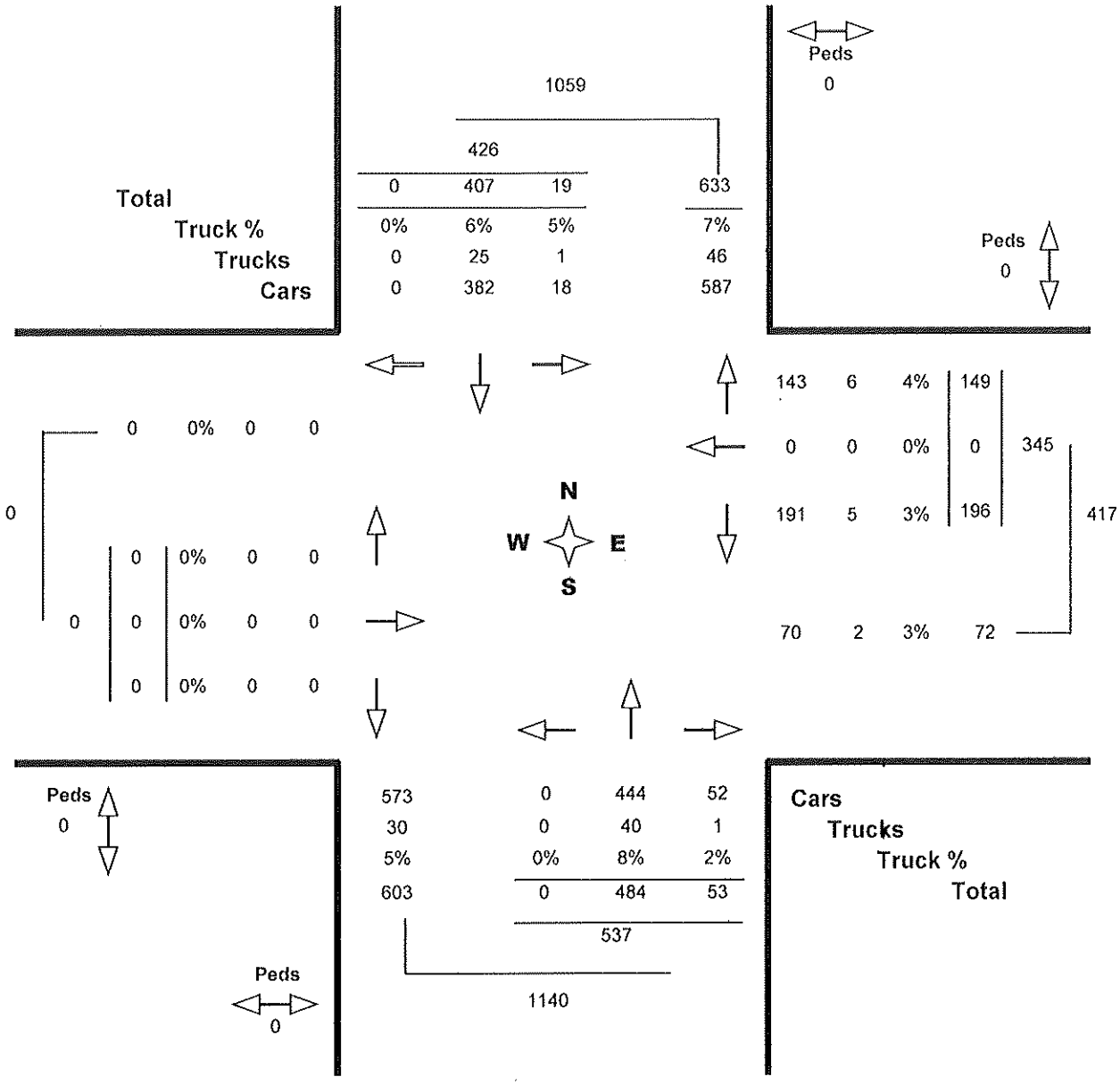
Turning Movements Report - PM Period

Location..... NINTH LINE @ Argentia Road

Municipality..... Mississauga

GeoID..... 343348

Count Date..... Thursday, 23 February, 2017 **Peak Hour.....** 05:00 PM —06:00 PM



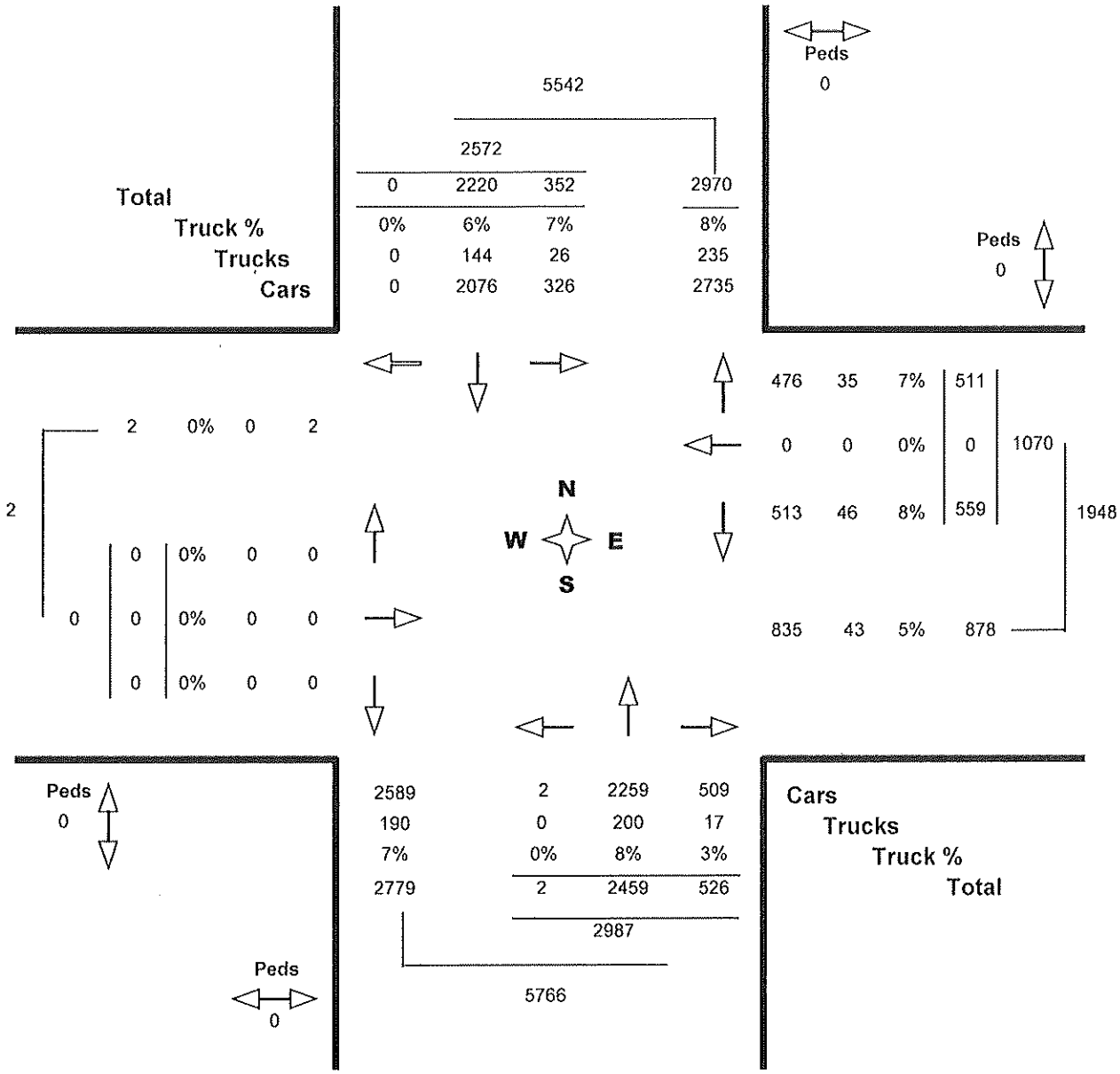
Turning Movements Count - Full Study Report

Location..... NINTH LINE @ Argentia Road

Municipality..... Mississauga

GeoID..... 343348

Count Date..... Thursday, 23 February, 2017



Turning Movement Count - Details Report

Location..... NINTH LINE @ NINTH LINE

Municipality..... Mississauga

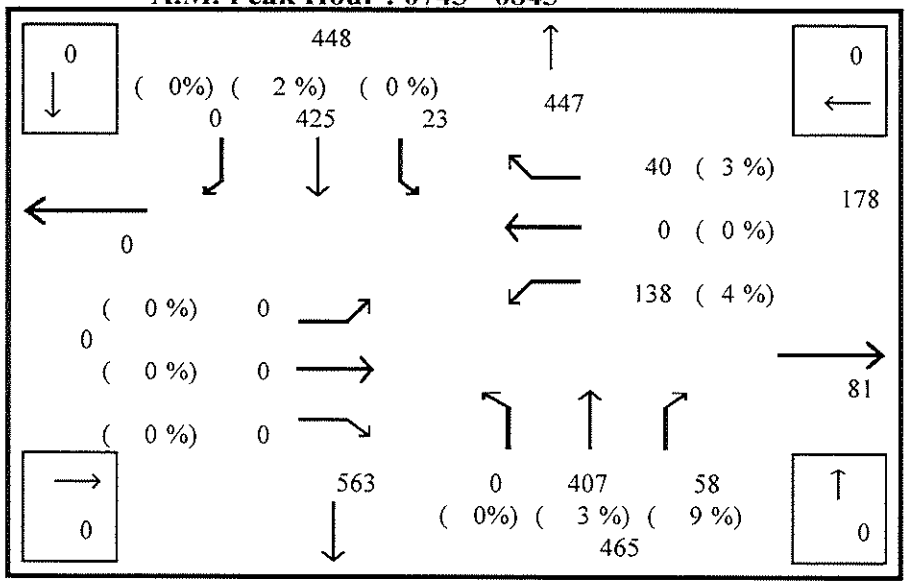
Count Date..... Thursday, February 23, 2017

		North Approach					South Approach					East Approach					West Approach				
Time Period		LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT
07:00	07:15	21	68	0	0	89	0	79	30	0	109	3	0	4	0	7	0	0	0	0	0
07:15	07:30	30	97	0	0	127	0	63	36	0	99	8	0	2	0	10	0	0	0	0	0
07:30	07:45	36	88	0	0	124	0	82	37	0	119	12	0	10	0	22	0	0	0	0	0
07:45	08:00	35	96	0	0	131	0	80	47	0	127	12	0	8	0	20	0	0	0	0	0
08:00	08:15	23	92	0	0	115	0	65	26	0	91	4	0	9	0	13	0	0	0	0	0
08:15	08:30	31	75	0	0	106	0	97	57	0	154	5	0	10	0	15	0	0	0	0	0
08:30	08:45	15	118	0	0	133	0	100	46	0	146	4	0	13	0	17	0	0	0	0	0
08:45	09:00	12	85	0	0	97	0	86	18	0	104	12	0	4	0	16	0	0	0	0	0
11:00	11:15	7	37	0	0	44	0	38	11	0	49	7	0	6	0	13	0	0	0	0	0
11:15	11:30	6	30	0	0	36	0	32	6	0	38	12	0	8	0	20	0	0	0	0	0
11:30	11:45	5	32	0	0	37	0	29	7	0	36	18	0	6	0	24	0	0	0	0	0
11:45	12:00	9	47	0	0	56	0	28	10	0	38	8	0	10	0	18	0	0	0	0	0
12:00	12:15	9	45	0	0	54	0	40	7	0	47	9	0	8	0	17	0	0	0	0	0
12:15	12:30	2	39	0	0	41	0	49	2	0	51	6	0	13	0	19	0	0	0	0	0
12:30	12:45	4	44	0	0	48	0	31	8	0	39	8	0	5	0	13	0	0	0	0	0
12:45	13:00	1	34	0	0	35	0	46	8	0	54	10	0	3	0	13	0	0	0	0	0
13:00	13:15	4	39	0	0	43	0	40	9	0	49	9	0	9	0	18	0	0	0	0	0
13:15	13:30	6	34	0	0	40	0	43	7	0	50	10	0	9	0	19	0	0	0	0	0
13:30	13:45	8	54	0	0	62	0	47	6	0	53	12	0	8	0	20	0	0	0	0	0
13:45	14:00	5	45	0	0	50	0	47	12	0	59	16	0	9	0	25	0	0	0	0	0
15:00	15:15	3	64	0	0	67	0	74	12	0	86	10	0	15	0	25	0	0	0	0	0
15:15	15:30	6	79	0	0	85	0	82	7	0	89	19	0	12	0	31	0	0	0	0	0
15:30	15:45	8	66	0	0	74	0	77	6	0	83	18	0	20	0	38	0	0	0	0	0
15:45	16:00	7	72	0	0	79	0	110	11	0	121	15	0	21	0	36	0	0	0	0	0
16:00	16:15	7	84	0	0	91	0	113	11	0	124	33	0	28	0	61	0	0	0	0	0
16:15	16:30	9	75	0	0	84	0	135	9	0	144	24	0	31	0	55	0	0	0	0	0
16:30	16:45	14	75	0	0	89	2	151	11	0	164	28	0	47	0	75	0	0	0	0	0
16:45	17:00	10	99	0	0	109	0	111	16	0	127	31	0	34	0	65	0	0	0	0	0
17:00	17:15	8	101	0	0	109	0	97	13	0	110	57	0	40	0	97	0	0	0	0	0
17:15	17:30	6	106	0	0	112	0	125	11	0	136	54	0	47	0	101	0	0	0	0	0
17:30	17:45	3	92	0	0	95	0	138	13	0	151	37	0	37	0	74	0	0	0	0	0
17:45	18:00	2	108	0	0	110	0	124	16	0	140	48	0	25	0	73	0	0	0	0	0
Total	.....	352	2220	0	0	2572	2	2459	526	0	2987	559	0	511	0	1070	0	0	0	0	0

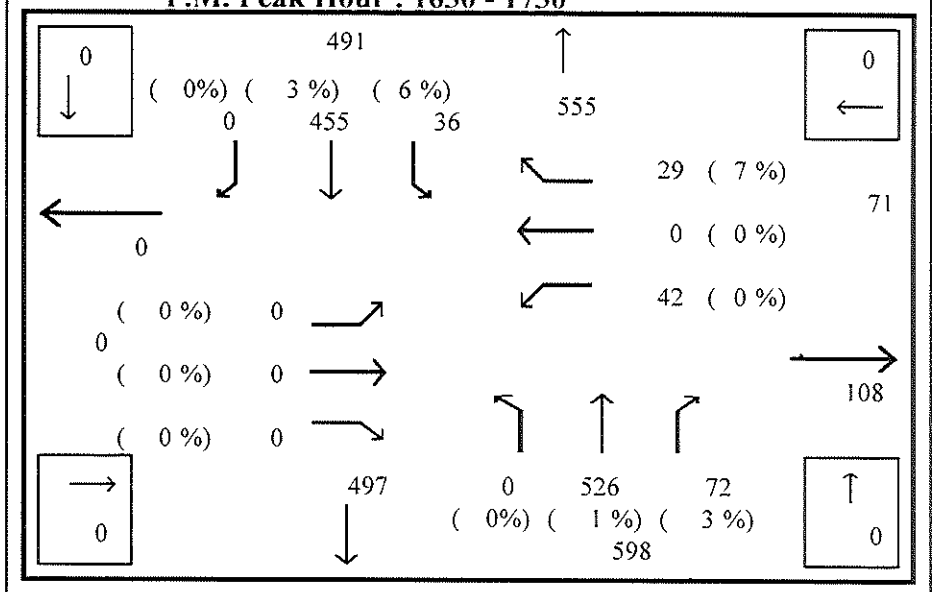
Count Date : Tuesday February 12 2013 2/10/2014

[NIN-TER-10-N] NINTH LINE/TERRAGAR BLVD

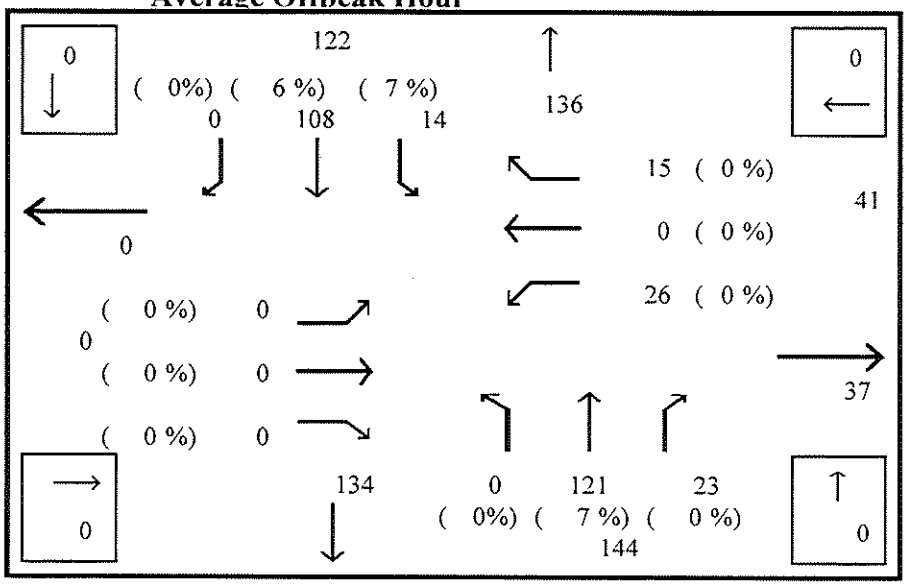
A.M. Peak Hour : 0745 - 0845



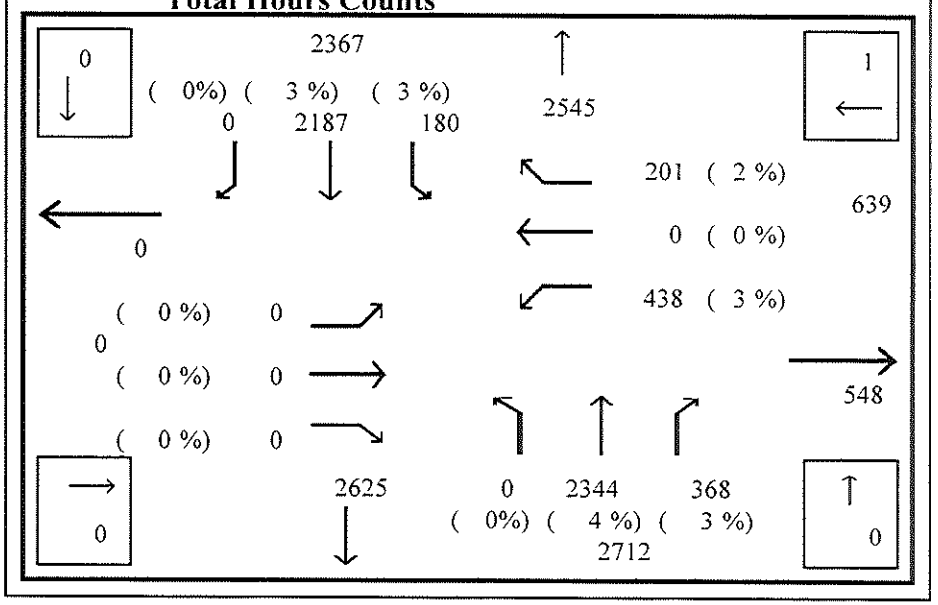
P.M. Peak Hour : 1630 - 1730



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

NINTH LINE/TERRAGAR BLVD NIN-TER-10-N ZArea: Z55

Counted On: 2013/02/12 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	42	4	2	0	1	54	0	1	0	17	0	10	0	0	131
730	0	0	0	0	0	0	97	9	1	0	6	83	0	0	0	20	0	7	0	0	223
745	0	0	0	0	0	0	87	6	3	0	5	110	0	3	0	28	0	7	0	0	249
800	0	0	0	0	0	0	104	4	3	0	6	107	0	4	0	34	0	11	1	0	274
815	0	0	0	0	0	0	88	16	1	0	5	112	0	1	0	42	0	12	1	0	278
830	0	0	0	0	0	0	102	13	5	0	7	105	0	1	0	33	0	7	3	0	276
845	0	0	0	0	0	0	99	20	10	0	5	94	0	1	0	24	0	9	1	0	263
900	0	0	0	0	0	0	101	15	6	0	8	97	0	3	0	14	0	7	2	0	253
Total	0	0	0	0	0	0	720	87	31	0	43	762	0	14	0	212	0	70	8	0	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	393	53	19	0	23	418	0	7	0	133	0	39	6	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	21	4	2	0	2	25	0	1	0	6	0	3	0	0	64
1130	0	0	0	0	0	0	34	6	2	0	4	25	0	4	0	14	0	8	1	0	98
1145	0	0	0	0	0	0	23	2	1	0	3	34	0	0	0	9	0	4	0	0	76
1200	0	0	0	0	0	0	28	4	0	0	6	26	0	2	0	7	0	4	0	0	77
1215	0	0	0	0	0	0	25	11	0	0	4	25	0	1	0	6	0	4	0	0	76
1230	0	0	0	0	0	0	33	8	2	0	4	24	0	1	0	6	0	1	0	0	79
1245	0	0	0	0	0	0	25	7	2	0	2	27	0	1	0	3	0	5	0	0	72
1300	0	0	0	0	0	0	35	8	2	0	4	18	0	2	0	6	0	2	0	0	77
1315	0	0	0	0	0	0	22	6	4	0	4	20	0	2	0	5	0	5	0	0	68
1330	0	0	0	0	0	0	34	7	4	0	3	27	0	0	0	3	0	5	0	0	83

Intersection count: 15-minute interval data

NINTH LINE/TERRAGAR BLVD NIN-TER-10-N ZArea: Z55

Counted On: 2013/02/12 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	28	2	4	0	2	27	0	2	1	6	0	4	0	0	75
1400	0	0	0	0	0	0	31	4	2	0	3	29	0	3	0	6	0	2	0	0	80
Offpeak Total	0	0	0	0	0	0	339	69	25	0	41	307	0	19	1	77	0	47	1	0	
Offpeak Hr Avg	0	0	0	0	0	0	113	23	8	0	14	102	0	6	0	26	0	16	0	0	

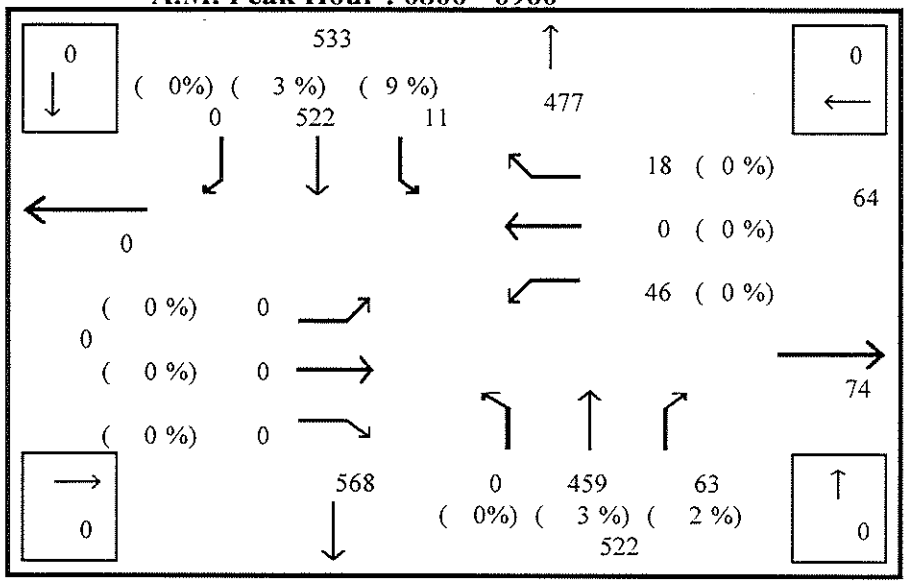
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	48	12	5	0	5	44	0	4	0	9	0	7	0	0	134
1530	0	0	0	0	0	0	61	16	5	0	9	47	0	4	0	14	0	10	0	0	166
1545	0	0	0	0	0	0	59	18	2	0	2	45	0	2	0	9	0	3	0	0	140
1600	0	0	0	0	0	0	84	19	7	0	9	82	0	6	0	14	0	7	5	0	233
1615	0	0	0	0	0	0	89	18	7	0	8	87	0	6	0	11	0	9	2	0	237
1630	0	0	0	0	0	0	105	16	3	0	14	103	0	4	0	15	0	7	0	0	267
1645	0	0	0	0	0	0	125	21	4	0	11	93	0	7	0	7	0	7	1	0	276
1700	0	0	0	0	0	0	126	16	1	0	5	111	0	5	0	11	0	8	0	0	283
1715	0	0	0	0	0	0	141	18	2	0	10	122	0	1	0	14	0	8	1	0	317
1730	0	0	0	0	0	0	128	15	1	0	8	115	0	3	0	10	0	4	0	0	284
1745	0	0	0	0	0	0	132	12	3	0	9	101	0	1	0	11	0	5	0	0	274
1800	0	0	0	0	0	0	101	19	2	0	0	95	0	3	0	11	0	4	0	0	235
Total	0	0	0	0	0	0	1199	200	42	0	90	1045	0	46	0	136	0	79	9	0	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1645 - 1730	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	520	70	8	0	34	441	0	16	0	42	0	27	2	0	0

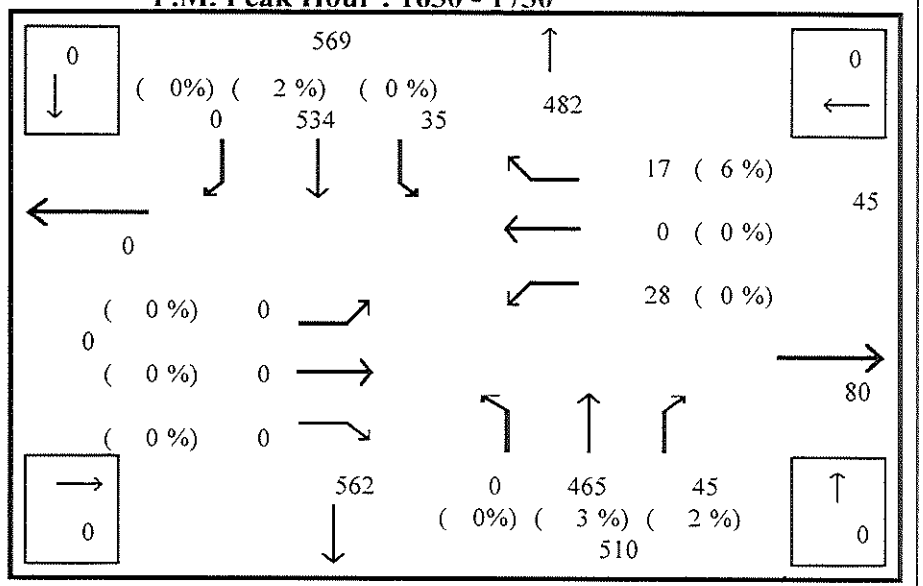
Count Date : Wednesday February 13 2013 2/10/2014

[HAZ-NIN-01-N] HAZELRIDGE RD/NINTH LINE

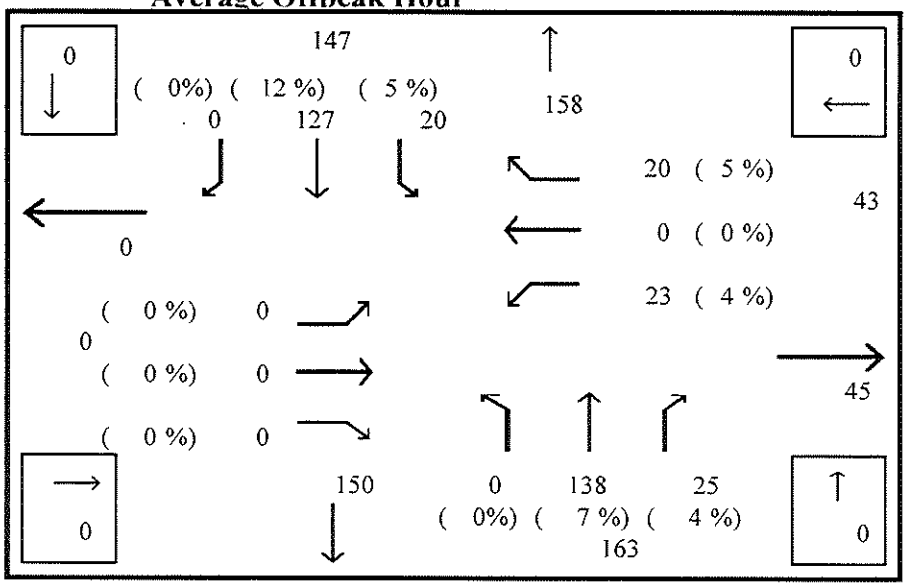
A.M. Peak Hour : 0800 - 0900



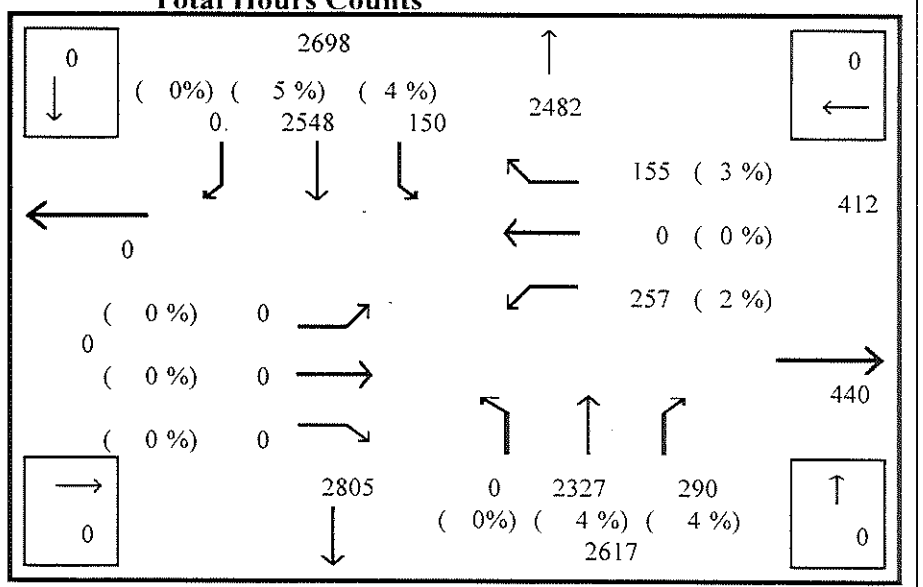
P.M. Peak Hour : 1630 - 1730



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

HAZELRIDGE RD/NINTH LINE HAZ-NIN-01-N ZArea: Z55

Counted On: 2013/02/13 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	46	2	1	0	1	59	0	1	0	8	0	4	0	0	122
730	0	0	0	0	0	0	81	5	2	0	0	108	0	1	0	8	0	6	0	0	211
745	0	0	0	0	0	0	93	7	4	0	0	119	0	0	0	21	0	12	0	0	256
800	0	0	0	0	0	0	101	11	0	0	0	120	0	2	0	10	0	5	0	0	249
815	0	0	0	0	0	0	102	14	0	0	2	144	0	4	0	14	0	4	0	0	284
830	0	0	0	0	0	0	123	22	6	0	2	133	0	7	0	14	0	7	0	0	314
845	0	0	0	0	0	0	114	11	5	0	3	117	0	3	0	8	0	2	0	0	263
900	0	0	0	0	0	0	104	15	6	0	3	112	0	3	0	10	0	5	0	0	258
Total	0	0	0	0	0	0	764	87	24	0	11	912	0	21	0	93	0	45	0	0	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
815 - 900	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	443	62	17	0	10	506	0	17	0	46	0	18	0	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	31	2	0	0	4	36	0	3	0	4	0	3	1	0	84
1130	0	0	0	0	0	0	38	8	4	0	4	27	0	3	0	7	0	3	0	0	94
1145	0	0	0	0	0	0	29	7	1	0	4	24	0	4	0	5	0	7	1	0	82
1200	0	0	0	0	0	0	36	5	1	0	4	24	0	2	0	6	0	10	0	0	88
1215	0	0	0	0	0	0	27	6	4	0	5	31	0	4	0	2	0	5	2	0	86
1230	0	0	0	0	0	0	31	5	3	0	4	25	0	3	0	6	0	3	1	0	81
1245	0	0	0	0	0	0	28	3	4	0	4	31	0	4	0	6	0	6	0	0	86
1300	0	0	0	0	0	0	35	8	3	0	7	31	0	6	0	8	0	4	0	0	102
1315	0	0	0	0	0	0	27	10	5	0	4	22	0	3	0	9	0	5	0	0	85
1330	0	0	0	0	0	0	34	6	4	0	7	28	0	4	0	4	0	5	0	0	92

Intersection count: 15-minute interval data

HAZELRIDGE RD/NINTH LINE HAZ-NIN-01-N ZArea: Z55

Counted On: 2013/02/13 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	35	10	5	0	8	32	0	5	0	7	0	5	0	0	107
1400	0	0	0	0	0	0	34	4	0	0	3	26	0	7	0	4	0	2	0	0	80
Offpeak Total	0	0	0	0	0	0	385	74	34	0	58	337	0	48	0	68	0	58	5	0	
Offpeak Hr Avg	0	0	0	0	0	0	128	25	11	0	19	112	0	16	0	23	0	19	2	0	

PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	63	12	7	0	9	56	0	4	0	12	0	9	0	0	172
1530	0	0	0	0	0	0	49	8	8	0	8	69	0	8	0	14	0	0	1	0	165
1545	0	0	0	0	0	0	53	10	4	0	8	66	0	9	0	11	0	8	0	0	169
1600	0	0	0	0	0	0	79	5	4	0	4	65	0	2	0	5	0	2	0	0	166
1615	0	0	0	0	0	0	97	14	5	0	0	89	0	6	0	8	0	5	2	0	226
1630	0	0	0	0	0	0	99	9	3	0	6	107	0	5	0	5	0	3	0	0	237
1645	0	0	0	0	0	0	111	14	2	0	9	122	0	1	0	6	0	4	0	0	269
1700	0	0	0	0	0	0	115	9	4	0	8	125	0	5	0	3	0	2	0	0	271
1715	0	0	0	0	0	0	110	12	4	0	8	132	0	4	0	12	0	5	1	0	288
1730	0	0	0	0	0	0	115	9	5	0	10	143	0	2	0	7	0	5	0	0	296
1745	0	0	0	0	0	0	95	9	0	0	3	107	0	2	0	3	0	4	0	0	223
1800	0	0	0	0	0	0	94	7	5	0	2	102	0	5	0	4	0	1	1	0	221
Total	0	0	0	0	0	0	1080	118	51	0	75	1183	0	53	0	90	0	48	5	0	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1645 - 1730	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	451	44	15	0	35	522	0	12	0	28	0	16	1	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis
www.accu-traffic.ca
Tel: 1-416-910-0171
Fax: 1-888-711-3125

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Mississauga
Site #: 1402000001
Intersection: Derry Rd & Ninth Line
TFR File #: 1
Count date: 25-Feb-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total: 1050
North Entering: 570
North Peds: 0
Peds Cross: ⋈

Heavys	0	2	1	3
Trucks	1	4	2	7
Cars	170	360	30	560
Totals	171	366	33	

Heavys	4
Trucks	7
Cars	469
Totals	480

East Leg Total: 2306
East Entering: 701
East Peds: 0
Peds Cross: ⧗

Ninth Line

Heavys	Trucks	Cars	Totals
8	21	878	907

Cars	Trucks	Heavys	Totals
30	0	0	30
503	19	7	529
136	1	5	142
669	20	12	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
1	5	171	177
2	13	1316	1331
0	3	117	120
3	21	1604	

Derry Rd

Cars	Trucks	Heavys	Totals
1582	17	6	1605

Ninth Line

Peds Cross: ⧗
West Peds: 0
West Entering: 1628
West Leg Total: 2535

Cars	613
Trucks	8
Heavys	7
Totals	628

Cars	205	268	236	709
Trucks	1	2	2	5
Heavys	1	3	3	7
Totals	207	273	241	

Peds Cross: ⋈
South Peds: 0
South Entering: 721
South Leg Total: 1349

Comments

Accu-Traffic Inc.
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Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Mississauga
Site #: 1402000001
Intersection: Derry Rd & Ninth Line
TFR File #: 1
Count date: 25-Feb-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total: 917
North Entering: 403
North Peds: 1
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	0	1	1
Cars	128	248	26	402
Totals	128	248	27	

Heavys	1
Trucks	1
Cars	512
Totals	514

East Leg Total: 2234
East Entering: 1582
East Peds: 0
Peds Cross: ⧗

Ninth Line

Heavys	Trucks	Cars	Totals
8	15	1607	1630

Cars	Trucks	Heavys	Totals
24	1	0	25
1374	14	7	1395
162	0	0	162
1560	15	7	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	139	139
8	8	451	467
0	2	198	200
8	10	788	

Derry Rd

Cars	Trucks	Heavys	Totals
634	9	9	652

Ninth Line

Peds Cross: ⧗
West Peds: 0
West Entering: 806
West Leg Total: 2436

Cars	608
Trucks	2
Heavys	0
Totals	610

Cars	105	349	157	611
Trucks	1	0	0	1
Heavys	1	1	1	3
Totals	107	350	158	

Peds Cross: ⋈
South Peds: 0
South Entering: 615
South Leg Total: 1225

Comments

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Accu-Traffic Inc.

Total Count Diagram

Municipality: Mississauga
Site #: 1402000001
Intersection: Derry Rd & Ninth Line
TFR File #: 1
Count date: 25-Feb-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total:	3529
North Entering:	1781
North Peds:	1
Peds Cross:	⋈

Heavys	2	6	1	9
Trucks	6	7	4	17
Cars	566	1092	97	1755
Totals	574	1105	102	

Heavys	7
Trucks	17
Cars	1724
Totals	1748

East Leg Total:	8211
East Entering:	4087
East Peds:	0
Peds Cross:	⧗

Ninth Line

Heavys	Trucks	Cars	Totals
36	59	4513	4608

Cars	Trucks	Heavys	Totals
108	2	0	110
3364	49	31	3444
525	2	6	533
3997	53	37	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
1	11	567	579
25	39	3293	3357
2	9	524	535
28	59	4384	

Derry Rd

Cars	Trucks	Heavys	Totals
4045	46	33	4124

Ninth Line

Peds Cross:	⧗
West Peds:	0
West Entering:	4471
West Leg Total:	9079

Cars	2141
Trucks	18
Heavys	14
Totals	2173

Cars	583	1049	655	2287
Trucks	4	4	3	11
Heavys	3	6	7	16
Totals	590	1059	665	

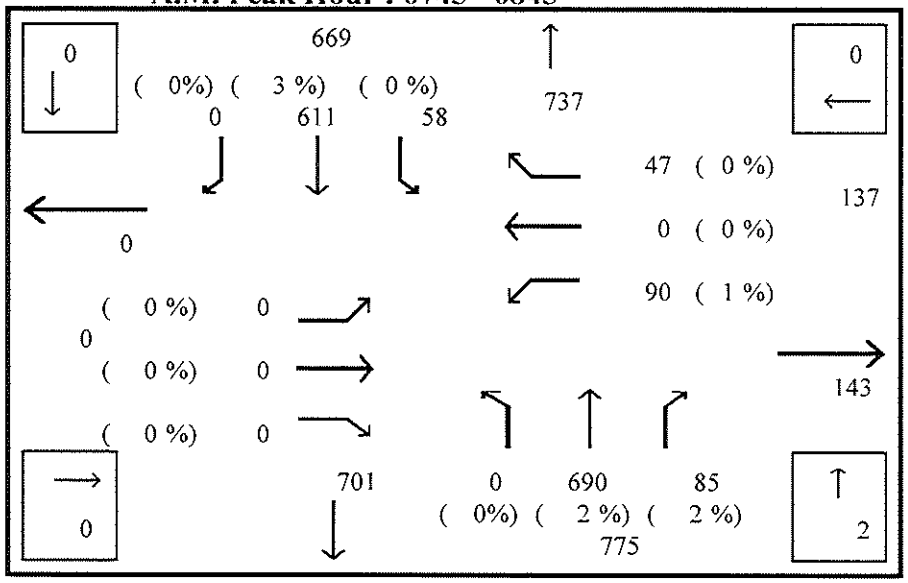
Peds Cross:	⋈
South Peds:	0
South Entering:	2314
South Leg Total:	4487

Comments

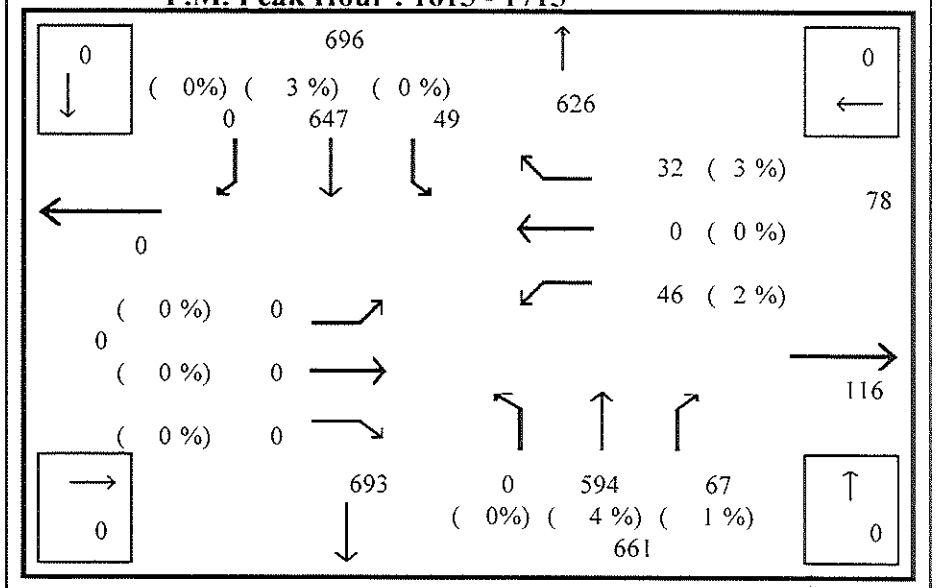
Count Date : Wednesday April 3 2013 2/10/2014

[BEA-NIN-01-N] BEACHAM ST/NINTH LINE

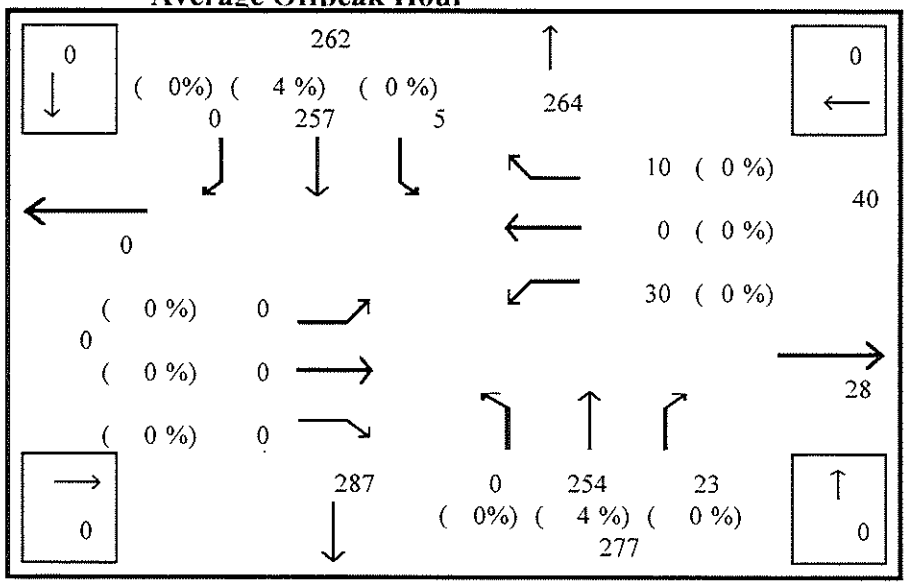
A.M. Peak Hour : 0745 - 0845



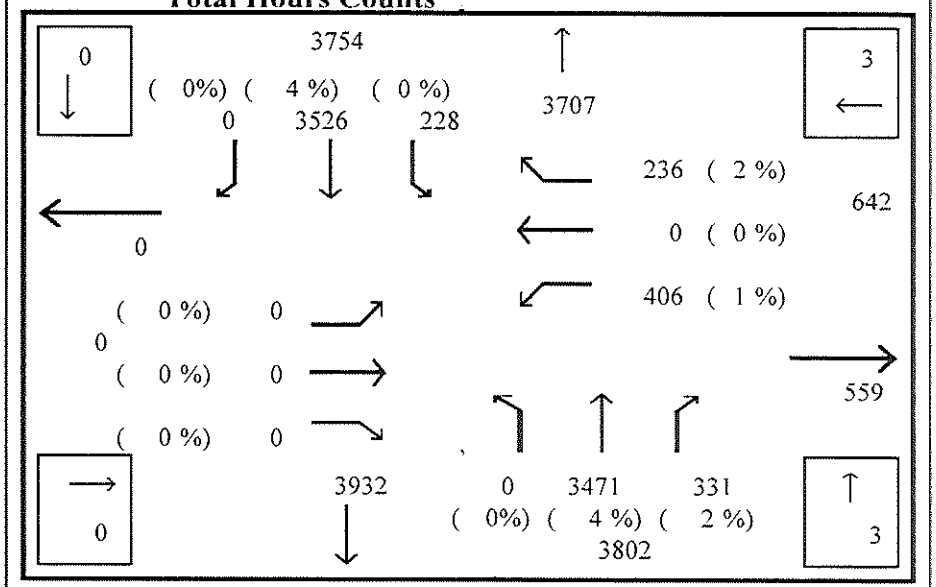
P.M. Peak Hour : 1615 - 1715



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

BEACHAM ST/NINTH LINE BEA-NIN-01-N ZArea: Z56

Counted On: 2013/04/03 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	75	4	7	0	2	115	0	4	0	15	0	9	1	0	232
730	0	0	0	0	0	0	113	3	1	0	2	130	0	3	0	16	0	8	1	0	277
745	0	0	0	0	0	0	142	3	5	0	3	141	0	1	0	30	0	7	0	0	332
800	0	0	0	0	0	0	161	14	1	0	9	145	0	3	0	29	0	8	1	2	371
815	0	0	0	0	0	0	163	35	2	0	20	151	0	0	0	23	0	10	0	0	404
830	0	0	0	0	0	0	181	19	7	0	19	141	0	6	0	22	0	17	0	0	412
845	0	0	0	0	0	0	169	15	8	0	10	157	0	8	0	15	0	12	0	0	394
900	0	0	0	0	0	0	162	11	8	0	11	149	0	6	0	14	0	8	0	0	369
Total	0	0	0	0	0	0	1166	104	39	0	76	1129	0	31	0	164	0	79	3	2	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	674	83	18	0	58	594	0	17	0	89	0	47	1	2	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	48	3	4	0	0	51	0	2	0	6	0	2	0	0	116
1130	0	0	0	0	0	0	54	2	3	0	0	59	0	1	0	11	0	2	0	0	132
1145	0	0	0	0	0	0	54	8	2	0	0	61	0	4	0	13	0	1	0	0	143
1200	0	0	0	0	0	0	50	7	2	0	1	51	0	1	0	12	0	2	0	0	126
1215	0	0	0	0	0	0	49	5	0	0	1	51	0	1	0	6	0	1	0	0	114
1230	0	0	0	0	0	0	71	7	4	0	0	63	0	4	0	5	0	3	0	0	157
1245	0	0	0	0	0	0	72	4	2	0	1	54	0	9	0	7	0	0	0	1	149
1300	0	0	0	0	0	0	68	9	1	0	0	67	0	3	0	5	0	2	0	0	155
1315	0	0	0	0	0	0	57	5	2	0	4	72	0	3	0	8	0	1	0	0	152
1330	0	0	0	0	0	0	64	8	3	0	4	75	0	3	0	8	0	7	1	0	173

Intersection count: 15-minute interval data

BEACHAM ST/NINTH LINE BEA-NIN-01-N ZArea: Z56

Counted On: 2013/04/03 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	73	3	4	0	2	68	0	0	0	4	0	6	0	0	160
1400	0	0	0	0	0	0	73	10	4	0	4	68	0	0	0	7	0	3	0	0	169
Offpeak Total	0	0	0	0	0	0	733	71	31	0	17	740	0	31	0	92	0	30	1	1	
Offpeak Hr Avg	0	0	0	0	0	0	244	24	10	0	6	247	0	10	0	31	0	10	0	0	

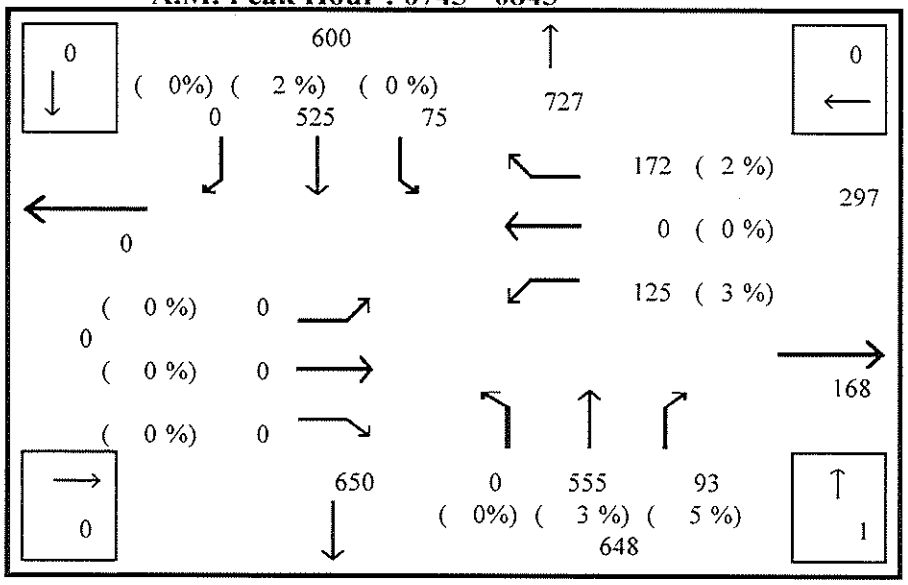
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	97	0	8	0	17	107	0	6	0	20	0	19	0	0	274
1530	0	0	0	0	0	0	102	15	8	0	8	94	0	6	0	16	0	18	0	0	267
1545	0	0	0	0	0	0	84	9	9	0	11	99	0	7	3	14	0	11	1	0	245
1600	0	0	0	0	0	0	107	12	10	0	10	115	0	9	0	14	0	9	2	0	288
1615	0	0	0	0	0	0	132	16	9	0	18	123	0	9	0	12	0	10	0	0	329
1630	0	0	0	0	0	0	117	17	7	0	11	134	0	4	0	15	0	10	1	0	316
1645	0	0	0	0	0	0	139	18	7	0	11	148	0	8	0	7	0	8	0	0	346
1700	0	0	0	0	0	0	154	16	5	0	10	163	0	4	0	15	0	4	1	0	372
1715	0	0	0	0	0	0	162	15	4	0	17	182	0	4	0	8	0	9	0	0	401
1730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1745	0	0	0	0	0	0	173	21	9	0	14	187	0	12	0	17	0	9	0	0	442
1800	0	0	0	0	0	0	165	9	2	0	8	173	0	1	0	6	0	16	1	0	381
Total	0	0	0	0	0	0	1432	148	78	0	135	1525	0	70	3	144	0	123	6	0	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1630 - 1715	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	572	66	23	0	49	627	0	20	0	45	0	31	2	0	0

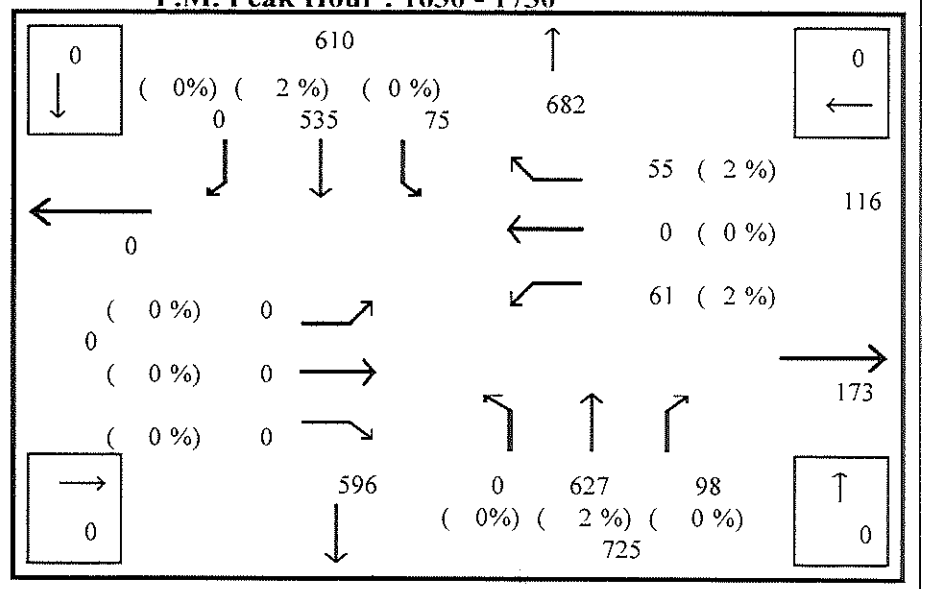
Count Date : Wednesday March 6 2013 2/10/2014

[DOU-NIN-01-N] DOUG LEAVENS BLVD/NINTH LINE

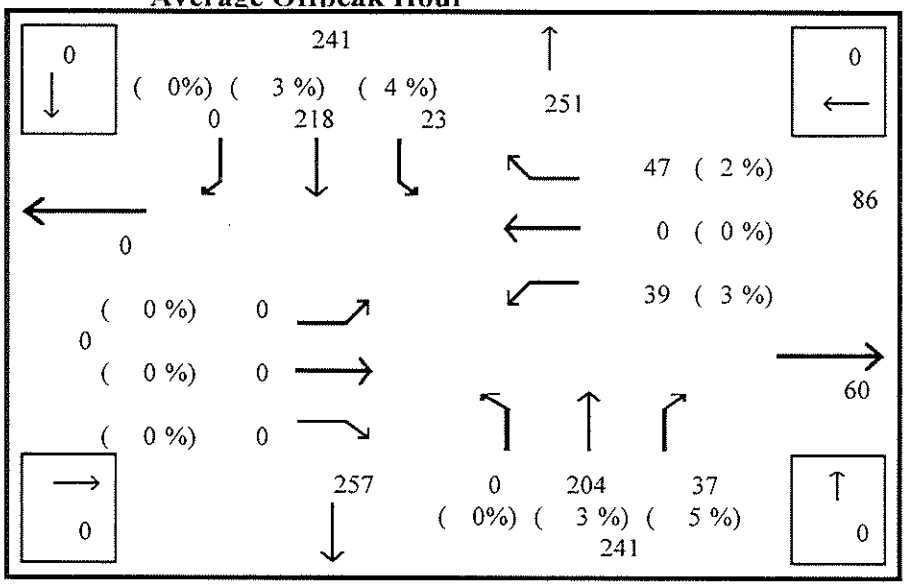
A.M. Peak Hour : 0745 - 0845



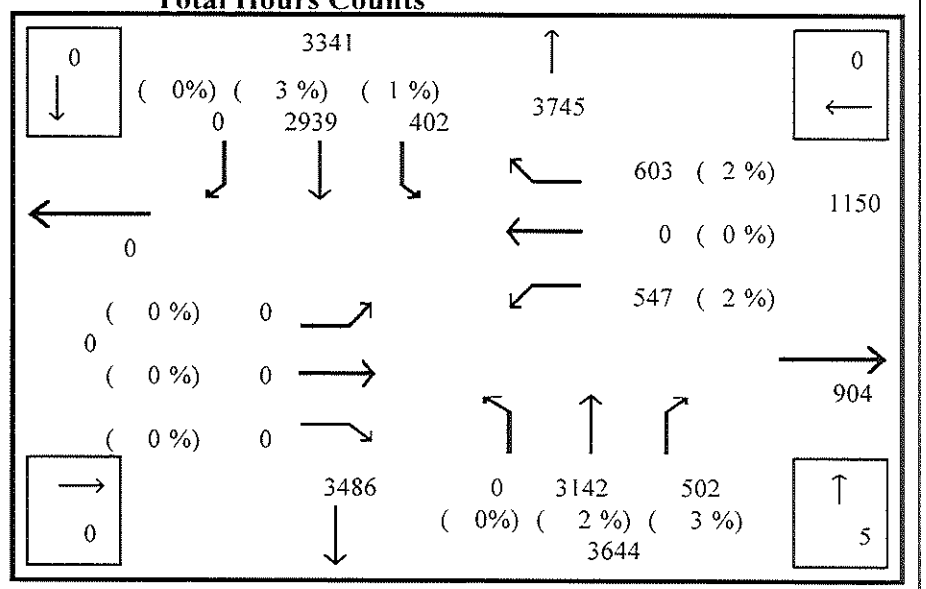
P.M. Peak Hour : 1630 - 1730



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

DOUG LEAVENS BLVD/NINTH LINE DOU-NIN-01-N ZArea: Z56

Counted On: 2013/03/06 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	53	2	4	0	3	73	0	6	0	7	0	10	1	0	159
730	0	0	0	0	0	0	86	5	3	0	14	105	0	0	0	24	0	25	3	0	265
745	0	0	0	0	0	0	128	12	6	0	12	150	0	2	0	27	0	21	1	0	359
800	0	0	0	0	0	0	131	24	3	0	20	112	0	1	0	32	0	40	1	0	364
815	0	0	0	0	0	0	147	27	3	0	28	129	0	1	0	22	0	39	4	0	400
830	0	0	0	0	0	0	138	15	8	0	12	148	0	4	0	29	0	41	0	0	395
845	0	0	0	0	0	0	122	22	8	0	15	128	0	2	0	38	0	48	3	1	386
900	0	0	0	0	0	0	125	17	4	0	19	130	0	7	0	31	0	29	1	0	363
Total	0	0	0	0	0	0	930	124	39	0	123	975	0	23	0	210	0	253	14	1	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	538	88	22	0	75	517	0	8	0	121	0	168	8	1	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	41	10	0	0	3	46	0	1	0	9	0	12	1	0	123
1130	0	0	0	0	0	0	51	9	5	0	5	48	0	4	0	14	0	12	0	0	148
1145	0	0	0	0	0	0	49	10	0	0	7	83	0	1	0	17	0	11	0	1	178
1200	0	0	0	0	0	0	48	7	0	0	3	68	0	1	0	5	0	8	0	1	140
1215	0	0	0	0	0	0	49	6	1	0	2	44	0	3	0	12	0	23	0	0	140
1230	0	0	0	0	0	0	70	7	5	0	4	67	0	3	0	8	0	14	0	0	178
1245	0	0	0	0	0	0	48	5	1	0	8	52	0	2	0	6	0	13	2	0	137
1300	0	0	0	0	0	0	49	12	3	0	3	43	0	1	0	9	0	10	0	0	130
1315	0	0	0	0	0	0	44	5	4	0	4	44	0	0	0	10	0	10	0	0	121
1330	0	0	0	0	0	0	47	11	2	0	10	49	0	1	0	6	0	8	0	0	134

Intersection count: 15-minute interval data

DOUG LEAVENS BLVD/NINTH LINE DOU-NIN-01-N ZArea: Z56

Counted On: 2013/03/06 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	47	10	2	0	9	45	0	1	0	8	0	7	0	0	129
1400	0	0	0	0	0	0	52	14	0	0	11	48	0	3	0	11	0	10	2	0	151
Offpeak Total	0	0	0	0	0	0	595	106	23	0	69	637	0	21	0	115	0	138	5	2	
Offpeak Hr Avg	0	0	0	0	0	0	198	35	8	0	23	212	0	7	0	38	0	46	2	1	

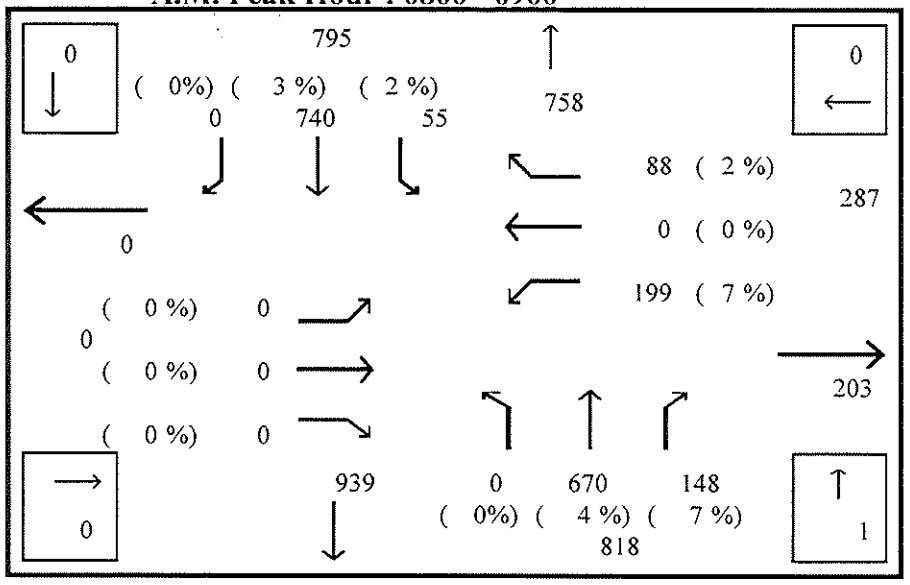
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	67	14	1	0	12	58	0	1	0	24	0	20	0	0	197
1530	0	0	0	0	0	0	119	23	4	0	9	92	0	7	0	30	0	25	1	0	310
1545	0	0	0	0	0	0	103	17	5	0	16	77	0	2	0	18	0	21	2	2	261
1600	0	0	0	0	0	0	95	20	1	0	16	89	0	3	0	19	0	24	0	0	267
1615	0	0	0	0	0	0	114	23	1	0	19	96	0	3	0	21	0	19	1	0	297
1630	0	0	0	0	0	0	136	21	4	0	23	111	0	2	0	15	0	14	0	0	326
1645	0	0	0	0	0	0	142	28	2	0	24	117	0	4	0	14	0	18	1	0	350
1700	0	0	0	0	0	0	161	25	2	0	17	132	0	4	0	19	0	11	1	0	372
1715	0	0	0	0	0	0	151	25	3	0	16	134	0	3	0	9	0	14	0	0	355
1730	0	0	0	0	0	0	163	20	3	0	18	139	0	2	0	18	0	11	0	0	374
1745	0	0	0	0	0	0	146	23	1	0	22	107	0	2	0	15	0	11	0	0	327
1800	0	0	0	0	0	0	144	19	1	0	15	99	0	2	0	9	0	10	0	0	299
Total	0	0	0	0	0	0	1541	258	28	0	207	1251	0	35	0	211	0	198	6	2	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1645 - 1730	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	617	98	10	0	75	522	0	13	0	60	0	54	2	0	0

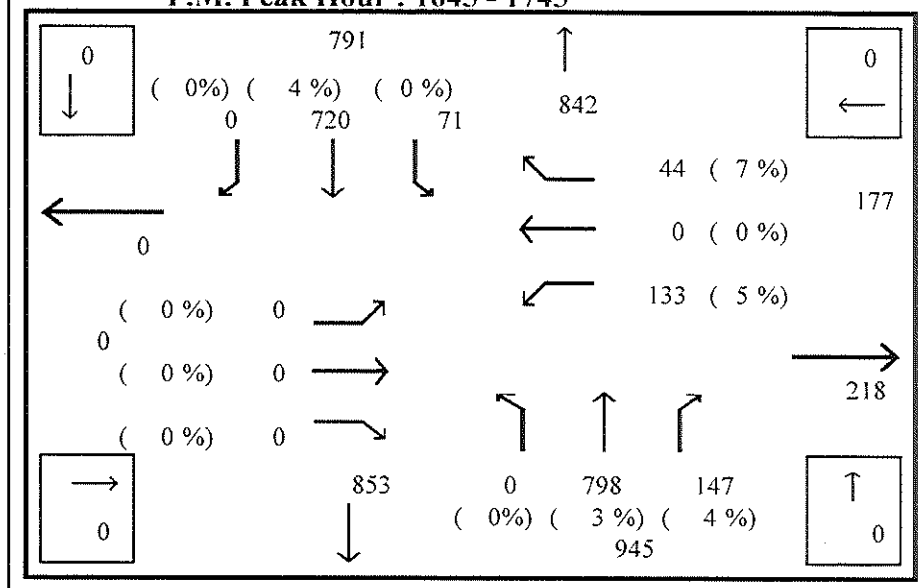
Count Date : Thursday April 4 2013 2/10/2014

[NIN-OSP-10-S] NINTH LINE/OSPREY BLVD

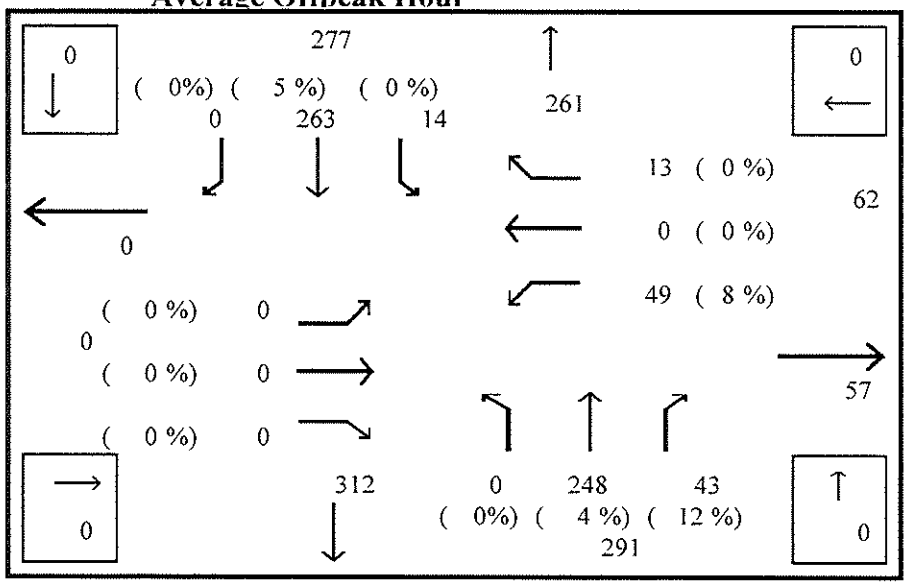
A.M. Peak Hour : 0800 - 0900



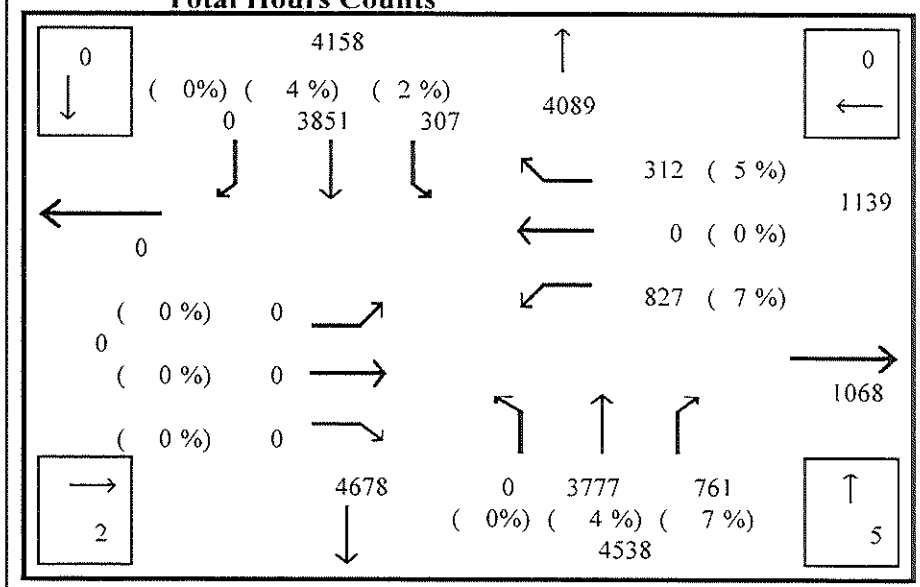
P.M. Peak Hour : 1645 - 1745



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

NINTH LINE/OSPREY BLVD NIN-OSP-10-S ZArea: Z56

Counted On: 2013/04/04 Traffic Control: Signal Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	95	5	5	0	7	83	0	5	0	15	0	11	1	0	227
730	0	0	0	0	0	0	104	8	6	0	4	124	0	10	0	32	0	7	0	0	295
745	0	0	0	0	0	0	125	8	2	0	8	187	0	1	0	41	0	14	2	0	388
800	0	0	0	0	0	0	135	10	5	0	3	163	0	4	0	36	0	14	2	3	372
815	0	0	0	0	0	0	176	24	6	0	17	198	0	5	0	50	0	26	4	0	506
830	0	0	0	0	0	0	154	36	8	0	11	174	0	1	0	47	0	20	2	1	453
845	0	0	0	0	0	0	159	39	13	0	11	177	0	6	0	45	0	21	5	0	476
900	0	0	0	0	0	0	156	38	9	0	15	172	0	8	0	43	0	19	5	0	465
Total	0	0	0	0	0	0	1104	168	54	0	76	1278	0	40	0	309	0	132	21	4	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
815 - 900	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	645	137	36	0	54	721	0	20	0	185	0	86	16	1	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	42	12	10	0	1	36	0	7	0	11	0	7	4	1	130
1130	0	0	0	0	0	0	53	5	0	1	4	68	0	5	0	10	0	4	0	0	149
1145	0	0	0	0	0	0	56	9	2	0	6	65	0	1	0	16	0	3	2	0	160
1200	0	0	0	0	0	0	64	6	4	0	3	68	0	4	0	9	0	1	0	0	159
1215	0	0	0	0	0	0	45	12	2	0	3	54	0	0	0	13	0	3	2	0	134
1230	0	0	0	0	0	0	67	8	6	1	4	59	0	1	0	17	0	5	0	0	167
1245	0	0	0	0	0	0	59	11	2	0	5	62	0	6	0	18	0	6	1	0	170
1300	0	0	0	0	0	0	63	11	2	0	5	78	0	2	0	11	0	1	0	0	173
1315	0	0	0	0	0	0	58	11	2	0	2	60	0	1	0	9	0	0	1	0	144
1330	0	0	0	0	0	0	69	9	5	0	2	73	0	4	0	7	0	2	1	0	172

Intersection count: 15-minute interval data

NINTH LINE/OSPREY BLVD NIN-OSP-10-S ZArea: Z56

Counted On: 2013/04/04 Traffic Control: Signal Report Date: 2014/02/11

1345	0	0	0	0	0	0	66	9	8	0	4	67	0	4	0	5	0	3	1	0	167
1400	0	0	0	0	0	0	72	11	4	0	5	66	0	0	0	11	0	4	1	0	174
Offpeak Total	0	0	0	0	0	0	714	114	47	2	44	756	0	35	0	137	0	39	13	1	
Offpeak Hr Avg	0	0	0	0	0	0	238	38	16	1	15	252	0	12	0	46	0	13	4	0	

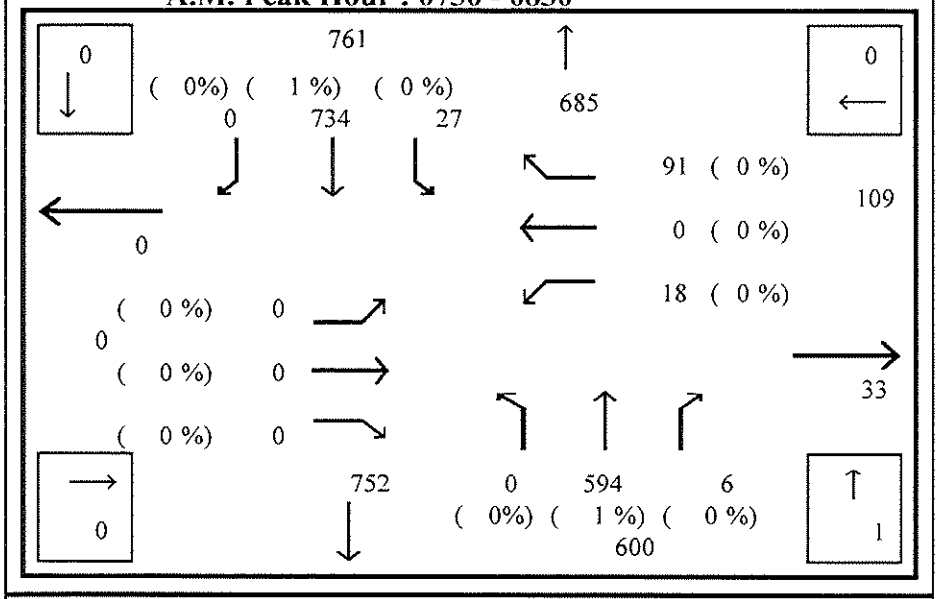
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	97	29	13	0	14	107	0	8	0	23	0	10	2	0	303
1530	0	0	0	0	0	0	114	34	11	0	4	102	0	16	0	31	0	2	8	0	322
1545	0	0	0	0	0	0	106	35	11	0	15	97	0	7	0	21	0	11	3	0	306
1600	0	0	0	0	0	0	88	22	13	0	9	92	0	8	0	3	0	9	5	0	249
1615	0	0	0	0	0	0	124	46	9	0	15	109	0	8	0	31	0	6	5	0	353
1630	0	0	0	0	0	0	153	42	10	0	20	143	0	4	0	42	0	17	4	0	435
1645	0	0	0	0	0	0	176	34	8	0	16	165	0	4	0	24	0	14	3	0	444
1700	0	0	0	0	0	0	201	27	8	0	22	182	0	4	0	38	0	14	5	0	501
1715	0	0	0	0	0	0	194	39	12	0	12	163	0	5	0	23	0	5	2	0	455
1730	0	0	0	0	0	0	191	37	6	0	21	175	0	7	0	32	0	10	1	0	480
1745	0	0	0	0	0	0	185	38	7	0	16	173	0	11	0	33	0	12	2	0	477
1800	0	0	0	0	0	0	172	41	4	0	18	154	0	3	0	22	0	15	0	0	429
Total	0	0	0	0	0	0	1801	424	112	0	182	1662	0	85	0	323	0	125	40	0	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1700 - 1745	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	771	141	33	0	71	693	0	27	0	126	0	41	10	0	0

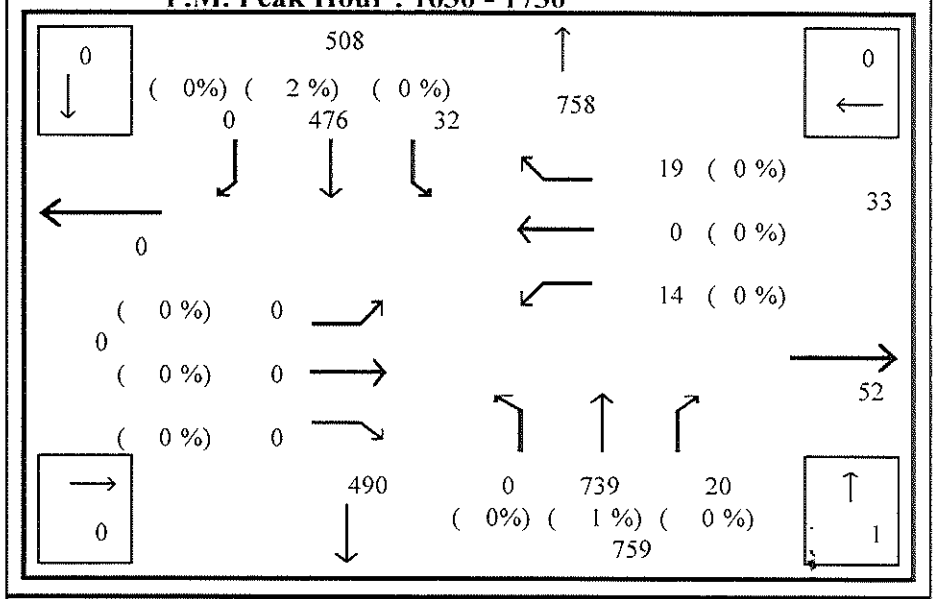
Count Date : Thursday April 11 2013 2/10/2014

[NIN-PAR-01-N] NINTH LINE/PARKGATE DR

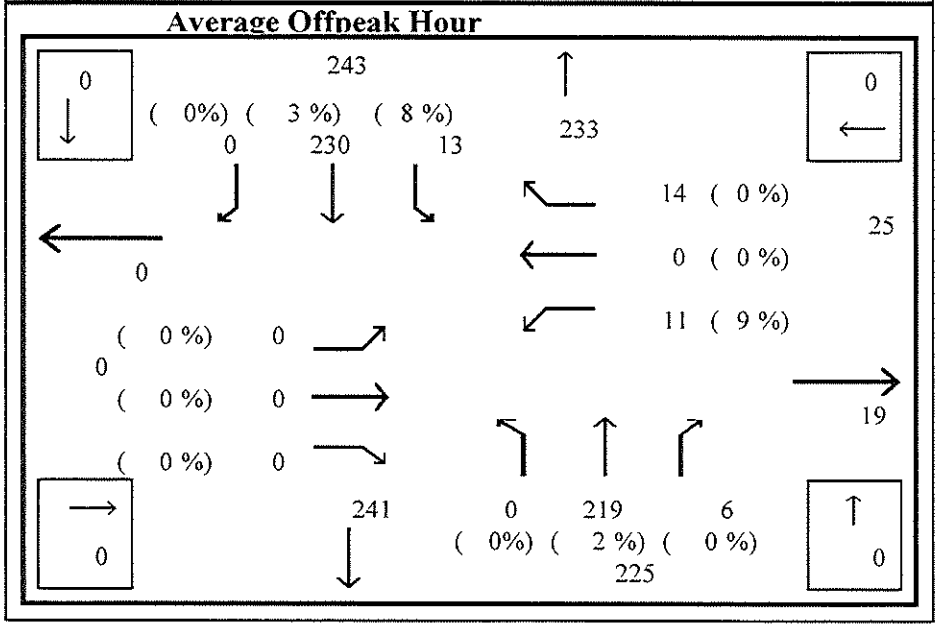
A.M. Peak Hour : 0730 - 0830



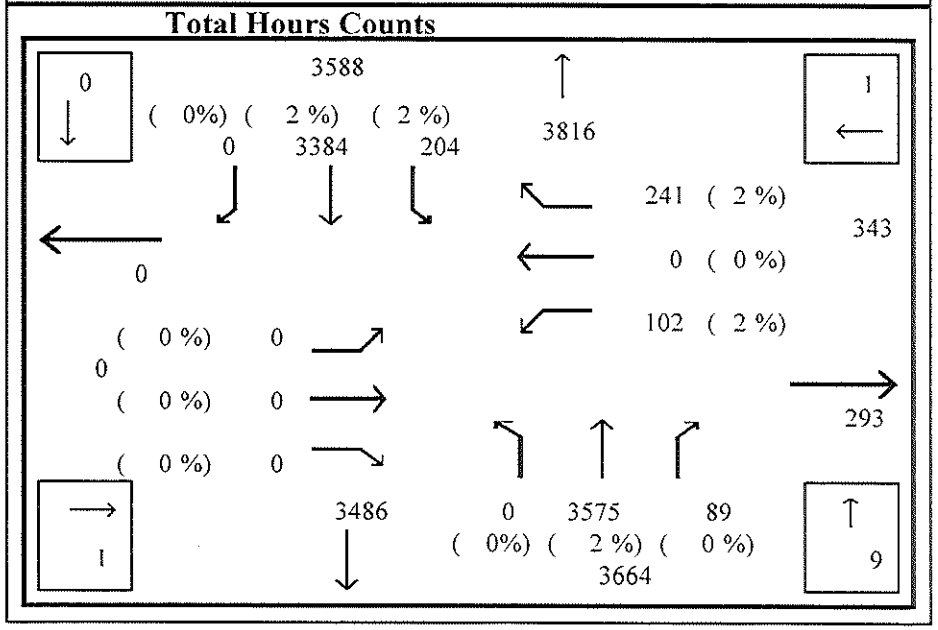
P.M. Peak Hour : 1630 - 1730



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

NINTH LINE/PARKGATE DR NIN-PAR-01-N ZArea: Z56

Counted On: 2013/04/11 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	64	1	1	0	1	143	0	2	0	3	0	7	0	0	222
730	0	0	0	0	0	0	101	0	1	0	0	153	0	0	0	3	0	10	0	0	268
745	0	0	0	0	0	0	134	2	1	0	3	218	0	3	0	5	0	12	0	0	378
800	0	0	0	0	0	0	143	1	3	0	3	163	0	0	0	1	0	17	0	0	331
815	0	0	0	0	0	0	154	1	1	0	2	159	0	3	0	7	0	29	0	0	356
830	0	0	0	0	0	0	156	2	2	0	19	186	0	2	0	5	0	33	0	1	405
845	0	0	0	0	0	0	120	2	2	0	14	189	0	3	0	6	0	17	0	0	353
900	0	0	0	0	0	0	102	3	4	0	4	140	0	2	0	5	0	5	1	0	266
Total	0	0	0	0	0	0	974	12	15	0	46	1351	0	15	0	35	0	130	1	1	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
745 - 830	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	587	6	7	0	27	726	0	8	0	18	0	91	0	1	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	47	2	1	0	3	69	0	1	0	2	0	4	0	0	129
1130	0	0	0	0	0	0	48	1	1	0	2	52	0	0	0	2	0	3	0	0	109
1145	0	0	0	0	0	0	46	2	0	0	2	58	0	6	0	3	0	1	0	1	118
1200	0	0	0	0	0	0	51	2	1	0	5	71	0	2	0	5	0	3	1	0	141
1215	0	0	0	0	0	0	44	1	2	1	3	56	0	3	1	1	0	8	0	1	118
1230	0	0	0	0	0	0	61	1	1	0	6	57	0	2	0	1	0	3	0	0	132
1245	0	0	0	0	0	0	66	2	2	0	3	63	0	2	0	4	0	3	0	0	145
1300	0	0	0	0	0	0	46	0	0	0	2	44	0	0	0	2	0	2	0	0	96
1315	0	0	0	0	0	0	49	2	3	0	4	48	0	1	0	5	0	3	1	0	116
1330	0	0	0	0	0	0	59	1	2	0	2	50	0	1	0	2	0	5	0	0	122

Intersection count: 15-minute interval data

NINTH LINE/PARKGATE DR NIN-PAR-01-N ZArea: Z56

Counted On: 2013/04/11 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	69	1	1	0	2	51	0	2	0	4	0	2	0	0	132
1400	0	0	0	0	0	0	55	3	2	0	5	51	0	3	0	0	0	6	1	0	126
Offpeak Total	0	0	0	0	0	0	641	18	16	1	39	670	0	23	1	31	0	43	3	2	
Offpeak Hr Avg	0	0	0	0	0	0	214	6	5	0	13	223	0	8	0	10	0	14	1	1	

PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	110	2	3	0	21	97	0	2	0	1	0	5	0	2	241
1530	0	0	0	0	0	0	136	4	2	0	15	107	0	2	0	4	0	10	0	1	280
1545	0	0	0	0	0	0	135	2	1	0	2	99	0	2	0	2	0	5	0	0	248
1600	0	0	0	0	0	0	131	5	1	0	9	88	0	3	0	2	0	5	0	1	244
1615	0	0	0	0	0	0	139	5	3	0	5	107	0	2	0	1	0	2	2	0	266
1630	0	0	0	0	0	0	162	7	6	0	6	113	0	2	0	3	0	8	0	1	307
1645	0	0	0	0	0	0	196	2	1	0	10	114	0	1	0	2	0	5	0	1	331
1700	0	0	0	0	0	0	175	5	1	0	9	111	0	5	0	7	0	4	0	0	317
1715	0	0	0	0	0	0	156	9	4	0	8	125	0	1	0	4	0	3	0	0	310
1730	0	0	0	0	0	0	206	4	0	0	5	118	0	1	0	1	0	7	0	0	342
1745	0	0	0	0	0	0	181	5	1	0	12	110	0	0	0	4	0	4	0	0	317
1800	0	0	0	0	0	0	179	9	0	0	12	118	0	2	0	3	0	6	0	0	329
Total	0	0	0	0	0	0	1906	59	23	0	114	1307	0	23	0	34	0	64	2	6	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1645 - 1730	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	733	20	6	0	32	468	0	8	0	14	0	19	0	1	0

MG8 ENG

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

Municipality: Region of Peel
Site #: 0000310242
Intersection: Britannia Road & Ninth Line
TFR File #: 7
Count date: 6-Jun-2013

Weather conditions:

Person(s) who counted:
BARRY

**** Signalized Intersection ****

Major Road: Britannia Road runs W/E

North Leg Total:	1558
North Entering:	881
North Peds:	0
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	3	20	5	28
Cars	110	688	55	853
Totals	113	708	60	

Cyclists	0
Trucks	23
Cars	654
Totals	677

East Leg Total:	1680
East Entering:	536
East Peds:	0
Peds Cross:	⧗

Ninth Line

Cyclists	Trucks	Cars	Totals
0	16	718	734

Britannia Road

Cars	Trucks	Cyclists	Totals
45	11	0	56
407	11	0	418
61	1	0	62
513	23	0	

N
W E
S

Cyclists	Trucks	Cars	Totals
0	1	83	84
0	12	956	968
0	4	152	156
0	17	1191	

Britannia Road

Cars	Trucks	Cyclists	Totals
1123	21	0	1144

Ninth Line

Peds Cross:	⧗
West Peds:	0
West Entering:	1208
West Leg Total:	1942

Cars	901
Trucks	25
Cyclists	0
Totals	926

Cars	201	526	112	839
Trucks	2	11	4	17
Cyclists	0	0	0	0
Totals	203	537	116	

Peds Cross:	⋈
South Peds:	0
South Entering:	856
South Leg Total:	1782

Comments

MG8 ENG

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 11:45:00
To: 12:45:00

Municipality: Region of Peel
Site #: 0000310242
Intersection: Britannia Road & Ninth Line
TFR File #: 7
Count date: 6-Jun-2013

Weather conditions:

Person(s) who counted:
BARRY

**** Signalized Intersection ****

Major Road: Britannia Road runs W/E

North Leg Total:	677
North Entering:	347
North Peds:	0
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	1	12	6	19
Cars	26	257	45	328
Totals	27	269	51	

Cyclists	1
Trucks	12
Cars	317
Totals	330

East Leg Total:	623
East Entering:	302
East Peds:	0
Peds Cross:	⧗

Ninth Line

Cyclists	Trucks	Cars	Totals
0	19	288	307

Cars	Trucks	Cyclists	Totals
52	5	1	58
190	17	0	207
34	3	0	37
276	25	1	

Britannia Road

N
W E
S

Cyclists	Trucks	Cars	Totals
0	0	32	32
0	23	197	220
0	1	48	49
0	24	277	

Britannia Road

Cars	Trucks	Cyclists	Totals
289	32	0	321

Ninth Line

Peds Cross:	⧗
West Peds:	0
West Entering:	301
West Leg Total:	608

Cars	339
Trucks	16
Cyclists	0
Totals	355

Cars	72	233	47	352
Trucks	1	7	3	11
Cyclists	0	0	0	0
Totals	73	240	50	

Peds Cross:	⋈
South Peds:	0
South Entering:	363
South Leg Total:	718

Comments

MG8 ENG

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 17:00:00
To: 18:00:00

Municipality: Region of Peel
Site #: 0000310242
Intersection: Britannia Road & Ninth Line
TFR File #: 7
Count date: 6-Jun-2013

Weather conditions:

Person(s) who counted:
BARRY

**** Signalized Intersection ****

Major Road: Britannia Road runs W/E

North Leg Total: 1695
North Entering: 701
North Peds: 0
Peds Cross: ⋈

Cyclists	0	0	0	0
Trucks	1	8	3	12
Cars	64	578	47	689
Totals	65	586	50	

Cyclists	0
Trucks	10
Cars	984
Totals	994

East Leg Total: 1556
East Entering: 959
East Peds: 0
Peds Cross: ⧗

Ninth Line

Cyclists	Trucks	Cars	Totals
0	11	1007	1018

Britannia Road

Cars	Trucks	Cyclists	Totals
81	2	0	83
775	7	0	782
94	0	0	94
950	9	0	

N
W E
S

Cyclists	Trucks	Cars	Totals
0	2	111	113
0	13	456	469
0	1	155	156
0	16	722	

Britannia Road

Cars	Trucks	Cyclists	Totals
581	16	0	597

Ninth Line

Peds Cross: ⧗
West Peds: 0
West Entering: 738
West Leg Total: 1756

Cars	827
Trucks	9
Cyclists	0
Totals	836

Cars	168	792	78	1038
Trucks	3	6	0	9
Cyclists	0	0	0	0
Totals	171	798	78	

Peds Cross: ⋈
South Peds: 0
South Entering: 1047
South Leg Total: 1883

Comments

MG8 ENG

Total Count Diagram

Municipality: Region of Peel
Site #: 0000310242
Intersection: Britannia Road & Ninth Line
TFR File #: 7
Count date: 6-Jun-2013

Weather conditions:

Person(s) who counted:
BARRY

**** Signalized Intersection ****

Major Road: Britannia Road runs W/E

North Leg Total:	8999
North Entering:	4406
North Peds:	1
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	13	109	34	156
Cars	442	3428	380	4250
Totals	455	3537	414	

Cyclists	7
Trucks	151
Cars	4435
Totals	4593

East Leg Total:	8684
East Entering:	4251
East Peds:	2
Peds Cross:	⧗

Ninth Line

Cyclists	Trucks	Cars	Totals
2	154	4637	4793

Britannia Road

Cars	Trucks	Cyclists	Totals
480	45	2	527
3136	114	0	3250
464	10	0	474
4080	169	2	

N
W E
S

Cyclists	Trucks	Cars	Totals
1	8	484	493
3	138	3301	3442
0	17	785	802
4	163	4570	

Britannia Road

Cars	Trucks	Cyclists	Totals
4242	187	4	4433

Ninth Line

Peds Cross:	⧗
West Peds:	0
West Entering:	4737
West Leg Total:	9530

Cars	4677
Trucks	136
Cyclists	0
Totals	4813

Cars	1059	3471	561	5091
Trucks	27	98	15	140
Cyclists	2	4	1	7
Totals	1088	3573	577	

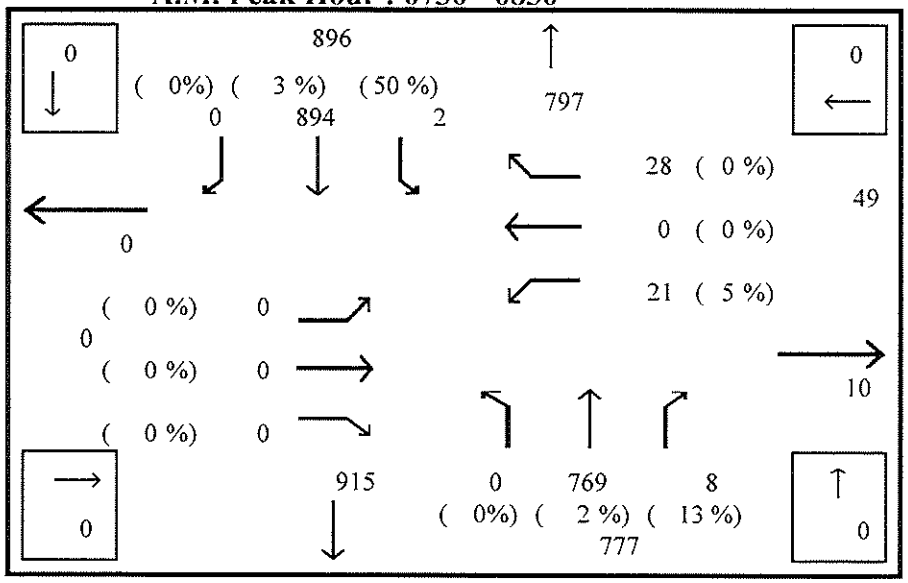
Peds Cross:	⋈
South Peds:	4
South Entering:	5238
South Leg Total:	10051

Comments

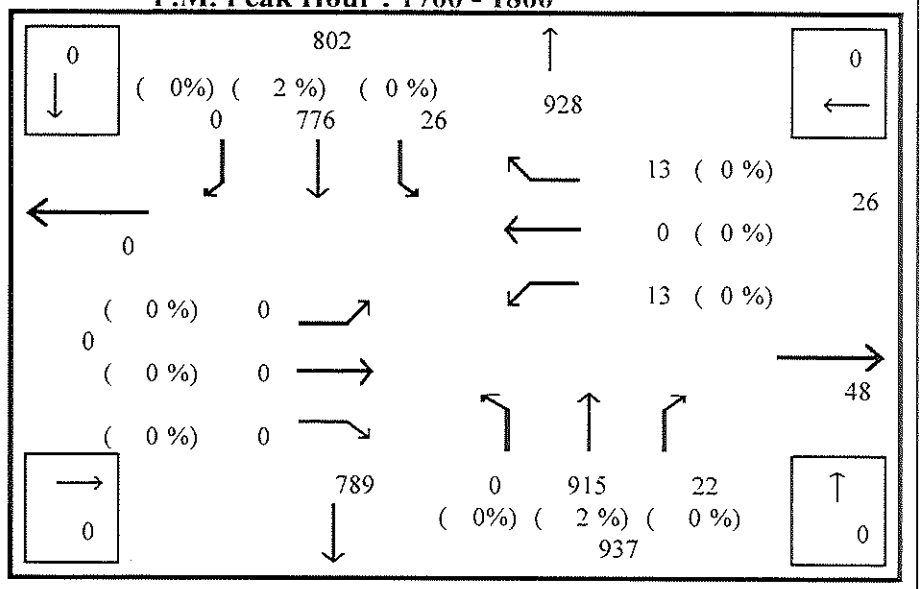
Count Date : Wednesday April 17 2013 2/10/2014

[FRE-NIN-01-N] FREEMAN TERR/NINTH LINE

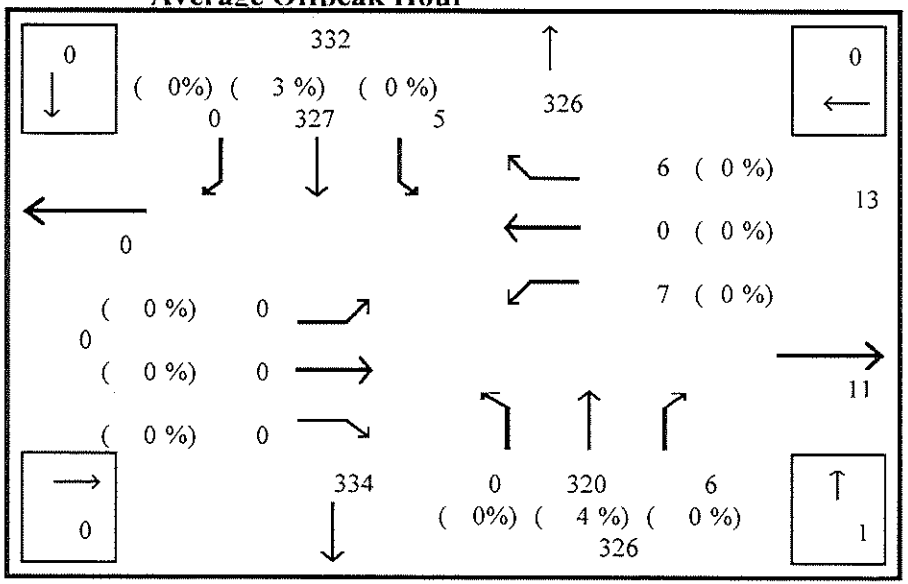
A.M. Peak Hour : 0730 - 0830



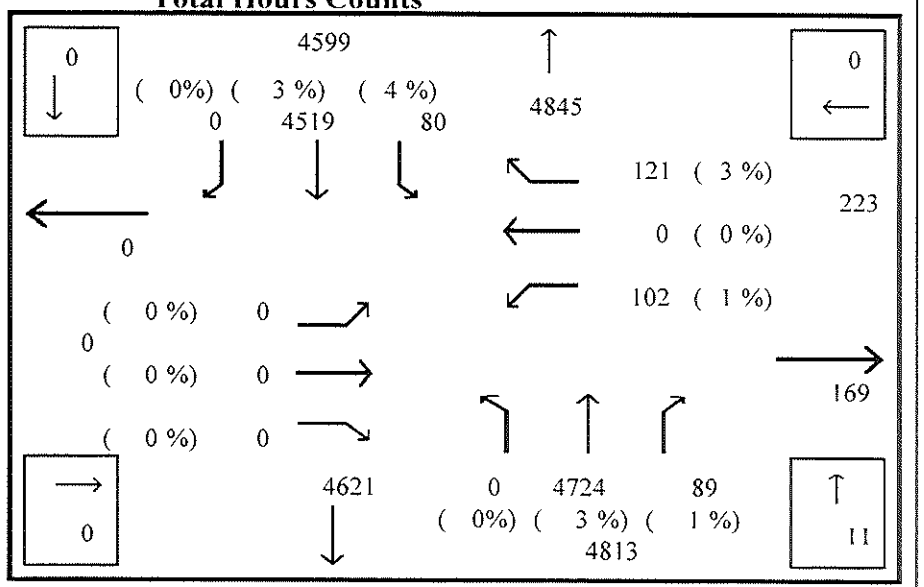
P.M. Peak Hour : 1700 - 1800



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

FREEMAN TERR/NINTH LINE FRE-NIN-01-N ZArea: Z57

Counted On: 2013/04/17 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	98	1	3	0	1	135	0	6	0	4	0	2	0	0	250
730	0	0	0	0	0	0	130	2	6	0	1	212	0	6	0	8	0	11	0	0	376
745	0	0	0	0	0	0	182	1	7	0	1	213	0	7	0	4	0	8	0	0	423
800	0	0	0	0	0	0	180	3	2	0	0	242	0	6	0	5	0	5	0	0	443
815	0	0	0	0	0	0	222	1	1	0	0	223	0	4	0	6	0	4	0	0	461
830	0	0	0	0	0	0	168	2	8	0	0	193	0	7	0	5	0	11	1	0	395
845	0	0	0	0	0	0	166	0	7	0	4	202	0	7	0	9	0	8	0	0	403
900	0	0	0	0	0	0	168	2	8	0	1	168	0	8	0	9	0	12	0	0	376
Total	0	0	0	0	0	0	1314	12	42	0	8	1588	0	51	0	50	0	61	1	0	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
745 - 830	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	752	7	18	0	1	871	0	24	0	20	0	28	1	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	72	3	4	0	1	67	0	6	0	2	0	4	0	0	159
1130	0	0	0	0	0	0	60	2	2	0	1	87	0	3	0	2	0	1	0	0	158
1145	0	0	0	0	0	0	83	3	4	0	0	84	0	2	0	2	0	0	0	0	178
1200	0	0	0	0	0	0	71	1	6	0	1	78	0	1	0	1	0	1	0	0	160
1215	0	0	0	0	0	0	76	2	1	0	1	70	0	5	0	0	0	3	0	0	158
1230	0	0	0	0	0	0	75	0	7	0	1	93	0	3	0	4	0	0	0	2	183
1245	0	0	0	0	0	0	75	2	3	0	3	96	0	0	0	3	0	0	0	0	182
1300	0	0	0	0	0	0	84	0	1	0	2	86	0	0	0	1	0	1	0	0	175
1315	0	0	0	0	0	0	94	3	3	0	0	70	0	2	0	3	0	1	0	0	176
1330	0	0	0	0	0	0	57	2	4	0	1	70	0	3	0	0	0	1	1	0	139

Intersection count: 15-minute interval data

FREEMAN TERR/NINTH LINE FRE-NIN-01-N ZArea: Z57

Counted On: 2013/04/17 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	74	1	2	0	1	73	0	3	0	3	0	5	0	2	162
1400	0	0	0	0	0	0	99	1	3	0	4	75	0	5	0	2	0	2	0	0	191
Offpeak Total	0	0	0	0	0	0	920	20	40	0	16	949	0	33	0	23	0	19	1	4	
Offpeak Hr Avg	0	0	0	0	0	0	307	7	13	0	5	316	0	11	0	8	0	6	0	1	

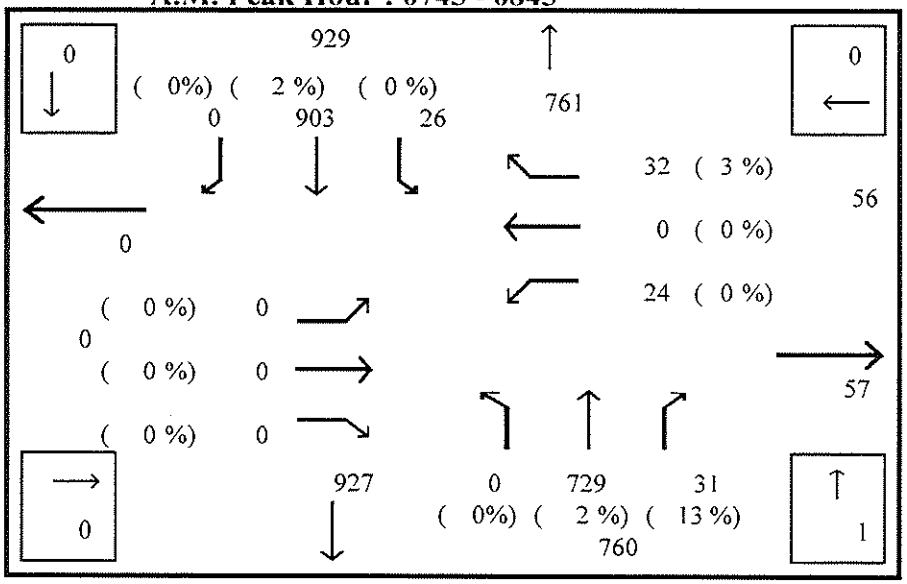
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	114	4	6	0	2	110	0	12	0	3	0	1	1	0	253
1530	0	0	0	0	0	0	166	5	8	0	2	123	0	4	0	0	0	1	1	0	310
1545	0	0	0	0	0	0	159	4	7	0	4	122	0	1	0	2	0	8	0	3	307
1600	0	0	0	0	0	0	174	6	5	0	4	129	0	2	0	1	0	5	0	2	326
1615	0	0	0	0	0	0	185	4	4	0	5	137	0	6	0	2	0	1	0	0	344
1630	0	0	0	0	0	0	194	2	10	0	2	137	0	6	0	3	0	3	1	0	358
1645	0	0	0	0	0	0	214	4	4	0	5	160	0	4	0	4	0	4	0	2	399
1700	0	0	0	0	0	0	241	5	3	0	3	167	0	5	0	0	0	1	0	0	425
1715	0	0	0	0	0	0	224	7	5	0	4	156	0	5	0	5	0	1	0	0	407
1730	0	0	0	0	0	0	242	5	1	0	5	198	0	1	0	1	0	6	0	0	459
1745	0	0	0	0	0	0	221	3	5	0	10	205	0	4	0	1	0	4	0	0	453
1800	0	0	0	0	0	0	213	7	4	0	7	203	0	4	0	6	0	2	0	0	446
Total	0	0	0	0	0	0	2347	56	62	0	53	1847	0	54	0	28	0	37	3	7	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1715 - 1800	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	900	22	15	0	26	762	0	14	0	13	0	13	0	0	0

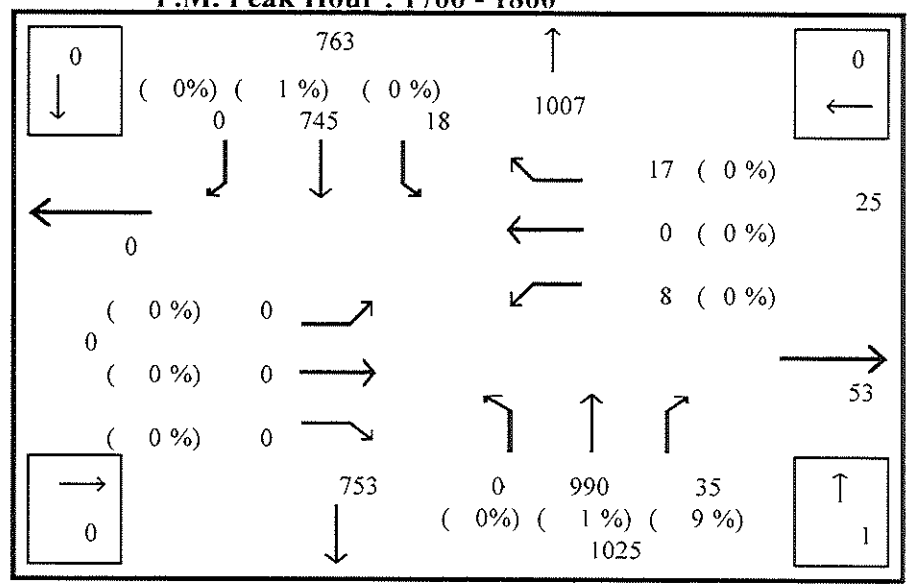
Count Date : Thursday April 18 2013 2/10/2014

[MCD-NIN-01-N] MCDOWELL DR/NINTH LINE

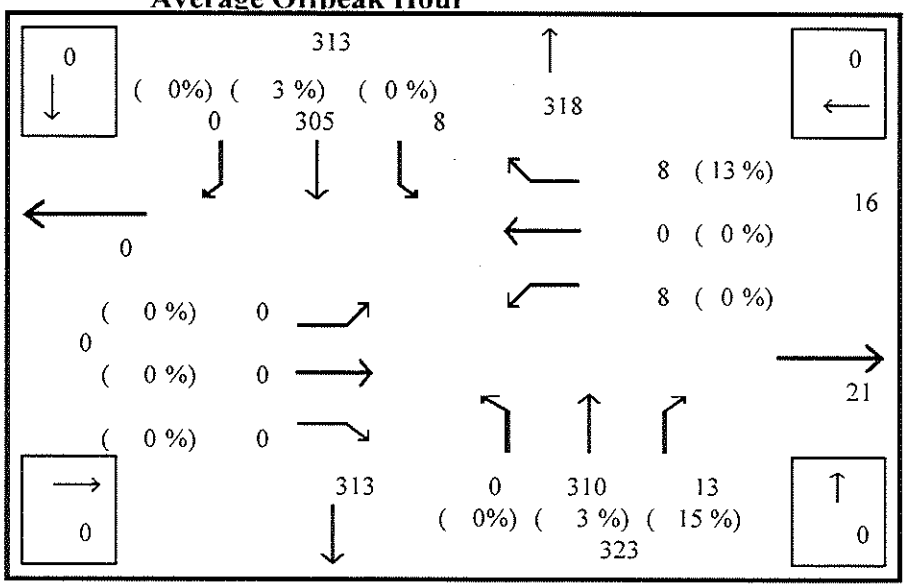
A.M. Peak Hour : 0745 - 0845



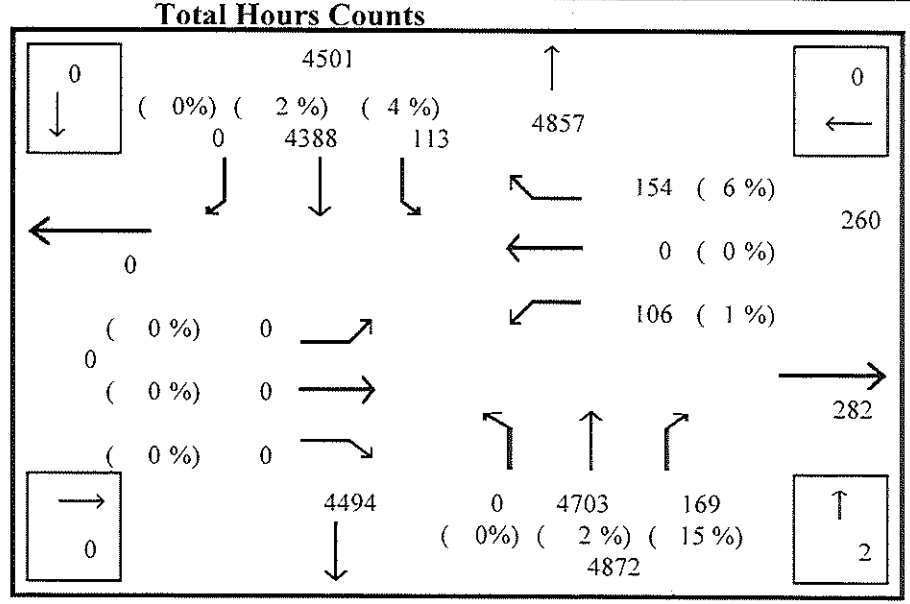
P.M. Peak Hour : 1700 - 1800



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

MCDOWELL DR/NINTH LINE MCD-NIN-01-N ZArea: Z57

Counted On: 2013/04/18 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	88	1	5	0	1	153	0	6	0	2	0	6	0	0	262
730	0	0	0	0	0	0	128	4	6	0	3	195	0	6	0	2	0	1	0	0	345
745	0	0	0	0	0	0	176	5	6	0	1	215	0	4	0	4	0	10	1	0	422
800	0	0	0	0	0	0	162	5	3	0	3	244	0	3	0	5	0	5	0	1	430
815	0	0	0	0	0	0	196	3	3	0	5	225	0	3	0	4	0	7	0	0	446
830	0	0	0	0	0	0	191	10	6	0	8	213	0	3	0	7	0	7	1	0	446
845	0	0	0	0	0	0	166	9	6	0	10	203	0	9	0	8	0	12	0	0	423
900	0	0	0	0	0	0	145	5	7	0	5	169	0	7	0	6	0	6	0	0	350
Total	0	0	0	0	0	0	1252	42	42	0	36	1617	0	41	0	38	0	54	2	1	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	715	27	18	0	26	885	0	18	0	24	0	31	1	1	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	65	0	2	0	0	73	0	4	0	4	0	1	0	0	149
1130	0	0	0	0	0	0	75	1	3	0	0	65	0	1	0	1	0	2	0	0	148
1145	0	0	0	0	0	0	69	3	5	0	1	85	0	2	0	1	0	2	0	0	168
1200	0	0	0	0	0	0	76	2	4	0	1	91	0	3	0	2	0	3	0	0	182
1215	0	0	0	0	0	0	73	5	2	0	4	71	0	1	0	2	0	1	0	0	159
1230	0	0	0	0	0	0	86	3	1	0	2	63	0	2	0	2	0	3	1	0	163
1245	0	0	0	0	0	0	72	5	2	0	2	61	0	0	0	2	0	2	1	0	147
1300	0	0	0	0	0	0	70	4	0	0	3	61	0	4	0	3	0	4	1	0	150
1315	0	0	0	0	0	0	73	0	4	0	3	80	0	1	0	2	0	1	0	0	164
1330	0	0	0	0	0	0	72	1	2	0	3	85	0	5	0	2	0	1	0	0	171

Intersection count: 15-minute interval data

MCDOWELL DR/NINTH LINE MCD-NIN-01-N ZArea: Z57

Counted On: 2013/04/18 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	83	6	2	0	3	77	0	2	0	1	0	4	0	0	178
1400	0	0	0	0	0	0	91	4	6	0	3	77	0	1	0	1	0	0	0	0	183
Offpeak Total	0	0	0	0	0	0	905	34	33	0	25	889	0	26	0	23	0	24	3	0	
Offpeak Hr Avg	0	0	0	0	0	0	302	11	11	0	8	296	0	9	0	8	0	8	1	0	

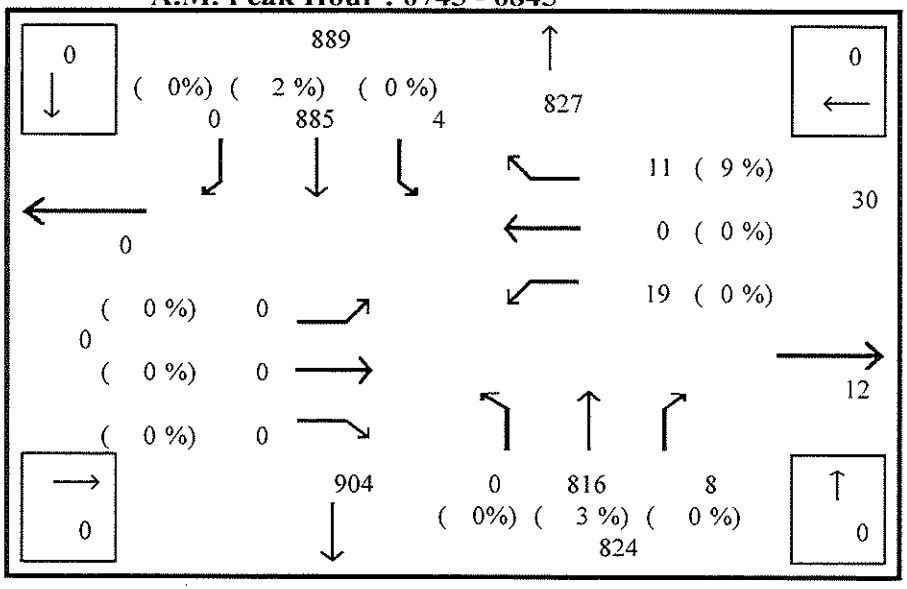
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	123	3	4	0	2	99	0	3	0	5	0	6	1	0	246
1530	0	0	0	0	0	0	152	7	3	0	4	122	0	2	0	7	0	5	0	0	302
1545	0	0	0	0	0	0	164	6	6	0	2	123	0	7	0	8	0	7	0	0	323
1600	0	0	0	0	0	0	182	2	5	0	5	127	0	5	0	6	0	11	0	0	343
1615	0	0	0	0	0	0	187	4	5	0	5	146	0	4	0	1	0	5	3	0	360
1630	0	0	0	0	0	0	212	3	6	0	4	143	0	2	0	3	0	3	1	0	377
1645	0	0	0	0	0	0	206	6	8	0	2	121	0	2	0	4	0	7	0	0	356
1700	0	0	0	0	0	0	238	4	3	0	6	162	0	6	0	2	0	6	0	0	427
1715	0	0	0	0	0	0	253	3	5	0	4	154	0	3	0	3	0	6	0	0	431
1730	0	0	0	0	0	0	244	6	2	0	5	182	0	2	0	1	0	5	0	1	447
1745	0	0	0	0	0	0	262	13	5	0	4	208	0	4	0	3	0	4	0	0	503
1800	0	0	0	0	0	0	219	10	3	0	5	190	0	2	0	1	0	2	0	0	432
Total	0	0	0	0	0	0	2442	67	55	0	48	1777	0	42	0	44	0	67	5	1	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1715 - 1800	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	978	32	15	0	18	734	0	11	0	8	0	17	0	1	0

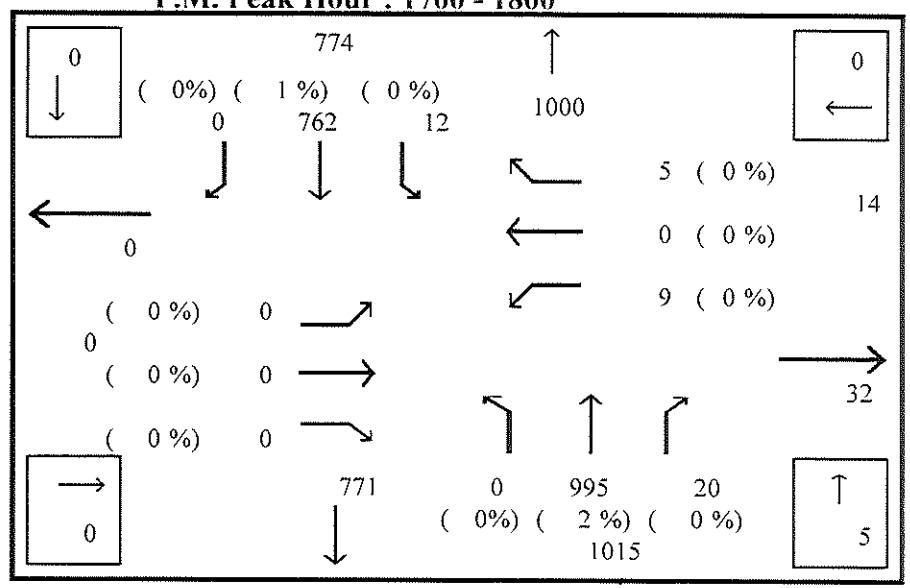
Count Date : Tuesday April 16 2013 2/10/2014

[LAC-NIN-01-N] LACMAN TR/NINTH LINE

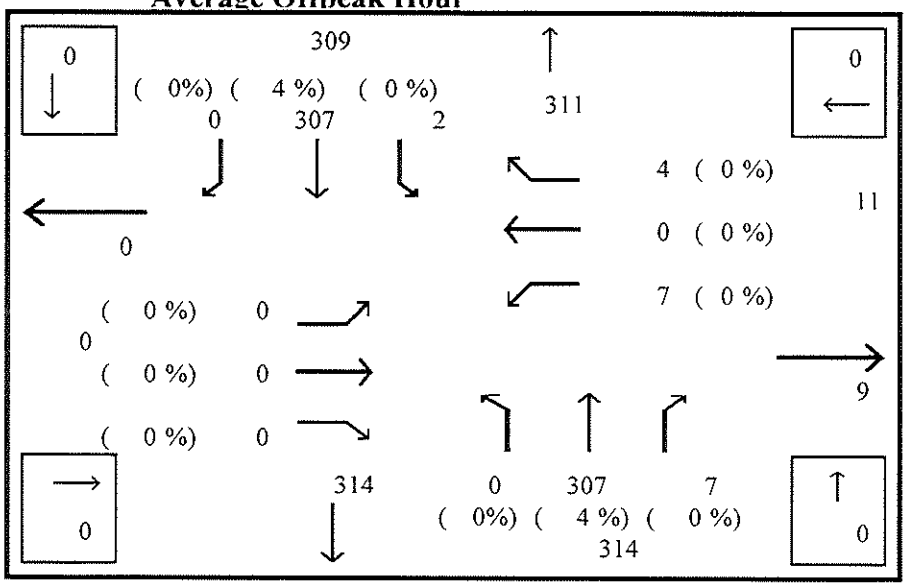
A.M. Peak Hour : 0745 - 0845



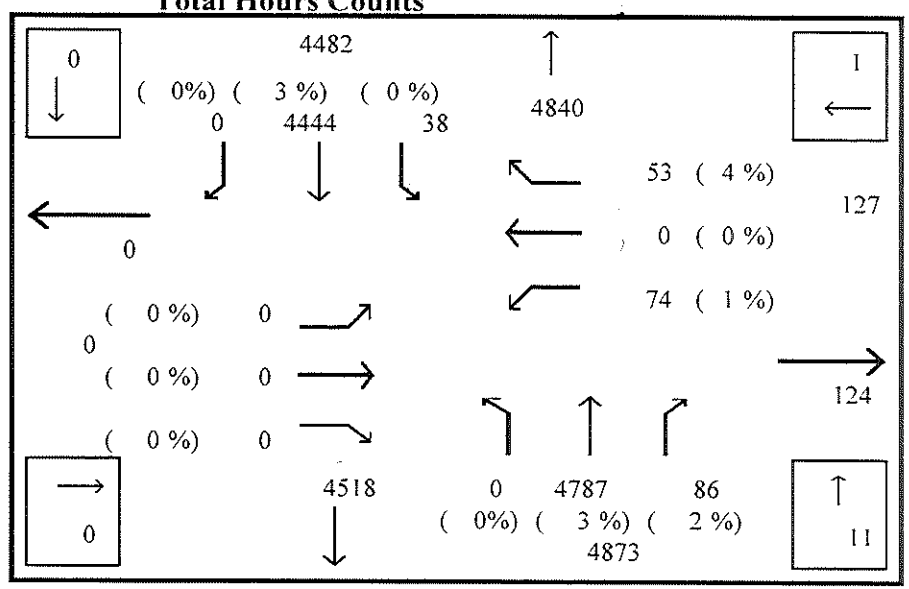
P.M. Peak Hour : 1700 - 1800



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

LACMAN TR/NINTH LINE LAC-NIN-01-N ZArea: Z57

Counted On: 2013/04/16 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	107	0	5	0	1	168	0	5	0	4	0	3	0	2	293
730	0	0	0	0	0	0	114	0	7	0	1	210	0	7	0	1	0	2	0	0	342
745	0	0	0	0	0	0	141	0	7	0	1	223	0	3	0	4	0	5	0	0	384
800	0	0	0	0	0	0	204	1	3	0	0	222	0	4	0	7	0	2	0	0	443
815	0	0	0	0	0	0	196	2	4	0	2	239	0	3	0	2	0	0	1	0	449
830	0	0	0	0	0	0	208	2	12	0	2	203	0	7	0	4	0	6	0	0	444
845	0	0	0	0	0	0	181	3	8	0	0	205	0	2	0	6	0	2	0	0	407
900	0	0	0	0	0	0	141	4	7	0	0	196	0	7	0	4	0	2	0	0	361
Total	0	0	0	0	0	0	1292	12	53	0	7	1666	0	38	0	32	0	22	1	2	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	789	8	27	0	4	869	0	16	0	19	0	10	1	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	70	0	2	0	0	69	0	5	0	2	0	1	0	0	149
1130	0	0	0	0	0	0	66	0	5	0	0	73	0	3	0	1	0	0	0	0	148
1145	0	0	0	0	0	0	86	2	2	0	1	77	0	0	0	2	0	2	0	0	172
1200	0	0	0	0	0	0	53	2	3	0	0	78	0	0	0	2	0	0	0	0	138
1215	0	0	0	0	0	0	71	1	2	0	1	83	0	7	0	2	0	0	0	0	167
1230	0	0	0	0	0	0	85	2	4	0	0	82	0	1	1	1	0	2	0	1	177
1245	0	0	0	0	0	0	66	3	7	0	2	75	0	1	0	3	0	1	0	0	158
1300	0	0	0	0	0	0	91	4	1	0	1	75	0	7	0	1	0	1	0	0	181
1315	0	0	0	0	0	0	66	3	3	0	0	61	0	2	0	1	0	2	0	0	138
1330	0	0	0	0	0	0	77	0	2	0	1	66	0	4	0	1	0	1	0	0	152

Intersection count: 15-minute interval data

LACMAN TR/NINTH LINE LAC-NIN-01-N ZArea: Z57

Counted On: 2013/04/16 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	59	0	4	0	0	82	0	2	0	3	0	0	0	0	150
1400	0	0	0	0	0	0	97	4	1	0	0	66	0	3	0	2	0	2	0	0	175
Offpeak Total	0	0	0	0	0	0	887	21	36	0	6	887	0	35	1	21	0	12	0	1	
Offpeak Hr Avg	0	0	0	0	0	0	296	7	12	0	2	296	0	12	0	7	0	4	0	0	

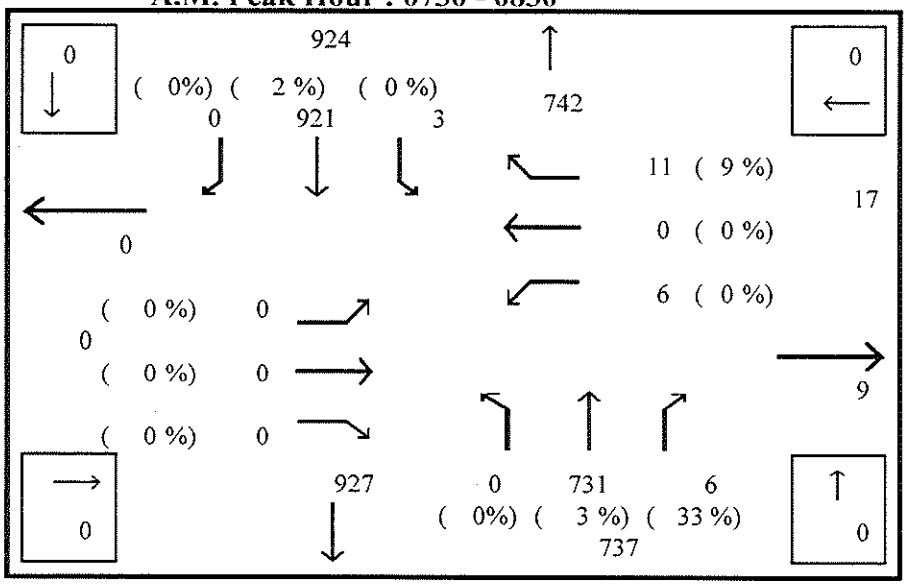
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	113	0	4	0	2	110	0	6	0	0	0	1	0	0	236
1530	0	0	0	0	0	0	168	3	7	0	2	137	0	5	0	3	0	4	0	2	329
1545	0	0	0	0	0	0	164	3	5	0	0	113	0	5	0	3	0	1	1	0	295
1600	0	0	0	0	0	0	177	5	4	0	4	112	0	7	0	0	0	1	0	0	310
1615	0	0	0	0	0	0	194	7	4	0	2	102	0	4	0	1	0	1	0	0	315
1630	0	0	0	0	0	0	225	4	6	0	0	140	0	2	0	1	0	1	1	0	380
1645	0	0	0	0	0	0	206	5	3	0	2	128	0	4	0	3	0	2	0	1	353
1700	0	0	0	0	0	0	244	4	2	0	1	176	0	5	0	0	0	1	0	0	433
1715	0	0	0	0	0	0	262	8	5	0	4	175	0	3	0	2	0	1	0	0	460
1730	0	0	0	0	0	0	256	5	3	0	8	185	0	4	0	3	0	1	0	5	465
1745	0	0	0	0	0	0	243	3	4	0	0	181	0	0	0	0	0	2	0	0	433
1800	0	0	0	0	0	0	219	4	3	0	0	210	0	4	0	4	0	1	0	0	445
Total	0	0	0	0	0	0	2471	51	50	0	25	1769	0	49	0	20	0	17	2	8	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1715 - 1800	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	980	20	15	0	12	751	0	11	0	9	0	5	0	5	0

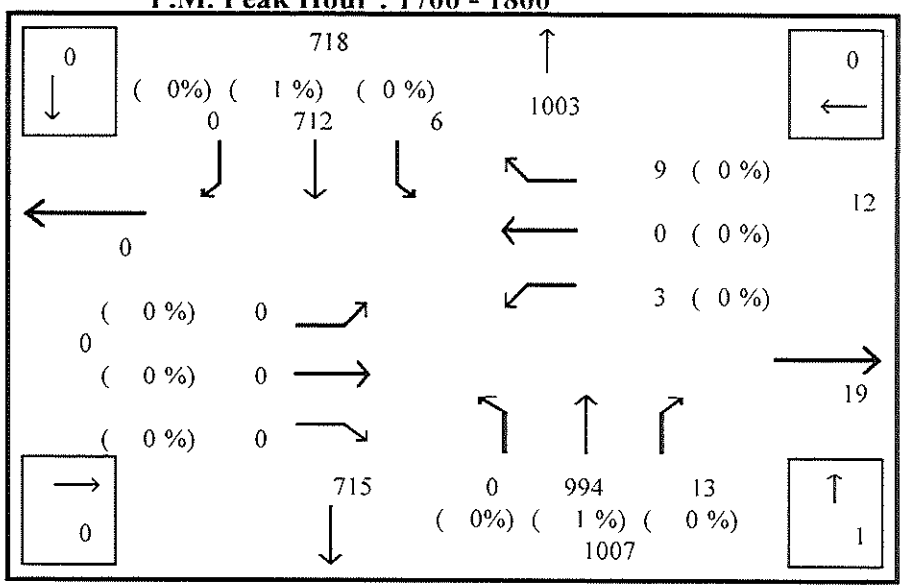
Count Date : Thursday April 25 2013 2/10/2014

[BRI-NIN-10-N] BRINWOOD GATE/NINTH LINE

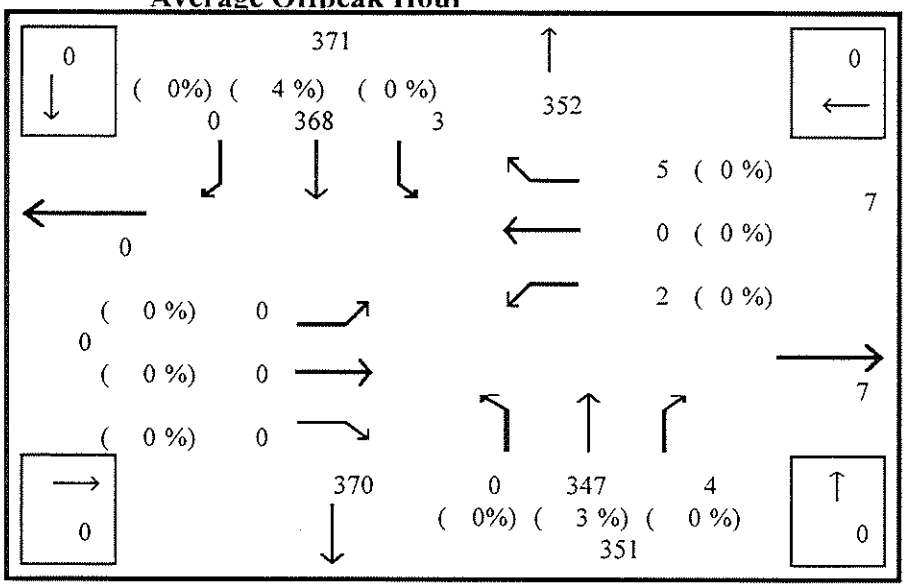
A.M. Peak Hour : 0730 - 0830



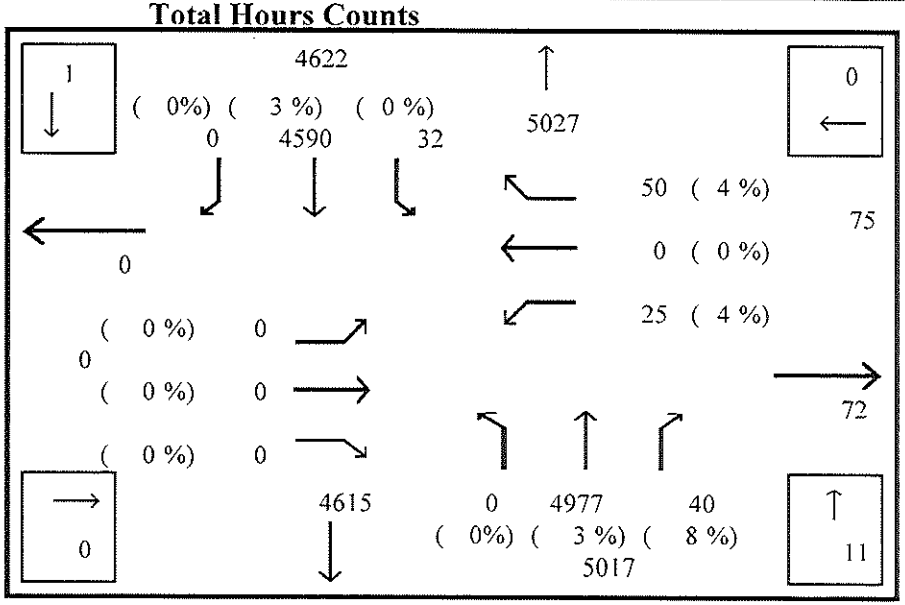
P.M. Peak Hour : 1700 - 1800



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

BRINWOOD GATE/NINTH LINE BRI-NIN-10-N ZArea: Z57

Counted On: 2013/04/25 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	82	0	10	0	0	151	0	6	0	0	0	1	0	0	250
730	0	0	0	0	0	0	110	0	4	0	0	218	0	10	0	1	0	6	0	0	349
745	0	0	0	0	0	0	188	0	8	0	1	230	0	4	0	4	0	3	0	0	438
800	0	0	0	0	0	0	144	2	3	0	0	212	0	4	0	1	0	1	1	0	368
815	0	0	0	0	0	0	199	2	4	0	1	254	0	6	0	0	0	5	0	0	471
830	0	0	0	0	0	0	180	0	7	0	1	206	0	5	0	1	0	1	0	0	401
845	0	0	0	0	0	0	195	1	3	0	0	231	0	3	0	1	0	2	1	0	437
900	0	0	0	0	0	0	156	0	5	0	0	181	0	11	0	0	0	1	0	1	354
Total	0	0	0	0	0	0	1254	5	44	0	3	1683	0	49	0	8	0	20	2	1	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
745 - 830	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	711	4	22	0	3	902	0	19	0	6	0	10	1	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	68	2	4	0	1	84	0	3	0	1	0	1	0	0	164
1130	0	0	0	0	0	0	83	0	1	0	1	79	0	3	0	1	0	1	1	0	170
1145	0	0	0	0	0	0	85	0	0	0	1	109	0	1	0	2	0	2	0	0	200
1200	0	0	0	0	0	0	71	2	6	0	0	89	0	2	0	0	0	1	0	0	171
1215	0	0	0	0	0	0	83	0	4	0	1	96	0	3	0	1	0	2	0	0	190
1230	0	0	0	0	0	0	106	0	4	0	0	76	0	5	0	1	0	1	0	0	193
1245	0	0	0	0	0	0	83	2	2	0	1	105	0	6	0	0	0	2	0	1	201
1300	0	0	0	0	0	0	85	2	2	0	1	90	0	4	0	0	0	2	0	0	186
1315	0	0	0	0	0	0	83	2	4	0	2	90	0	3	0	0	0	0	0	1	184
1330	0	0	0	0	0	0	84	2	2	0	0	85	0	5	0	1	0	0	0	0	179

Intersection count: 15-minute interval data

BRINWOOD GATE/NINTH LINE BRI-NIN-10-N ZArea: Z57

Counted On: 2013/04/25 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	82	0	4	0	0	80	0	4	0	0	0	2	0	0	172
1400	0	0	0	0	0	0	93	0	3	0	1	77	0	5	0	0	0	1	0	0	180
Offpeak Total	0	0	0	0	0	0	1006	12	36	0	9	1060	0	44	0	7	0	15	1	2	
Offpeak Hr Avg	0	0	0	0	0	0	335	4	12	0	3	353	0	15	0	2	0	5	0	1	

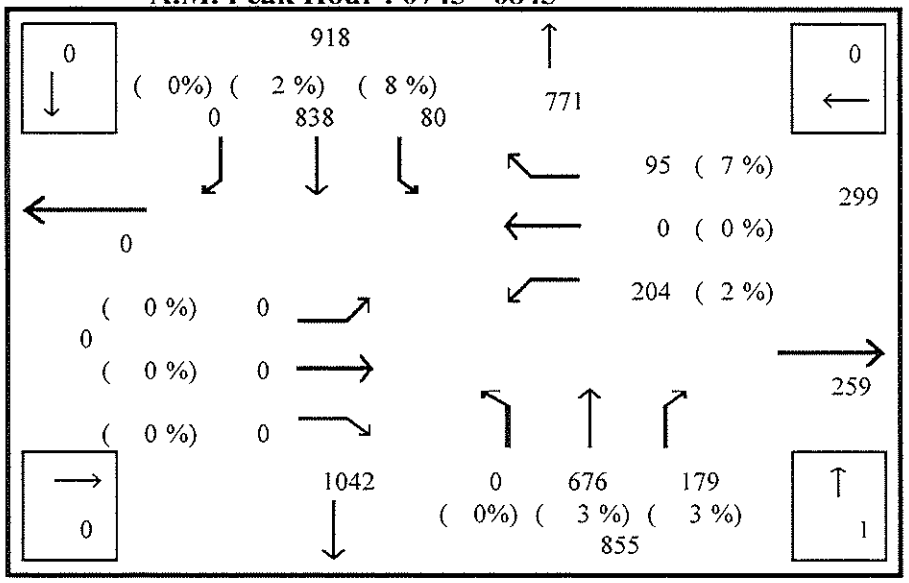
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	119	0	8	0	1	98	0	3	0	0	0	1	0	5	230
1530	0	0	0	0	0	0	178	1	7	0	2	111	0	4	0	0	0	1	0	1	304
1545	0	0	0	0	0	0	167	1	9	0	2	109	0	7	0	0	0	0	0	0	295
1600	0	0	0	0	0	0	197	2	11	0	2	126	0	7	0	3	0	0	0	0	348
1615	0	0	0	0	0	0	169	0	5	0	0	124	0	3	0	0	0	2	0	1	303
1630	0	0	0	0	1	0	250	1	5	0	2	146	0	4	0	1	0	0	0	0	409
1645	0	0	0	0	0	0	224	1	9	0	1	155	0	5	0	1	0	0	0	0	396
1700	0	0	0	0	0	0	280	1	8	0	4	137	0	3	0	1	0	0	0	0	434
1715	0	0	0	0	0	0	236	1	4	0	0	145	0	2	0	1	0	1	0	0	390
1730	0	0	0	0	0	0	247	4	1	0	2	185	0	3	0	1	0	2	0	0	445
1745	0	0	0	0	0	0	255	4	3	0	3	196	0	1	0	0	0	3	0	0	465
1800	0	0	0	0	0	0	244	4	4	0	1	179	0	1	0	1	0	3	0	1	437
Total	0	0	0	0	1	0	2566	20	74	0	20	1711	0	43	0	9	0	13	0	8	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1715 - 1800	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	982	13	12	0	6	705	0	7	0	3	0	9	0	1	0

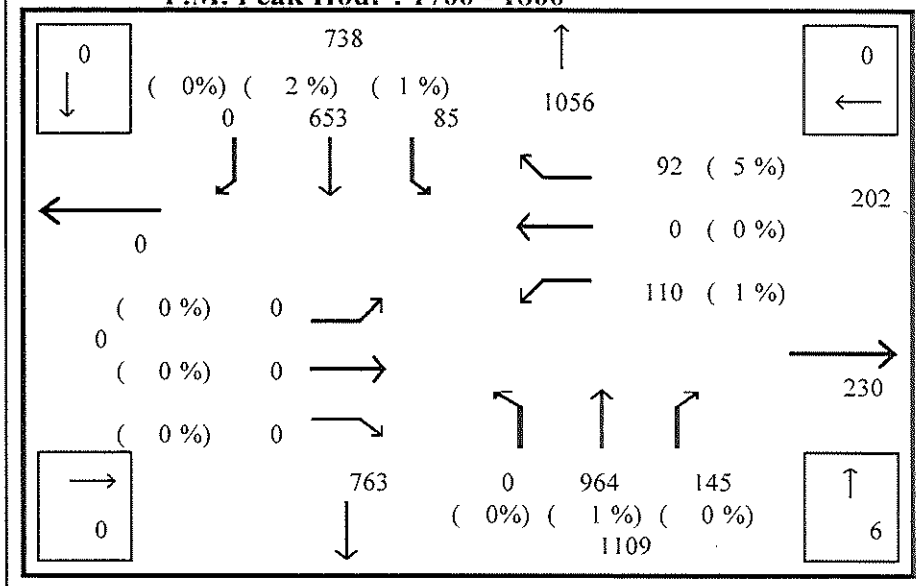
Count Date : Thursday May 2 2013 2/10/2014

[NIN-THO-01-S] NINTH LINE/THOMAS ST

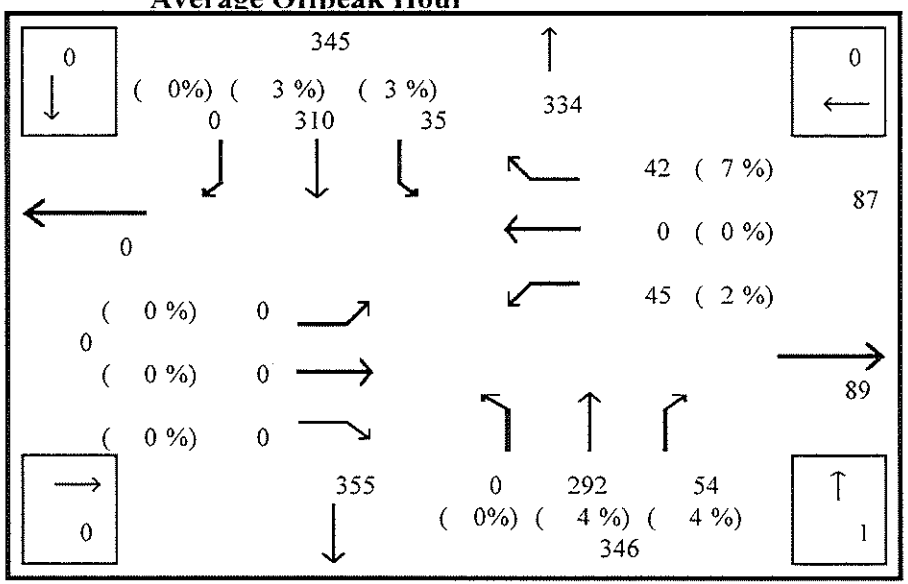
A.M. Peak Hour : 0745 - 0845



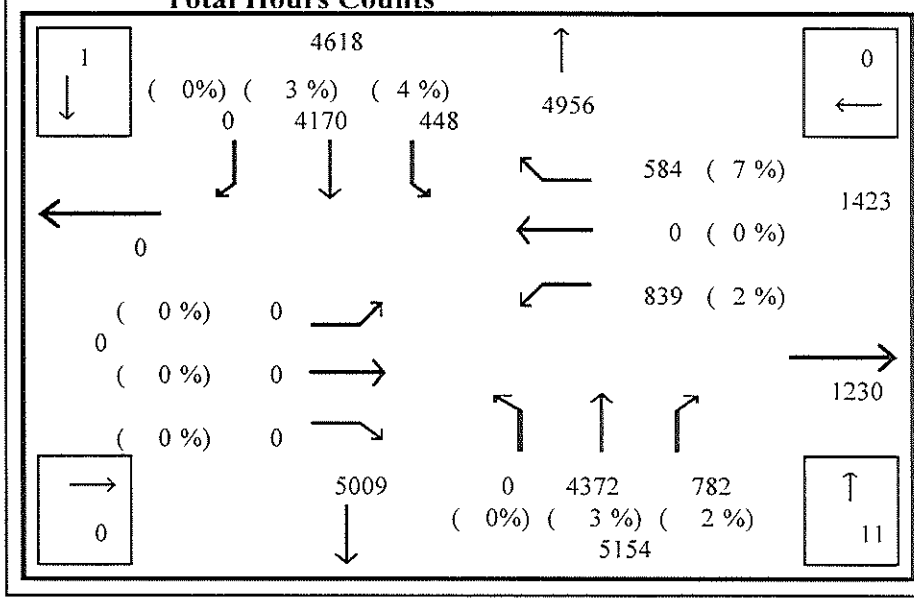
P.M. Peak Hour : 1700 - 1800



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

NINTH LINE/THOMAS ST | NIN-THO-01-S | ZArea: Z57

Counted On: 2013/05/02 | Traffic Control: Signal | Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	75	12	5	0	5	160	0	5	0	23	0	14	3	0	302
730	0	0	0	0	0	0	88	24	3	0	16	204	0	4	0	24	0	15	2	0	380
745	0	0	0	0	0	0	144	25	5	0	18	218	0	7	0	50	0	24	5	1	496
800	0	0	0	0	0	0	138	30	3	0	21	186	0	4	0	44	0	20	4	0	450
815	0	0	0	0	0	0	180	43	6	0	23	233	0	3	0	54	0	18	0	1	560
830	0	0	0	0	0	0	159	58	9	0	15	197	0	5	0	57	0	29	5	0	534
845	0	0	0	0	0	0	177	43	9	0	15	209	0	7	0	44	0	21	3	0	528
900	0	0	0	0	0	0	127	25	7	0	19	151	0	5	0	47	0	18	3	0	402
Total	0	0	0	0	0	0	1088	260	47	0	132	1558	0	40	0	343	0	159	25	2	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	654	174	27	0	74	825	0	19	0	199	0	88	12	1	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	57	10	1	0	7	81	0	5	0	15	0	7	0	0	183
1130	0	0	0	0	0	0	72	12	3	0	4	81	0	2	0	10	0	11	2	0	197
1145	0	0	0	0	0	0	89	17	3	0	8	71	0	2	0	19	0	14	0	0	223
1200	0	0	0	0	0	0	68	15	6	0	7	62	0	4	0	8	0	4	2	0	176
1215	0	0	0	0	0	0	64	13	3	0	9	83	0	0	0	11	0	12	0	0	195
1230	0	0	0	0	0	0	70	7	4	0	5	77	0	5	0	14	0	7	0	0	189
1245	0	0	0	0	0	0	75	13	4	0	11	82	0	0	0	12	0	13	0	0	210
1300	0	0	0	0	1	0	68	9	3	0	7	72	0	4	0	3	0	5	1	0	172
1315	0	0	0	0	0	0	77	13	3	0	9	79	0	2	0	12	0	15	0	0	210
1330	0	0	0	0	0	0	72	15	5	0	11	72	0	2	0	12	0	10	2	0	201

Intersection count: 15-minute interval data

NINTH LINE/THOMAS ST NIN-THO-01-S ZArea: Z57

Counted On: 2013/05/02 Traffic Control: Signal Report Date: 2014/02/11

1345	0	0	0	0	0	0	63	19	0	0	12	68	0	2	0	9	0	10	1	0	184
1400	0	0	0	0	0	0	66	14	5	0	11	75	0	5	0	8	0	12	3	3	199
Offpeak Total	0	0	0	0	1	0	841	157	40	0	101	903	0	33	0	133	0	120	11	3	
Offpeak Hr Avg	0	0	0	0	0	0	280	52	13	0	34	301	0	11	0	44	0	40	4	1	

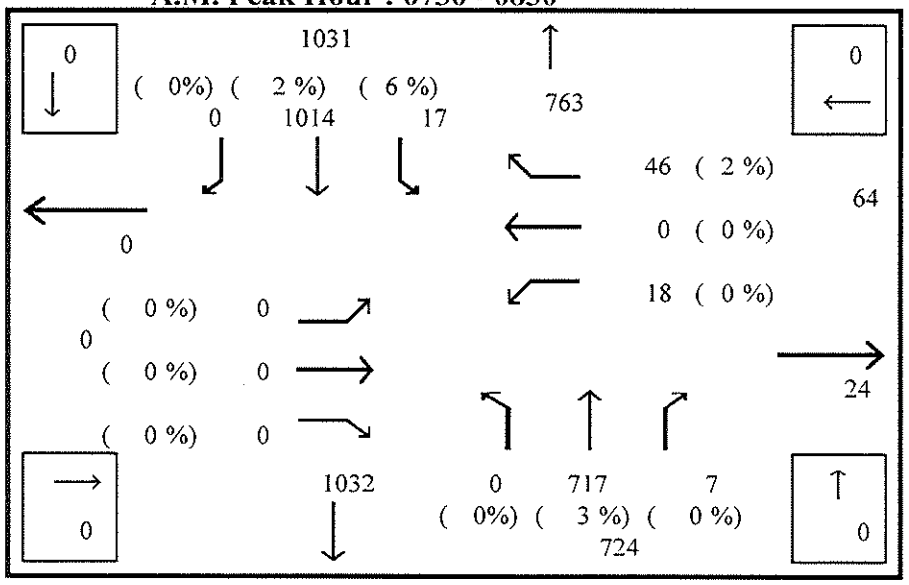
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	103	26	3	0	11	90	0	7	0	26	0	31	0	0	297
1530	0	0	0	0	0	0	135	22	5	0	10	105	0	2	0	40	0	23	2	0	344
1545	0	0	0	0	0	0	135	29	6	0	10	111	0	6	0	41	0	30	3	0	371
1600	0	0	0	0	0	0	155	18	7	0	19	108	0	9	0	28	0	20	3	0	367
1615	0	0	0	0	0	0	179	29	3	0	13	104	0	5	0	26	0	26	3	0	388
1630	0	0	0	0	0	0	223	29	11	0	16	161	0	3	0	21	0	14	1	0	479
1645	0	0	0	0	0	0	214	20	6	0	14	135	0	3	0	33	0	11	0	0	436
1700	0	0	0	0	0	0	225	29	0	0	19	148	0	4	0	22	0	25	1	0	473
1715	0	0	0	0	0	0	241	20	2	0	20	144	0	6	0	35	0	27	2	2	497
1730	0	0	0	0	0	0	255	39	1	0	16	143	0	2	0	25	0	24	2	0	507
1745	0	0	0	0	0	0	220	40	3	0	23	171	0	3	0	22	0	19	1	4	502
1800	0	0	0	0	0	0	242	46	0	0	25	184	0	1	0	27	0	17	1	0	543
Total	0	0	0	0	0	0	2327	347	47	0	196	1604	0	51	0	346	0	267	19	6	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1715 - 1800	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	958	145	6	0	84	642	0	12	0	109	0	87	6	6	0

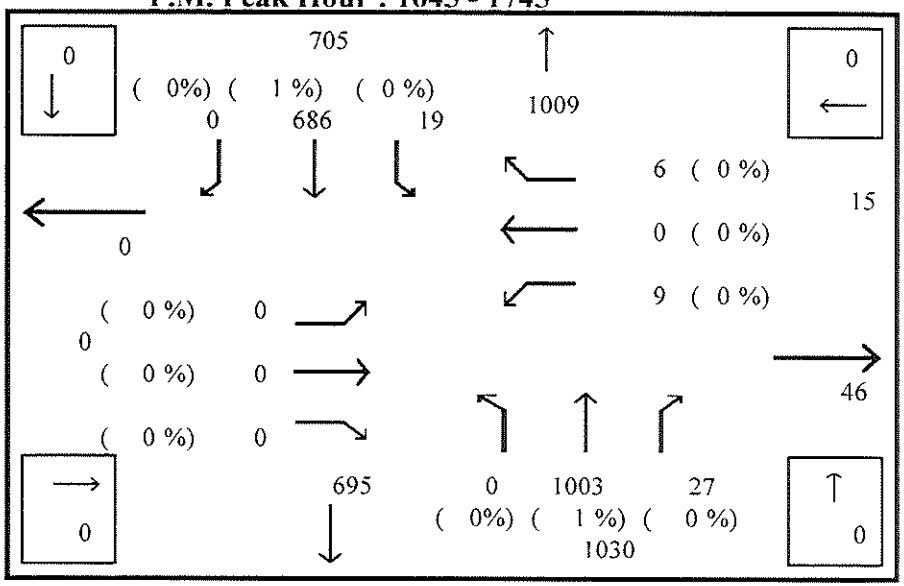
Count Date : Wednesday April 24 2013 2/10/2014

[DEE-NIN-01-N] DEEPWOOD HTS/NINTH LINE

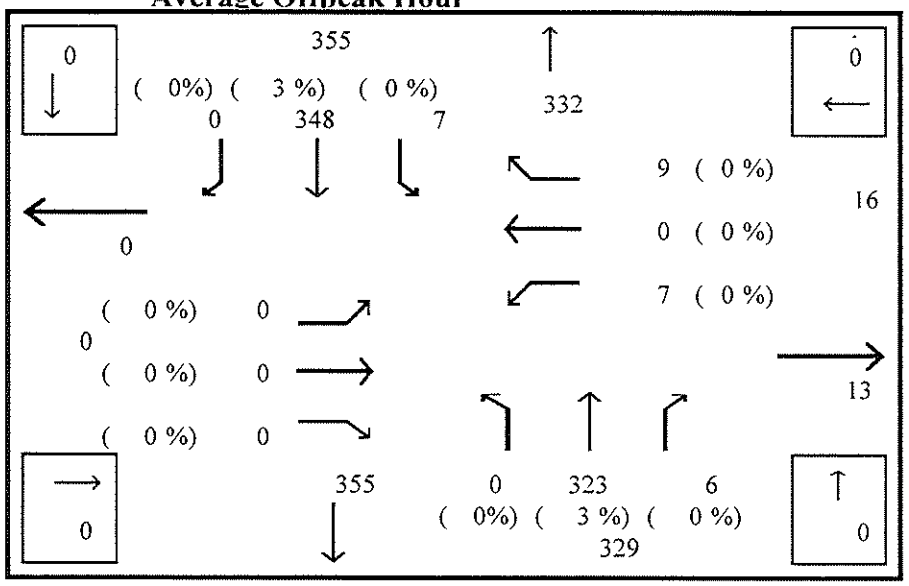
A.M. Peak Hour : 0730 - 0830



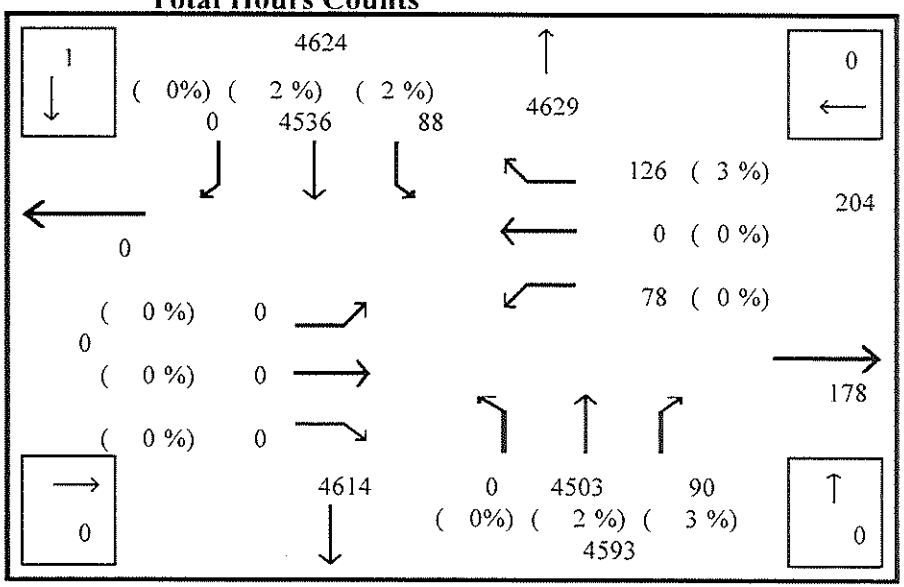
P.M. Peak Hour : 1645 - 1745



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

DEEPWOOD HTS/NINTH LINE DEE-NIN-01-N ZArea: Z57

Counted On: 2013/04/24 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	64	2	2	0	1	159	0	3	0	3	0	3	0	0	237
730	0	0	0	0	0	0	108	2	6	0	3	227	0	2	0	3	0	10	0	0	361
745	0	0	0	0	0	0	150	2	4	0	4	249	0	7	0	7	0	7	1	0	431
800	0	0	0	0	0	0	146	2	3	0	6	237	0	5	0	5	0	10	0	0	414
815	0	0	0	0	0	0	194	2	3	0	3	258	0	1	0	4	0	11	0	0	476
830	0	0	0	0	0	0	209	1	8	0	3	254	0	4	0	2	0	17	0	0	498
845	0	0	0	0	1	0	167	0	3	0	0	208	0	3	0	9	0	12	0	0	402
900	0	0	0	0	0	0	124	2	11	0	2	200	0	3	0	5	0	6	0	0	353
Total	0	0	0	0	1	0	1162	13	40	0	22	1792	0	28	0	38	0	76	1	0	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
745 - 830	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	699	7	18	0	16	998	0	17	0	18	0	45	1	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	74	1	5	0	1	69	0	5	0	0	0	2	0	0	157
1200	0	0	0	0	0	0	54	0	2	0	3	92	0	4	0	3	0	1	0	0	159
1215	0	0	0	0	0	0	81	0	4	0	4	84	0	4	0	1	0	1	0	0	179
1230	0	0	0	0	0	0	75	1	1	0	1	104	0	4	0	2	0	1	0	0	189
1245	0	0	0	0	0	0	102	2	3	0	3	99	0	2	0	2	0	4	0	0	217
1300	0	0	0	0	0	0	81	3	2	0	2	75	0	3	0	1	0	4	0	0	171
1315	0	0	0	0	0	0	88	0	3	0	1	85	0	0	0	1	0	4	0	0	182
1330	0	0	0	0	0	0	65	1	1	0	2	87	0	3	0	4	0	3	1	0	167
1345	0	0	0	0	0	0	77	4	1	0	2	68	0	1	0	1	0	3	0	0	157
1400	0	0	0	0	0	0	87	2	3	0	0	82	0	1	0	3	0	0	0	0	178

Intersection count: 15-minute interval data

DEEPWOOD HTS/NINTH LINE DEE-NIN-01-N ZArea: Z57

Counted On: 2013/04/24 Traffic Control: Two-way Stop Report Date: 2014/02/11

Offpeak Total	0	0	0	0	0	0	784	14	25	0	19	845	0	27	0	18	0	23	1	0
Offpeak Hr Avg	0	0	0	0	0	0	261	5	8	0	6	282	0	9	0	6	0	8	0	0

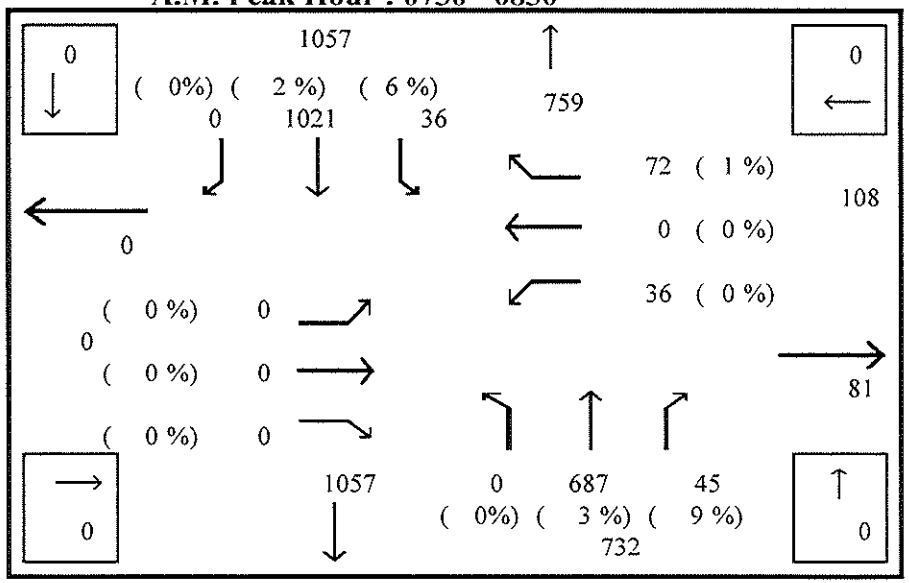
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	134	3	2	0	2	90	0	5	0	4	0	1	0	0	241
1530	0	0	0	0	0	0	174	5	3	0	4	152	0	5	0	2	0	4	0	0	349
1545	0	0	0	0	0	0	181	6	4	0	1	162	0	3	0	4	0	2	0	0	363
1600	0	0	0	0	0	0	165	5	6	0	3	134	0	4	0	1	0	3	1	0	322
1615	0	0	0	0	0	0	187	4	1	0	4	138	0	5	0	1	0	1	0	0	341
1630	0	0	0	0	0	0	202	3	6	0	5	164	0	3	0	1	0	2	1	0	387
1645	0	0	0	0	0	0	207	3	6	0	4	132	0	2	0	0	0	1	0	0	355
1700	0	0	0	0	0	0	242	3	1	0	3	166	0	1	0	0	0	2	0	0	418
1715	0	0	0	0	0	0	254	7	2	0	6	170	0	2	0	3	0	1	0	0	445
1730	0	0	0	0	0	0	253	8	3	0	6	169	0	0	0	1	0	2	0	0	442
1745	0	0	0	0	0	0	247	9	1	0	4	176	0	2	0	5	0	1	0	0	445
1800	0	0	0	0	0	0	210	4	4	0	3	159	0	2	0	0	0	3	0	0	385
Total	0	0	0	0	0	0	2456	60	39	0	45	1812	0	34	0	22	0	23	2	0	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1700 - 1745	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	996	27	7	0	19	681	0	5	0	9	0	6	0	0	0

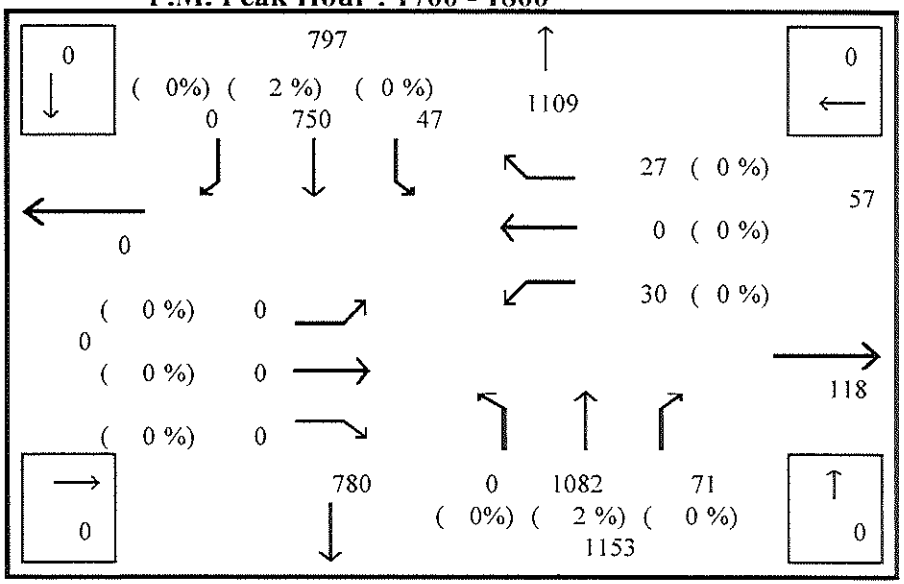
Count Date : Wednesday May 1 2013 2/10/2014

[NIN-TAC-01-N] NINTH LINE/TACC DR

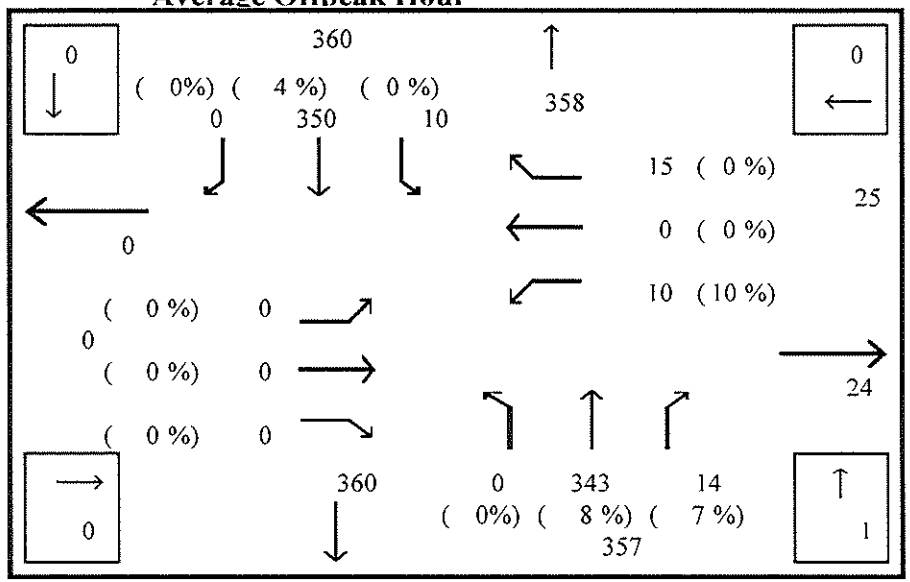
A.M. Peak Hour : 0730 - 0830



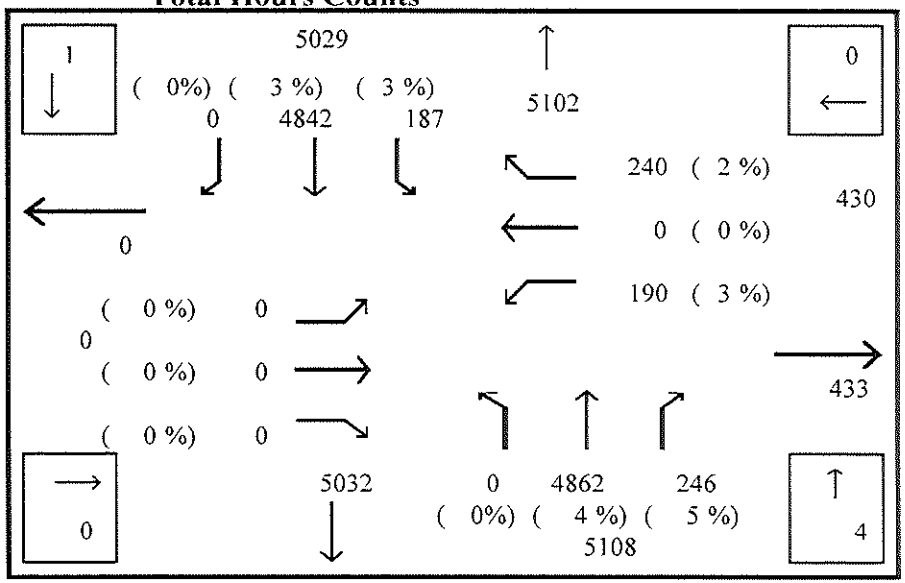
P.M. Peak Hour : 1700 - 1800



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

NINTH LINE/TACC DR | NIN-TAC-01-N | ZArea: Z57

Counted On: 2013/05/01 | Traffic Control: Two-way Stop | Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	65	2	6	0	6	178	0	5	0	9	0	4	0	0	275
730	0	0	0	0	0	0	111	6	7	0	2	236	0	8	0	13	0	7	1	0	391
745	0	0	0	0	0	0	133	10	3	0	9	244	0	6	0	11	0	17	1	0	434
800	0	0	0	0	0	0	179	11	7	0	8	239	0	7	0	10	0	16	0	0	477
815	0	0	0	0	0	0	185	15	5	0	3	251	0	4	0	5	0	22	0	0	490
830	0	0	0	0	0	0	170	5	9	0	14	266	0	6	0	10	0	16	0	0	496
845	0	0	0	0	1	0	147	6	7	0	3	230	0	7	0	9	0	23	1	0	433
900	0	0	0	0	0	0	123	7	3	0	3	246	0	5	0	11	0	5	0	0	403
Total	0	0	0	0	1	0	1113	62	47	0	48	1890	0	48	0	78	0	110	3	0	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
745 - 830	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	667	41	24	0	34	1000	0	23	0	36	0	71	1	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	66	1	7	0	3	85	0	3	0	4	0	3	1	0	173
1130	0	0	0	0	0	0	66	4	2	0	3	94	0	2	0	4	0	5	0	0	180
1145	0	0	0	0	0	0	74	1	5	0	0	76	0	4	0	3	0	5	0	0	168
1200	0	0	0	0	0	0	79	1	5	0	3	79	0	3	0	0	0	1	1	0	172
1215	0	0	0	0	0	0	80	6	17	0	3	84	0	1	0	0	0	4	0	1	195
1230	0	0	0	0	0	0	82	3	11	0	4	87	0	2	0	3	0	3	0	0	195
1245	0	0	0	0	0	0	87	3	8	0	4	87	0	8	0	2	0	5	0	0	204
1300	0	0	0	0	0	0	102	4	6	0	1	84	0	4	0	2	0	4	1	0	208
1315	0	0	0	0	0	0	87	6	2	0	4	85	0	2	0	0	0	2	0	0	188
1330	0	0	0	0	0	0	77	1	8	0	4	84	0	2	0	4	0	4	1	0	185

Intersection count: 15-minute interval data

NINTH LINE/TACC DR NIN-TAC-01-N ZArea: Z57

Counted On: 2013/05/01 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	77	5	5	0	0	83	0	5	0	4	0	5	0	1	184
1400	0	0	0	0	0	0	75	3	5	0	2	84	0	4	0	2	0	4	0	1	179
Offpeak Total	0	0	0	0	0	0	952	38	81	0	31	1012	0	40	0	28	0	45	4	3	
Offpeak Hr Avg	0	0	0	0	0	0	317	13	27	0	10	337	0	13	0	9	0	15	1	1	

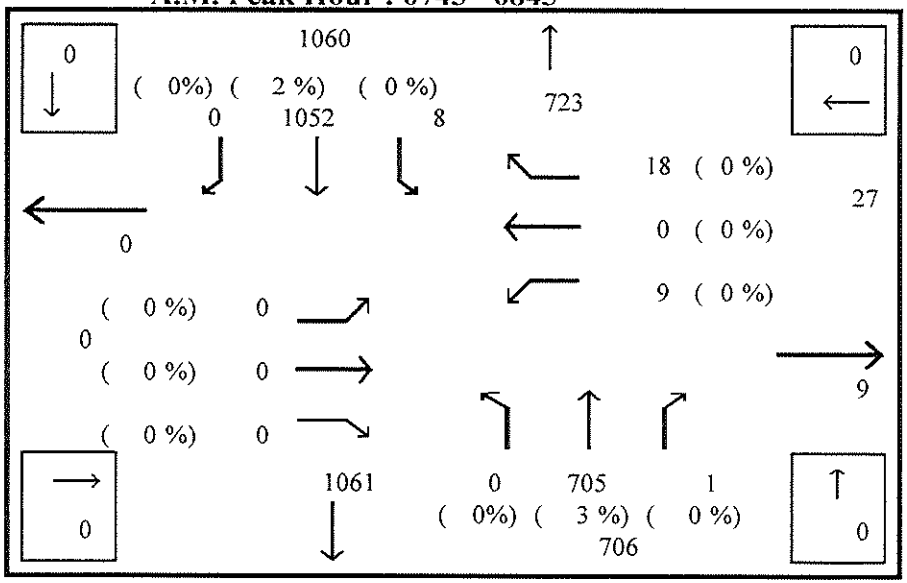
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	140	6	4	0	9	103	0	11	0	9	0	5	1	0	288
1530	0	0	0	0	0	0	151	5	7	0	2	132	0	5	0	10	0	8	1	1	321
1545	0	0	0	0	0	0	182	9	13	0	9	148	0	3	0	3	0	9	0	0	376
1600	0	0	0	0	0	0	167	4	6	0	6	117	0	3	0	4	0	6	0	0	313
1615	0	0	0	0	0	0	166	9	3	0	6	131	0	5	0	5	0	6	0	0	331
1630	0	0	0	0	0	0	244	10	12	0	9	135	0	2	0	5	0	5	0	0	422
1645	0	0	0	0	0	0	242	8	4	0	3	134	0	4	0	3	0	7	0	0	405
1700	0	0	0	0	0	0	253	12	5	0	11	170	0	5	0	10	0	8	0	0	474
1715	0	0	0	0	0	0	236	10	5	0	12	169	0	1	0	8	0	6	0	0	447
1730	0	0	0	0	0	0	283	16	7	0	7	181	0	5	0	7	0	5	0	0	511
1745	0	0	0	0	0	0	290	22	2	0	15	216	0	3	0	3	0	12	0	0	563
1800	0	0	0	0	0	0	254	23	5	0	13	171	0	4	0	12	0	4	0	0	486
Total	0	0	0	0	0	0	2608	134	73	0	102	1807	0	51	0	79	0	81	2	1	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1715 - 1800	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	1063	71	19	0	47	737	0	13	0	30	0	27	0	0	0

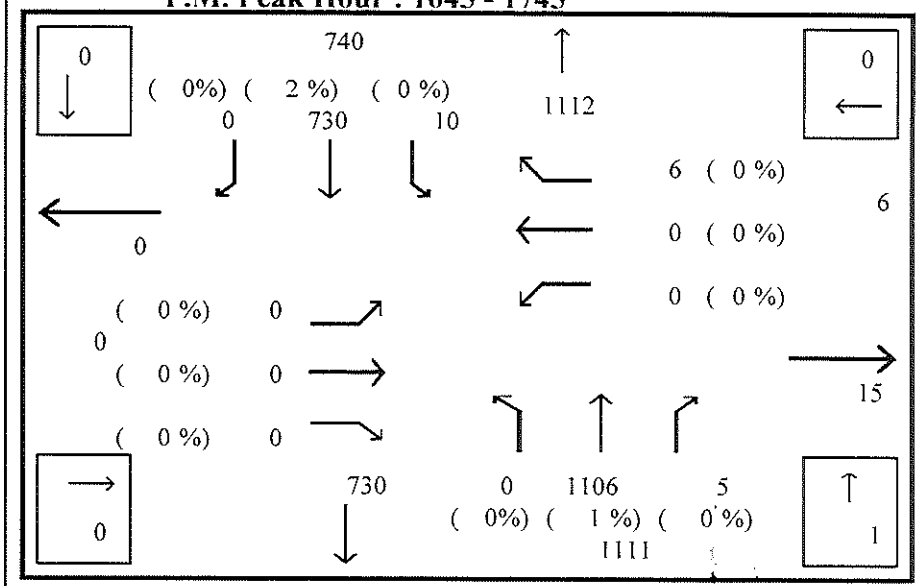
Count Date : Tuesday April 23 2013 2/10/2014

[JAN-NIN-10-N] JANICE DR/NINTH LINE

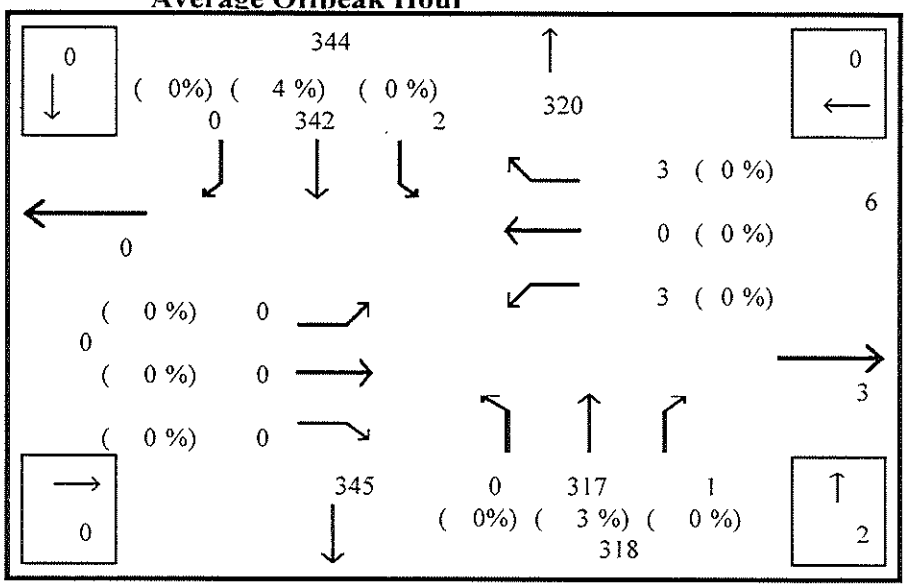
A.M. Peak Hour : 0745 - 0845



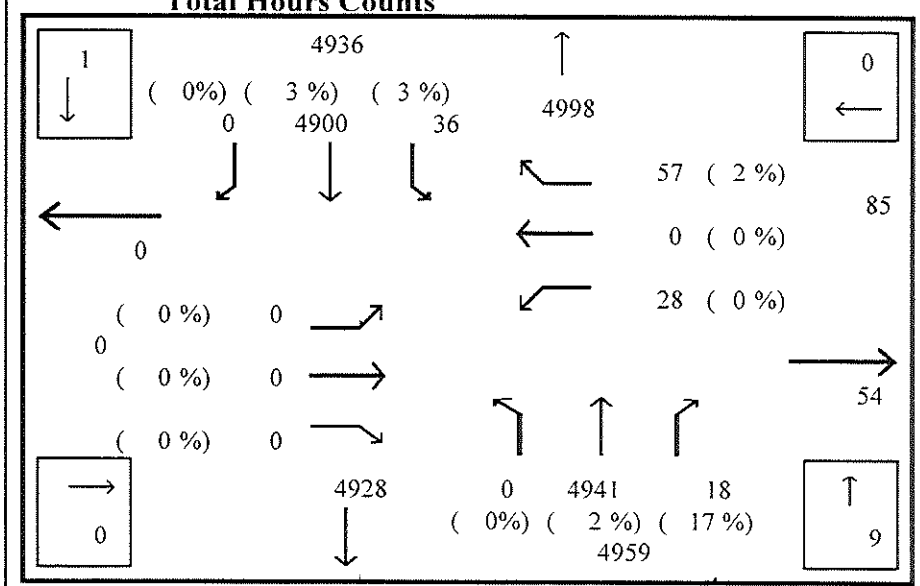
P.M. Peak Hour : 1645 - 1745



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

JANICE DR/NINTH LINE JAN-NIN-10-N ZArea: Z57

Counted On: 2013/04/23 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	78	1	3	0	0	177	0	8	0	1	0	3	0	0	271
730	0	0	0	0	0	0	129	0	6	0	0	231	0	6	0	1	0	2	0	0	375
745	0	0	0	0	0	0	145	0	4	0	0	245	0	2	0	0	0	5	0	0	401
800	0	0	0	0	0	0	174	0	5	0	1	255	0	6	0	2	0	4	0	0	447
815	0	0	0	0	0	0	188	0	3	0	2	254	0	3	0	2	0	5	0	0	457
830	0	0	0	0	0	0	183	1	11	0	2	277	0	4	0	3	0	5	0	0	486
845	0	0	0	0	0	0	138	0	3	0	3	248	0	5	0	2	0	4	0	0	403
900	0	0	0	0	0	0	139	0	7	0	3	211	0	7	0	2	0	8	0	1	377
Total	0	0	0	0	0	0	1174	2	42	0	11	1898	0	41	0	13	0	36	0	1	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	683	1	22	0	8	1034	0	18	0	9	0	18	0	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	71	0	0	0	0	79	0	3	0	1	0	0	1	1	155
1130	0	0	0	0	1	0	81	0	1	0	1	78	0	2	0	2	0	0	0	0	165
1145	0	0	0	0	0	0	77	0	1	0	0	82	0	2	0	2	0	1	0	0	165
1200	0	0	0	0	0	0	65	0	1	0	0	86	0	3	0	0	0	0	0	0	155
1215	0	0	0	0	0	0	65	0	5	0	0	74	0	1	0	1	0	1	0	0	147
1230	0	0	0	0	0	0	92	0	4	0	0	83	0	3	0	2	0	0	0	0	184
1245	0	0	0	0	0	0	79	0	3	0	1	102	0	4	0	0	0	1	0	2	190
1300	0	0	0	0	0	0	85	0	5	0	2	84	0	5	0	0	0	0	0	0	181
1315	0	0	0	0	0	0	85	1	3	0	0	90	0	7	0	0	0	1	0	1	187
1330	0	0	0	0	0	0	70	0	4	0	2	68	0	3	0	0	0	0	0	1	147

Intersection count: 15-minute interval data

JANICE DR/NINTH LINE JAN-NIN-10-N ZArea: Z57

Counted On: 2013/04/23 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	65	0	3	0	0	81	0	2	0	1	0	4	0	0	156
1400	0	0	0	0	0	0	87	2	2	0	0	81	0	4	0	2	0	0	0	1	178
Offpeak Total	0	0	0	0	1	0	922	3	32	0	6	988	0	39	0	11	0	8	1	6	
Offpeak Hr Avg	0	0	0	0	0	0	307	1	11	0	2	329	0	13	0	4	0	3	0	2	

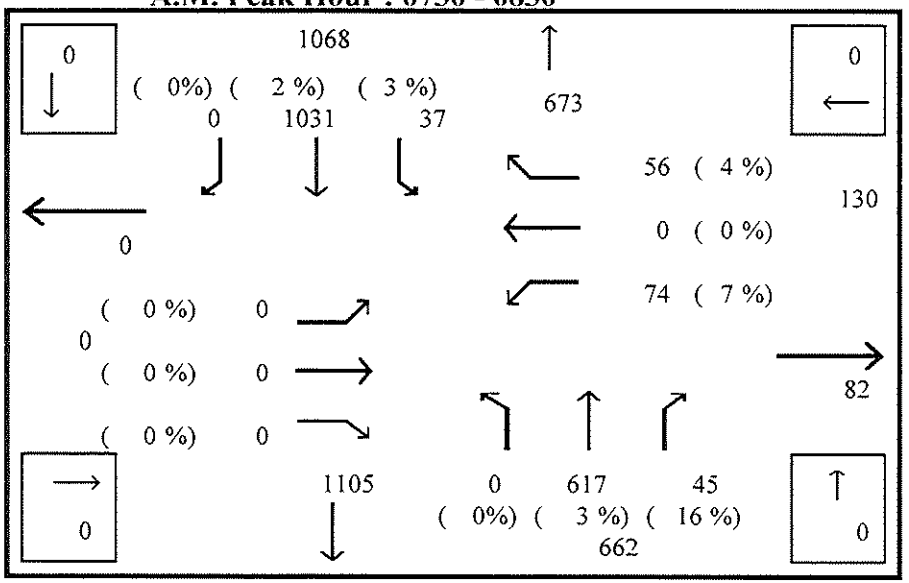
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	144	0	3	0	2	130	0	6	0	0	0	1	0	0	286
1530	0	0	0	0	0	0	190	2	7	0	1	121	0	6	0	2	0	1	0	0	330
1545	0	0	0	0	0	0	149	0	8	0	1	162	0	2	0	0	0	1	0	1	323
1600	0	0	0	0	0	0	207	2	7	0	0	132	0	8	0	0	0	0	0	0	356
1615	0	0	0	0	0	0	199	0	4	0	0	133	0	4	0	0	0	0	0	0	340
1630	0	0	0	0	0	0	237	0	4	0	1	134	0	4	0	1	0	0	0	0	381
1645	0	0	0	0	0	0	239	0	5	0	2	171	0	4	0	0	0	1	0	0	422
1700	0	0	0	0	0	0	281	2	2	0	2	181	0	3	0	0	0	0	0	0	471
1715	0	0	0	0	0	0	254	0	4	0	5	167	0	2	0	0	0	2	0	0	434
1730	0	0	0	0	0	0	286	2	2	0	0	197	0	3	0	0	0	3	0	1	493
1745	0	0	0	0	0	0	275	1	2	0	3	173	0	4	0	0	0	1	0	0	459
1800	0	0	0	0	0	0	263	1	2	0	1	185	0	3	0	1	0	2	0	0	458
Total	0	0	0	0	0	0	2724	10	50	0	18	1886	0	49	0	4	0	12	0	2	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1700 - 1745	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	1096	5	10	0	10	718	0	12	0	0	0	6	0	1	0

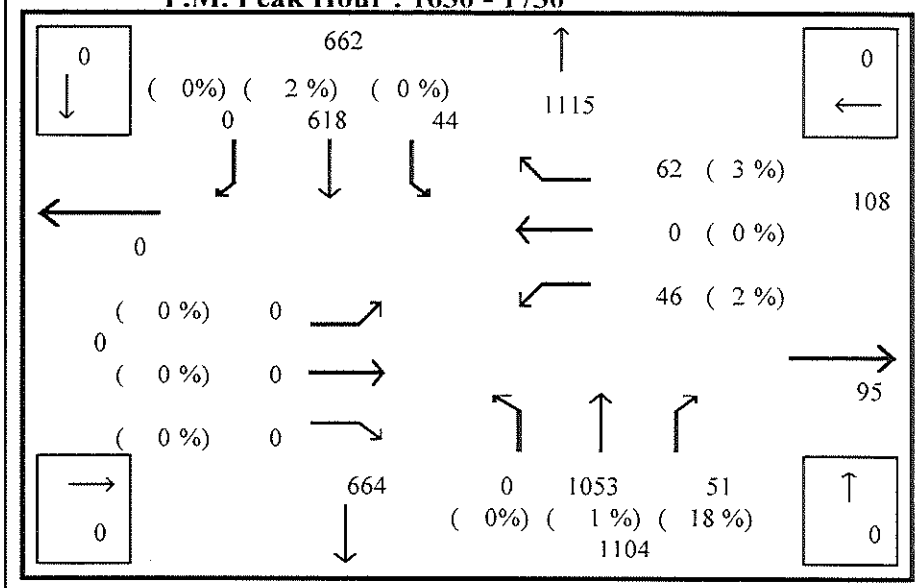
Count Date : Tuesday April 30 2013 2/10/2014

[ERI-NIN-10-S] ERIN CENTRE BLVD/NINTH LINE

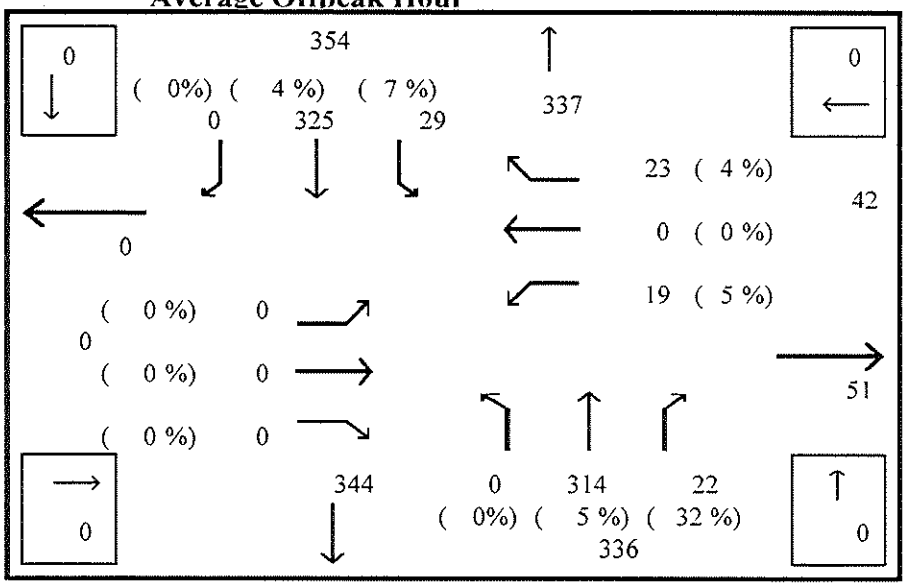
A.M. Peak Hour : 0730 - 0830



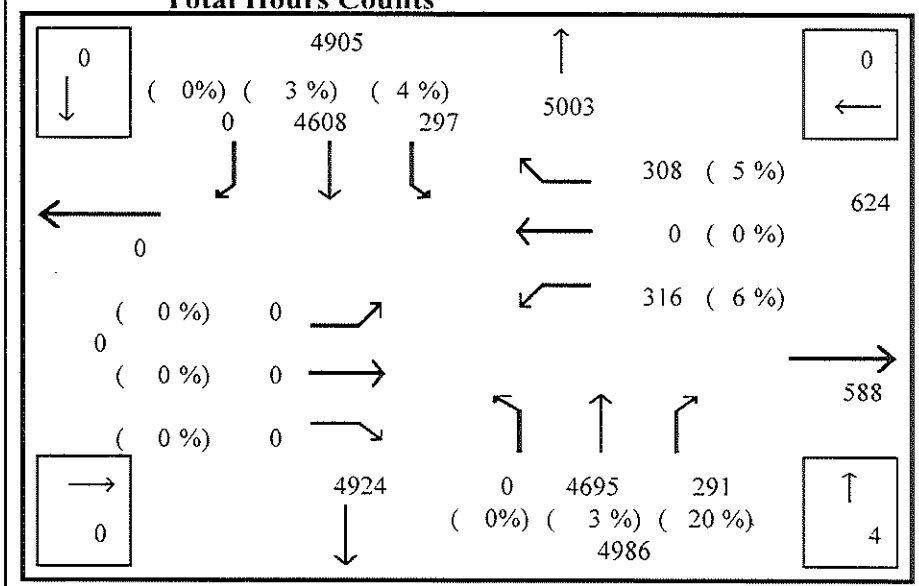
P.M. Peak Hour : 1630 - 1730



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

ERIN CENTRE BLVD/NINTH LINE ERI-NIN-10-N ZArea: Z39E

Counted On: 2013/04/30 Traffic Control: Signal Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	50	2	6	0	3	175	0	4	0	11	0	3	1	0	255
730	0	0	0	0	0	0	110	11	6	0	4	228	0	5	0	12	0	8	1	0	385
745	0	0	0	0	0	0	136	6	7	0	10	244	0	6	0	12	0	14	1	0	436
800	0	0	0	0	0	0	144	8	8	0	5	277	0	8	0	13	0	11	1	0	475
815	0	0	0	0	0	0	162	11	4	0	16	252	0	3	0	20	0	13	2	0	483
830	0	0	0	0	0	0	155	13	8	0	5	238	0	4	0	24	0	16	3	0	466
845	0	0	0	0	0	0	139	10	9	0	11	212	0	3	0	24	0	12	1	0	421
900	0	0	0	0	0	0	95	7	5	0	9	224	0	8	0	9	0	12	3	1	372
Total	0	0	0	0	0	0	991	68	53	0	63	1850	0	41	0	125	0	89	13	1	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
745 - 830	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	597	38	27	0	36	1011	0	21	0	69	0	54	7	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	60	4	4	0	4	70	0	2	0	4	0	3	1	0	152
1130	0	0	0	0	0	0	76	1	2	0	9	68	0	2	0	3	0	3	3	0	167
1145	0	0	0	0	0	0	63	2	7	0	7	82	0	5	0	5	0	6	0	0	177
1200	0	0	0	0	0	0	67	2	4	0	8	74	0	1	0	4	0	5	0	0	165
1215	0	0	0	0	0	0	73	6	3	0	5	96	0	6	0	4	0	7	1	1	201
1230	0	0	0	0	0	0	79	7	4	0	13	78	0	3	0	6	0	5	1	0	196
1245	0	0	0	0	0	0	86	5	7	0	6	107	0	3	0	8	0	11	0	0	233
1300	0	0	0	0	0	0	73	5	5	0	10	82	0	5	0	4	0	6	0	0	190
1315	0	0	0	0	0	0	85	5	12	0	7	66	0	8	0	4	0	7	0	0	194
1330	0	0	0	0	0	0	77	2	9	0	3	75	0	2	0	4	0	5	1	0	178

Intersection count: 15-minute interval data

ERIN CENTRE BLVD/NINTH LINE ERI-NIN-10-N ZArea: Z39E

Counted On: 2013/04/30 Traffic Control: Signal Report Date: 2014/02/11

1345	0	0	0	0	0	0	84	2	5	0	7	69	0	3	0	3	0	5	0	0	178
1400	0	0	0	0	0	0	75	5	5	0	3	69	0	5	0	4	0	4	0	1	170
Offpeak Total	0	0	0	0	0	0	898	46	67	0	82	936	0	45	0	53	0	67	7	2	
Offpeak Hr Avg	0	0	0	0	0	0	299	15	22	0	27	312	0	15	0	18	0	22	2	1	

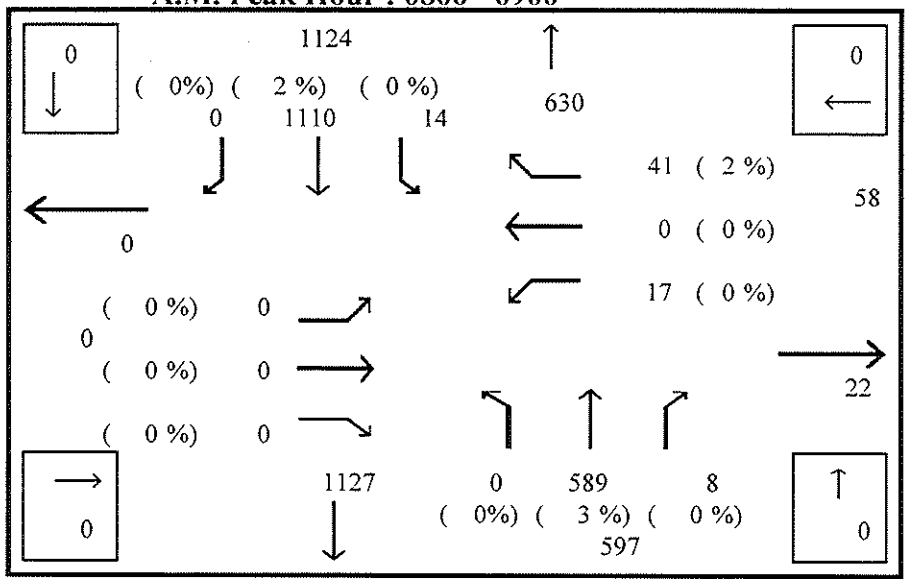
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	136	8	1	0	8	102	0	7	0	8	0	11	0	0	281
1530	0	0	0	0	0	0	174	12	4	0	11	137	0	4	0	11	0	7	3	0	363
1545	0	0	0	0	0	0	177	10	6	0	15	153	0	5	0	11	0	18	2	0	397
1600	0	0	0	0	0	0	184	8	6	0	12	130	0	9	0	9	0	9	2	1	369
1615	0	0	0	0	0	0	221	3	6	0	6	131	0	6	0	7	0	6	0	0	386
1630	0	0	0	0	0	0	252	9	7	0	9	137	0	4	0	6	0	12	2	0	438
1645	0	0	0	0	0	0	237	6	6	0	12	156	0	2	0	10	0	13	2	0	444
1700	0	0	0	0	0	0	276	14	4	0	12	157	0	3	0	13	0	19	0	0	498
1715	0	0	0	0	0	0	253	11	7	0	9	137	0	4	0	9	0	13	1	0	444
1730	0	0	0	0	0	0	276	11	3	0	11	157	0	2	0	13	0	15	0	0	488
1745	0	0	0	0	0	0	238	11	4	0	16	150	0	3	0	11	0	10	0	0	443
1800	0	0	0	0	0	0	263	16	3	0	18	152	0	1	0	11	0	5	1	0	470
Total	0	0	0	0	0	0	2687	119	57	0	139	1699	0	50	0	119	0	138	13	1	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1645 - 1730	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	1042	42	20	0	44	607	0	11	0	45	0	60	3	0	0

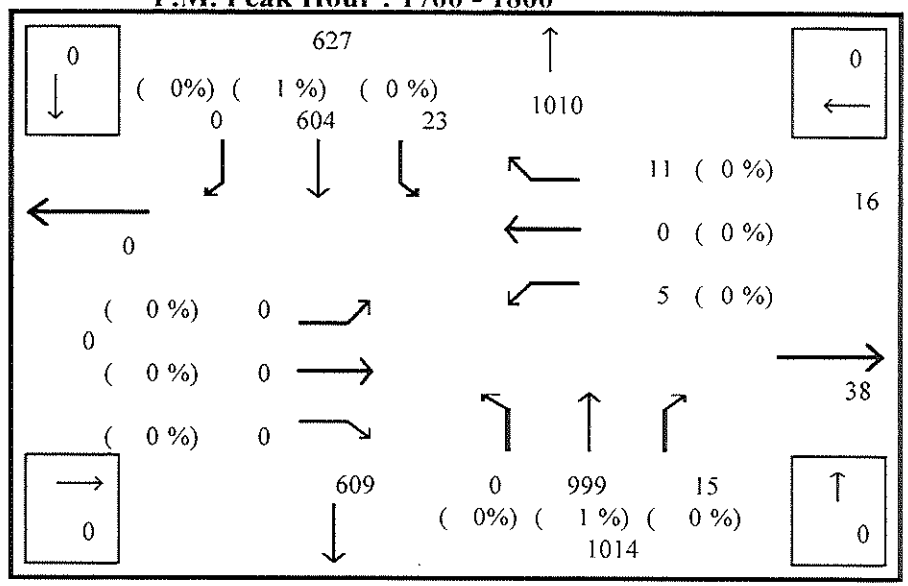
Count Date : Wednesday April 10 2013 2/10/2014

[CAN-NIN-10-N] CANDLELIGHT DR/NINTH LINE

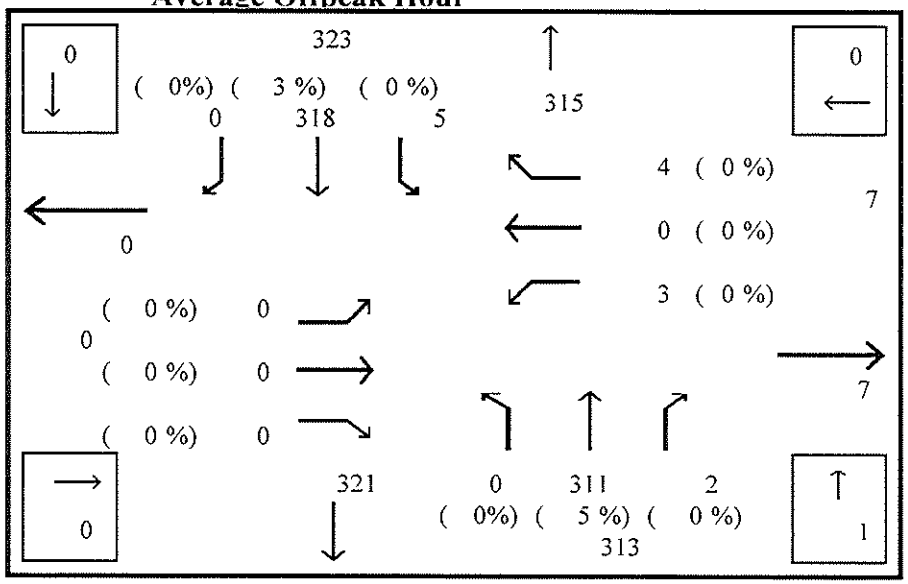
A.M. Peak Hour : 0800 - 0900



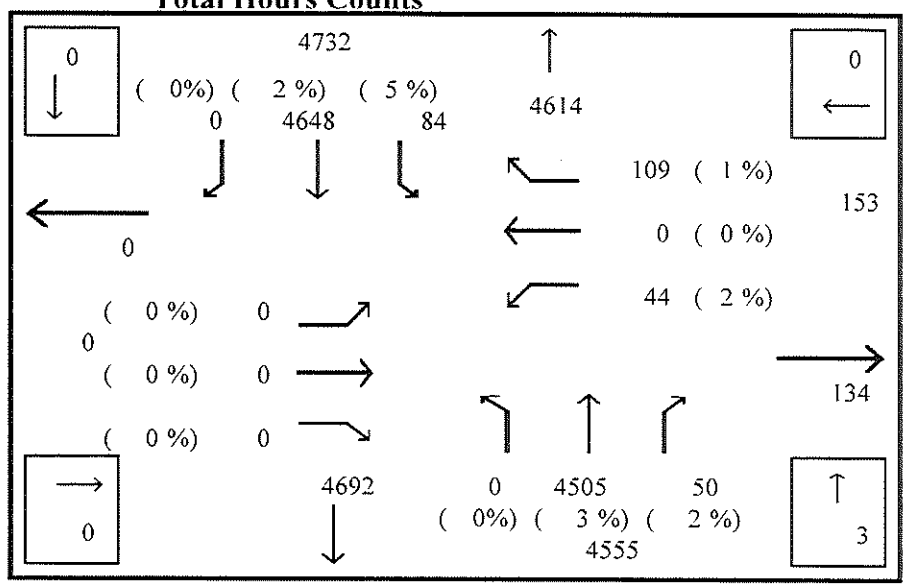
P.M. Peak Hour : 1700 - 1800



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

CANDLELIGHT DR/NINTH LINE CAN-NIN-10-N ZArea: Z38E

Counted On: 2013/04/10 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	58	0	6	0	3	177	0	3	0	3	0	1	0	0	251
730	0	0	0	0	0	0	110	0	7	0	0	224	0	4	0	4	0	1	0	0	350
745	0	0	0	0	0	0	151	0	5	0	0	261	0	2	0	2	0	6	0	0	427
800	0	0	0	0	0	0	132	1	5	0	1	243	0	4	0	0	0	12	1	0	399
815	0	0	0	0	0	0	156	2	6	0	0	279	0	3	0	3	0	13	0	0	462
830	0	0	0	0	0	0	161	4	4	0	5	291	0	4	0	6	0	10	1	0	486
845	0	0	0	0	0	0	119	1	4	0	3	281	0	3	0	4	0	7	0	0	422
900	0	0	0	0	0	0	133	1	6	0	6	241	0	8	0	4	0	10	0	0	409
Total	0	0	0	0	0	0	1020	9	43	0	18	1997	0	31	0	26	0	60	2	0	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
815 - 900	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	569	8	20	0	14	1092	0	18	0	17	0	40	1	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	55	0	7	0	0	80	0	3	0	2	0	1	0	0	148
1130	0	0	0	0	0	0	64	0	1	0	1	64	0	6	0	0	0	1	0	1	137
1145	0	0	0	0	0	0	80	0	8	0	3	93	0	2	0	0	0	0	0	1	186
1200	0	0	0	0	0	0	61	1	4	0	2	76	0	3	0	0	0	2	0	0	149
1215	0	0	0	0	0	0	70	2	1	0	3	78	0	0	0	0	0	1	0	0	155
1230	0	0	0	0	0	0	60	2	7	0	1	76	0	3	0	1	0	2	0	0	152
1245	0	0	0	0	0	0	86	0	3	0	0	73	0	1	0	1	0	2	0	0	166
1300	0	0	0	0	0	0	77	1	5	0	0	72	0	3	0	1	0	0	0	1	159
1315	0	0	0	0	0	0	84	1	6	0	0	76	0	2	0	1	0	2	0	0	172
1330	0	0	0	0	0	0	64	0	0	0	2	68	0	0	0	0	0	1	0	0	135

Intersection count: 15-minute interval data

CANDLELIGHT DR/NINTH LINE CAN-NIN-10-N ZArea: Z38E

Counted On: 2013/04/10 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	84	0	4	0	2	91	0	2	0	0	0	1	0	0	184
1400	0	0	0	0	0	0	102	1	2	0	1	78	0	5	0	3	0	1	0	0	193
Offpeak Total	0	0	0	0	0	0	887	8	48	0	15	925	0	30	0	9	0	14	0	3	
Offpeak Hr Avg	0	0	0	0	0	0	296	3	16	0	5	308	0	10	0	3	0	5	0	1	

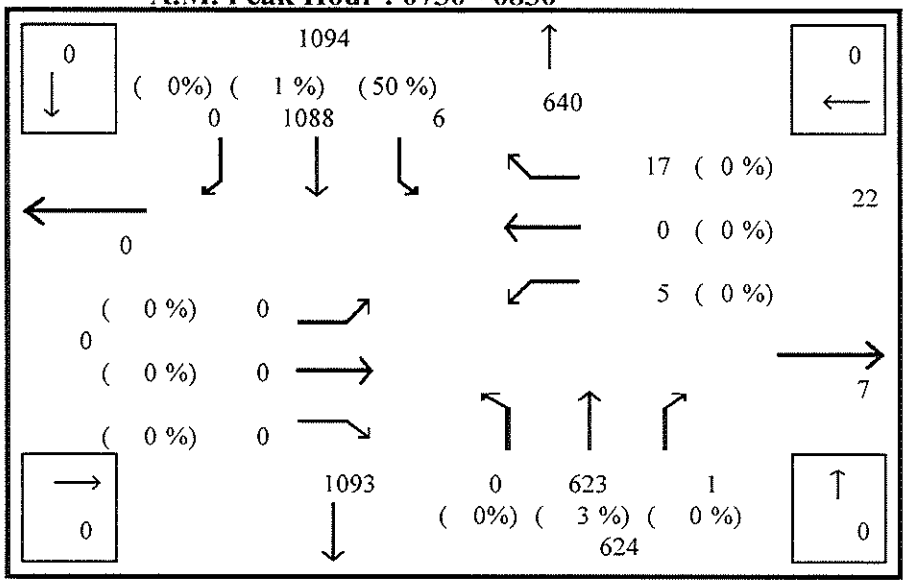
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	139	3	4	0	2	119	0	4	0	0	0	2	0	0	273
1530	0	0	0	0	0	0	153	1	4	0	4	129	0	7	0	1	0	1	0	0	300
1545	0	0	0	0	0	0	191	3	5	0	4	133	0	3	0	2	0	3	0	0	344
1600	0	0	0	0	0	0	179	1	4	0	3	142	0	3	0	0	0	4	0	0	336
1615	0	0	0	0	0	0	185	1	3	0	2	113	0	7	0	0	0	2	0	0	313
1630	0	0	0	0	0	0	204	2	6	0	1	119	0	2	0	0	0	2	0	0	336
1645	0	0	0	0	0	0	230	3	1	0	5	135	0	2	0	0	0	5	0	0	381
1700	0	0	0	0	0	0	200	3	1	0	3	146	0	1	0	0	0	4	0	0	358
1715	0	0	0	0	0	0	283	5	5	0	4	122	0	2	0	1	0	3	0	0	425
1730	0	0	0	0	0	0	249	4	1	0	3	150	0	3	0	2	0	3	0	0	415
1745	0	0	0	0	0	0	244	3	3	0	7	167	0	0	0	1	0	1	0	0	426
1800	0	0	0	0	0	0	211	3	3	0	9	159	0	1	0	1	0	4	0	0	391
Total	0	0	0	0	0	0	2468	32	40	0	47	1634	0	35	0	8	0	34	0	0	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1715 - 1800	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	987	15	12	0	23	598	0	6	0	5	0	11	0	0	0

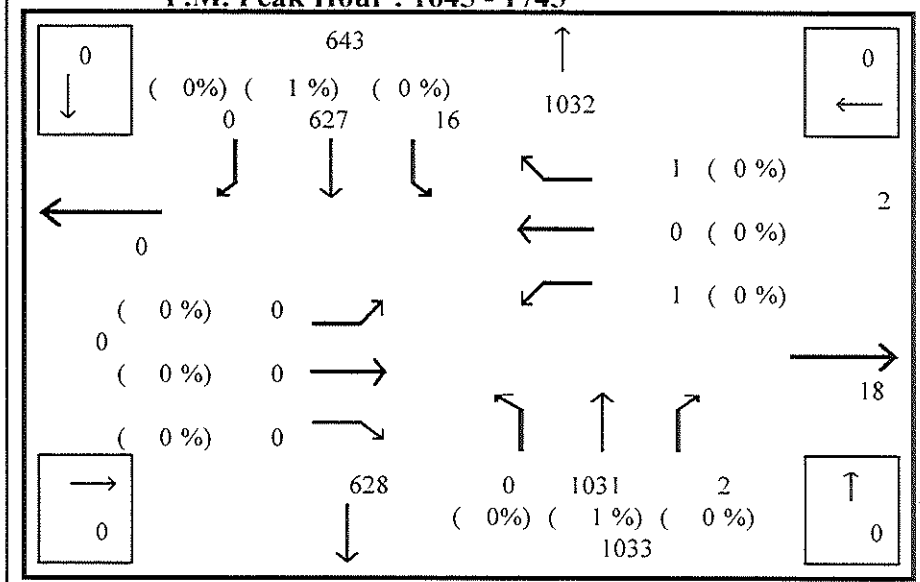
Count Date : Wednesday April 3 2013 2/10/2014

[NIN-SKY-10-N] NINTH LINE/SKYVIEW ST

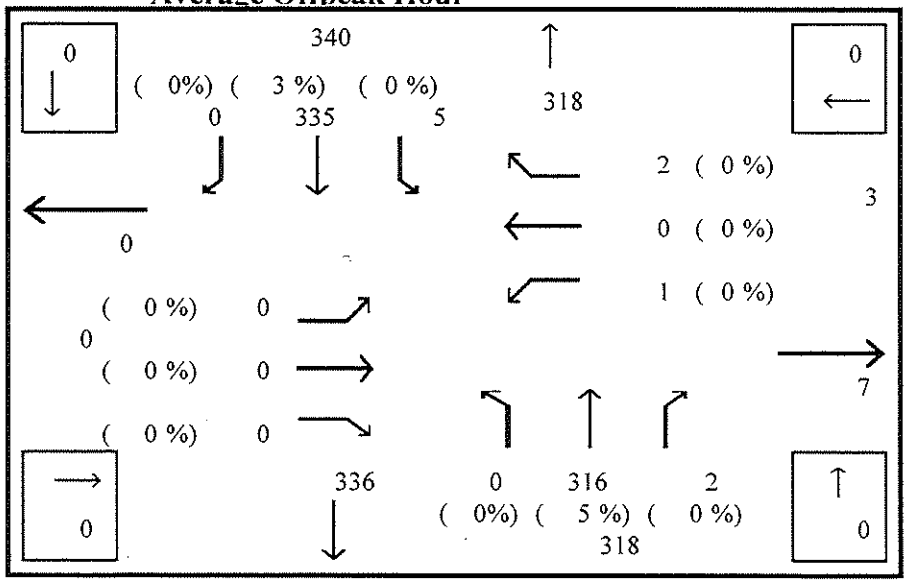
A.M. Peak Hour : 0730 - 0830



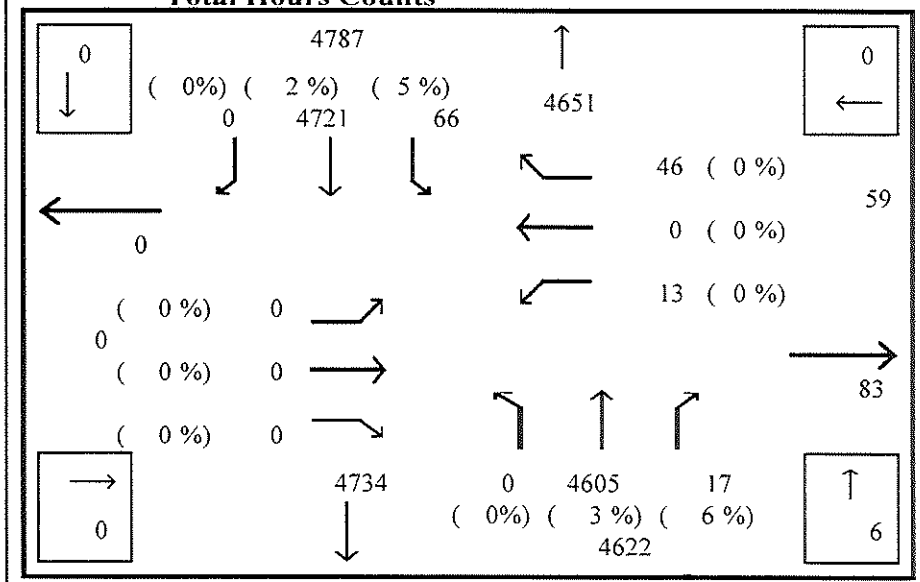
P.M. Peak Hour : 1645 - 1745



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

NINTH LINE/SKYVIEW ST | NIN-SKY-10-N | ZArea: Z56

Counted On: 2013/04/03 | Traffic Control: Two-way Stop | Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	66	0	7	0	0	184	0	2	0	0	0	1	0	0	260
730	0	0	0	0	0	0	96	0	4	0	1	240	0	4	0	1	0	2	0	0	348
745	0	0	0	0	0	0	144	0	6	0	0	271	0	7	0	3	0	5	0	0	436
800	0	0	0	0	0	0	152	0	2	0	0	261	0	4	0	0	0	1	0	0	420
815	0	0	0	0	0	0	169	1	6	0	3	269	0	2	0	2	0	6	0	0	458
830	0	0	0	0	0	0	139	0	5	0	0	273	0	4	0	0	0	5	0	0	426
845	0	0	0	0	0	0	126	0	4	0	2	264	0	3	0	0	0	7	0	0	406
900	0	0	0	0	0	0	105	0	5	0	4	243	0	5	0	0	0	6	0	0	368
Total	0	0	0	0	0	0	997	1	39	0	10	2005	0	31	0	6	0	33	0	0	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
745 - 830	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	604	1	19	0	3	1074	0	17	0	5	0	17	0	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	74	1	2	0	2	84	0	2	0	0	0	2	0	0	167
1130	0	0	0	0	0	0	73	1	3	0	1	81	0	2	0	0	0	0	0	0	161
1145	0	0	0	0	0	0	61	1	6	0	3	97	0	1	0	0	0	2	0	0	171
1200	0	0	0	0	0	0	71	0	3	0	0	83	0	1	0	0	0	0	0	0	158
1215	0	0	0	0	0	0	74	1	3	0	0	94	0	2	0	0	0	0	0	0	174
1230	0	0	0	0	0	0	88	1	5	0	0	71	0	3	0	0	0	0	0	0	168
1245	0	0	0	0	0	0	95	1	6	0	3	92	0	6	0	0	0	0	0	0	203
1300	0	0	0	0	0	0	75	0	4	0	2	78	0	3	0	0	0	0	0	0	162
1315	0	0	0	0	0	0	73	1	5	0	1	88	0	2	0	1	0	0	0	0	171
1330	0	0	0	0	0	0	61	0	2	0	1	87	0	0	0	1	0	3	0	0	155

Intersection count: 15-minute interval data

NINTH LINE/SKYVIEW ST NIN-SKY-10-N ZArea: Z56

Counted On: 2013/04/03 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	80	0	2	0	4	65	0	4	0	0	0	0	0	0	155
1400	0	0	0	0	0	0	81	1	3	0	0	57	0	2	0	1	0	0	0	1	145
Offpeak Total	0	0	0	0	0	0	906	8	44	0	17	977	0	28	0	3	0	7	0	1	
Offpeak Hr Avg	0	0	0	0	0	0	302	3	15	0	6	326	0	9	0	1	0	2	0	0	

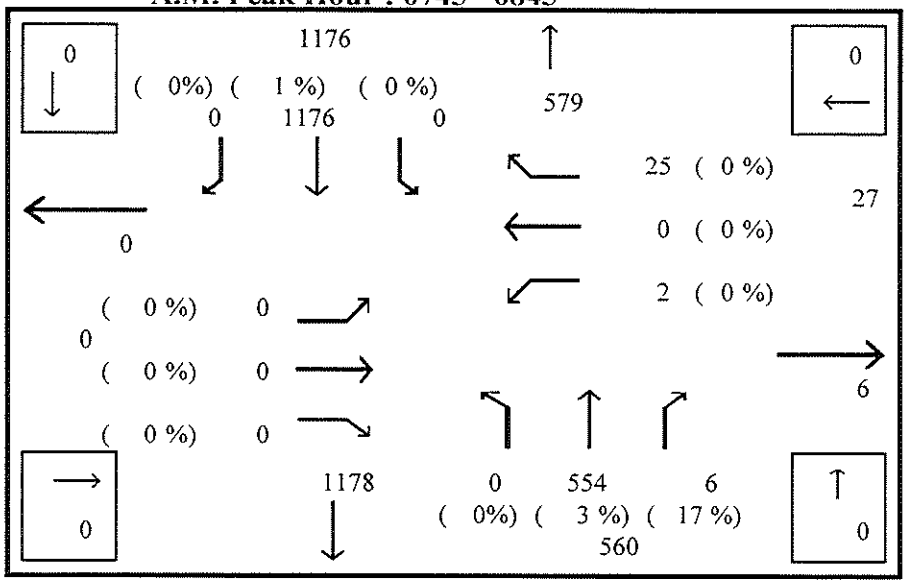
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	136	0	1	0	0	117	0	5	0	0	0	2	0	0	261
1530	0	0	0	0	0	0	160	1	5	0	5	118	0	5	0	0	0	1	0	0	295
1545	0	0	0	0	0	0	181	1	3	0	5	143	0	2	0	0	0	0	0	0	335
1600	0	0	0	0	0	0	177	1	7	0	2	104	0	4	0	1	0	1	0	4	297
1615	0	0	0	0	0	0	174	1	9	0	0	114	0	4	0	1	0	0	0	0	303
1630	0	0	0	0	0	0	234	0	11	0	3	140	0	3	0	0	0	0	0	1	391
1645	0	0	0	0	0	0	249	0	2	0	1	145	0	4	0	0	0	0	0	0	401
1700	0	0	0	0	0	0	234	0	3	0	5	167	0	2	0	0	0	0	0	0	411
1715	0	0	0	0	0	0	253	1	4	0	8	136	0	2	0	1	0	0	0	0	405
1730	0	0	0	0	0	0	248	1	3	0	0	148	0	0	0	0	0	1	0	0	401
1745	0	0	0	0	0	0	282	0	4	0	3	171	0	1	0	0	0	0	0	0	461
1800	0	0	0	0	0	0	239	1	1	0	4	147	0	1	0	1	0	1	0	0	395
Total	0	0	0	0	0	0	2567	7	53	0	36	1650	0	33	0	4	0	6	0	5	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1700 - 1745	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	1017	2	14	0	16	622	0	5	0	1	0	1	0	0	0

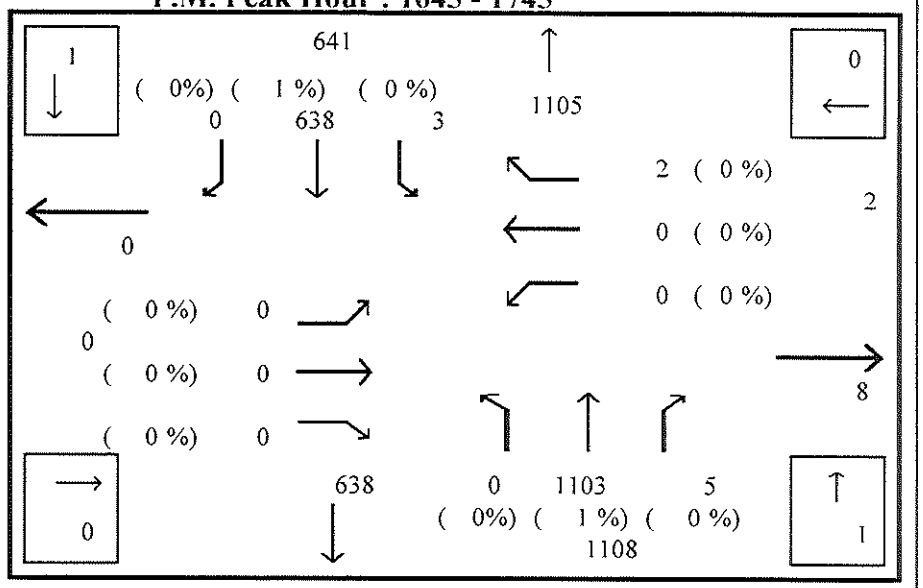
Count Date : Thursday April 4 2013 2/10/2014

[NIN-STA-10-N] NINTH LINE/STARDUST DR

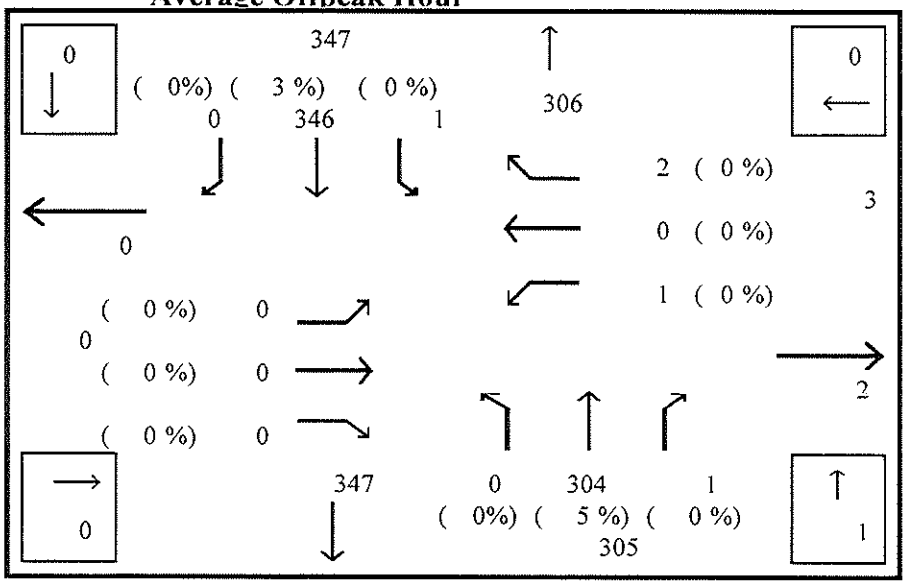
A.M. Peak Hour : 0745 - 0845



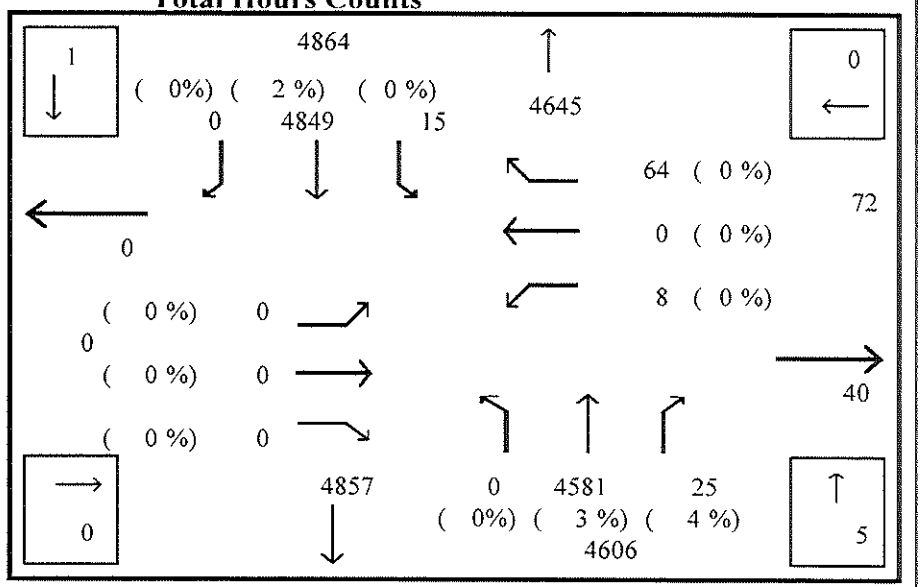
P.M. Peak Hour : 1645 - 1745



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

NINTH LINE/STARDUST DR NIN-STA-10-N ZArea: Z56

Counted On: 2013/04/04 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	0	0	0	0	0	57	0	7	0	0	173	0	2	0	0	0	5	0	0	244
730	0	0	0	0	0	0	106	0	4	0	1	217	0	6	0	0	0	4	0	0	338
745	0	0	0	0	0	0	126	0	2	0	0	279	0	1	0	0	0	5	0	0	413
800	0	0	0	0	0	0	140	1	3	0	0	260	0	2	0	0	0	3	0	0	409
815	0	0	0	0	0	0	164	1	5	0	0	320	0	5	0	1	0	8	0	0	504
830	0	0	0	0	0	0	125	2	6	0	0	282	0	5	0	0	0	9	0	0	429
845	0	0	0	0	0	0	108	1	4	0	0	298	0	4	0	1	0	5	0	0	421
900	0	0	0	0	0	0	116	2	5	0	2	233	0	5	0	1	0	5	0	0	369
Total	0	0	0	0	0	0	942	7	36	0	3	2062	0	30	0	3	0	44	0	0	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	0	0	537	5	18	0	0	1160	0	16	0	2	0	25	0	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	0	0	0	0	0	53	0	2	0	0	72	0	0	0	1	0	1	0	0	129
1130	0	0	0	0	0	0	66	1	4	0	0	77	0	7	0	0	0	0	0	0	155
1145	0	0	0	0	0	0	68	0	5	0	0	107	0	2	0	0	0	1	0	1	183
1200	0	0	0	0	0	0	81	0	4	0	0	85	0	3	0	0	0	0	0	0	173
1215	0	0	0	0	0	0	74	1	4	0	0	71	0	5	0	0	0	2	0	0	157
1230	0	0	0	0	0	0	89	0	2	0	1	77	0	1	0	1	0	0	0	0	171
1245	0	0	0	0	0	0	72	0	4	0	1	83	0	4	0	1	0	1	0	0	166
1300	0	0	0	0	0	0	71	0	4	0	1	97	0	3	0	1	0	1	0	0	178
1315	0	0	0	0	0	0	74	1	3	0	0	85	0	2	0	1	0	1	0	0	167
1330	0	0	0	0	0	0	69	0	1	0	0	80	0	1	0	0	0	0	0	0	151

Intersection count: 15-minute interval data

NINTH LINE/STARDUST DR NIN-STA-10-N ZArea: Z56

Counted On: 2013/04/04 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	0	0	0	0	0	70	1	7	0	1	84	0	5	0	0	0	0	0	2	168
1400	0	0	0	0	0	0	82	1	3	0	1	84	0	4	0	0	0	1	0	0	176
Offpeak Total	0	0	0	0	0	0	869	5	43	0	5	1002	0	37	0	5	0	8	0	3	
Offpeak Hr Avg	0	0	0	0	0	0	290	2	14	0	2	334	0	12	0	2	0	3	0	1	

PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	0	0	0	0	0	142	1	1	0	0	127	0	2	0	0	0	2	0	0	275
1530	0	0	0	0	0	0	161	2	6	0	0	124	0	8	0	0	0	2	0	0	303
1545	0	0	0	0	0	0	182	0	8	0	3	128	0	4	0	0	0	2	0	0	327
1600	0	0	0	0	0	0	197	2	3	0	0	134	0	3	0	0	0	0	0	0	339
1615	0	0	0	0	0	0	189	0	11	0	0	113	0	7	0	0	0	0	0	1	320
1630	0	0	0	0	0	0	207	1	7	0	0	133	0	3	0	0	0	0	0	0	351
1645	0	0	0	0	0	0	236	0	3	0	1	142	0	1	0	0	0	4	0	0	387
1700	0	0	0	0	0	0	258	1	3	0	2	167	0	4	0	0	0	0	0	1	435
1715	0	0	0	0	0	0	268	0	5	0	0	137	0	3	0	0	0	0	0	0	413
1730	0	0	0	0	1	0	293	3	0	0	0	165	0	0	0	0	0	1	0	0	462
1745	0	0	0	0	0	0	273	1	3	0	1	161	0	1	0	0	0	1	0	0	441
1800	0	0	0	0	0	0	234	1	2	0	0	146	0	5	0	0	0	0	0	0	388
Total	0	0	0	0	1	0	2640	12	52	0	7	1677	0	41	0	0	0	12	0	2	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1700 - 1745	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	0	0	0	0	1	0	1092	5	11	0	3	630	0	8	0	0	0	2	0	1	0

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Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Mississauga
Site #: 1402000002
Intersection: Eglinton Ave & Ninth Line
TFR File #: 2
Count date: 25-Feb-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Eglinton Ave runs W/E

North Leg Total: 1641
North Entering: 1074
North Peds: 0
Peds Cross: ⋈

Heavys	1	1	6	8
Trucks	0	3	6	9
Cars	73	558	426	1057
Totals	74	562	438	

Heavys	16
Trucks	6
Cars	545
Totals	567

East Leg Total: 1599
East Entering: 424
East Peds: 0
Peds Cross: ⧗

Ninth Line

Heavys	Trucks	Cars	Totals
3	3	259	265

Cars	Trucks	Heavys	Totals
198	2	13	213
172	3	2	177
34	0	0	34
404	5	15	

Eglinton Ave

N
W E
S

Heavys	Trucks	Cars	Totals
0	1	64	65
1	1	669	671
1	0	48	49
2	2	781	

Eglinton Ave

Cars	Trucks	Heavys	Totals
1161	7	7	1175

Ninth Line

Peds Cross: ⧗
West Peds: 0
West Entering: 785
West Leg Total: 1050

Cars	640
Trucks	3
Heavys	2
Totals	645

Cars	14	283	66	363
Trucks	0	3	0	3
Heavys	0	3	0	3
Totals	14	289	66	

Peds Cross: ⋈
South Peds: 0
South Entering: 369
South Leg Total: 1014

Comments

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Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Mississauga
Site #: 1402000002
Intersection: Eglinton Ave & Ninth Line
TFR File #: 2
Count date: 25-Feb-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Eglinton Ave runs W/E

North Leg Total: 1539
North Entering: 552
North Peds: 0
Peds Cross: ⋈

Heavys	0	2	1	3
Trucks	0	1	3	4
Cars	64	297	184	545
Totals	64	300	188	

Heavys	9
Trucks	3
Cars	975
Totals	987

East Leg Total: 1465
East Entering: 1025
East Peds: 0
Peds Cross: ⧗

Ninth Line

Heavys	Trucks	Cars	Totals
0	1	815	816

Cars	Trucks	Heavys	Totals
401	2	9	412
573	1	0	574
38	1	0	39
1012	4	9	

Eglinton Ave

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	48	48
0	2	218	220
0	0	18	18
0	2	284	

Eglinton Ave

Cars	Trucks	Heavys	Totals
434	5	1	440

Ninth Line

Peds Cross: ⧗
West Peds: 0
West Entering: 286
West Leg Total: 1102

Cars	353
Trucks	2
Heavys	2
Totals	357

Cars	178	526	32	736
Trucks	0	1	0	1
Heavys	0	0	0	0
Totals	178	527	32	

Peds Cross: ⋈
South Peds: 0
South Entering: 737
South Leg Total: 1094

Comments

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Fax: 1-888-711-3125

Accu-Traffic Inc.

Total Count Diagram

Municipality: Mississauga
Site #: 1402000002
Intersection: Eglinton Ave & Ninth Line
TFR File #: 2
Count date: 25-Feb-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Eglinton Ave runs W/E

North Leg Total:	5754
North Entering:	3021
North Peds:	0
Peds Cross:	⋈

Heavys	1	7	10	18
Trucks	1	8	13	22
Cars	252	1583	1146	2981
Totals	254	1598	1169	

Heavys	50
Trucks	14
Cars	2669
Totals	2733

East Leg Total:	5744
East Entering:	2698
East Peds:	0
Peds Cross:	⧗

Ninth Line

Heavys	Trucks	Cars	Totals
6	11	2030	2047

Cars	Trucks	Heavys	Totals
1062	7	43	1112
1450	8	4	1462
123	1	0	124
2635	16	47	

Eglinton Ave

N
W E
S

Heavys	Trucks	Cars	Totals
0	1	207	208
6	7	1689	1702
1	1	128	130
7	9	2024	

Eglinton Ave

Cars	Trucks	Heavys	Totals
3009	21	16	3046

Ninth Line

Peds Cross:	⧗
West Peds:	0
West Entering:	2040
West Leg Total:	4087

Cars	1834
Trucks	10
Heavys	8
Totals	1852

Cars	328	1400	174	1902
Trucks	2	6	1	9
Heavys	1	7	0	8
Totals	331	1413	175	

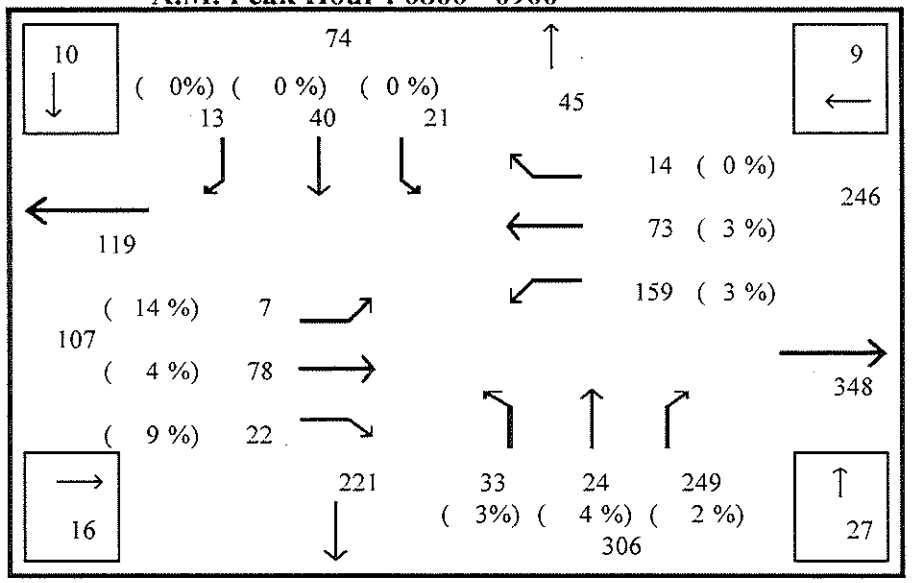
Peds Cross:	⋈
South Peds:	0
South Entering:	1919
South Leg Total:	3771

Comments

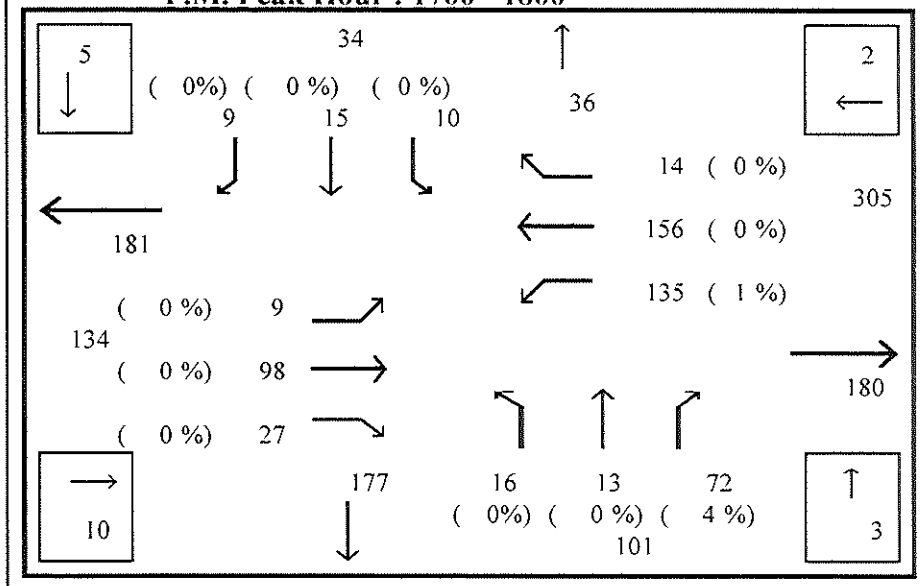
Count Date : Wednesday April 10 2013 2/10/2014

[ROS-TER-01-N] ROSEHURST DR/TERRAGAR BLVD

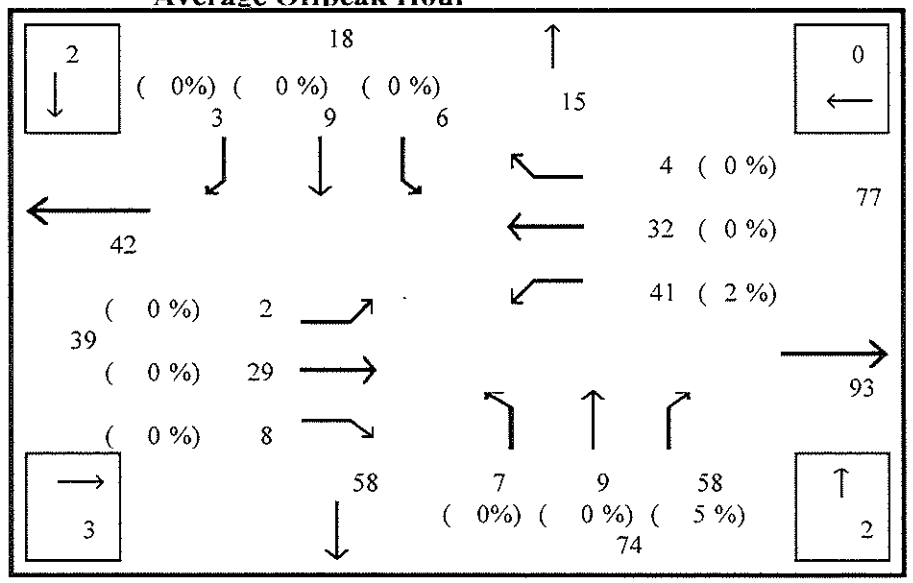
A.M. Peak Hour : 0800 - 0900



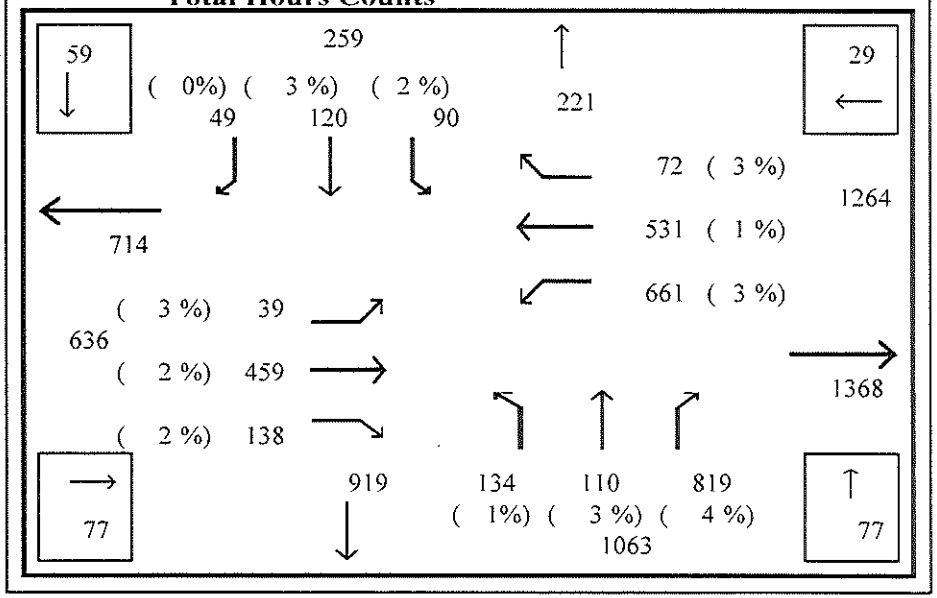
P.M. Peak Hour : 1700 - 1800



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

ROSEHURST DR/TERRAGAR BLVD ROS-TER-01-N ZArea: Z55

Counted On: 2013/04/10 Traffic Control: All-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	1	6	1	0	1	2	0	12	1	1	8	3	2	0	2	2	15	2	2	1	57
730	1	21	3	1	1	1	2	18	3	0	2	2	2	1	0	2	17	2	2	1	80
745	2	24	6	1	2	2	0	35	4	2	3	2	4	0	1	9	21	0	3	4	116
800	1	12	9	0	2	7	4	26	2	0	7	6	4	0	0	20	18	1	4	0	121
815	3	10	4	0	8	7	3	48	1	0	10	10	3	0	2	39	21	4	1	4	164
830	0	20	7	2	0	13	11	96	2	3	2	20	4	0	0	77	13	4	2	9	273
845	1	23	5	1	1	10	8	56	3	0	7	6	4	0	4	17	14	5	2	1	162
900	2	22	4	3	1	2	1	43	2	13	2	4	2	0	3	21	23	1	2	13	134
Total	11	138	39	8	16	44	29	334	18	19	41	53	25	1	12	187	142	19	18	33	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
815 - 900	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	6	75	20	6	10	32	23	243	8	16	21	40	13	0	9	154	71	14	7	27	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	5	1	0	0	2	9	24	2	0	2	2	1	0	0	5	8	1	0	2	62
1130	0	8	1	0	0	1	2	17	0	6	1	5	0	0	0	11	12	0	0	3	58
1145	0	7	4	0	0	2	2	27	1	2	0	1	0	0	0	14	12	0	1	0	71
1200	0	7	2	0	2	5	0	7	0	0	3	0	1	0	0	9	6	0	0	0	40
1215	1	10	2	0	0	0	2	7	1	0	1	2	1	0	0	16	8	1	0	0	52
1230	0	3	4	0	2	2	2	9	0	0	0	5	1	0	0	18	8	0	1	0	53
1245	5	6	3	0	0	4	2	24	2	0	2	4	1	0	0	6	6	0	0	0	65
1300	0	12	1	0	2	4	3	18	1	1	5	2	1	0	0	11	6	2	0	0	66
1315	0	10	2	0	0	1	1	7	0	0	0	1	1	0	2	8	9	2	1	1	43
1330	2	4	2	0	0	2	3	11	0	1	2	3	0	0	0	5	9	0	0	1	43

Intersection count: 15-minute interval data

ROSEHURST DR/TERRAGAR BLVD ROS-TER-01-N ZArea: Z55

Counted On: 2013/04/10 Traffic Control: All-way Stop Report Date: 2014/02/11

1345	0	8	1	0	0	0	0	7	1	0	1	1	4	0	0	6	8	3	0	0	40
1400	0	8	3	0	1	0	1	8	0	0	1	1	0	0	0	14	4	2	0	0	42
Offpeak Total	8	88	26	0	7	23	27	166	8	10	18	27	11	0	2	123	96	11	3	7	
Offpeak Hr Avg	3	29	9	0	2	8	9	55	3	3	6	9	4	0	1	41	32	4	1	2	

PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	1	15	8	1	11	16	12	83	2	3	7	3	0	1	3	18	11	2	2	14	182
1530	2	24	6	0	0	5	5	23	1	6	2	3	0	0	0	16	9	4	2	3	102
1545	3	12	5	0	5	4	2	26	3	21	2	7	2	0	4	28	15	2	2	9	113
1600	2	15	3	0	6	2	3	8	1	1	2	2	1	0	0	20	13	3	2	1	77
1615	2	12	4	1	6	6	1	16	1	3	3	0	0	1	0	25	15	2	1	1	90
1630	0	16	7	1	0	2	6	13	2	0	1	4	0	0	0	29	13	2	0	0	96
1645	0	15	3	0	3	10	5	29	2	3	1	3	1	1	4	30	26	4	0	1	130
1700	0	19	7	0	0	4	4	16	0	1	1	0	0	1	2	28	28	7	1	5	116
1715	0	23	6	0	0	6	3	28	1	2	2	6	2	0	2	34	30	3	0	1	144
1730	2	24	8	0	5	2	1	13	1	5	0	1	1	0	0	40	48	1	1	0	143
1745	3	25	7	0	0	4	4	13	0	0	4	4	3	0	0	32	44	5	0	0	148
1800	4	26	6	0	0	4	5	15	1	3	4	4	3	0	0	28	34	5	0	2	139
Total	19	226	70	3	36	65	51	283	15	48	29	37	13	4	15	328	286	40	11	37	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1715 - 1800	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	9	98	27	0	5	16	13	69	3	10	10	15	9	0	2	134	156	14	1	3	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis
www.accu-traffic.ca
Tel: 1-416-910-0171
Fax: 1-888-711-3125

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Mississauga
Site #: 1402000003
Intersection: Derry Rd & Rosehurst Dr / Lisgar Dı
TFR File #: 3
Count date: 25-Feb-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total:	638
North Entering:	421
North Peds:	14
Peds Cross:	⋈

Heavys	1	8	6	15
Trucks	0	0	0	0
Cars	91	97	218	406
Totals	92	105	224	

Heavys	10
Trucks	1
Cars	206
Totals	217

East Leg Total:	2820
East Entering:	741
East Peds:	24
Peds Cross:	⧗

Rosehurst Dr

Heavys	Trucks	Cars	Totals
12	18	662	692

Cars	Trucks	Heavys	Totals
124	1	7	132
478	17	10	505
97	1	6	104
699	19	23	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	22	22
6	19	1469	1494
0	0	20	20
6	19	1511	

Derry Rd

Cars	Trucks	Heavys	Totals
2041	19	19	2079

Lisgar Dr

Peds Cross:	⧗
West Peds:	12
West Entering:	1536
West Leg Total:	2228

Cars	214
Trucks	1
Heavys	14
Totals	229

Cars	93	60	354	507
Trucks	1	0	0	1
Heavys	1	3	7	11
Totals	95	63	361	

Peds Cross:	⋈
South Peds:	3
South Entering:	519
South Leg Total:	748

Comments

Accu-Traffic Inc.
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Tel: 1-416-910-0171
Fax: 1-888-711-3125

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Mississauga
Site #: 1402000003
Intersection: Derry Rd & Rosehurst Dr / Lisgar Dı
TFR File #: 3
Count date: 25-Feb-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total: 459
North Entering: 181
North Peds: 4
Peds Cross: ⋈

Heavys	0	2	0	2
Trucks	1	0	0	1
Cars	44	35	99	178
Totals	45	37	99	

Heavys	3
Trucks	0
Cars	275
Totals	278

East Leg Total: 2776
East Entering: 2002
East Peds: 2
Peds Cross: ⧗

Rosehurst Dr

Heavys	Trucks	Cars	Totals
7	13	1554	1574

Cars	Trucks	Heavys	Totals
182	0	3	185
1463	12	7	1482
332	1	2	335
1977	13	12	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	57	57
11	6	498	515
0	1	51	52
11	7	606	

Derry Rd

Cars	Trucks	Heavys	Totals
754	6	14	774

Lisgar Dr

Peds Cross: ⧗
West Peds: 9
West Entering: 624
West Leg Total: 2198

Cars	418
Trucks	2
Heavys	4
Totals	424

Cars	47	36	157	240
Trucks	0	0	0	0
Heavys	0	0	3	3
Totals	47	36	160	

Peds Cross: ⋈
South Peds: 6
South Entering: 243
South Leg Total: 667

Comments

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Accu-Traffic Inc.

Total Count Diagram

Municipality: Mississauga
Site #: 1402000003
Intersection: Derry Rd & Rosehurst Dr / Lisgar Dı
TFR File #: 3
Count date: 25-Feb-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total:	1826
North Entering:	1008
North Peds:	30
Peds Cross:	⋈

Heavys	1	17	9	27
Trucks	1	0	0	1
Cars	218	184	578	980
Totals	220	201	587	

Heavys	30
Trucks	2
Cars	786
Totals	818

East Leg Total:	10141
East Entering:	4909
East Peds:	40
Peds Cross:	⧗

Rosehurst Dr

Heavys	Trucks	Cars	Totals
38	52	3966	4056

Cars	Trucks	Heavys	Totals
526	2	18	546
3507	49	35	3591
754	2	16	772
4787	53	69	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
1	0	124	125
31	38	3675	3744
2	1	114	117
34	39	3913	

Derry Rd

Cars	Trucks	Heavys	Totals
5129	43	60	5232

Lisgar Dr

Peds Cross:	⧗
West Peds:	48
West Entering:	3986
West Leg Total:	8042

Cars	1052
Trucks	3
Heavys	35
Totals	1090

Cars	241	136	876	1253
Trucks	2	0	5	7
Heavys	2	11	20	33
Totals	245	147	901	

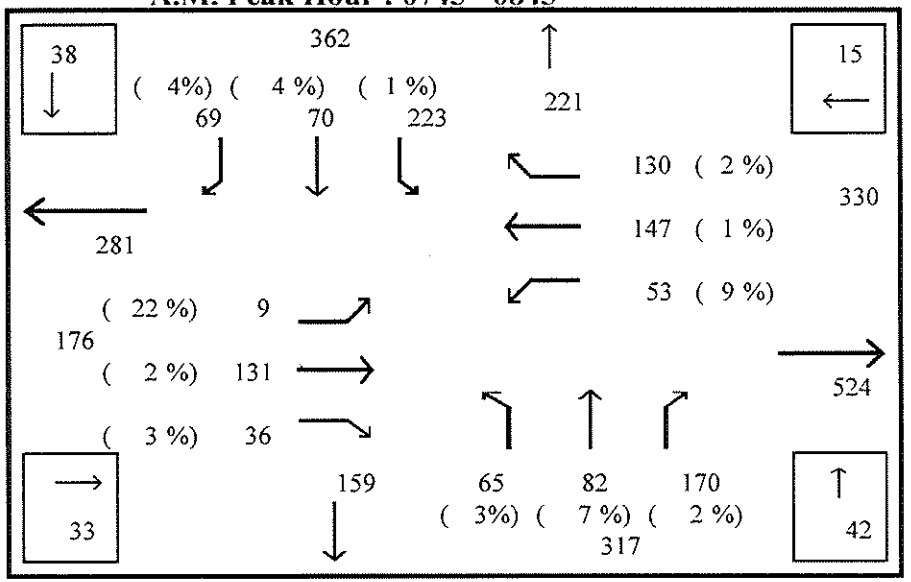
Peds Cross:	⋈
South Peds:	23
South Entering:	1293
South Leg Total:	2383

Comments

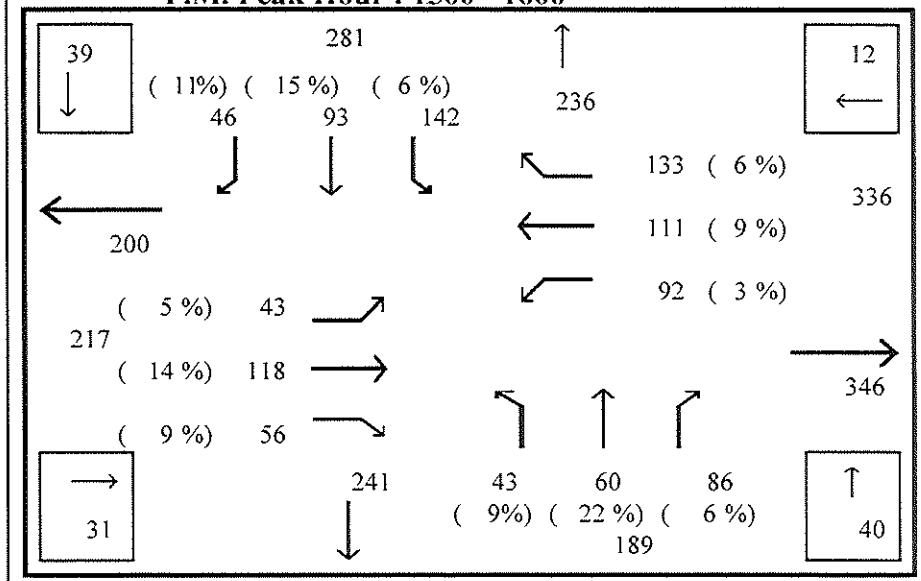
Count Date : Wednesday February 6 2013 2/10/2014

[DOU-LIS-01-N] DOUG LEAVENS BLVD/LISGAR DR

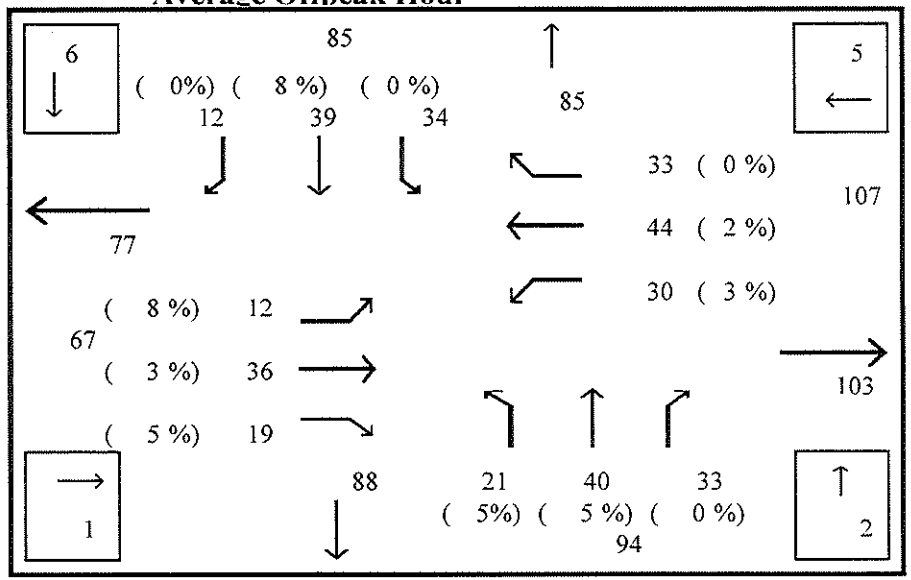
A.M. Peak Hour : 0745 - 0845



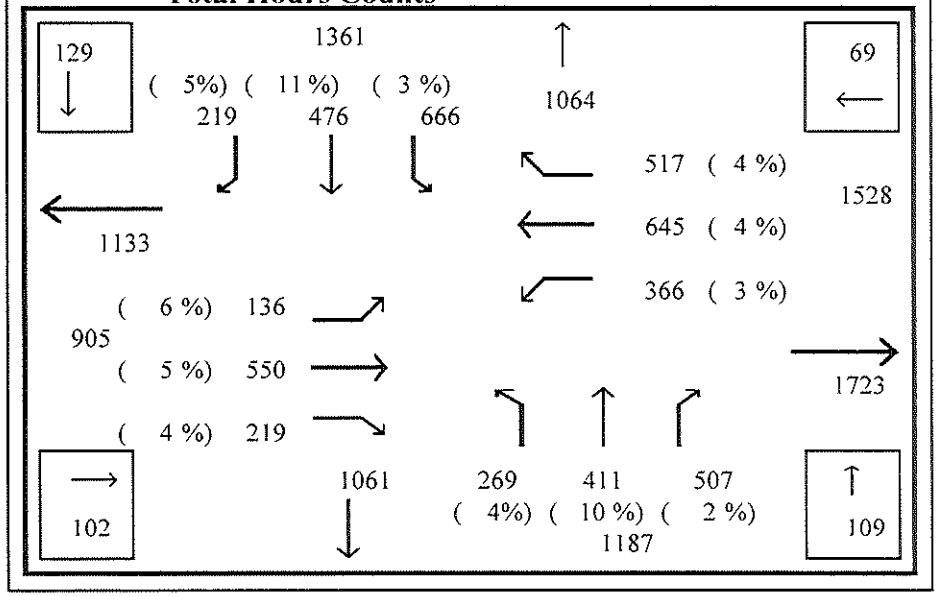
P.M. Peak Hour : 1500 - 1600



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

DOUG LEAVENS BLVD/LISGAR DR DOU-LIS-01-N ZArea: Z56

Counted On: 2013/02/06 Traffic Control: All-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	1	8	2	0	0	7	15	7	1	1	2	3	5	1	0	3	30	4	5	0	94
730	3	7	4	0	0	14	10	28	2	3	22	6	5	5	0	7	26	5	4	2	148
745	4	17	4	0	2	14	10	27	1	1	37	8	4	5	0	9	19	8	0	2	167
800	2	37	8	1	0	14	18	42	6	2	35	9	8	1	2	16	33	12	3	1	245
815	1	48	4	1	11	10	30	54	0	14	75	17	23	2	4	7	36	37	2	32	347
830	3	24	9	2	13	19	17	44	2	9	68	32	25	2	6	19	49	55	4	7	374
845	1	20	14	1	14	20	11	26	4	8	42	9	10	4	3	6	27	24	0	2	219
900	2	17	9	0	2	13	11	19	0	0	23	11	7	3	0	6	25	23	1	0	170
Total	17	178	54	5	42	111	122	247	16	38	304	95	87	23	15	73	245	168	19	46	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	7	129	35	5	38	63	76	166	12	33	220	67	66	9	15	48	145	128	9	42	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	3	9	2	0	0	3	14	9	1	0	10	8	1	1	0	6	7	5	0	0	79
1130	3	14	8	0	2	9	14	12	2	0	11	7	3	2	0	6	9	10	0	0	110
1145	3	9	5	1	0	5	10	6	3	0	8	11	4	2	0	9	14	4	0	1	94
1200	4	8	10	1	0	8	10	8	0	0	7	6	3	0	0	7	12	10	0	0	94
1215	3	6	4	0	1	5	10	7	2	1	7	7	5	1	2	8	11	5	1	0	82
1230	3	9	9	0	0	5	11	8	0	0	9	11	5	1	2	7	14	9	1	1	102
1245	4	10	1	0	2	7	7	11	1	0	10	14	2	1	10	8	8	10	0	1	94
1300	2	11	3	1	0	4	9	10	0	0	10	11	3	1	0	7	11	9	0	0	92
1315	2	4	4	1	4	2	8	4	0	2	8	7	3	1	0	6	6	10	0	2	66
1330	2	9	4	0	3	3	7	11	0	0	8	9	4	0	0	6	11	12	1	1	87

Intersection count: 15-minute interval data

DOUG LEAVENS BLVD/LISGAR DR DOU-LIS-01-N ZArea: Z56

Counted On: 2013/02/06 Traffic Control: All-way Stop Report Date: 2014/02/11

1345	3	10	1	0	2	4	4	6	0	0	6	5	1	0	1	8	11	9	1	0	69
1400	4	8	4	3	5	6	11	7	1	0	9	12	4	1	2	11	14	7	4	0	106
Offpeak Total	36	107	55	7	19	61	115	99	10	3	103	108	38	11	17	89	128	100	8	6	
Offpeak Hr Avg	12	36	18	2	6	20	38	33	3	1	34	36	13	4	6	30	43	33	3	2	

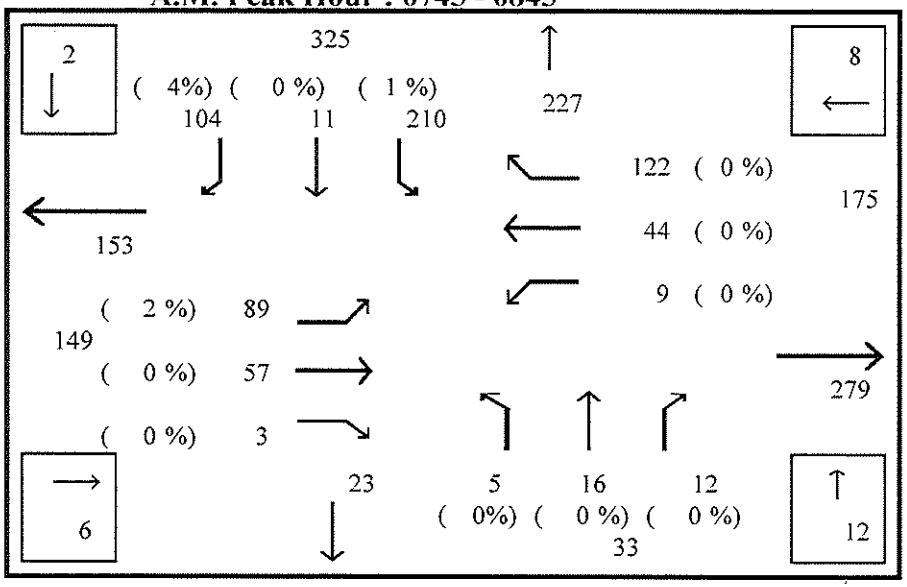
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	9	25	13	4	12	8	5	36	6	7	49	22	17	8	0	19	30	24	5	7	280
1530	17	29	17	8	16	17	17	21	5	11	41	19	7	7	6	25	28	42	6	20	306
1545	9	30	10	6	7	9	14	15	2	6	24	19	7	8	5	22	24	36	7	9	242
1600	6	17	11	6	4	5	11	9	9	7	19	19	10	5	1	23	19	23	3	4	195
1615	4	14	6	1	9	7	12	11	4	5	15	20	9	5	3	14	19	14	4	5	159
1630	5	22	11	3	6	7	10	9	1	6	21	18	7	5	6	15	28	15	1	2	178
1645	4	11	7	0	4	5	12	9	1	6	14	21	9	6	5	17	12	14	4	3	146
1700	3	19	3	0	3	5	9	7	3	1	10	11	4	2	2	14	15	11	1	0	117
1715	4	24	5	1	0	7	12	9	0	4	9	18	4	2	2	18	21	12	0	5	146
1730	8	16	5	3	3	3	11	9	3	5	14	23	2	2	4	3	17	12	1	2	132
1745	4	11	9	1	2	8	8	6	2	3	11	16	3	0	0	9	14	12	0	0	114
1800	2	18	4	1	2	6	11	8	2	0	10	15	4	1	3	14	16	14	1	0	127
Total	75	236	101	34	68	87	132	149	38	61	237	221	83	51	37	193	243	229	33	57	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1515 - 1600	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	41	101	51	24	39	39	47	81	22	31	133	79	41	28	12	89	101	125	21	40	0

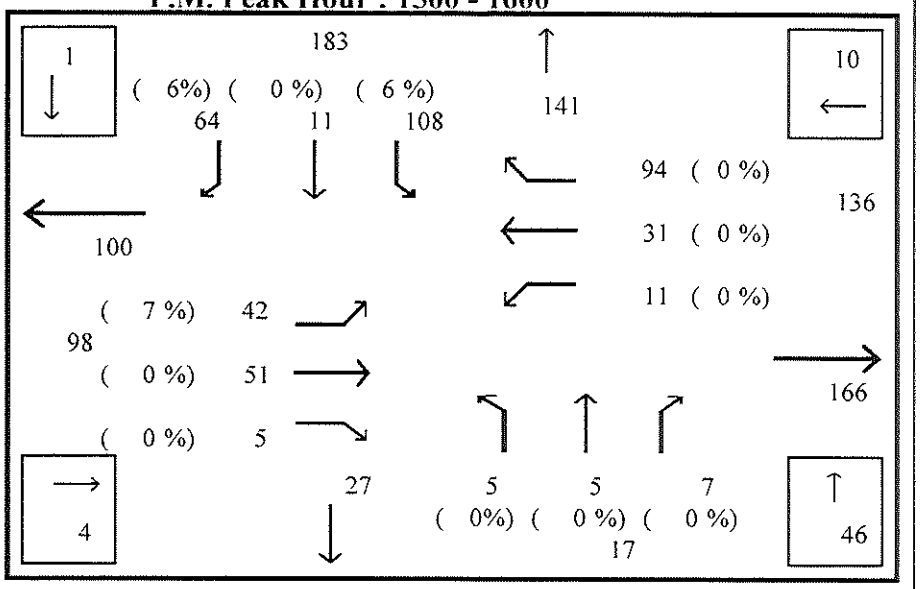
Count Date : Thursday April 11 2013 2/10/2014

[LIS-OSP-10-N] LISGAR DR/OSPREY BLVD

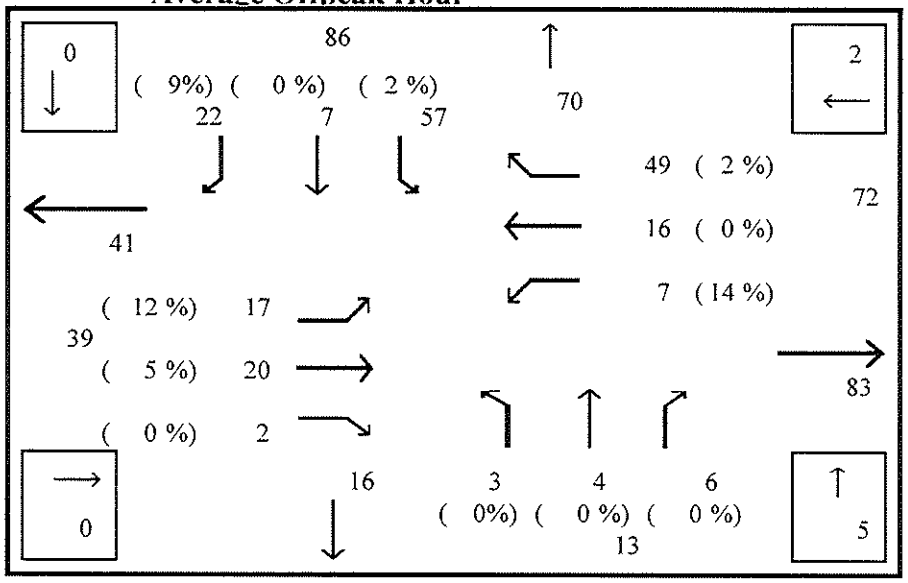
A.M. Peak Hour : 0745 - 0845



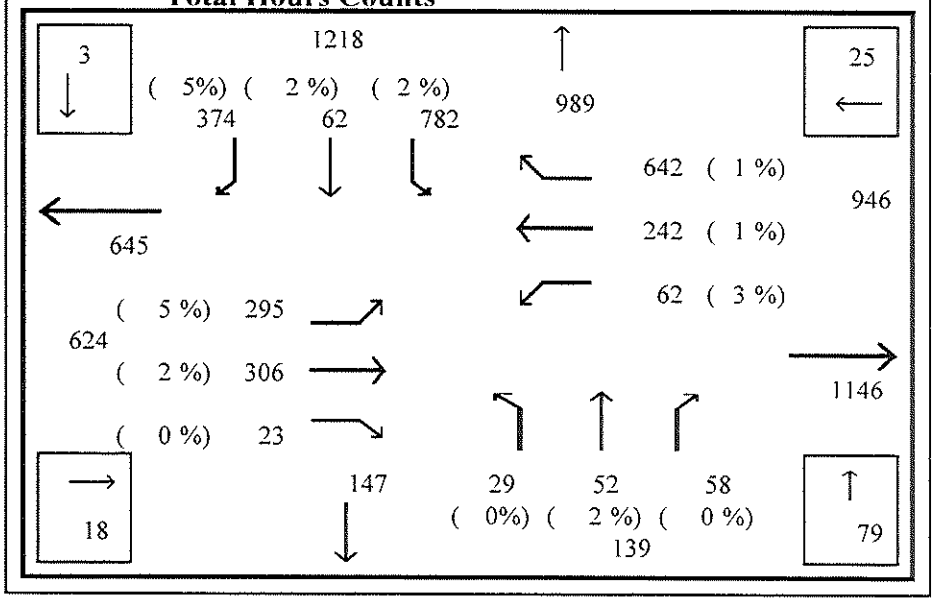
P.M. Peak Hour : 1500 - 1600



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

LISGAR DR/OSPREY BLVD LIS-OSP-10-N ZArea: Z56

Counted On: 2013/04/11 Traffic Control: All-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	2	7	0	0	0	0	0	2	0	4	22	0	8	1	0	0	9	2	0	2	53
730	4	4	0	1	0	0	1	2	0	0	40	0	16	0	0	0	12	12	0	0	92
745	9	11	0	0	0	0	1	0	0	0	38	1	25	2	0	2	17	10	0	1	116
800	12	11	0	1	0	1	1	2	0	0	45	3	14	1	0	0	15	16	0	2	122
815	21	11	0	0	0	1	6	5	0	0	39	1	21	2	0	3	14	31	0	0	155
830	36	24	1	1	2	1	5	4	0	5	68	3	28	1	7	4	8	48	0	9	232
845	18	11	2	0	0	2	4	1	0	1	56	4	37	2	1	2	7	27	0	1	173
900	5	6	0	2	0	1	4	4	0	0	40	4	15	0	0	1	12	11	2	0	107
Total	107	85	3	5	2	6	22	20	0	10	348	16	164	9	8	12	94	157	2	15	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	87	57	3	2	2	5	16	12	0	6	208	11	100	6	8	9	44	122	0	12	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	7	3	1	0	0	0	2	1	0	0	12	3	6	0	0	1	4	11	0	2	51
1130	1	4	0	1	0	0	0	3	0	0	11	0	3	0	2	0	3	7	1	6	34
1145	2	4	0	1	0	0	0	0	0	0	16	2	3	1	0	1	3	9	0	1	42
1200	3	3	0	1	0	0	0	2	0	0	11	0	4	1	0	1	2	14	0	0	42
1215	9	3	0	1	0	1	0	0	0	0	13	1	5	3	2	0	6	16	1	4	59
1230	2	6	0	0	0	0	0	0	0	0	15	0	7	0	0	1	5	23	0	2	59
1245	8	8	0	1	0	1	2	3	0	0	21	2	9	1	0	2	2	13	0	0	73
1300	0	2	1	0	0	1	1	0	0	0	14	0	6	0	0	2	7	10	4	0	48
1315	2	7	0	1	0	1	1	1	0	0	14	0	5	2	0	5	3	11	0	0	53
1330	5	6	1	1	0	2	1	2	1	0	14	2	5	1	1	3	5	10	1	0	60

Intersection count: 15-minute interval data

LISGAR DR/OSPREY BLVD LIS-OSP-10-N ZArea: Z56

Counted On: 2013/04/11 Traffic Control: All-way Stop Report Date: 2014/02/11

1345	4	7	2	1	0	2	3	3	0	0	15	5	5	0	2	2	3	12	0	1	64
1400	5	6	1	0	0	1	3	3	0	0	13	6	5	0	0	3	5	9	0	0	60
Offpeak Total	48	59	6	8	0	9	13	18	1	0	169	21	63	9	7	21	48	145	7	16	
Offpeak Hr Avg	16	20	2	3	0	3	4	6	0	0	56	7	21	3	2	7	16	48	2	5	

PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	12	21	1	1	0	2	1	4	0	2	52	3	16	6	10	0	10	25	0	43	154
1530	10	9	1	1	1	0	2	0	0	0	16	3	22	1	0	3	4	18	0	3	90
1545	10	8	2	0	0	1	1	2	0	2	15	2	13	1	0	4	8	27	0	0	94
1600	7	13	1	1	0	2	1	1	0	0	19	3	9	2	0	4	9	24	0	0	96
1615	8	7	0	0	0	0	0	2	0	0	10	0	6	0	0	0	5	25	0	0	63
1630	7	11	0	3	0	0	0	3	0	2	15	1	7	1	0	3	8	20	0	2	79
1645	11	10	1	0	0	0	0	0	0	0	10	2	7	0	0	3	10	40	1	0	95
1700	12	11	1	1	0	1	2	1	0	0	14	1	10	2	0	2	6	26	0	0	90
1715	10	19	1	1	0	3	3	2	0	0	16	1	12	0	0	2	12	35	0	0	117
1730	8	11	1	0	0	1	0	0	0	2	18	1	2	1	0	1	8	39	0	0	91
1745	15	18	2	2	0	1	3	3	0	0	36	4	12	2	0	2	9	28	0	0	137
1800	14	17	3	0	0	3	3	2	0	0	31	3	11	0	0	3	9	27	0	0	126
Total	124	155	14	10	1	14	16	20	0	8	252	24	127	16	10	27	98	334	1	48	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1515 - 1600	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	39	51	5	3	1	5	5	7	0	4	102	11	60	10	10	11	31	94	0	46	0

MG8 ENG

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

Municipality: Region of Peel
Site #: 0000309755
Intersection: Britannia Road & Churchill Meadow
TFR File #: 7
Count date: 6-Jun-2013

Weather conditions:

Person(s) who counted:
THOMAS

**** Signalized Intersection ****

Major Road: Britannia Road runs W/E

North Leg Total:	131
North Entering:	110
North Peds:	8
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	0	1	0	1
Cars	17	18	74	109
Totals	17	19	74	

Cyclists	0
Trucks	4
Cars	17
Totals	21

East Leg Total:	1915
East Entering:	566
East Peds:	10
Peds Cross:	⧗

Maple Gate Circle

Cyclists	Trucks	Cars	Totals
0	21	516	537

Cars	Trucks	Cyclists	Totals
13	4	0	17
469	20	0	489
51	9	0	60
533	33	0	

Britannia Road

N
W E
S

Cyclists	Trucks	Cars	Totals
0	0	1	1
0	16	1050	1066
0	0	14	14
0	16	1065	

Britannia Road

Cars	Trucks	Cyclists	Totals
1330	19	0	1349

Churchill Meadows Blvd

Peds Cross:	⧗
West Peds:	6
West Entering:	1081
West Leg Total:	1618

Cars	83
Trucks	10
Cyclists	0
Totals	93

Cars	30	3	206	239
Trucks	1	0	3	4
Cyclists	0	0	0	0
Totals	31	3	209	

Peds Cross:	⋈
South Peds:	4
South Entering:	243
South Leg Total:	336

Comments

MG8 ENG

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 11:30:00
To: 12:30:00

Municipality: Region of Peel
Site #: 0000309755
Intersection: Britannia Road & Churchill Meadow
TFR File #: 7
Count date: 6-Jun-2013

Weather conditions:

Person(s) who counted:
THOMAS

**** Signalized Intersection ****

Major Road: Britannia Road runs W/E

North Leg Total:	68
North Entering:	29
North Peds:	3
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	0	0	1	1
Cars	6	1	21	28
Totals	6	1	22	

Cyclists	0
Trucks	1
Cars	38
Totals	39

East Leg Total:	810
East Entering:	371
East Peds:	4
Peds Cross:	⧗

Maple Gate Circle

Cyclists	Trucks	Cars	Totals
1	22	250	273

Cars	Trucks	Cyclists	Totals
27	1	0	28
222	22	1	245
97	1	0	98
346	24	1	

Britannia Road

N
W E
S

Cyclists	Trucks	Cars	Totals
0	0	7	7
0	35	289	324
0	0	11	11
0	35	307	

Britannia Road

Cars	Trucks	Cyclists	Totals
401	38	0	439

Churchill Meadows Blvd

Peds Cross:	⧗
West Peds:	6
West Entering:	342
West Leg Total:	615

Cars	109
Trucks	1
Cyclists	0
Totals	110

Cars	22	4	91	117
Trucks	0	0	2	2
Cyclists	0	0	0	0
Totals	22	4	93	

Peds Cross:	⋈
South Peds:	1
South Entering:	119
South Leg Total:	229

Comments

MG8 ENG

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 17:00:00
To: 18:00:00

Municipality: Region of Peel
Site #: 0000309755
Intersection: Britannia Road & Churchill Meadow
TFR File #: 7
Count date: 6-Jun-2013

Weather conditions:

Person(s) who counted:
THOMAS

**** Signalized Intersection ****

Major Road: Britannia Road runs W/E

North Leg Total:	157
North Entering:	48
North Peds:	4
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	0	0	1	1
Cars	7	11	29	47
Totals	7	11	30	

Cyclists	0
Trucks	1
Cars	108
Totals	109

East Leg Total:	1894
East Entering:	1221
East Peds:	3
Peds Cross:	⧗

Maple Gate Circle

Cyclists	Trucks	Cars	Totals
0	8	958	966

Cars	Trucks	Cyclists	Totals
77	1	0	78
916	8	0	924
219	0	0	219
1212	9	0	

Britannia Road

N
W E
S

Cyclists	Trucks	Cars	Totals
0	0	16	16
0	11	530	541
0	0	32	32
0	11	578	

Britannia Road

Cars	Trucks	Cyclists	Totals
660	13	0	673

Churchill Meadows Blvd

Peds Cross:	⧗
West Peds:	2
West Entering:	589
West Leg Total:	1555

Cars	262
Trucks	0
Cyclists	0
Totals	262

Cars	35	15	101	151
Trucks	0	0	1	1
Cyclists	0	0	0	0
Totals	35	15	102	

Peds Cross:	⋈
South Peds:	0
South Entering:	152
South Leg Total:	414

Comments

MG8 ENG

Total Count Diagram

Municipality: Region of Peel
Site #: 0000309755
Intersection: Britannia Road & Churchill Meadow
TFR File #: 7
Count date: 6-Jun-2013

Weather conditions:

Person(s) who counted:
THOMAS

**** Signalized Intersection ****

Major Road: Britannia Road runs W/E

North Leg Total:	869
North Entering:	434
North Peds:	26
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	1	2	9	12
Cars	74	59	289	422
Totals	75	61	298	

Cyclists	0
Trucks	13
Cars	422
Totals	435

East Leg Total:	10537
East Entering:	5149
East Peds:	40
Peds Cross:	⧗

Maple Gate Circle

Cyclists	Trucks	Cars	Totals
2	148	4085	4235

Cars	Trucks	Cyclists	Totals
302	8	0	310
3810	144	1	3955
859	24	1	884
4971	176	2	

Britannia Road

N
W E
S

Cyclists	Trucks	Cars	Totals
0	1	63	64
4	161	3976	4141
0	3	125	128
4	165	4164	

Britannia Road

Cars	Trucks	Cyclists	Totals
5198	186	4	5388

Churchill Meadows Blvd

Peds Cross:	⧗
West Peds:	34
West Entering:	4333
West Leg Total:	8568

Cars	1043
Trucks	29
Cyclists	1
Totals	1073

Cars	201	57	933	1191
Trucks	3	4	16	23
Cyclists	1	0	0	1
Totals	205	61	949	

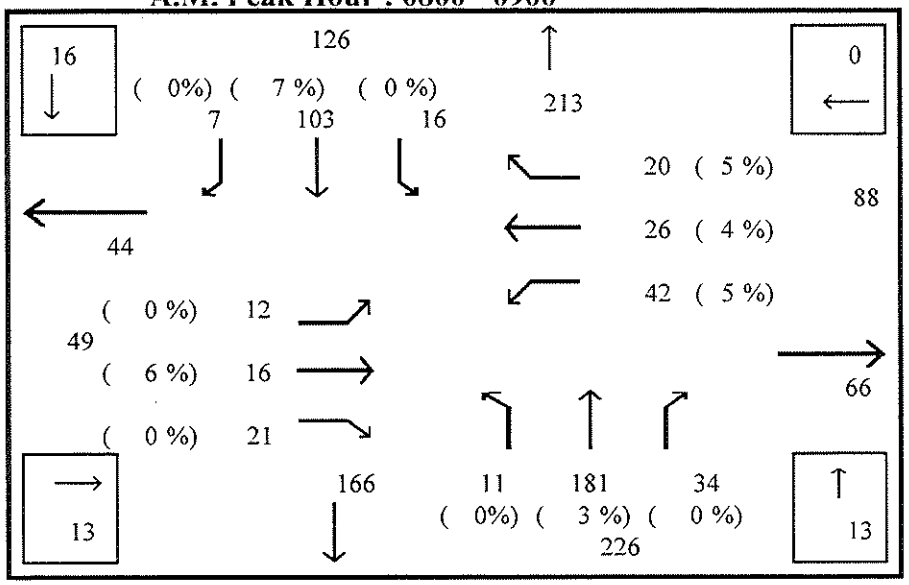
Peds Cross:	⋈
South Peds:	21
South Entering:	1215
South Leg Total:	2288

Comments

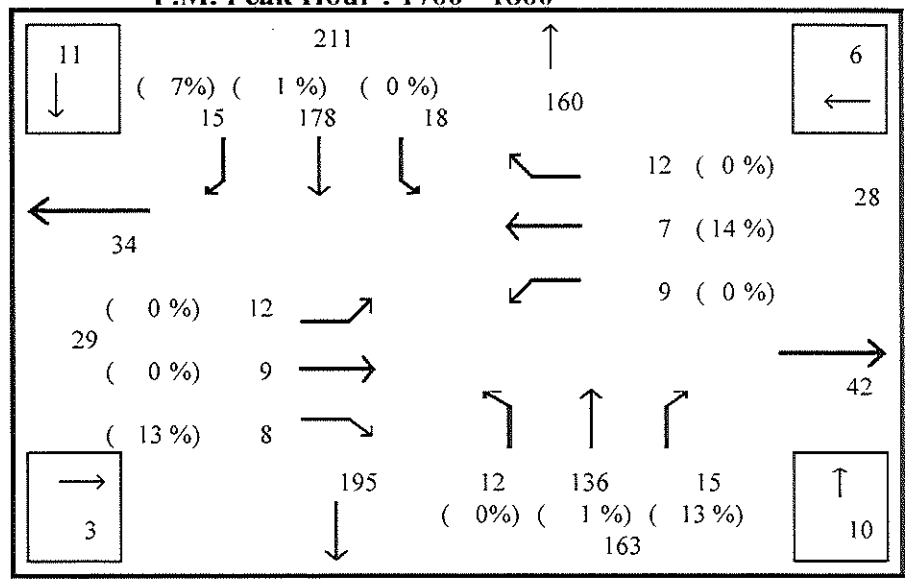
Count Date : Wednesday April 17 2013 2/10/2014

[CHU-FRE-01-N] CHURCHILL MEADOWS BLVD/FREEMAN TERR

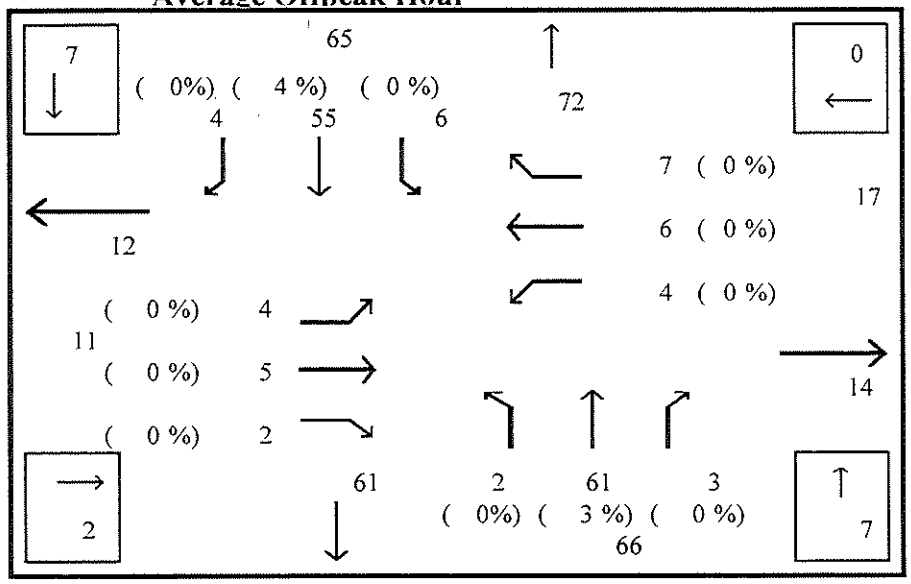
A.M. Peak Hour : 0800 - 0900



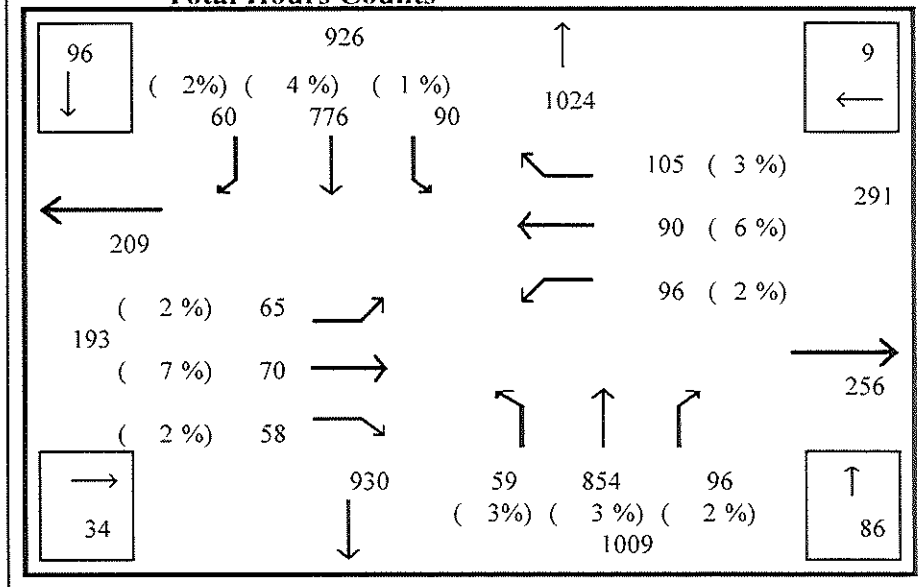
P.M. Peak Hour : 1700 - 1800



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/FREEMAN TERR CHU-FRE-01-N ZArea: Z57

Counted On: 2013/04/17 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	5	1	0	1	1	0	38	1	0	1	0	8	0	3	0	0	1	3	0	1	61
730	1	3	1	1	0	0	27	1	0	0	1	15	1	1	0	1	7	3	0	1	63
745	2	3	4	1	2	3	41	2	2	0	1	23	2	2	1	2	2	2	1	0	93
800	7	2	4	0	7	1	48	4	1	2	2	29	1	2	0	3	1	3	0	1	108
815	7	1	7	0	5	4	54	3	1	4	4	30	0	1	0	10	1	2	0	2	125
830	1	5	8	1	9	3	49	21	2	6	6	22	5	3	0	14	8	8	3	4	159
845	3	5	2	0	1	2	32	4	1	0	1	18	0	2	0	5	8	5	0	3	88
900	1	4	4	0	1	2	41	6	1	3	5	26	2	1	0	11	8	4	1	4	117
Total	27	24	30	4	26	15	330	42	8	16	20	171	11	15	1	46	36	30	5	16	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
815 - 900	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	12	15	21	1	16	11	176	34	5	13	16	96	7	7	0	40	25	19	4	13	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	1	0	1	1	1	19	0	0	1	1	10	1	1	0	2	3	4	0	2	44
1130	0	0	0	0	3	0	14	0	0	2	2	7	0	0	1	0	0	2	0	8	25
1145	0	1	1	0	4	1	8	1	1	0	1	7	0	0	1	0	0	1	0	1	22
1200	0	2	2	0	1	1	10	2	1	0	2	12	2	1	0	1	2	0	0	2	38
1215	1	3	2	0	2	2	18	2	1	0	1	13	1	1	0	0	2	4	0	1	51
1230	3	1	1	0	0	1	18	1	0	2	3	23	3	0	0	2	3	4	0	0	63
1245	2	1	0	0	1	0	15	1	0	1	2	13	2	1	0	1	1	1	0	4	40
1300	2	2	0	1	3	0	15	0	0	1	0	9	1	0	0	2	0	1	0	4	33
1315	1	1	0	0	4	2	12	1	1	0	1	18	2	0	0	1	4	0	0	0	44
1330	1	0	1	0	1	0	20	1	0	0	2	16	2	1	0	2	0	2	1	0	49

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/FREEMAN TERR CHU-FRE-01-N ZArea: Z57

Counted On: 2013/04/17 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	1	0	0	0	1	0	14	1	0	0	0	16	0	0	0	0	3	1	0	0	36
1400	1	3	0	0	1	0	15	0	1	0	4	15	0	3	0	1	0	1	0	0	44
Offpeak Total	12	15	7	2	22	8	178	10	5	7	19	159	14	8	2	12	18	21	1	22	
Offpeak Hr Avg	4	5	2	1	7	3	59	3	2	2	6	53	5	3	1	4	6	7	0	7	

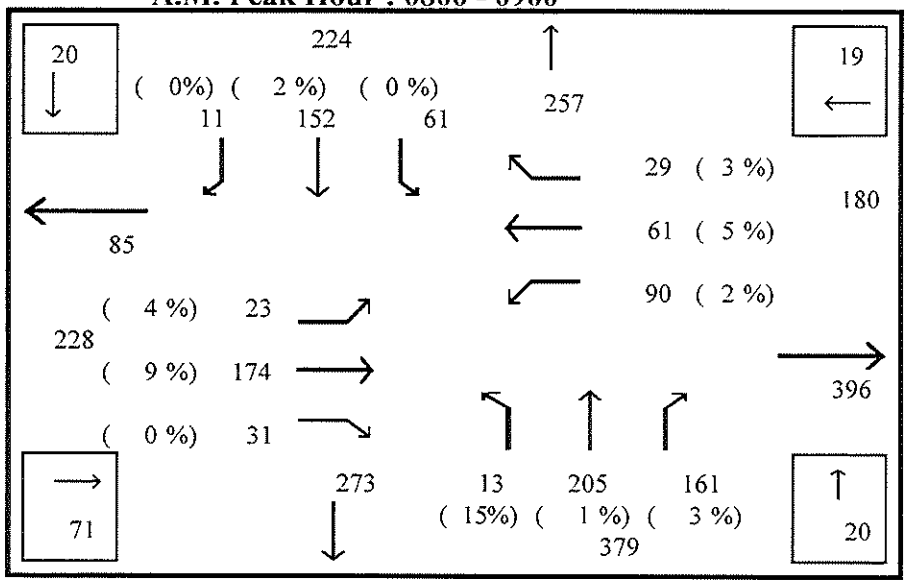
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	3	5	0	24	3	14	7	3	0	3	21	3	5	0	4	3	6	1	13	81
1530	4	2	1	0	3	2	27	5	3	0	7	36	2	1	0	5	1	4	0	1	100
1545	1	2	0	0	6	2	23	4	3	1	4	20	2	1	0	4	13	13	1	8	93
1600	1	4	2	0	1	4	16	1	1	2	4	32	1	2	0	2	1	4	1	1	76
1615	1	2	1	0	0	3	23	2	1	0	1	27	0	2	0	3	0	4	0	4	70
1630	0	1	0	0	0	0	28	3	0	1	7	36	5	0	0	2	1	3	0	4	86
1645	2	3	3	0	2	5	19	2	1	0	1	28	4	0	0	7	5	1	0	1	81
1700	4	0	1	0	1	3	35	5	2	4	5	35	3	0	0	0	1	4	0	6	98
1715	5	5	2	0	1	8	30	2	2	0	3	35	4	1	0	0	1	3	0	2	101
1730	3	0	2	1	1	2	28	2	2	1	3	34	2	0	1	4	2	5	0	3	90
1745	0	1	2	0	6	0	35	3	0	0	5	56	3	0	0	3	3	1	0	3	112
1800	4	3	1	0	3	2	41	6	0	2	7	52	5	1	5	2	0	3	1	2	128
Total	25	26	20	1	48	34	319	42	18	11	50	412	34	13	6	36	31	51	4	48	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1715 - 1800	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	12	9	7	1	11	12	134	13	4	3	18	177	14	2	6	9	6	12	1	10	0

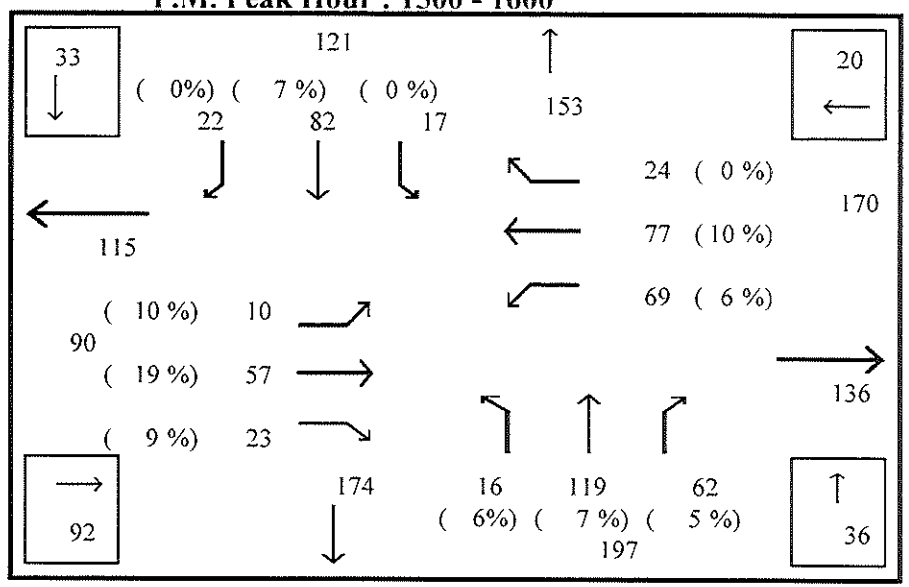
Count Date : Thursday April 18 2013 2/10/2014

[CHU-MCD-01-N] CHURCHILL MEADOWS BLVD/MCDOWELL DR

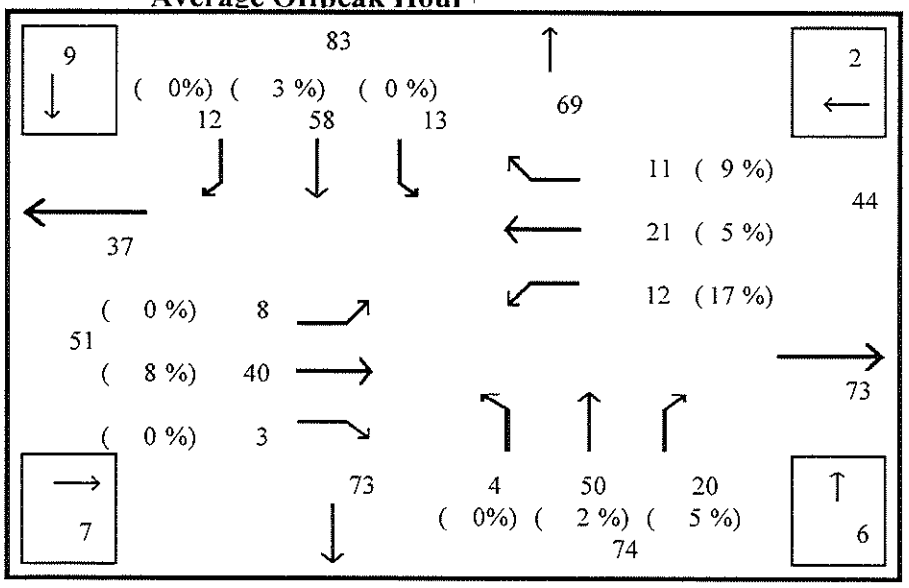
A.M. Peak Hour : 0800 - 0900



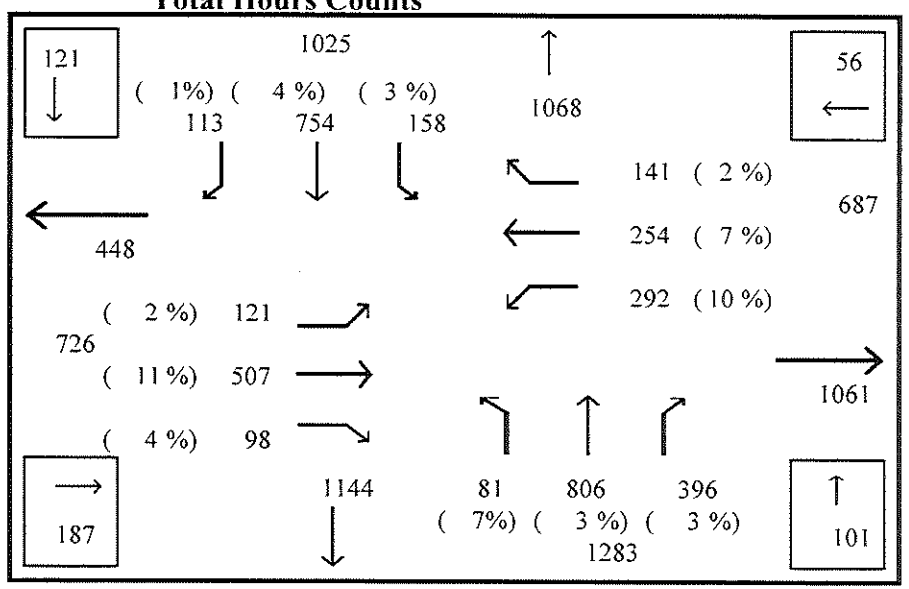
P.M. Peak Hour : 1500 - 1600



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/MCDOWELL DR CHU-MCD-01-N ZArea: Z57

Counted On: 2013/04/18 Traffic Control: All-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	8	3	3	2	0	2	14	1	2	0	0	14	1	3	1	1	2	2	1	0	59
730	8	7	1	1	0	2	31	4	1	0	3	19	0	1	0	2	1	2	2	0	85
745	7	10	2	1	3	1	27	9	0	0	3	24	2	2	0	5	6	4	2	0	105
800	9	14	2	2	4	1	39	12	0	0	5	25	2	4	0	16	4	6	2	5	143
815	3	30	11	2	4	0	44	40	1	0	11	46	1	1	0	25	5	10	2	2	232
830	9	46	5	6	7	4	71	41	1	24	16	57	4	2	8	24	17	7	1	5	311
845	5	37	8	5	2	3	47	23	3	8	15	22	4	0	3	18	25	8	1	7	224
900	5	45	7	4	7	4	40	52	5	39	19	24	2	0	8	21	11	3	2	6	244
Total	54	192	39	23	27	17	313	182	13	71	72	231	16	13	20	112	71	42	13	25	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
815 - 900	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	22	158	31	17	20	11	202	156	10	71	61	149	11	3	19	88	58	28	6	20	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	2	7	1	0	2	3	12	6	0	4	8	19	2	0	0	8	18	10	2	0	98
1130	2	3	0	1	0	1	8	2	0	0	3	15	3	0	0	2	3	1	0	0	44
1145	0	4	0	0	1	2	7	7	3	1	2	13	3	0	0	1	1	2	1	0	46
1200	1	5	3	1	2	1	6	5	0	0	1	7	2	0	1	4	4	3	5	1	48
1215	1	11	0	1	7	1	11	5	0	5	3	12	2	0	0	9	4	3	0	2	63
1230	4	12	2	2	4	3	14	2	0	4	3	15	4	1	2	1	9	4	0	4	76
1245	2	5	0	1	0	2	22	5	0	0	2	23	4	1	0	1	6	2	2	3	78
1300	4	8	0	1	4	0	14	7	0	3	3	14	4	0	2	3	5	1	0	7	64
1315	4	7	1	0	2	0	16	6	0	4	0	12	2	1	1	1	5	4	1	2	60
1330	0	16	1	2	2	0	9	6	2	2	7	11	3	0	0	1	0	0	0	0	58

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/MCDOWELL DR CHU-MCD-01-N ZArea: Z57

Counted On: 2013/04/18 Traffic Control: All-way Stop Report Date: 2014/02/11

1345	3	24	2	0	3	0	11	2	0	0	6	11	2	2	0	0	3	0	0	0	66
1400	2	9	1	1	0	0	16	6	1	0	2	17	4	2	0	0	1	2	2	1	66
Offpeak Total	25	111	11	10	27	13	146	59	6	23	40	169	35	7	6	31	59	32	13	20	
Offpeak Hr Avg	8	37	4	3	9	4	49	20	2	8	13	56	12	2	2	10	20	11	4	7	

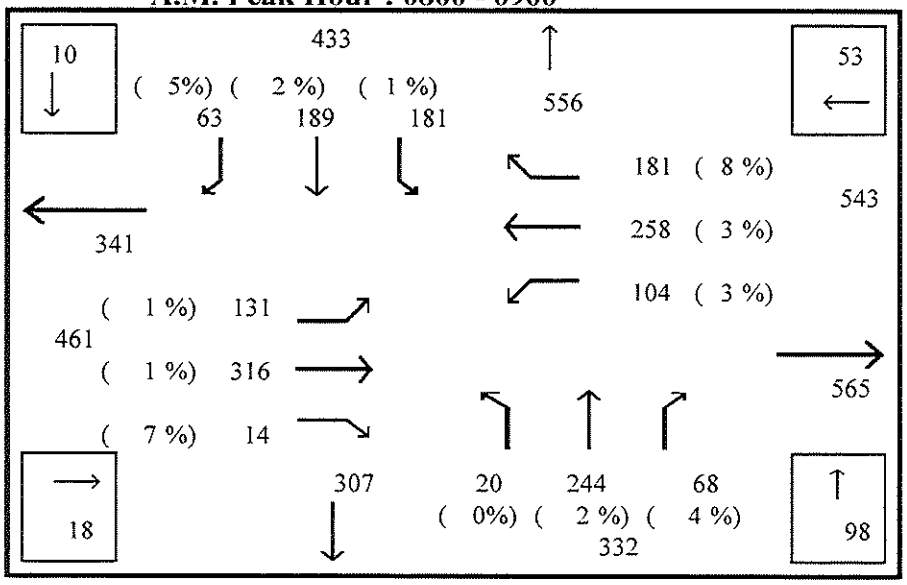
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	2	7	1	2	20	0	23	15	4	45	8	22	6	0	15	12	19	7	2	16	130
1530	4	23	8	3	3	8	39	23	3	16	7	23	4	0	0	12	23	6	4	5	190
1545	1	9	9	6	7	5	28	17	3	28	1	13	7	2	1	31	20	7	6	10	165
1600	2	7	3	3	3	2	21	4	2	3	1	18	5	4	4	10	7	4	0	5	93
1615	2	7	2	2	3	1	28	8	4	1	0	31	2	2	1	5	4	4	3	1	105
1630	5	6	0	1	5	4	24	9	3	0	5	28	2	2	0	8	11	3	3	1	114
1645	3	16	2	2	5	3	24	10	0	0	0	28	6	2	0	3	5	4	0	5	108
1700	1	17	4	1	8	4	16	7	0	0	5	28	4	0	4	6	3	5	2	1	103
1715	3	9	3	2	4	5	33	10	3	0	1	31	6	0	2	12	3	2	3	5	126
1730	4	17	2	0	3	5	29	13	0	0	8	30	6	3	3	10	3	3	0	1	133
1745	5	18	7	5	0	3	30	14	0	0	1	37	3	0	0	5	5	10	1	3	144
1800	7	12	3	3	6	5	30	12	0	0	4	32	10	4	0	6	2	9	1	3	140
Total	39	148	44	30	67	45	325	142	22	93	41	321	61	19	30	120	105	64	25	56	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1515 - 1600	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	9	46	21	14	33	15	111	59	12	92	17	76	22	6	20	65	69	24	12	36	0

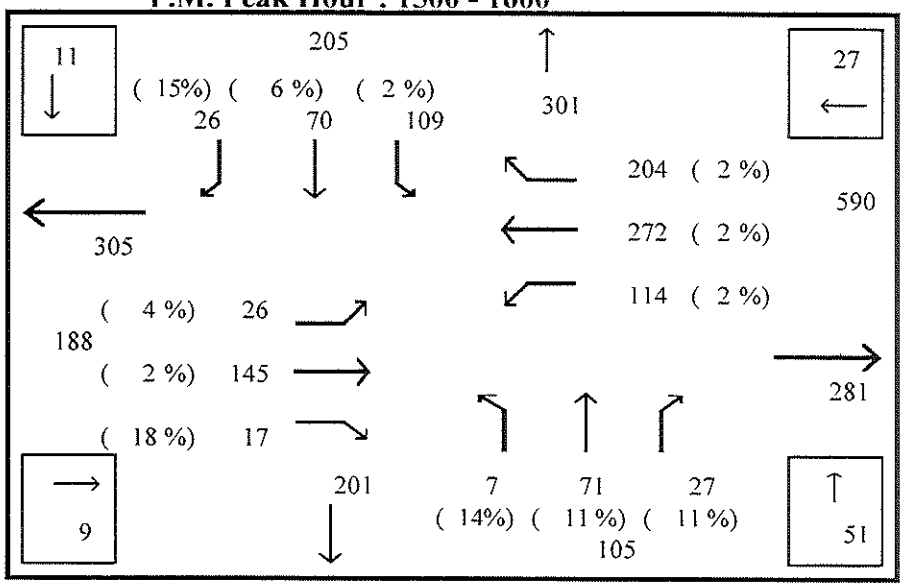
Count Date : Wednesday April 10 2013 2/10/2014

[CHU-THO-01-S] CHURCHILL MEADOWS BLVD/THOMAS ST

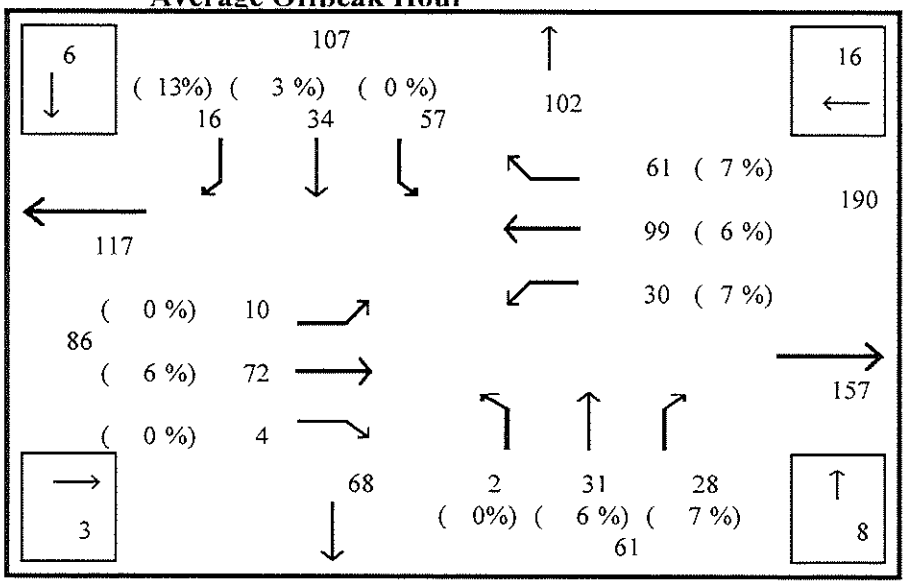
A.M. Peak Hour : 0800 - 0900



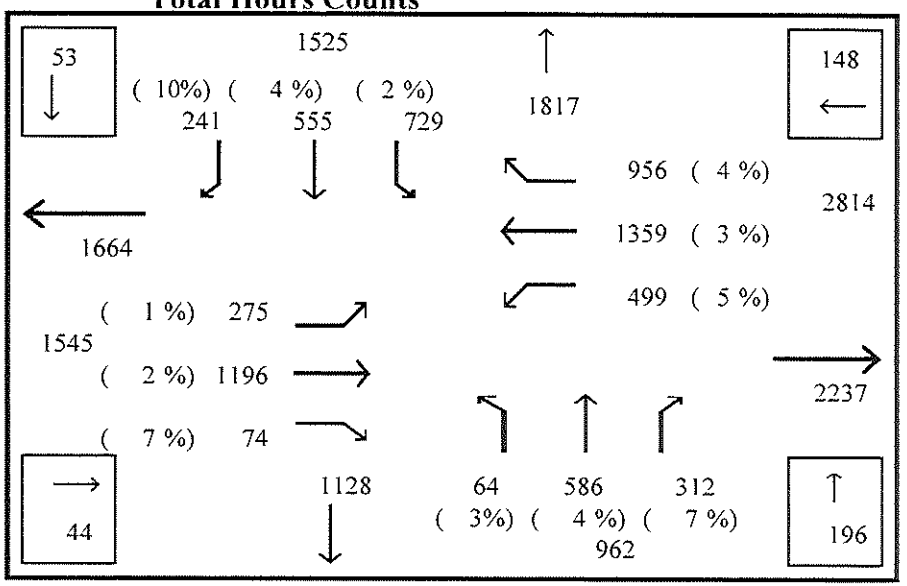
P.M. Peak Hour : 1500 - 1600



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/THOMAS ST CHU-THO-01-S ZArea: Z57

Counted On: 2013/04/10 Traffic Control: Signal Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	5	35	1	0	1	2	3	16	3	0	19	6	6	4	1	3	17	5	2	3	127
730	6	56	1	0	0	0	13	12	2	0	22	6	3	2	1	4	27	8	2	1	164
745	10	68	1	2	0	5	16	18	2	1	24	12	8	4	2	8	30	14	2	0	224
800	15	55	1	2	4	4	22	12	4	5	40	27	9	5	2	4	34	11	3	12	248
815	53	93	4	2	4	8	105	8	1	12	37	89	12	2	24	16	46	17	7	26	500
830	67	89	5	0	5	5	106	5	3	2	59	48	18	2	12	36	86	32	7	63	568
845	7	64	4	4	1	5	16	22	1	2	40	25	16	2	4	19	53	43	6	4	327
900	3	66	0	0	0	2	13	30	2	2	43	23	14	3	13	30	66	75	4	5	374
Total	166	526	17	10	15	31	294	123	18	24	284	236	86	24	59	120	359	205	33	114	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
815 - 900	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	130	312	13	6	10	20	240	65	7	18	179	185	60	9	53	101	251	167	24	98	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	4	15	0	1	1	1	8	4	0	0	27	11	5	2	7	3	21	15	2	3	119
1130	0	12	1	2	0	1	7	12	0	0	22	4	3	0	7	5	26	16	8	5	119
1145	5	15	0	1	2	0	9	5	5	1	17	9	4	0	2	6	26	25	6	3	133
1200	0	28	3	1	7	0	7	4	0	1	12	12	1	0	7	2	25	14	4	4	113
1215	2	20	1	0	0	0	7	14	0	1	14	8	3	0	1	19	16	19	3	0	126
1230	2	22	0	3	1	0	4	7	1	2	18	7	2	1	3	6	29	14	1	1	117
1245	7	22	0	1	2	0	2	5	0	1	18	6	4	2	9	10	20	12	0	5	109
1300	5	21	1	1	0	1	15	6	0	1	15	6	4	0	4	9	21	14	2	0	121
1315	3	7	0	1	2	1	9	4	5	1	5	8	1	0	5	4	34	8	1	1	91
1330	1	16	0	1	2	0	5	7	0	1	11	16	4	0	3	12	24	11	2	1	110

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/THOMAS ST CHU-THO-01-S ZArea: Z57

Counted On: 2013/04/10 Traffic Control: Signal Report Date: 2014/02/11

1345	1	11	1	1	1	2	9	7	0	0	5	9	5	2	1	5	19	10	2	0	89
1400	2	16	4	1	0	1	7	3	1	1	9	5	7	0	0	3	20	13	4	2	96
Offpeak Total	32	205	11	14	18	7	89	78	12	10	173	101	43	7	49	84	281	171	35	25	
Offpeak Hr Avg	11	68	4	5	6	2	30	26	4	3	58	34	14	2	16	28	94	57	12	8	

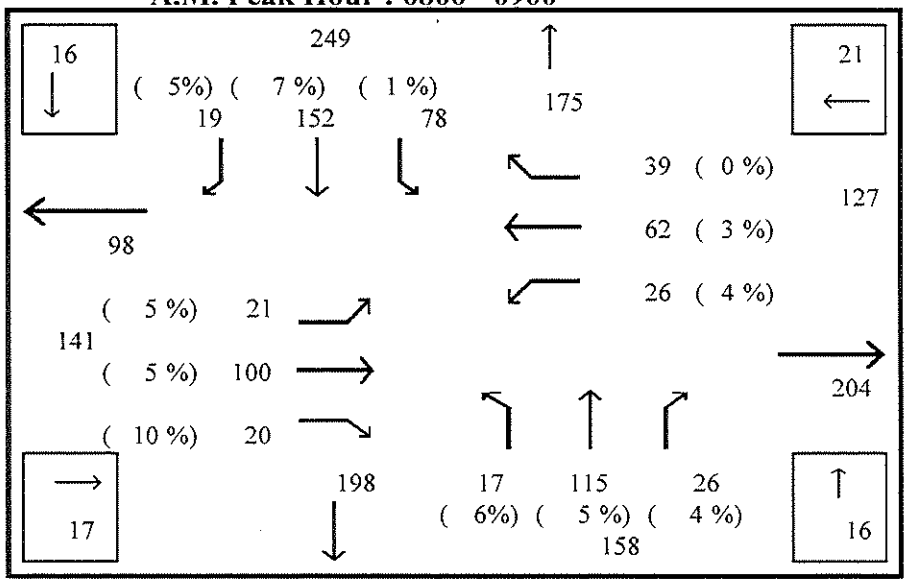
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	11	30	3	0	0	4	10	7	4	1	25	11	8	2	4	18	54	39	5	17	231
1530	5	28	3	0	3	1	11	7	3	6	23	8	7	1	1	39	89	67	1	17	293
1545	6	40	5	6	4	1	20	8	0	0	35	25	5	2	14	29	76	53	2	10	313
1600	3	44	3	1	4	0	22	2	5	2	24	22	2	5	8	26	48	41	3	7	251
1615	1	27	2	1	0	2	16	10	1	0	14	13	7	0	1	15	41	36	6	3	192
1630	9	56	4	0	1	1	7	2	4	0	24	17	7	4	0	12	55	46	2	0	250
1645	9	20	2	0	2	2	10	6	1	0	17	10	7	1	1	11	50	32	3	0	181
1700	5	29	1	0	3	1	12	10	0	0	16	17	7	6	4	12	48	35	5	1	204
1715	8	28	2	0	1	3	16	11	0	0	28	9	5	3	3	31	59	42	2	2	247
1730	6	48	9	0	0	7	22	9	1	0	13	19	7	1	2	26	43	41	2	0	254
1745	5	44	3	0	1	0	18	3	0	1	18	26	11	1	0	31	60	65	1	0	286
1800	6	47	4	0	1	2	13	15	0	0	22	20	14	2	2	21	57	44	2	0	269
Total	74	441	41	8	20	24	177	90	19	10	259	197	87	28	40	271	680	541	34	57	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1515 - 1600	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	25	142	14	7	11	6	63	24	12	9	107	66	22	10	27	112	267	200	11	51	0

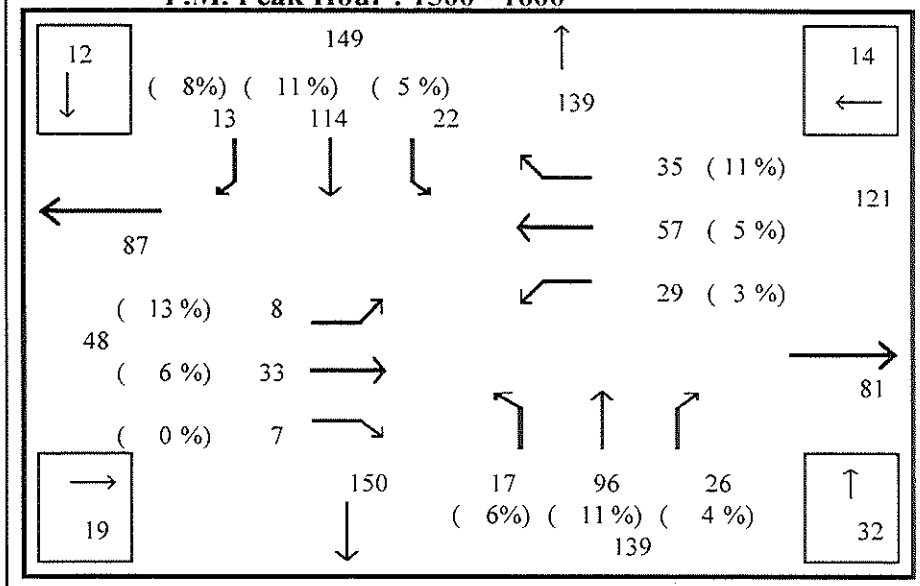
Count Date : Tuesday April 23 2013 2/10/2014

[CHU-TAC-01-N] CHURCHILL MEADOWS BLVD/TACC DR

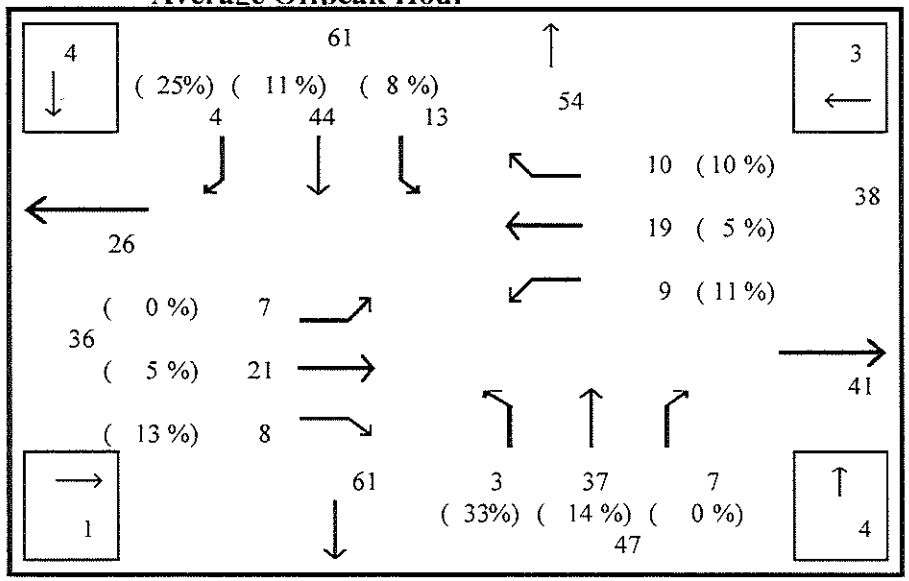
A.M. Peak Hour : 0800 - 0900



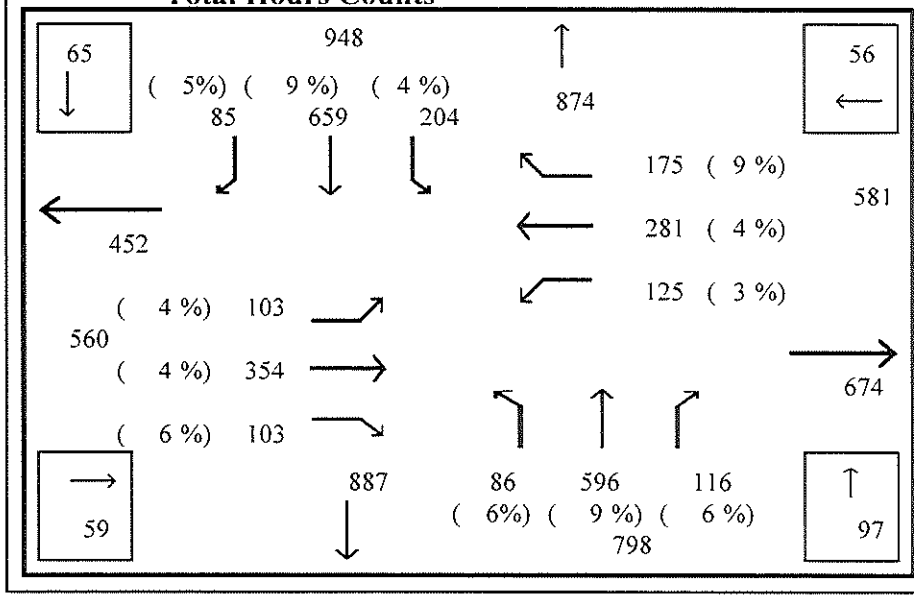
P.M. Peak Hour : 1500 - 1600



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/TACC DR CHU-TAC-01-N ZArea: Z57

Counted On: 2013/04/23 Traffic Control: All-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	6	9	4	1	2	0	11	0	2	1	7	10	2	2	0	0	0	2	0	4	56
730	3	12	2	0	0	1	17	1	2	0	5	16	1	4	0	3	8	1	1	2	77
745	5	23	2	0	2	8	16	3	2	2	9	28	3	2	3	1	7	4	0	1	113
800	5	25	3	1	2	5	12	3	5	4	5	21	2	6	1	3	6	3	2	2	107
815	3	36	8	3	6	5	26	12	3	8	37	33	6	3	13	3	16	14	0	10	208
830	8	27	3	1	3	4	31	10	1	4	23	49	5	4	5	7	19	17	3	1	212
845	2	20	6	2	5	6	17	1	3	4	8	25	3	2	2	12	22	5	0	4	134
900	7	12	1	2	2	1	35	2	1	1	9	35	4	3	1	3	3	3	0	1	121
Total	39	164	29	10	22	30	165	32	19	24	103	217	26	26	25	32	81	49	6	25	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
815 - 900	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	20	95	18	8	16	16	109	25	8	17	77	142	18	12	21	25	60	39	3	16	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	3	5	6	2	1	0	9	5	1	1	3	11	1	3	2	5	5	5	0	1	64
1130	1	5	4	0	1	0	12	2	1	0	9	9	1	5	2	4	4	2	1	2	60
1145	4	3	2	1	0	0	11	0	2	0	1	9	0	1	0	1	5	5	0	1	45
1200	2	4	0	0	3	1	12	1	1	0	4	12	1	1	1	1	4	0	0	1	44
1215	4	7	0	1	0	1	10	1	0	0	4	13	1	3	0	4	5	5	2	0	61
1230	0	10	1	0	1	0	7	4	3	0	4	12	1	0	0	3	8	2	0	1	55
1245	0	7	3	2	2	0	7	1	4	0	1	6	2	0	0	3	4	3	1	2	44
1300	0	6	1	0	3	2	5	3	0	1	3	10	3	1	3	1	3	0	0	1	38
1315	1	6	2	0	0	2	9	0	1	0	3	8	1	0	1	2	5	2	0	0	42
1330	2	1	2	1	2	1	6	1	1	0	3	6	1	1	0	0	5	2	0	3	33

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/TACC DR CHU-TAC-01-N ZArea: Z57

Counted On: 2013/04/23 Traffic Control: All-way Stop Report Date: 2014/02/11

1345	2	4	1	0	0	0	3	2	0	1	2	12	0	2	1	1	5	2	1	0	37
1400	2	3	1	0	0	1	6	0	3	0	2	10	0	1	0	1	3	2	1	0	36
Offpeak Total	21	61	23	7	13	8	97	20	17	3	39	118	12	18	10	26	56	30	6	12	
Offpeak Hr Avg	7	20	8	2	4	3	32	7	6	1	13	39	4	6	3	9	19	10	2	4	

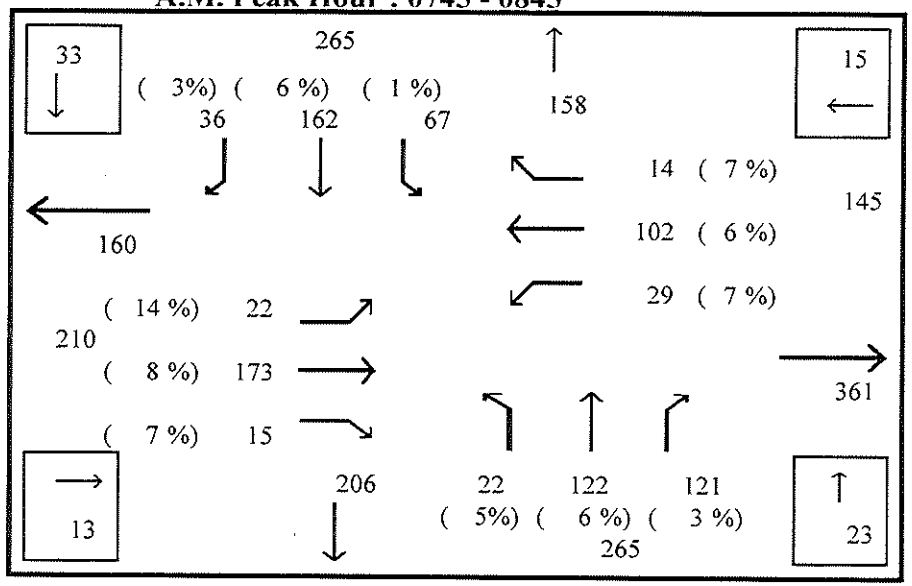
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	12	4	2	5	2	16	10	2	7	4	20	1	4	6	8	16	17	4	7	122
1530	3	6	0	0	1	2	23	6	2	8	4	39	3	2	2	6	16	8	1	3	121
1545	2	4	2	1	1	7	20	4	4	4	6	21	2	4	2	11	12	2	2	13	104
1600	2	9	1	0	5	5	26	5	5	0	7	22	6	4	4	3	10	4	1	9	110
1615	3	6	1	1	6	5	19	1	2	1	10	14	0	2	2	5	7	8	3	8	87
1630	4	8	4	1	0	2	18	2	0	2	3	12	1	3	0	3	10	4	1	3	76
1645	3	10	4	2	3	4	17	1	4	0	1	20	6	2	3	4	9	7	1	3	95
1700	6	11	6	0	0	5	17	6	5	3	3	23	0	3	0	3	5	4	0	3	97
1715	3	11	4	0	3	1	29	5	2	0	2	22	4	1	0	6	10	9	2	1	111
1730	1	12	4	0	3	2	28	7	3	1	3	24	11	1	0	4	13	6	1	1	120
1745	6	12	9	0	1	4	27	6	1	6	8	21	5	1	0	8	13	6	0	3	127
1800	6	14	6	0	2	4	39	4	1	0	3	26	4	1	2	2	13	6	1	6	130
Total	39	115	45	7	30	43	279	57	31	32	54	264	43	28	21	63	134	81	17	60	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1515 - 1600	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	7	31	7	3	12	16	85	25	13	19	21	102	12	14	14	28	54	31	8	32	0

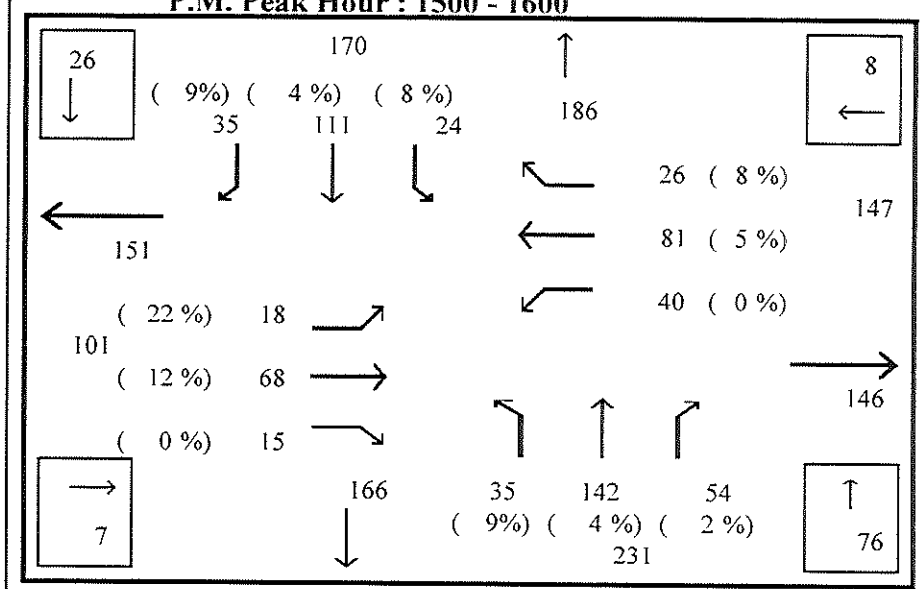
Count Date : Wednesday September 12 2012 2/10/2014

[CHU-ERI-10-S] CHURCHILL MEADOWS BLVD/ERIN CENTRE BLVD

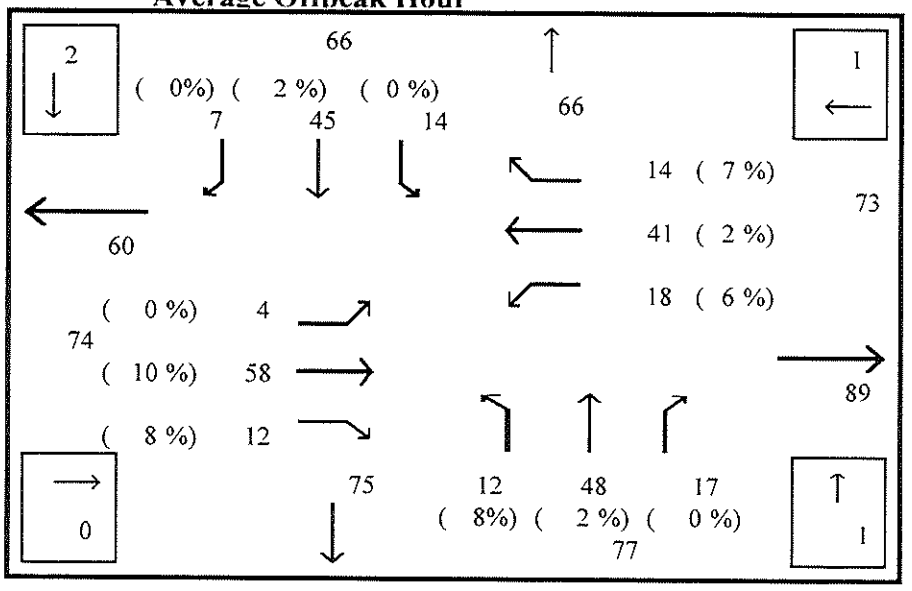
A.M. Peak Hour : 0745 - 0845



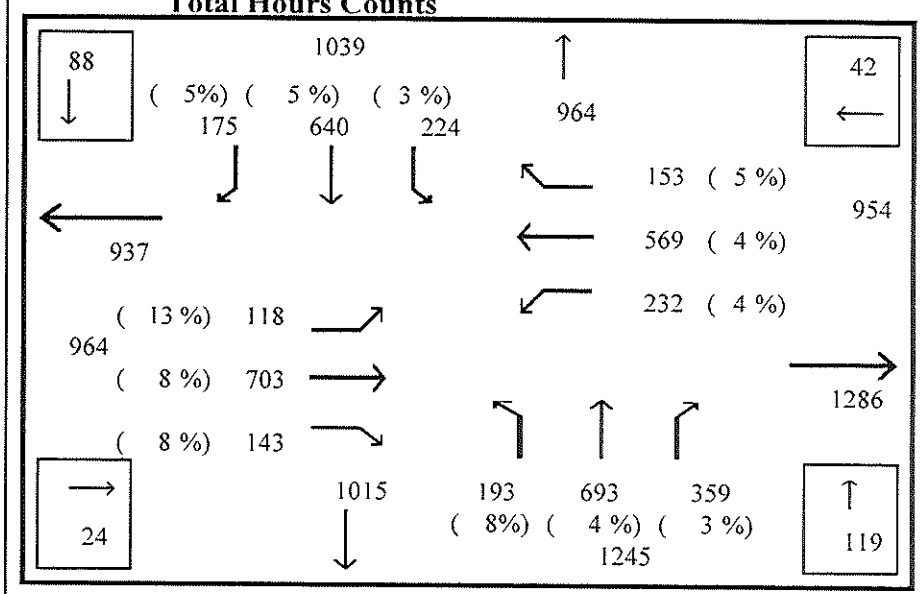
P.M. Peak Hour : 1500 - 1600



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/ERIN CENTRE BLVD CHU-ERI-10-N ZArea: Z57

Counted On: 2012/09/12 Traffic Control: All-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	26	4	2	1	2	5	8	1	0	8	8	3	3	0	3	10	1	0	0	84
730	6	31	9	5	0	7	25	23	0	0	15	25	6	2	1	10	18	6	1	2	189
745	2	33	6	1	6	5	9	26	2	0	14	14	5	2	5	1	17	6	1	3	144
800	4	33	4	5	13	6	22	18	5	8	20	32	8	2	12	0	18	2	1	8	180
815	4	61	2	5	9	6	22	42	0	0	22	33	5	4	2	7	23	4	3	3	243
830	3	32	3	5	8	5	37	36	4	3	10	39	6	2	0	10	39	4	4	7	239
845	8	34	5	2	3	4	34	21	3	2	14	48	16	4	1	10	16	3	1	5	223
900	8	27	4	3	3	4	24	14	3	0	9	35	11	3	5	15	19	4	4	0	187
Total	35	277	37	28	43	39	178	188	18	13	112	234	60	22	26	56	160	30	15	28	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	19	160	14	17	33	21	115	117	12	13	66	152	35	12	15	27	96	13	9	23	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	2	13	2	1	0	2	7	5	0	0	3	8	1	0	1	4	7	3	1	0	59
1130	0	14	1	2	0	4	12	4	1	0	2	16	2	1	2	3	5	6	0	1	73
1145	2	15	5	3	2	3	12	5	3	0	6	17	3	0	0	4	11	4	0	0	93
1200	0	12	2	1	2	4	20	2	1	0	5	20	1	0	0	3	6	1	0	0	78
1215	0	4	0	2	1	1	11	5	0	0	1	7	3	0	0	4	12	3	0	0	53
1230	1	18	4	1	0	2	13	7	1	0	4	10	2	1	0	2	7	2	0	2	75
1245	2	16	3	2	0	5	6	5	1	0	3	6	3	0	0	8	10	3	1	0	74
1300	1	15	7	2	0	3	5	5	0	0	6	9	0	0	0	6	8	5	3	0	75
1315	1	11	1	1	2	2	14	2	0	0	3	13	1	0	0	9	16	3	2	0	79
1330	1	12	2	3	1	2	17	2	0	0	3	11	1	0	0	4	7	5	2	0	72

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/ERIN CENTRE BLVD CHU-ERI-10-N ZArea: Z57

Counted On: 2012/09/12 Traffic Control: All-way Stop Report Date: 2014/02/11

1345	2	14	3	0	0	3	12	6	0	0	4	7	2	0	0	3	14	2	1	0	73
1400	1	14	4	2	0	2	14	3	0	0	3	10	2	0	0	2	17	2	0	0	76
Offpeak Total	13	158	34	20	8	33	143	51	7	0	43	134	21	2	3	52	120	39	10	3	
Offpeak Hr Avg	4	53	11	7	3	11	48	17	2	0	14	45	7	1	1	17	40	13	3	1	

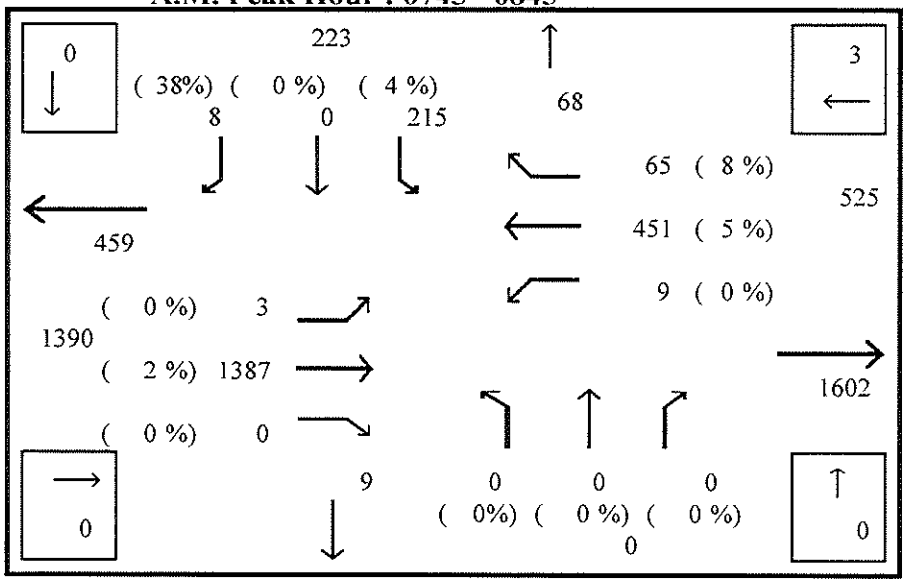
PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	2	14	5	3	9	3	42	13	1	0	4	21	5	3	3	5	13	6	1	16	141
1530	7	14	4	3	4	13	26	21	3	0	12	50	11	1	1	10	22	5	1	20	203
1545	1	13	2	4	10	6	41	8	5	5	1	25	9	3	3	15	27	3	4	28	167
1600	4	19	4	2	3	10	27	11	1	2	5	11	7	2	1	10	15	10	0	12	138
1615	7	19	6	6	2	10	27	7	2	0	5	15	4	1	0	10	19	5	0	1	143
1630	4	21	5	3	0	12	25	6	1	0	4	17	9	2	0	10	17	7	0	3	143
1645	4	18	8	2	3	11	31	9	4	0	5	18	7	3	0	10	22	8	0	2	160
1700	8	16	6	4	3	9	23	7	1	0	8	20	9	0	0	11	31	7	2	0	162
1715	5	20	7	3	3	14	34	8	3	4	6	24	7	3	0	10	27	6	1	2	178
1730	3	24	4	1	0	9	24	10	1	0	8	8	10	3	0	8	28	8	1	0	150
1745	6	19	4	2	0	6	24	5	2	0	2	15	4	2	0	7	24	7	3	0	132
1800	4	16	5	1	0	3	23	5	1	0	2	15	4	1	5	9	23	4	0	4	116
Total	55	213	60	34	37	106	347	110	25	11	62	239	86	24	13	115	268	76	13	88	

PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1515 - 1600	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	14	60	15	12	26	32	136	53	10	7	22	107	32	9	8	40	77	24	6	76	0

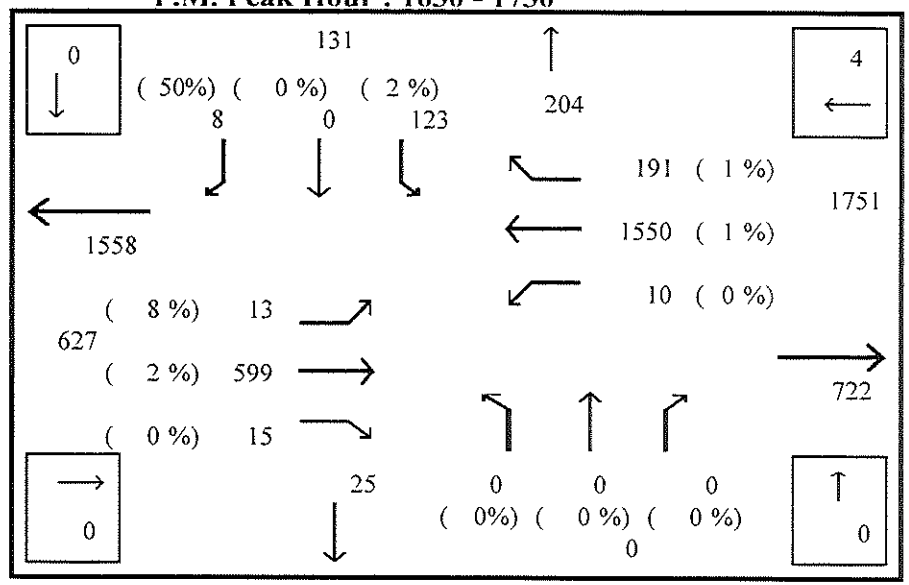
Count Date : Thursday April 25 2013 2/10/2014

[CHU-EGL-10-N] CHURCHILL MEADOWS BLVD/EGLINTON AVE W

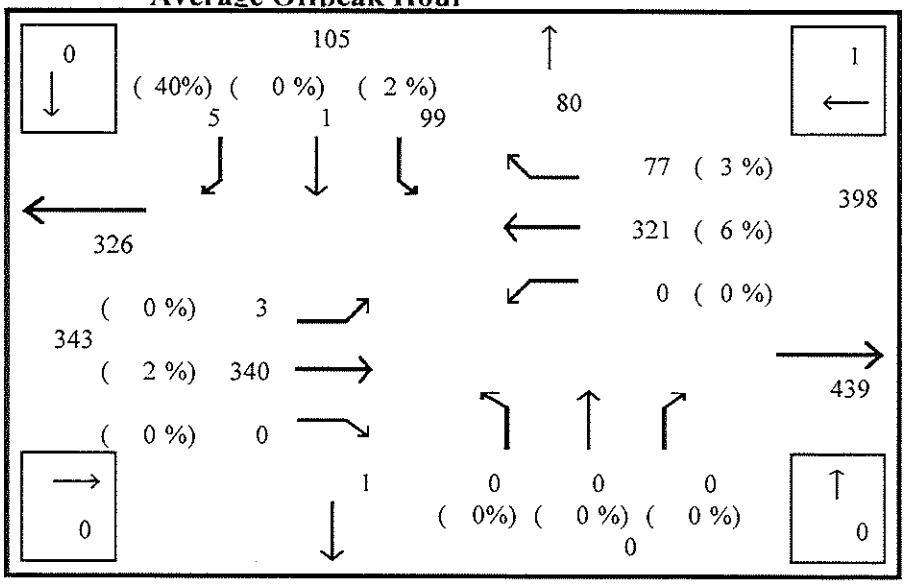
A.M. Peak Hour : 0745 - 0845



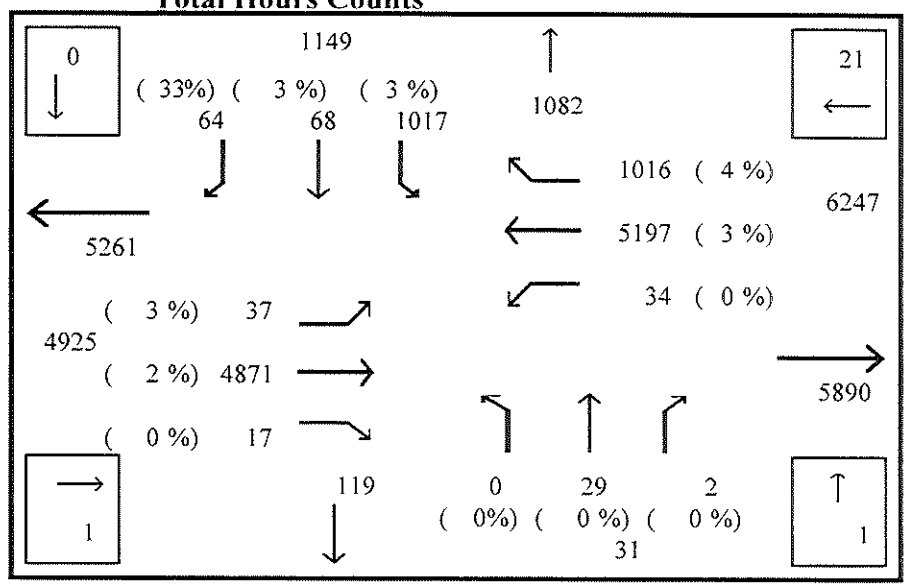
P.M. Peak Hour : 1630 - 1730



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/EGLINTON AVE W CHU-EGL-10-N ZArea: Z57

Counted On: 2013/04/25 Traffic Control: Two-way Stop Report Date: 2014/02/11

Time Ending	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
715	0	79	0	4	0	0	27	1	0	0	15	63	3	3	1	10	27	20	1	0	253
730	1	265	0	6	0	0	0	0	0	0	41	0	1	2	2	2	67	6	3	0	394
745	0	275	0	8	0	0	0	0	0	0	28	0	4	2	1	0	68	6	1	0	392
800	0	337	0	3	0	0	0	0	0	0	36	0	1	4	0	0	87	6	7	0	481
815	0	333	0	12	0	0	0	0	0	0	62	0	1	4	2	0	101	19	3	0	535
830	0	346	0	4	0	0	0	0	0	0	53	0	2	3	0	0	128	19	12	0	567
845	3	349	0	3	0	0	0	0	0	0	56	0	1	0	1	9	113	16	5	0	555
900	1	281	0	5	0	0	0	0	0	0	55	0	2	1	1	1	89	22	2	0	459
Total	5	2265	0	45	0	0	27	1	0	0	346	63	15	19	8	22	680	114	34	0	

AM Peak	E - East					N - North					S - South					W - West					All Vehicles
800 - 845	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	3	1365	0	22	0	0	0	0	0	0	207	0	5	11	3	9	429	60	27	0	0

Offpeak	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1115	0	86	0	2	0	0	0	0	0	0	36	0	1	0	1	0	74	10	7	0	216
1130	0	91	0	1	0	0	0	0	0	0	32	0	1	1	1	1	69	22	5	0	223
1145	0	74	0	0	0	0	0	0	0	0	18	0	0	1	0	0	94	17	10	0	214
1200	2	101	0	0	0	0	0	0	0	0	8	0	2	1	0	0	68	9	6	0	197
1215	2	76	0	2	0	0	0	0	0	0	19	0	1	0	0	0	87	22	4	0	213
1230	1	84	0	2	0	0	2	1	0	0	27	0	1	1	0	1	66	10	7	0	203
1245	0	89	0	2	0	0	0	0	0	0	39	0	1	0	0	0	72	23	5	0	231
1300	1	100	0	4	0	0	0	0	0	1	32	0	0	1	0	0	75	25	6	0	244
1315	0	92	2	1	0	0	0	0	0	0	16	1	0	0	0	0	75	35	3	0	225
1330	3	79	0	3	0	0	0	0	0	0	19	2	1	1	1	0	66	16	4	0	194

Intersection count: 15-minute interval data

CHURCHILL MEADOWS BLVD/EGLINTON AVE W CHU-EGL-10-N ZArea: Z57

Counted On: 2013/04/25 Traffic Control: Two-way Stop Report Date: 2014/02/11

1345	0	64	0	2	0	0	0	0	0	0	26	0	2	2	0	0	75	14	4	0	189
1400	0	63	0	4	0	0	0	0	0	0	21	0	2	3	2	0	85	22	2	0	202
Offpeak Total	9	999	2	23	0	0	2	1	0	1	293	3	12	11	5	2	906	225	63	0	
Offpeak Hr Avg	3	333	1	8	0	0	1	0	0	0	98	1	4	4	2	1	302	75	21	0	

PM	E - East					N - North					S - South					W - West					All Vehicles
	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
1515	0	77	0	10	0	0	0	0	0	0	30	0	0	1	0	0	155	52	11	0	336
1530	0	98	0	7	0	0	0	0	0	0	42	0	1	1	0	0	184	28	5	0	366
1545	1	105	0	4	0	0	0	0	0	0	21	0	2	1	2	0	236	62	13	0	445
1600	0	139	0	5	0	0	0	0	0	0	25	0	0	1	0	0	215	46	16	0	447
1615	3	105	0	1	0	0	0	0	0	0	24	0	2	2	0	0	261	45	6	0	449
1630	0	104	0	7	0	0	0	0	0	0	23	0	2	3	0	0	264	45	8	1	456
1645	4	147	3	3	0	0	0	0	0	0	15	0	0	1	2	0	414	41	7	0	635
1700	1	122	12	1	0	0	0	0	0	0	30	0	1	3	0	10	445	42	7	0	674
1715	5	164	0	1	0	0	0	0	0	0	32	0	2	2	1	0	328	29	6	0	569
1730	2	152	0	10	0	0	0	0	0	0	43	0	1	1	1	0	342	77	3	0	631
1745	5	143	0	1	0	0	0	0	0	0	39	0	1	2	2	0	335	88	8	0	622
1800	1	131	0	3	0	0	0	0	0	0	27	0	4	2	0	0	279	83	5	0	535
Total	22	1487	15	53	0	0	0	0	0	0	351	0	16	20	8	10	3458	638	95	1	

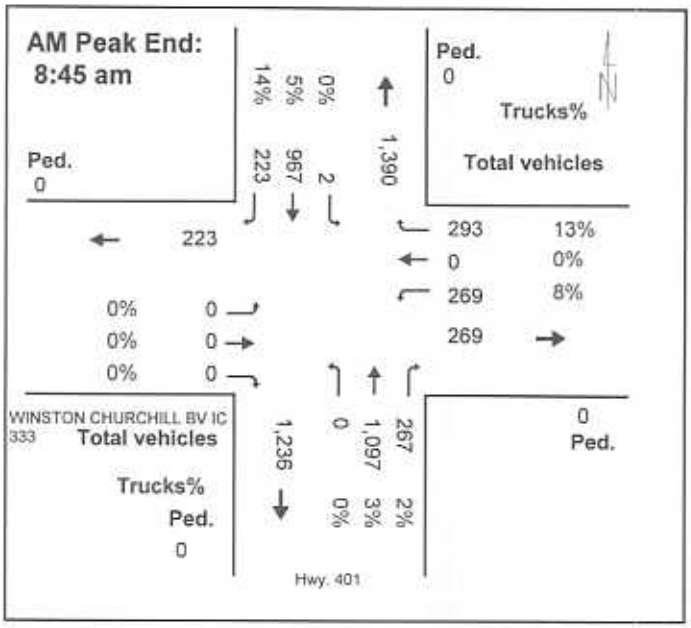
PM Peak	E - East					N - North					S - South					W - West					All Vehicles
1645 - 1730	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	LT	Thru	RT	Trk	Peds	
Total	12	585	15	15	0	0	0	0	0	0	120	0	4	7	4	10	1529	189	23	0	0

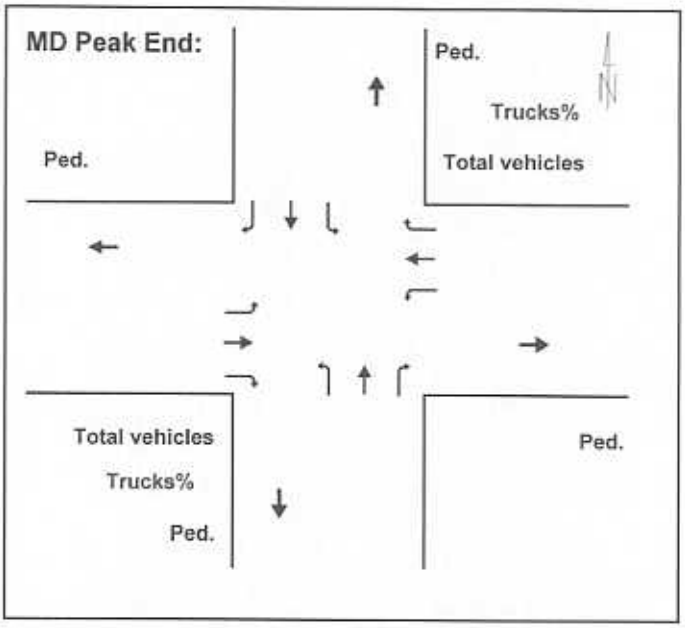
Ontario

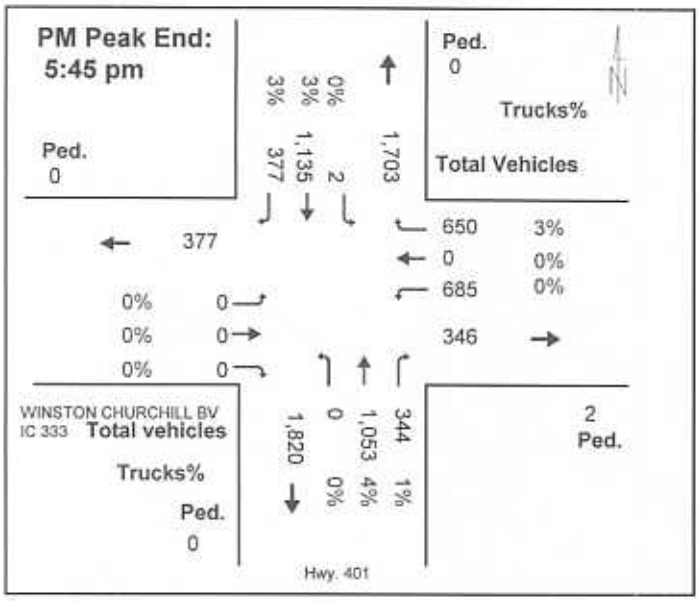
Hwy. 401 @ WINSTON CHURCHILL BV IC 333

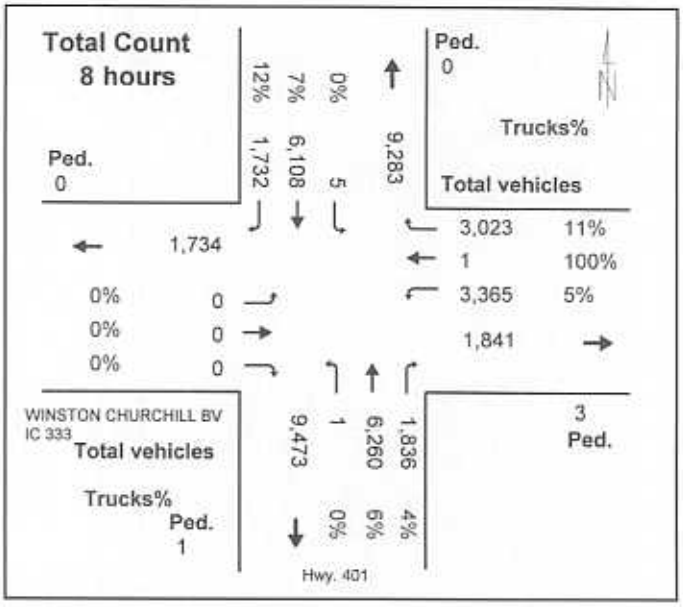
Central

Intersection ID:476880000(--N--) **Count Day: Tuesday** **Count Date: 27-Sep-2011**









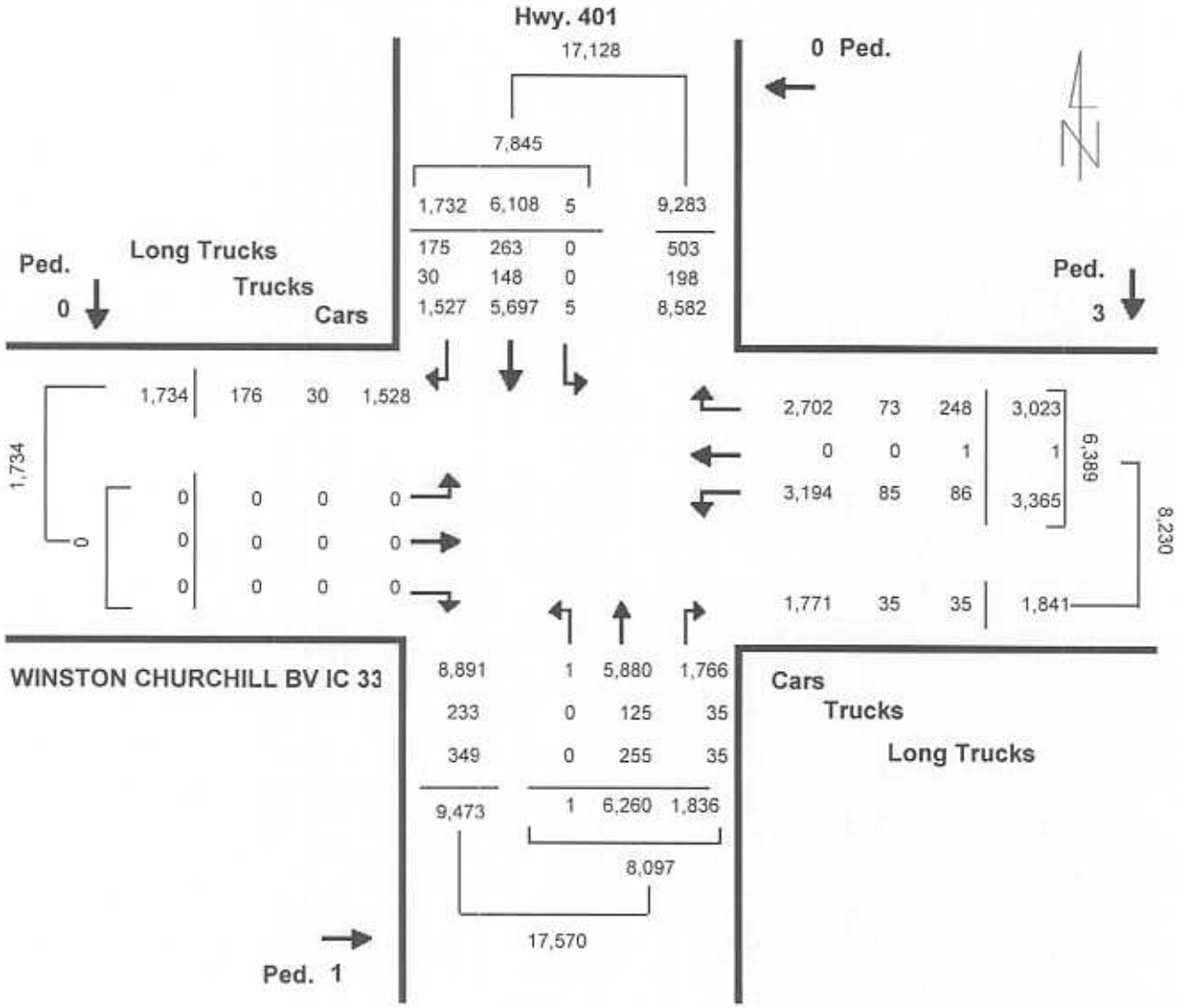
Traffic
Engineering
Software

COUNT TOTAL

Hwy. 401 @ WINSTON CHURCHILL BV IC 333

Central

Intersection ID:476880000(--N--) Date: 27-Sep-2011



15 MIN REPORT

Intersection ID:476880000(--N--) **Hwy. 401 @ WINSTON CHURCHILL BV IC 333** **Municipality: Central** **Date: 27-Sep-2011**

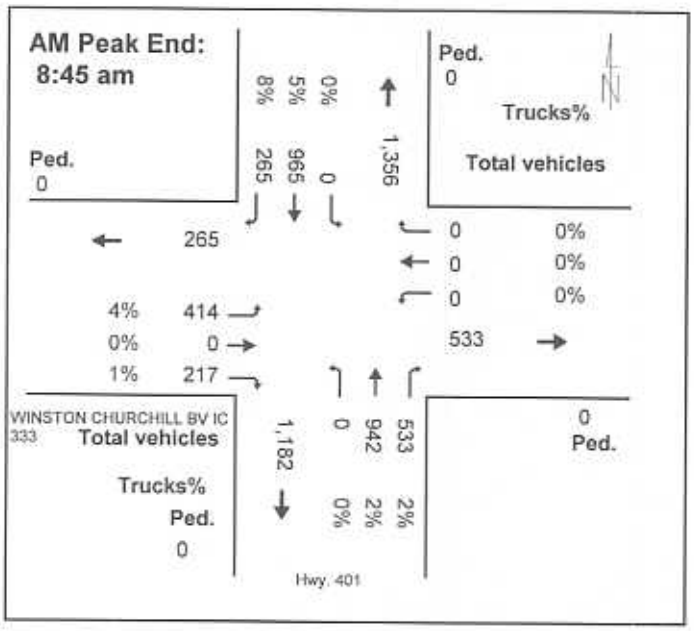
	NORTH APPROACH										EAST APPROACH										SOUTH APPROACH										WEST APPROACH										
Time	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Period1																																									
7:15	0	160	42	0	0	1	0	6	5	0	33	0	33	2	0	3	7	0	5	0	0	168	36	0	4	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	510
7:30	0	157	49	0	1	0	0	10	3	0	62	0	67	1	0	1	3	0	11	0	0	191	75	0	1	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	640
7:45	0	161	70	0	3	1	0	8	7	0	60	0	67	2	0	3	4	0	8	0	0	254	70	0	4	2	0	6	2	0	0	0	0	0	0	0	0	0	0	0	732
8:00	0	194	42	0	2	0	0	5	2	0	53	0	77	2	0	2	4	0	5	0	0	254	72	0	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	721
8:15	0	209	44	0	6	0	0	3	9	0	75	0	63	2	0	3	2	0	8	0	0	262	60	0	2	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	753
8:30	1	310	69	0	9	0	0	3	6	0	54	0	56	3	0	7	2	0	5	0	0	285	69	0	2	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	886
8:45	1	210	36	0	6	6	0	10	9	0	66	0	60	3	0	2	3	0	5	0	0	263	60	0	3	1	0	12	2	0	0	0	0	0	0	0	0	0	0	0	758
9:00	0	193	46	0	4	5	0	8	9	0	36	0	66	1	0	3	3	0	8	0	0	253	38	0	3	3	0	6	0	0	0	0	0	0	0	0	0	0	0	0	685
9:15	1	154	33	0	0	1	0	15	11	0	46	0	36	5	0	2	3	0	9	0	0	181	40	0	4	1	0	9	0	0	0	0	0	0	0	0	0	0	0	0	551
9:30	0	161	31	0	6	2	0	5	8	0	51	0	62	3	0	4	4	0	11	0	0	138	37	0	1	1	0	9	2	0	0	0	0	0	0	0	0	0	0	0	536
9:45	0	141	18	0	6	1	0	9	7	0	52	0	39	5	0	2	1	0	12	0	0	96	33	0	5	2	0	9	1	0	0	0	0	0	0	0	0	0	0	0	439
10:00	0	127	15	0	12	3	0	8	10	0	54	0	32	4	0	1	5	0	9	0	0	111	20	0	0	3	0	6	2	0	0	0	0	0	0	0	0	0	0	0	422
10:15	0	122	19	0	10	0	0	6	6	0	45	0	35	2	0	7	2	0	11	0	0	95	34	0	6	2	0	13	3	0	0	0	0	0	0	0	0	0	0	0	418
10:30	0	116	10	0	8	0	0	11	5	0	48	0	33	3	0	6	2	0	8	0	0	110	24	0	4	0	0	10	1	0	0	0	0	0	0	0	0	0	0	0	399
10:45	0	115	12	0	7	1	0	6	3	0	56	0	28	3	0	1	3	0	9	0	0	96	19	0	4	2	0	9	1	0	0	0	0	0	0	0	0	0	0	0	375
11:00	0	104	21	0	3	0	0	14	4	0	73	0	45	5	0	2	6	0	9	0	0	97	26	0	2	1	0	8	1	0	0	0	0	0	0	0	0	0	0	0	421
Period2																																									
14:15	0	132	36	0	9	1	0	12	5	0	77	0	68	5	0	1	2	0	13	1	0	144	43	0	6	3	0	13	1	0	0	0	0	0	0	0	0	0	0	0	572
14:30	0	125	23	0	9	0	0	6	4	0	122	0	84	3	0	2	5	0	6	0	0	127	42	0	4	1	0	12	2	0	0	0	0	0	0	0	0	0	0	0	577
14:45	0	123	22	0	3	1	0	15	10	0	106	0	82	1	0	1	1	0	18	0	0	145	53	0	6	2	0	8	2	0	0	0	0	0	0	0	0	0	0	0	599
15:00	0	144	30	0	4	2	0	12	8	0	124	0	79	1	0	5	6	0	10	0	0	158	48	0	4	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0	640
15:15	0	168	44	0	6	1	0	8	5	0	122	0	101	3	0	1	3	0	8	0	0	150	45	0	2	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	678
15:30	0	140	46	0	3	0	0	13	7	0	145	0	103	2	0	0	3	1	4	0	0	153	57	0	4	0	0	8	2	0	0	0	0	0	0	0	0	0	0	0	691
15:45	0	148	62	0	1	1	0	14	5	0	148	0	129	3	0	3	0	0	9	0	0	178	48	0	6	1	0	7	0	0	0	0	0	0	0	0	0	0	0	0	763
16:00	0	186	40	0	5	2	0	12	4	0	135	0	119	3	0	1	1	0	5	0	0	170	61	0	3	1	0	9	1	0	0	0	0	0	0	0	0	0	0	0	758
16:15	0	171	69	0	2	0	0	8	4	0	136	0	118	6	0	0	5	0	7	0	1	185	84	0	4	3	0	7	1	0	0	0	0	0	0	0	0	0	0	0	811
16:30	0	169	76	0	2	1	0	2	2	0	155	0	112	4	0	1	1	0	6	0	0	153	81	0	2	1	0	16	2	1	0	0	0	0	0	0	0	0	0	0	787
16:45	0	247	107	0	4	0	0	7	3	0	159	0	147	2	0	3	0	0	5	0	0	232	80	0	9	0	0	6	2	0	0	0	0	0	0	0	0	0	0	0	1013
17:00	0	253	89	0	6	0	0	1	3	0	155	0	163	1	0	4	0	0	4	0	0	236	74	0	5	1	0	4	1	0	0	0	0	0	0	0	0	0	0	0	1000
17:15	1	280	94	0	2	0	0	5	2	0	185	0	153	1	0	0	4	0	5	1	0	246	91	0	4	1	0	5	1	0	0	0	0	0	0	0	0	0	0	0	1081
17:30	1	306	109	0	2	0	0	3	2	0	161	0	162	2	0	1	0	0	1	0	0	252	98	0	8	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	1114
17:45	0	262	72	0	5	0	0	10	6	0	176	0	153	0	0	0	0	0	4	1	0	275	76	0	5	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	1053
18:00	0	209	51	0	2	0	0	8	1	0	224	0	130	2	0	1	1	0	10	0	0	222	72	0	5	0	0	13	1	0	0	0	0	0	0	0	0	0	0	0	952

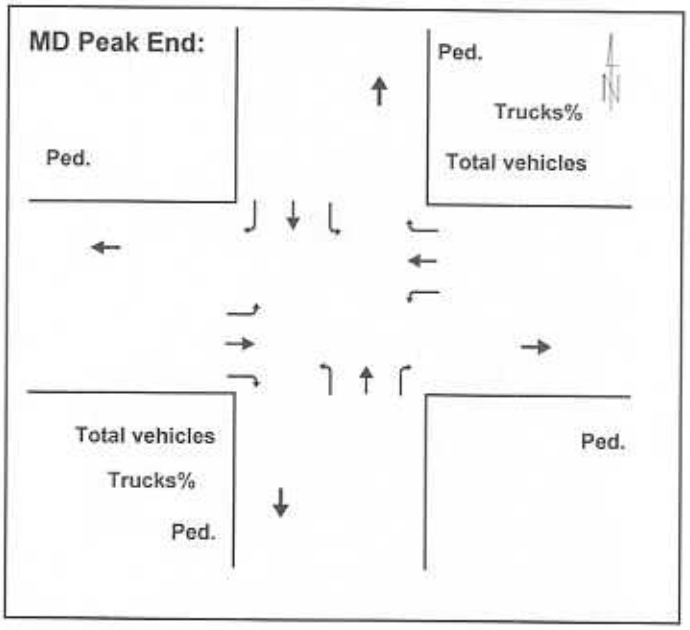
Ontario

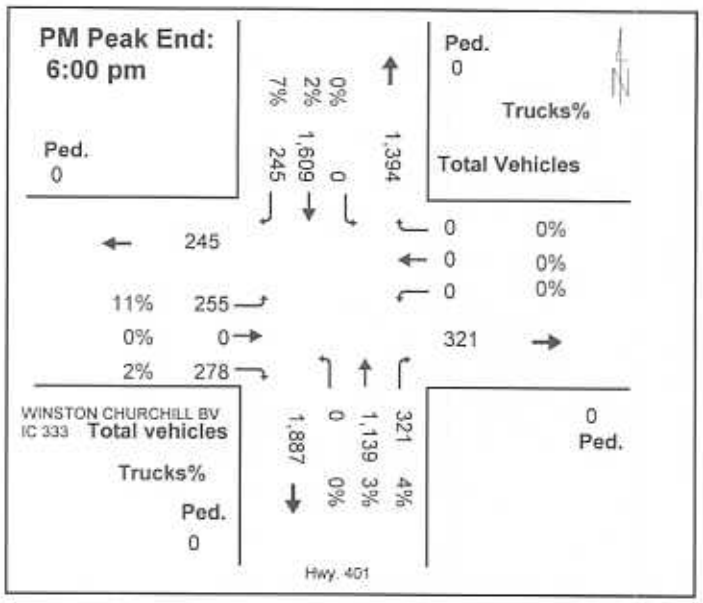
Hwy. 401 @ WINSTON CHURCHILL BV IC 333

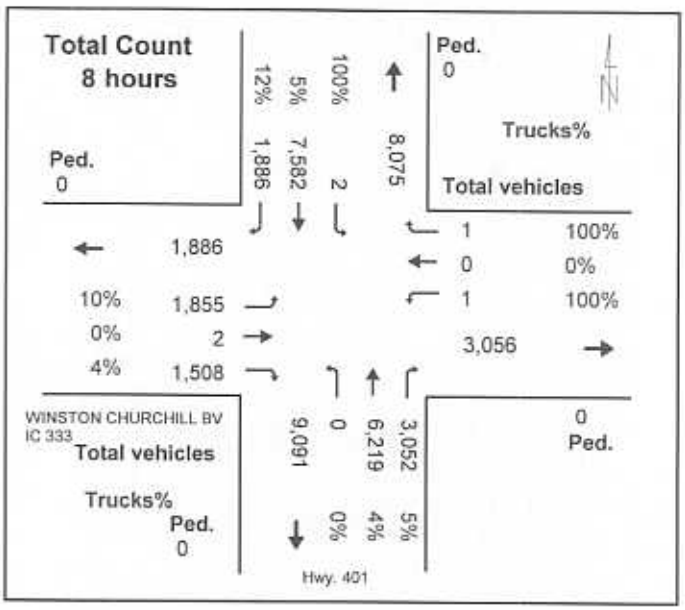
Central

Intersection ID:476880000(--S--) | Count Day: Tuesday | Count Date: 27-Sep-2011









Traffic
Engineering
Software

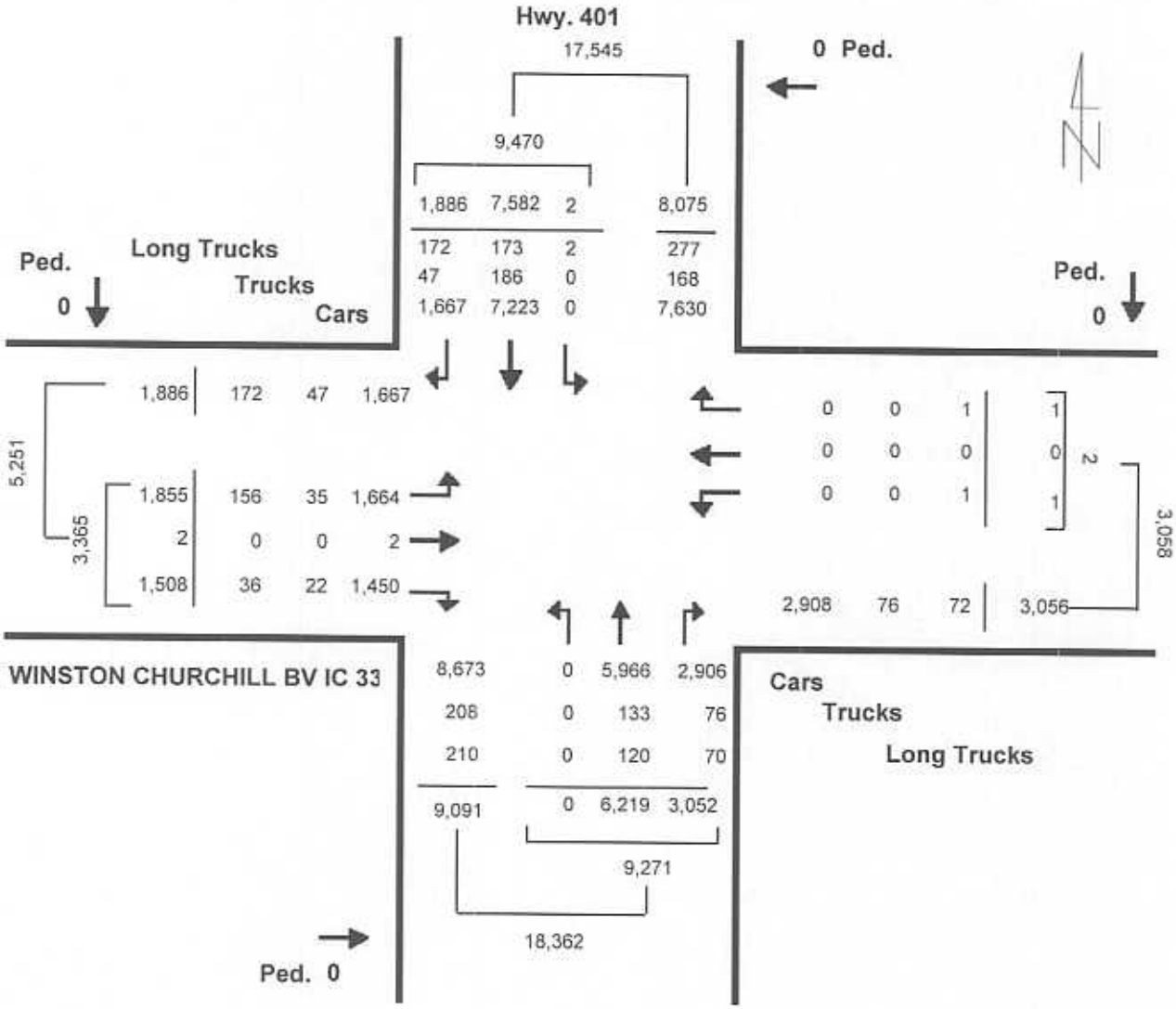
COUNT TOTAL

Hwy. 401 @ WINSTON CHURCHILL BV IC 333

Central

Intersection ID:476880000(--S--)

Date: 27-Sep-2011



15 MIN REPORT

Intersection ID:476880000(--S--) **Hwy. 401 @ WINSTON CHURCHILL BV IC 333** **Municipality: Central** **Date: 27-Sep-2011**

	NORTH APPROACH									EAST APPROACH										SOUTH APPROACH									WEST APPROACH									
Time	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Period1																																									
7:15	0	136	62	0	1	1	0	11	3	0	0	0	0	0	0	0	0	0	0	0	0	126	84	0	3	0	0	1	0	0	84	0	59	2	0	1	1	0	1	0	576
7:30	0	163	53	0	2	0	0	7	4	0	0	0	0	0	0	0	0	0	0	0	0	168	92	0	1	1	0	0	0	0	94	0	52	0	0	0	8	0	0	0	645
7:45	0	153	64	0	4	1	0	6	4	0	0	0	0	0	0	0	0	0	0	0	0	237	122	0	6	1	0	3	1	0	85	2	82	0	0	0	4	0	1	0	776
8:00	0	195	55	0	4	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	233	137	0	3	2	0	1	0	0	99	0	56	0	0	1	3	0	1	0	798
8:15	0	233	51	0	7	1	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	232	126	0	0	0	0	0	1	0	88	0	43	3	0	0	3	0	0	0	793
8:30	0	274	84	0	11	1	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	231	146	0	1	0	0	3	1	0	121	0	62	1	0	0	2	0	0	0	943
8:45	0	219	55	0	6	3	0	7	6	0	0	0	0	0	0	0	0	0	0	0	0	228	116	0	4	1	0	6	3	0	88	0	54	0	0	0	6	0	0	0	802
9:00	0	172	61	0	4	1	0	7	5	0	0	0	0	0	0	0	0	0	0	0	0	186	88	0	5	1	0	4	1	0	100	0	55	1	0	2	2	0	2	0	697
9:15	0	149	52	0	4	1	0	10	8	0	0	0	0	0	0	0	1	0	0	0	0	149	108	0	5	3	0	2	3	0	70	0	49	0	0	3	6	0	0	0	623
9:30	0	162	48	0	6	3	1	5	4	0	0	0	0	0	0	0	0	0	1	0	0	125	99	0	1	1	0	5	2	0	51	0	35	1	0	2	5	0	2	0	559
9:45	0	134	57	0	8	3	0	6	4	0	0	0	0	0	0	0	0	0	0	0	0	82	102	0	7	5	0	3	1	0	47	0	45	1	0	0	6	0	2	0	513
10:00	0	139	44	0	15	2	0	8	5	0	0	0	0	0	0	0	0	0	0	0	0	96	75	0	3	3	0	5	0	0	35	0	24	0	0	1	3	0	1	0	459
10:15	0	126	39	0	7	4	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	105	102	0	5	5	0	7	3	0	22	0	32	3	0	2	8	0	2	0	480
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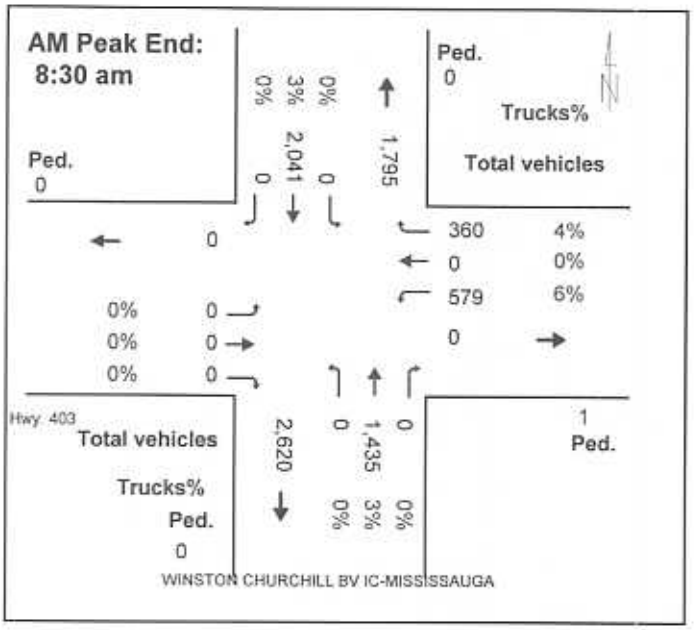
10:45	0	127	43	0	6	4	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	93	78	0	8	3	0	7	2	0	22	0	28	0	0	1	3	0	1	0	434
11:00	0	145	33	0	5	2	0	12	9	0	0	0	0	0	0	0	0	0	0	0	0	103	103	0	2	4	0	3	6	0	21	0	25	1	0	0	7	0	1	0	482
Period2																																									
14:15	0	164	46	0	11	3	0	7	9	0	0	0	0	0	0	0	0	0	0	0	0	167	96	0	7	2	0	9	6	0	24	0	35	3	0	0	6	0	3	0	598
14:30	0	205	37	0	11	1	0	4	7	0	0	0	0	0	0	0	0	0	0	0	0	138	72	0	3	3	0	4	3	0	33	0	31	3	0	0	9	0	2	0	566
14:45	0	191	35	0	3	1	1	4	11	0	0	0	0	0	0	0	0	0	0	0	0	174	96	0	7	6	0	4	3	0	20	0	38	0	0	1	6	0	3	0	604
15:00	0	216	52	0	5	0	0	7	11	0	0	0	0	0	0	0	0	0	0	0	0	173	73	0	4	5	0	3	5	0	29	0	28	1	0	1	1	0	0	0	614
15:15	0	237	48	0	6	2	0	5	8	0	0	0	0	0	0	0	0	0	0	0	0	169	65	0	4	3	0	7	4	0	27	0	35	0	0	1	4	0	1	0	626
15:30	0	249	38	0	5	0	0	5	9	0	0	0	0	0	0	0	0	0	0	0	0	185	93	0	3	6	0	6	2	0	21	0	42	2	0	1	3	0	1	0	671
15:45	0	251	46	0	3	1	0	8	4	0	0	0	0	0	0	0	0	0	0	0	0	204	62	0	6	2	0	5	3	0	23	0	31	1	0	0	1	0	3	0	654
16:00	0	259	62	0	8	0	0	3	10	0	0	0	0	0	0	0	0	0	0	0	0	190	65	0	4	5	0	3	3	0	44	0	54	0	0	0	8	0	2	0	720
16:15	0	258	50	0	8	1	0	7	6	0	0	0	0	0	0	0	0	0	0	0	0	244	84	0	6	2	0	3	1	0	26	0	28	1	0	0	5	0	1	0	731
16:30	0	273	58	0	4	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	203	73	0	2	3	0	8	2	0	32	0	46	1	0	1	9	0	1	0	721
16:45	0	340	66	0	4	2	0	3	4	0	0	0	0	0	0	0	0	0	0	0	0	273	66	0	6	1	0	2	4	0	36	0	25	3	0	0	5	0	1	0	841
17:00	0	348	60	0	5	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	244	76	0	5	1	0	2	1	0	60	0	55	1	0	0	3	0	1	0	865
17:15	0	412	53	0	3	0	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	282	65	0	5	0	0	3	1	0	53	0	77	1	0	0	3	0	0	0	966
17:30	0	410	66	0	2	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	299	89	0	5	2	0	2	1	0	57	0	85	3	0	0	4	0	0	0	1030
17:45	0	375	56	0	5	0	0	5	6	0	0	0	0	0	0	0	0	0	0	0	0	282	79	0	5	3	0	2	2	0	67	0	58	0	0	1	6	0	0	0	952
18:00	0	383	52	0	4	0	0	4	5	0	0	0	0	0	0	0	0	0	0	0	0	247	75	0	4	2	0	3	2	0	50	0	53	1	0	3	10	0	1	0	899

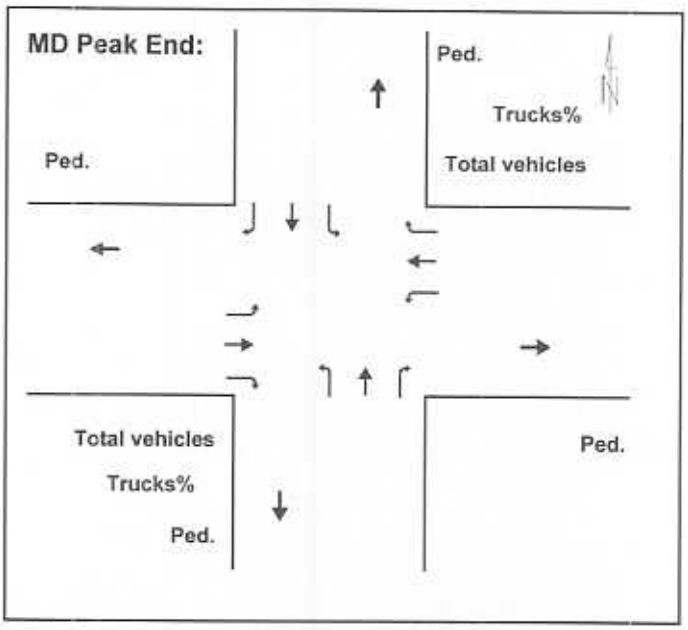
Ontario

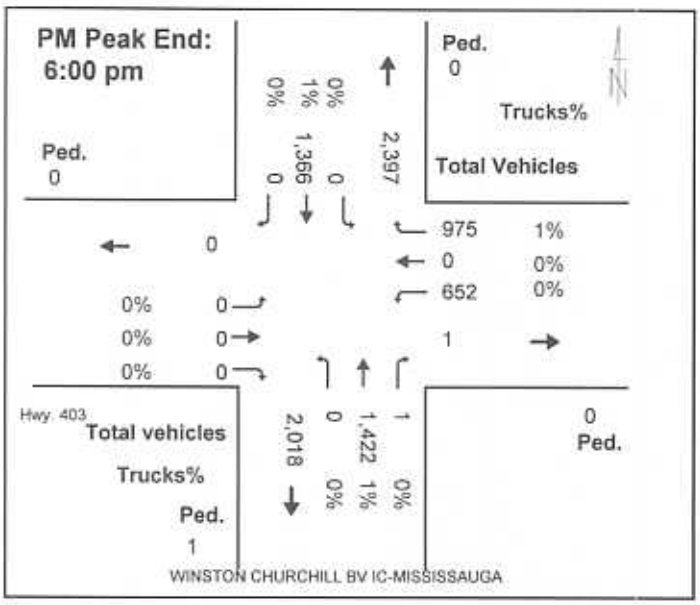
Hwy. 403 @ WINSTON CHURCHILL BV IC-MISSISSAUGA

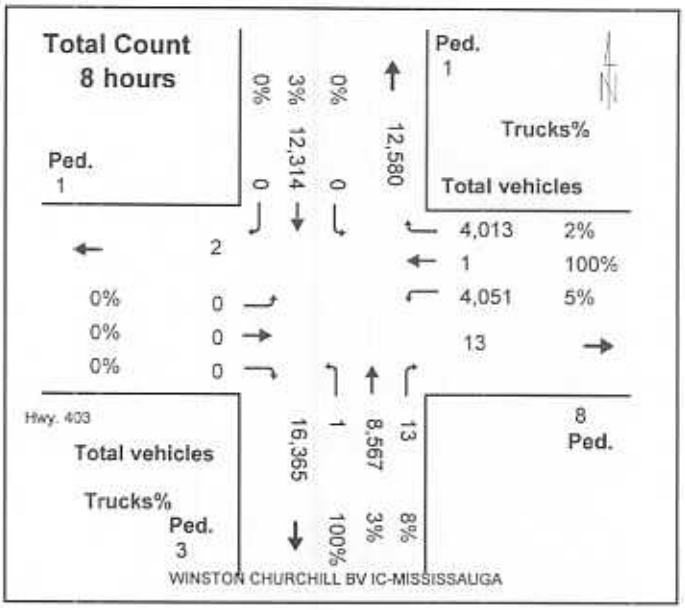
Central

Intersection ID:482700000(--N--) | Count Day: Wednesday | Count Date: 27-Apr-2011









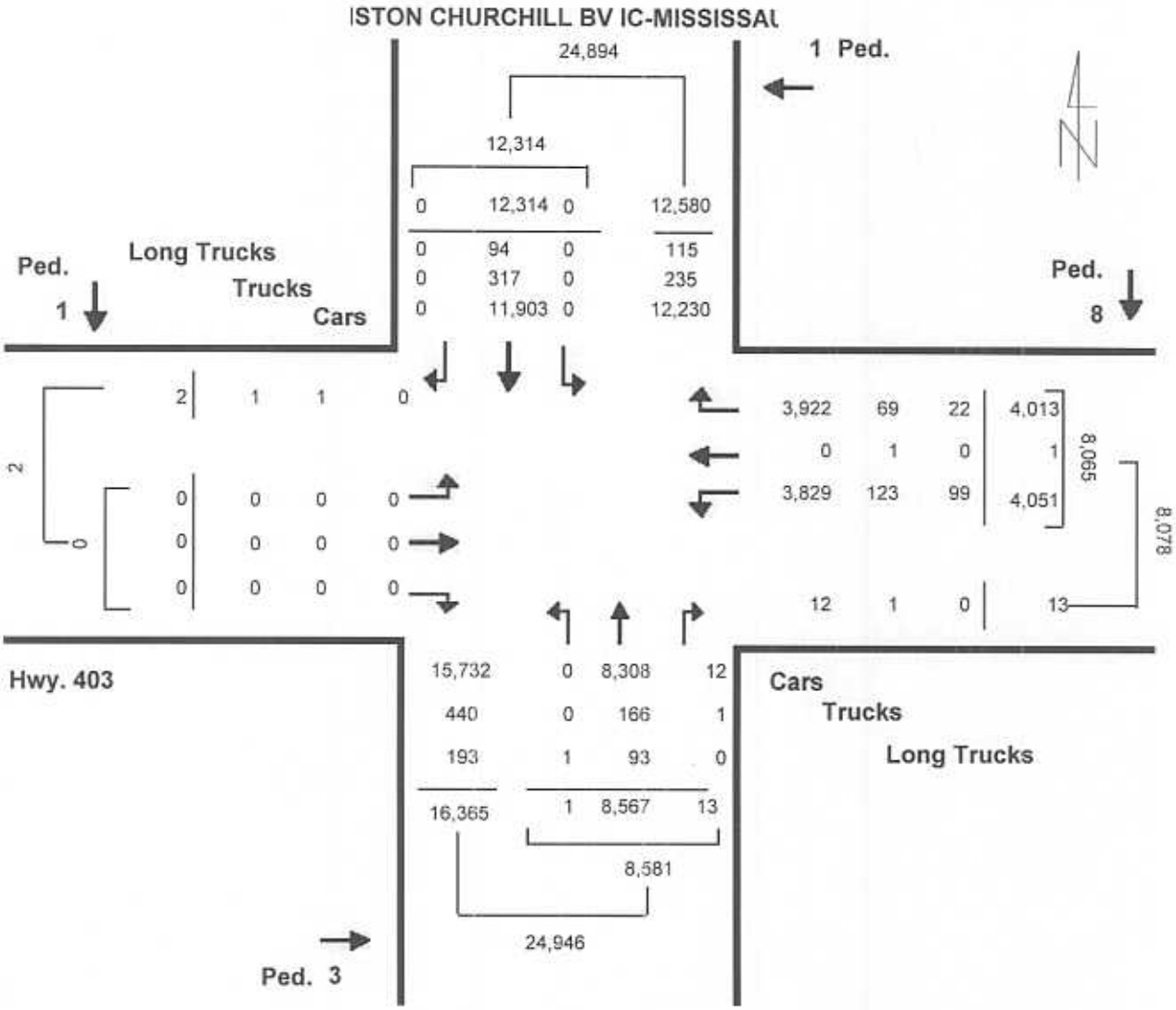
Traffic
Engineering
Software

COUNT TOTAL

Hwy. 403 @ WINSTON CHURCHILL BV IC-MISSISSAUGA

Central

Intersection ID:482700000(--N--) Date: 27-Apr-2011



15 MIN REPORT

Intersection ID:482700000(--N--) **Hwy. 403 @ WINSTON CHURCHILL BV IC-MISSISS.** **Municipality: Central** **Date: 27-Apr-2011**

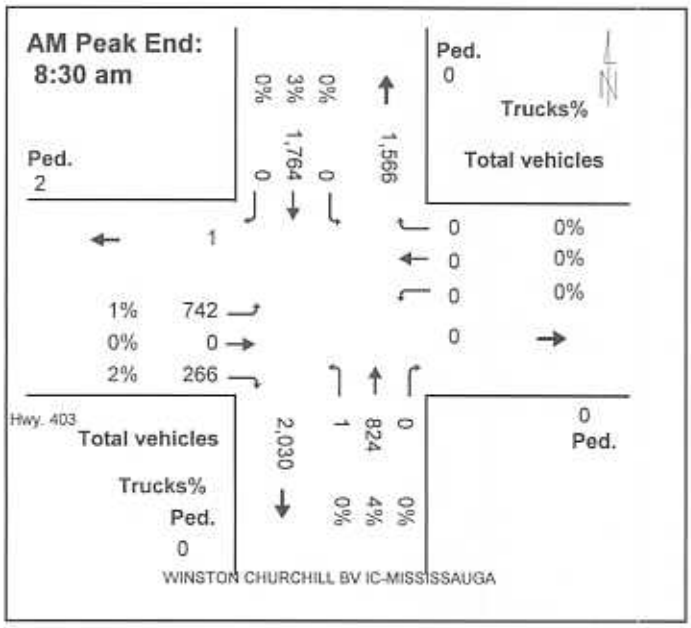
	NORTH APPROACH										EAST APPROACH										SOUTH APPROACH										WEST APPROACH										
Time	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Period1																																									
7:15	0	434	0	0	9	0	0	2	0	0	105	0	60	2	0	1	1	0	1	0	0	201	0	0	6	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	825
7:30	0	464	0	0	6	0	0	1	0	0	148	0	66	3	0	4	4	0	0	0	0	240	0	0	5	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	944
7:45	0	482	0	0	8	0	0	2	0	0	127	0	69	2	0	3	4	0	1	0	0	372	0	0	11	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	1086
8:00	0	464	0	0	10	0	0	3	0	0	125	0	98	4	0	1	9	0	0	1	0	343	0	0	4	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	1069
8:15	0	497	0	0	9	0	0	3	0	0	127	0	89	7	0	1	3	0	3	0	0	332	0	0	9	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	1085
8:30	0	542	0	0	18	0	0	3	0	0	167	0	91	4	0	3	0	0	1	0	0	343	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1176
8:45	0	431	0	0	14	0	0	1	0	0	138	0	70	2	0	0	6	0	1	0	0	264	0	0	8	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	939
9:00	0	490	0	0	16	0	0	5	0	0	132	0	71	1	0	5	5	0	1	0	0	197	0	0	11	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	940
9:15	0	424	0	0	9	0	0	6	0	0	102	0	57	9	0	4	3	0	2	0	0	168	0	0	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	791
9:30	0	409	0	0	10	0	0	3	0	0	105	0	53	4	0	2	3	0	2	0	0	183	0	0	7	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	784
9:45	0	394	0	0	16	0	0	5	0	0	83	0	63	9	0	1	6	0	1	1	0	141	0	0	3	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	727
10:00	0	340	0	0	11	0	0	2	0	0	90	0	69	9	0	5	2	0	1	2	0	149	0	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	685
10:15	0	311	0	0	12	0	0	4	0	0	72	0	41	4	0	2	4	0	1	2	0	145	0	0	5	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	606
10:30	0	291	0	0	1	0	0	2	0	0	87	0	59	5	0	1	2	0	1	0	0	136	0	0	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	591
10:45	0	310	0	0	7	0	0	4	0	0	64	0	60	4	0	3	6	0	1	0	0	149	0	0	4	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	614
11:00	0	273	0	0	7	0	0	4	0	0	73	0	71	3	0	1	5	0	1	0	0	169	0	0	10	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	619
Period2																																									
14:15	0	312	0	0	12	0	0	2	0	0	108	0	132	10	0	3	8	0	0	0	0	228	0	0	6	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	825
14:30	0	294	0	0	10	0	0	5	0	0	121	0	101	6	0	5	4	0	0	0	0	202	0	0	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	754
14:45	0	295	0	0	13	0	0	1	0	0	104	0	117	4	0	3	3	0	1	0	0	270	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	819
15:00	0	350	0	0	14	0	0	3	0	0	89	0	169	2	1	2	3	0	0	0	0	223	0	0	7	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	868
15:15	0	318	0	0	7	0	0	4	0	0	98	0	148	3	0	0	2	0	3	1	0	230	1	0	5	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	826
15:30	0	367	0	0	10	0	0	4	0	0	142	0	194	4	0	1	0	0	0	0	0	255	0	0	8	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	988
15:45	0	399	0	0	16	0	0	2	0	0	143	0	154	2	0	4	4	0	0	0	0	322	0	0	6	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	1055
16:00	0	362	0	0	14	0	0	3	0	0	121	0	148	4	0	3	1	0	0	0	0	301	0	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	962
16:15	0	295	0	0	14	0	0	4	0	0	104	0	146	4	0	1	4	0	0	0	0	273	8	0	11	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	867
16:30	0	360	0	0	12	0	0	4	0	0	132	0	176	5	0	3	1	0	0	0	0	338	1	0	3	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	1040
16:45	0	291	0	0	12	0	0	2	0	1	135	0	182	4	0	0	3	0	0	1	0	327	1	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	962
17:00	0	358	0	0	7	0	0	3	0	0	139	0	198	1	0	2	1	0	0	0	0	396	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1109
17:15	0	266	0	0	6	0	0	2	0	0	134	0	225	2	0	2	0	0	0	0	0	303	1	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	944
17:30	0	379	0	0	1	0	0	3	0	0	160	0	238	0	0	1	0	0	0	0	0	383	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1167
17:45	0	362	0	0	4	0	0	0	0	0	182	0	254	0	0	1	2	0	0	0	0	367	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1177
18:00	0	339	0	0	2	0	0	2	0	0	172	0	253	0	0	1	0	0	0	0	0	358	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1129

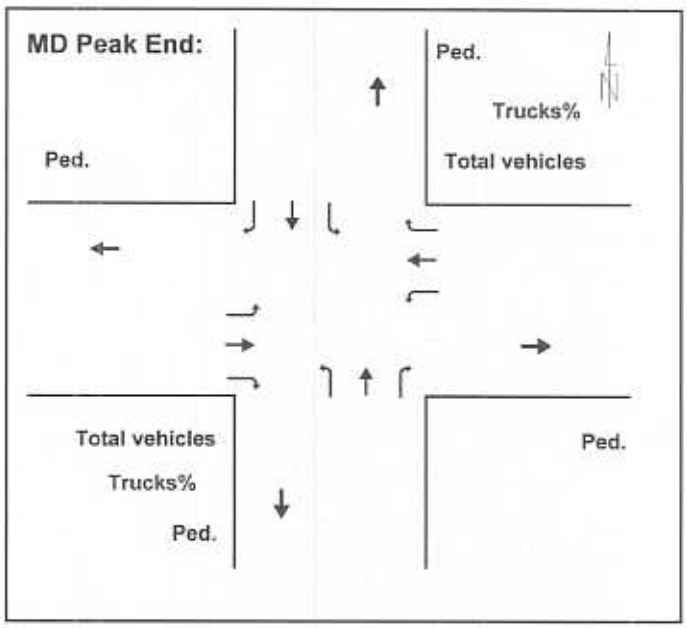
Ontario

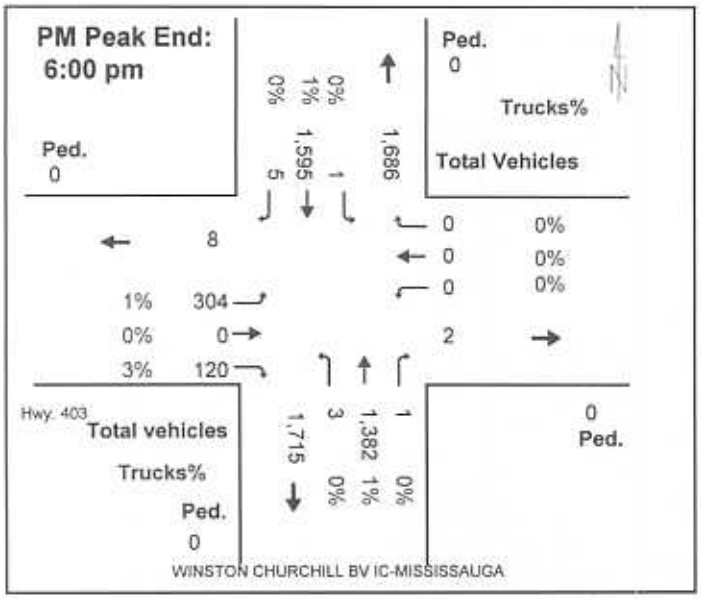
Hwy. 403 @ WINSTON CHURCHILL BV IC-MISSISSAUGA

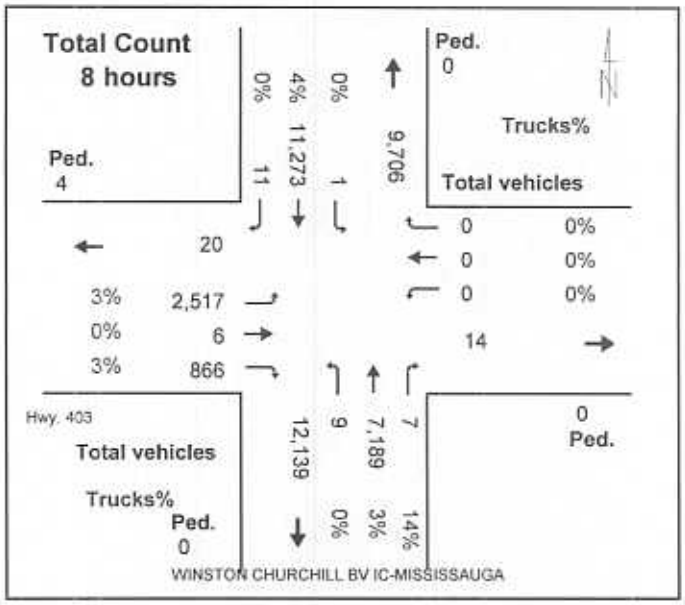
Central

Intersection ID:482700000(--S--) **Count Day:Wednesday** **Count Date: 27-Apr-2011**









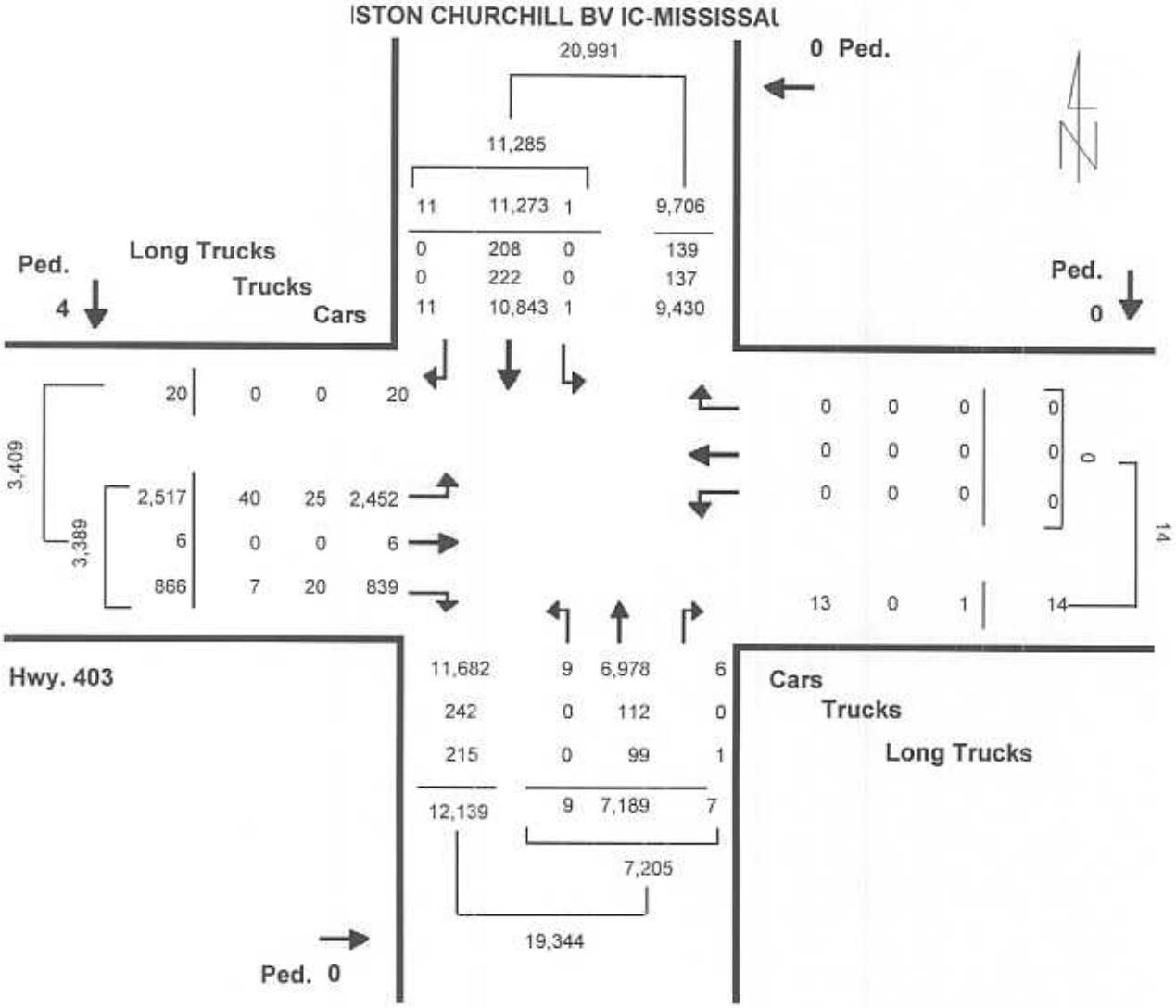
Traffic Engineering Software

COUNT TOTAL

Hwy. 403 @ WINSTON CHURCHILL BV IC-MISSISSAUGA

Central

Intersection ID:482700000(--S--) **Date: 27-Apr-2011**



15 MIN REPORT

Intersection ID:482700000(--S--) **Hwy. 403 @ WINSTON CHURCHILL BV IC-MISSISS.** **Municipality: Central** **Date: 27-Apr-2011**

Time	NORTH APPROACH										EAST APPROACH										SOUTH APPROACH										WEST APPROACH										Total
	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Period1																																									
7:15	0	282	0	0	6	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	132	1	0	1	0	0	2	0	0	94	1	36	2	0	0	2	0	0	0	563
7:30	0	423	0	0	4	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	163	0	0	3	0	0	4	0	0	125	0	50	1	0	0	1	0	0	0	779
7:45	0	379	0	0	7	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	206	0	0	4	0	0	5	0	0	216	0	58	0	0	1	5	0	0	0	887
8:00	0	439	0	0	8	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	212	0	0	3	0	0	5	0	0	182	0	64	1	0	1	1	0	0	0	926
8:15	0	378	0	0	6	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	190	0	0	6	0	0	2	0	0	180	0	75	1	0	1	3	0	1	2	853
8:30	0	511	0	0	10	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	184	0	0	6	0	0	1	0	0	153	0	63	0	0	2	0	0	0	0	933
8:45	0	443	0	0	9	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	203	0	0	3	0	0	1	0	0	92	0	39	1	0	1	3	0	0	0	805
9:00	0	445	1	0	7	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	171	0	0	4	0	0	5	0	0	46	0	23	0	0	0	2	0	0	0	716
9:15	0	333	0	0	11	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	166	0	0	4	0	0	3	0	0	36	0	27	0	0	1	0	0	0	0	590
9:30	0	304	0	0	8	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	118	0	0	5	0	0	3	1	0	45	4	20	2	0	0	1	0	0	0	521
9:45	0	268	0	0	18	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	1	117	0	0	4	0	0	2	0	0	50	0	12	0	0	0	1	0	0	0	486
10:00	0	256	0	0	9	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	128	0	0	2	0	0	1	0	0	41	0	21	1	0	0	1	0	0	0	465
10:15	0	235	0	0	10	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	2	120	0	0	4	0	0	1	0	0	42	0	15	0	0	0	2	0	0	0	439
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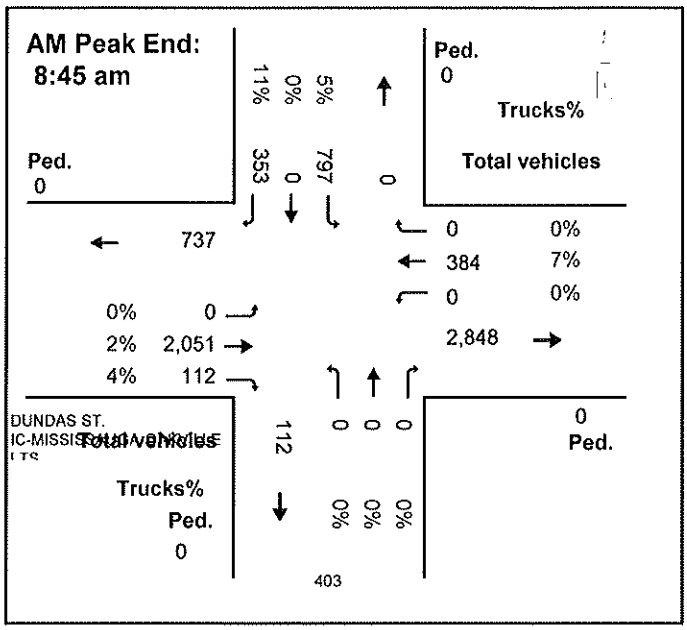
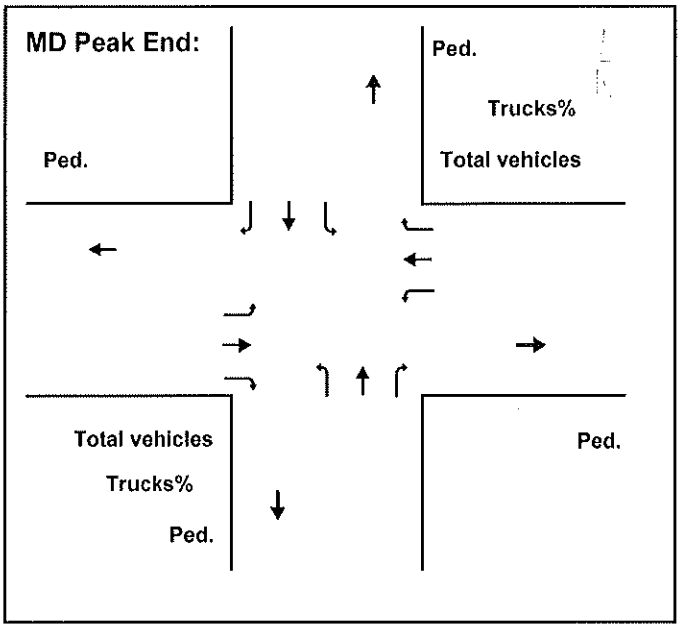
10:45	0	206	1	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	133	0	0	2	0	0	1	0	0	41	0	10	4	0	0	0	0	0	0	416
11:00	0	225	0	0	6	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	150	0	0	6	0	0	3	0	0	49	0	16	1	0	0	3	0	0	0	467
Period2																																									
14:15	0	278	0	0	11	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	1	188	0	0	7	0	0	4	0	0	56	0	13	0	0	1	1	0	2	0	574
14:30	0	272	1	0	14	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	214	0	0	2	0	0	5	0	0	32	0	12	0	0	3	1	0	0	0	564
14:45	0	243	0	0	13	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	217	0	0	5	0	0	1	0	0	65	0	8	4	0	1	1	0	0	0	563
15:00	0	315	2	0	10	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	208	1	0	4	0	0	7	0	0	60	0	9	1	0	2	3	0	0	0	629
15:15	0	303	0	0	6	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	226	0	0	3	0	0	6	0	0	48	0	16	0	0	1	1	0	1	0	616
15:30	0	384	0	0	6	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	258	0	0	6	0	0	3	0	0	85	0	23	0	0	2	2	0	0	0	773
15:45	0	343	0	0	5	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	255	1	0	3	0	0	3	0	0	84	0	12	2	0	0	0	0	0	0	714
16:00	0	384	0	0	6	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	303	0	0	4	0	0	2	0	0	77	0	20	0	0	0	1	0	0	0	802
16:15	0	334	1	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	311	0	0	8	0	0	4	0	0	49	0	15	0	0	1	1	0	0	0	738
16:30	0	344	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	275	0	0	2	0	0	8	0	0	53	0	19	0	0	0	0	0	0	1	711
16:45	0	333	0	0	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	302	1	0	1	0	0	3	0	0	75	0	19	0	0	0	0	0	0	1	742
17:00	0	350	0	0	3	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	336	1	0	1	0	0	1	0	0	45	1	15	1	0	0	1	0	0	0	760
17:15	0	323	1	0	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	286	0	0	1	0	0	4	0	0	74	0	14	0	0	0	1	0	0	0	711
17:30	1	451	3	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	359	0	0	2	0	0	1	0	0	80	0	29	1	0	0	0	0	0	0	933
17:45	0	417	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	338	1	0	3	0	0	2	0	0	73	0	35	0	0	1	1	0	1	0	875
18:00	0	389	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	385	0	0	0	0	0	1	0	0	73	0	39	1	0	0	0	0	1	0	892

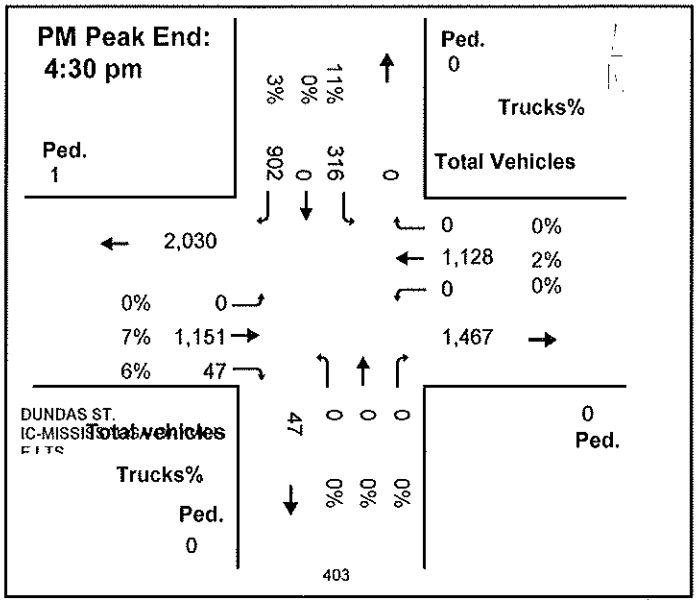
HWY 403 @ DUNDAS ST. IC-MISSISSAUGA-OAKVILLE LTS

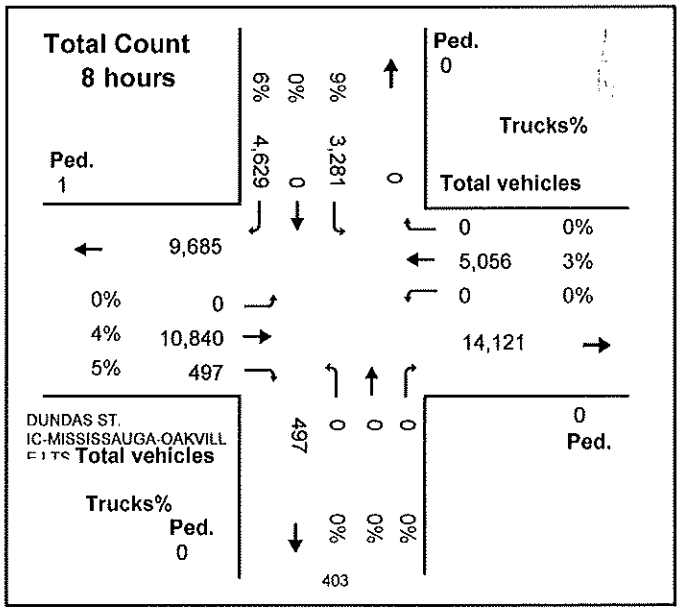
Central

Intersection ID:482730000(--S--) **Count Day:Wednesday** **Count Date: 14-Nov-2012**









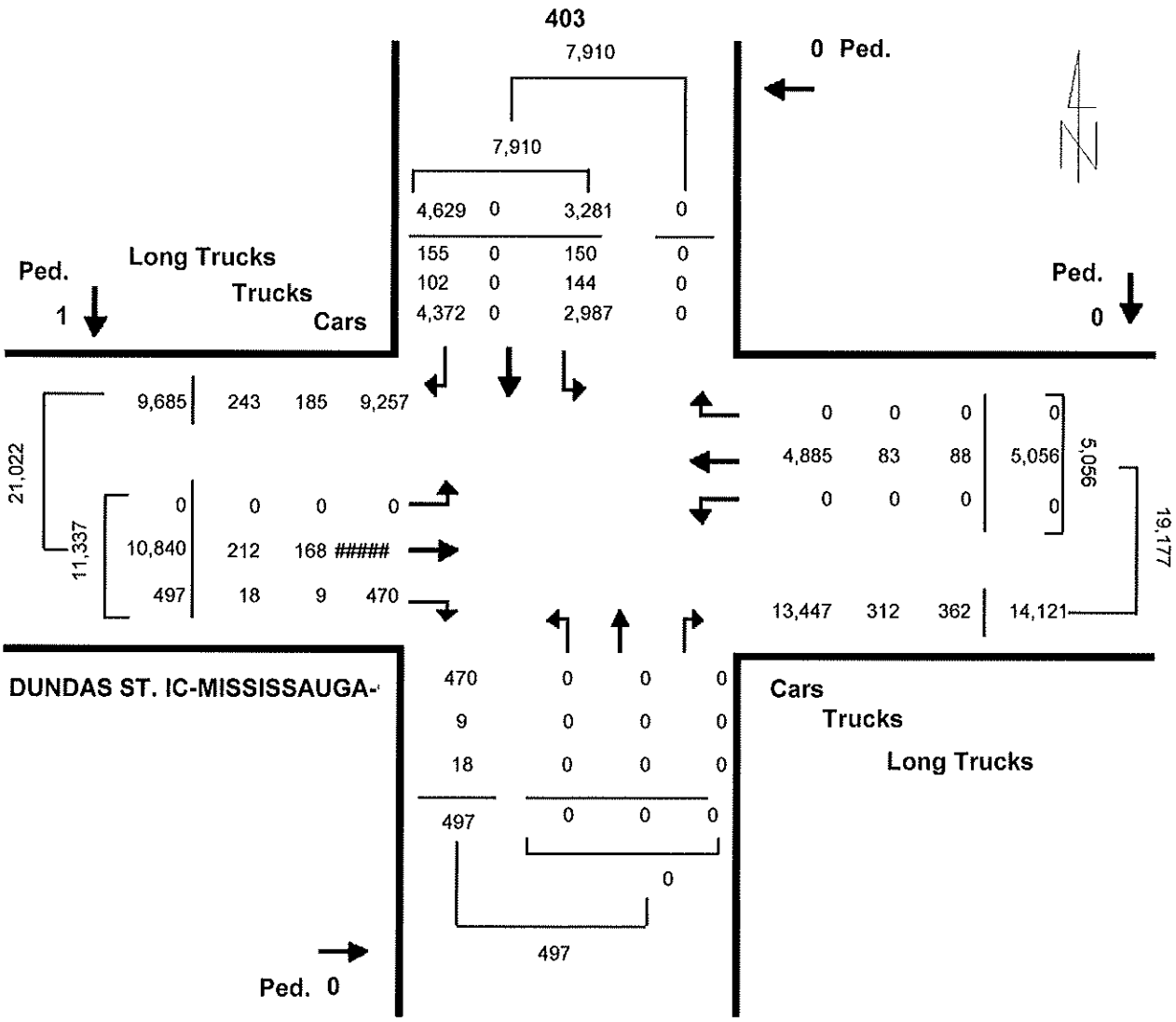
Traffic Engineering Software

COUNT TOTAL

HWY 403 @ DUNDAS ST. IC-MISSISSAUGA-OAKVILLE LTS

Central

Intersection ID:482730000(--S--) Date: 14-Nov-2012



15 MIN REPORT

Intersection ID:482730000(--S--) **HWY 403 @ DUNDAS ST. IC-MISSISSAUGA-OAKVII** **Municipality: Central** **Date: 14-Nov-2012**

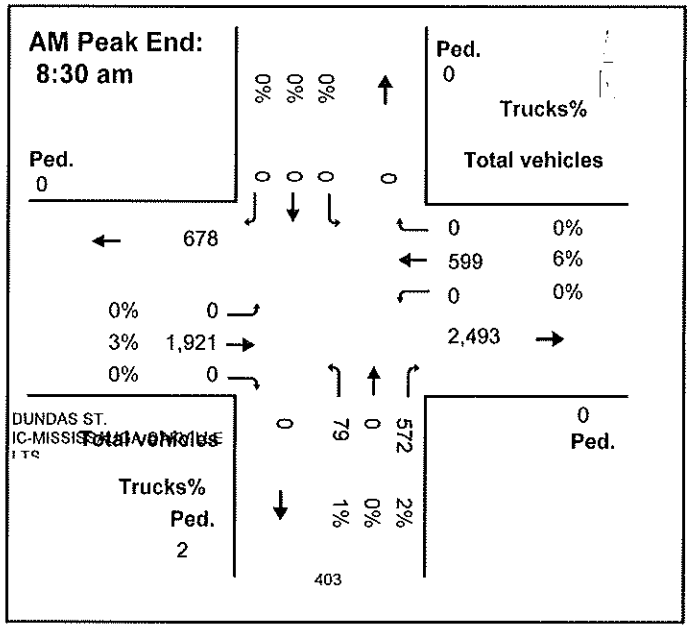
	NORTH APPROACH										EAST APPROACH										SOUTH APPROACH										WEST APPROACH									
Time	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Period1																																									
6:15	23	0	34	2	0	0	0	0	6	0	0	19	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	200	8	0	0	0	0	0	0	0	294
6:30	38	0	55	3	0	3	2	0	8	0	0	18	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	286	7	0	3	0	0	3	2	0	429
6:45	67	0	89	3	0	5	3	0	6	0	0	24	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	359	18	0	0	0	0	4	0	0	582
7:00	120	0	69	0	0	2	5	0	8	0	0	34	0	0	6	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	452	11	0	6	0	0	4	0	0	718
7:15	87	0	60	3	0	5	6	0	5	0	0	52	0	0	3	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	442	20	0	2	0	0	4	1	0	696
7:30	99	0	79	2	0	3	1	0	6	0	0	52	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	465	24	0	1	0	0	3	0	0	742
7:45	118	0	75	5	0	5	9	0	3	0	0	77	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	504	36	0	3	0	0	3	0	0	850
8:00	173	0	69	6	0	5	4	0	5	0	0	80	0	0	3	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	526	28	0	7	0	0	1	1	0	914
8:15	233	0	78	7	0	7	3	0	5	0	0	76	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	502	21	0	4	1	0	8	1	0	948
8:30	163	0	90	3	0	5	11	0	5	0	0	122	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	510	27	0	6	0	0	4	1	0	953
8:45	185	0	77	4	0	1	5	0	6	0	0	80	0	0	8	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	475	31	0	6	0	0	2	1	0	882
9:00	171	0	79	5	0	4	7	0	10	0	0	92	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	434	29	0	6	2	0	6	2	0	849
9:15	133	0	62	10	0	6	10	0	9	0	0	79	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	387	24	0	3	1	0	3	1	0	733
9:30	134	0	74	2	0	4	10	0	3	0	0	75	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	331	10	0	3	0	0	10	1	0	660
9:45	95	0	56	9	0	4	7	0	6	0	0	104	0	0	6	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	336	14	0	6	2	0	12	0	0	666
10:00	78	0	55	9	0	3	4	0	6	0	0	79	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	303	11	0	5	0	0	10	1	0	572
Period2																																									
14:15	70	0	75	9	0	3	5	0	13	0	0	171	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	244	12	0	8	1	0	7	0	0	623
14:30	69	0	104	6	0	4	5	0	3	0	0	191	0	0	4	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	224	11	0	11	0	0	16	0	0	653
14:45	58	0	119	5	0	4	5	0	6	0	0	206	0	0	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	201	9	0	5	0	0	6	0	0	631
15:00	65	0	125	5	0	3	2	0	2	0	0	193	0	0	3	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	224	5	0	9	1	0	4	1	0	650
15:15	58	0	155	8	0	2	4	0	3	0	0	219	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	257	13	0	6	0	0	13	0	0	742
15:30	52	0	180	5	0	4	5	0	5	0	0	204	0	0	2	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	230	10	0	7	0	0	11	0	0	720
15:45	59	0	223	5	0	2	7	0	6	0	0	268	0	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	286	14	0	4	0	0	8	1	0	888
16:00	85	0	200	3	0	2	4	0	3	0	0	298	0	0	4	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	274	11	0	7	0	0	12	0	0	906
16:15	72	0	242	2	0	3	4	0	3	0	0	275	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	259	10	0	11	0	0	13	1	1	898
16:30	65	0	211	6	0	1	4	0	6	0	0	269	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	248	9	0	10	0	0	19	1	0	853
16:45	70	0	307	4	0	4	3	0	4	0	0	238	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	215	14	0	5	0	0	9	0	0	874
17:00	69	0	244	5	0	1	3	0	1	0	0	299	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	258	8	0	3	1	0	4	0	0	897
17:15	73	0	234	1	0	2	6	0	1	0	0	254	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	244	9	0	6	0	0	5	1	0	836
17:30	66	0	330	3	0	1	3	0	0	0	0	226	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	279	6	0	3	0	0	1	1	0	920
17:45	74	0	266	1	0	2	1	0	0	0	0	248	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	275	6	0	10	0	0	3	0	0	888
18:00	65	0	256	3	0	2	2	0	2	0	0	263	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	230	4	0	2	0	0	4	0	0	837

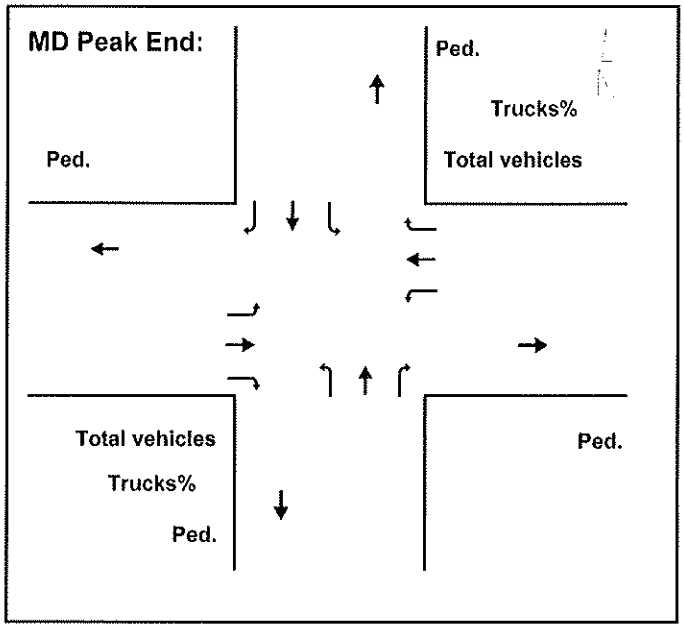
Ontario

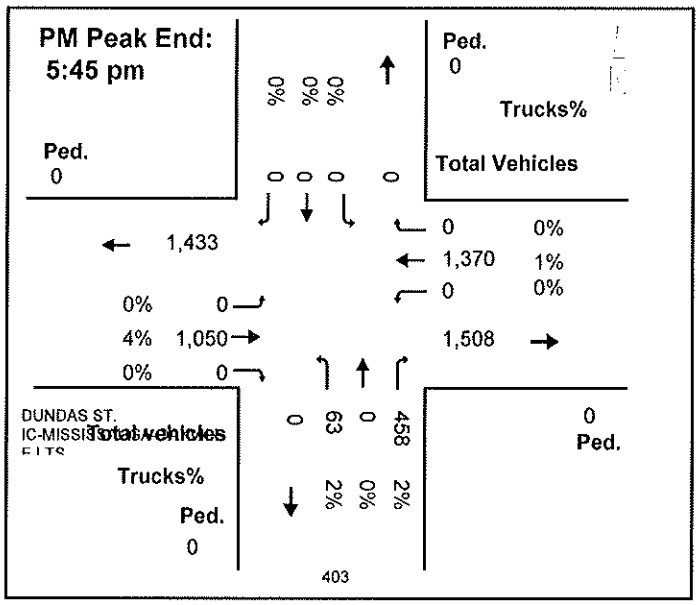
HWY 403 @ DUNDAS ST. IC-MISSISSAUGA-OAKVILLE LTS

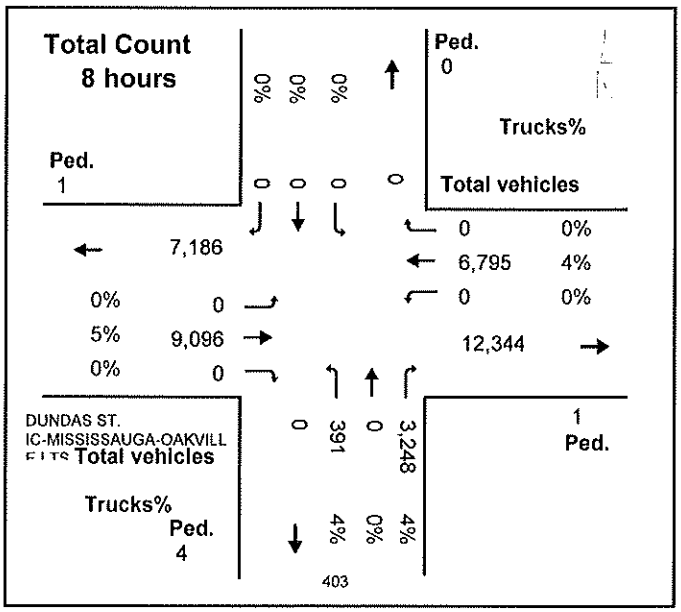
Central

Intersection ID:482730000(--N--) | Count Day: Wednesday | Count Date: 14-Nov-2012









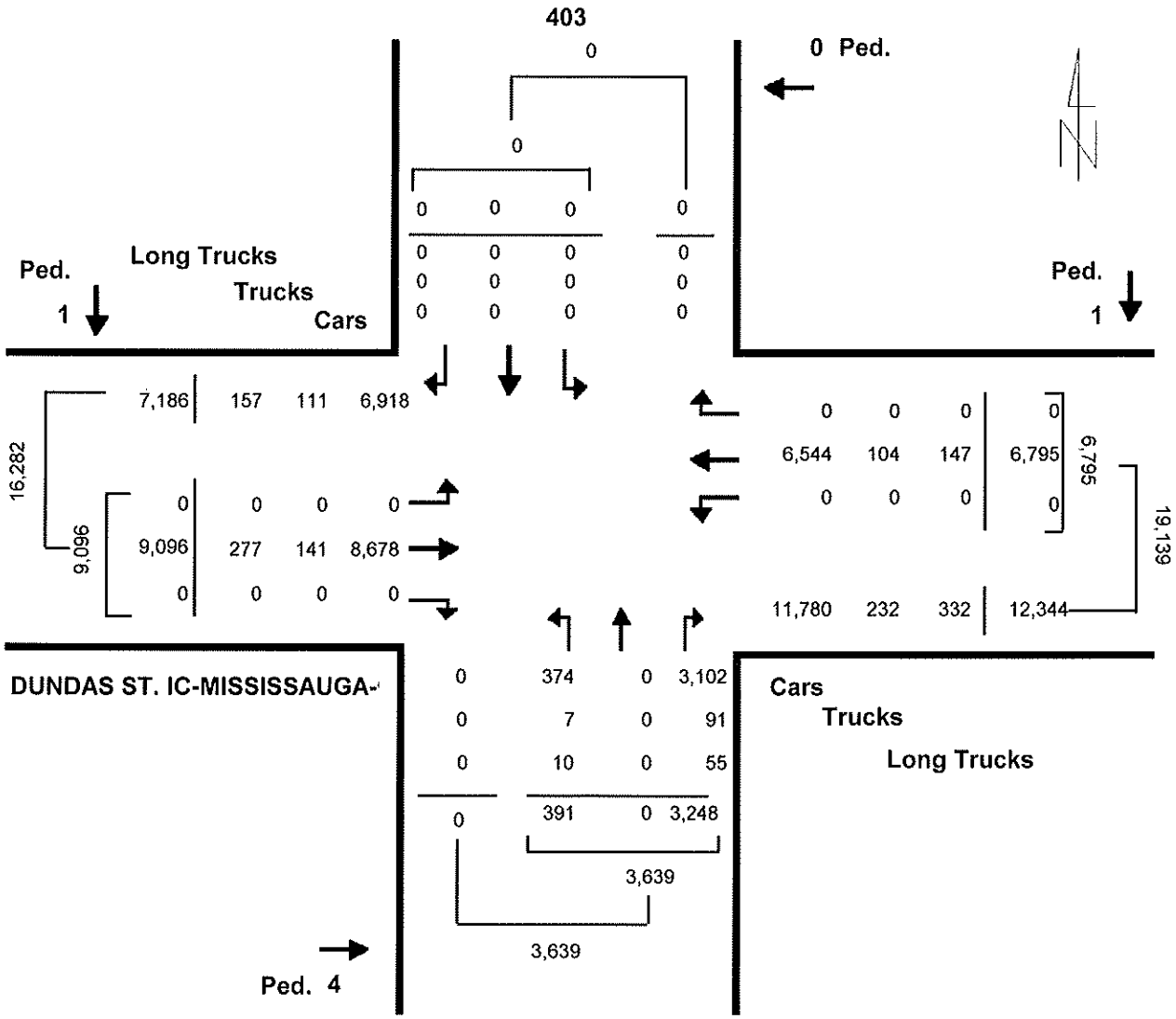
Traffic Engineering Software

COUNT TOTAL

HWY 403 @ DUNDAS ST. IC-MISSISSAUGA-OAKVILLE LTS

Central

Intersection ID:482730000(--N--) Date: 14-Nov-2012



15 MIN REPORT

Intersection ID:482730000(--N--) **HWY 403 @ DUNDAS ST. IC-MISSISSAUGA-OAKVII** **Municipality: Central** **Date: 14-Nov-2012**

	NORTH APPROACH										EAST APPROACH										SOUTH APPROACH										WEST APPROACH									
Time	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Period1																																									
6:15	0	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0	0	1	0	0	3	0	29	0	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	72
6:30	0	0	0	0	0	0	0	0	0	0	0	48	0	0	4	0	0	1	0	0	4	0	31	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	93
6:45	0	0	0	0	0	0	0	0	0	0	0	40	0	0	2	0	0	2	0	0	3	0	66	1	0	2	0	0	5	0	0	251	0	0	0	0	0	0	0	0	372
7:00	0	0	0	0	0	0	0	0	0	0	0	52	0	0	0	0	0	10	0	1	3	0	85	0	0	1	0	0	2	0	0	327	0	0	4	0	0	5	0	0	490
7:15	0	0	0	0	0	0	0	0	0	0	0	80	0	0	3	0	0	9	0	0	8	0	72	0	0	2	0	0	1	0	0	292	0	0	1	0	0	9	0	0	477
7:30	0	0	0	0	0	0	0	0	0	0	0	93	0	0	0	0	0	10	0	0	11	0	132	0	0	5	0	0	1	0	0	365	0	0	1	0	0	3	0	0	621
7:45	0	0	0	0	0	0	0	0	0	0	0	158	0	0	2	0	0	8	0	0	16	0	161	0	0	0	1	0	3	0	0	346	0	0	1	0	0	13	0	0	709
8:00	0	0	0	0	0	0	0	0	0	0	0	156	0	0	3	0	0	9	0	0	14	0	127	0	0	3	0	0	0	2	0	557	0	0	6	0	0	6	0	0	883
8:15	0	0	0	0	0	0	0	0	0	0	0	115	0	0	3	0	0	1	0	0	27	0	134	0	0	0	0	0	2	0	0	503	0	0	6	0	0	6	0	0	797
8:30	0	0	0	0	0	0	0	0	0	0	0	135	0	0	5	0	0	4	0	0	21	0	140	0	0	2	0	0	0	0	0	457	0	0	7	0	0	13	0	0	784
8:45	0	0	0	0	0	0	0	0	0	0	0	130	0	0	10	0	0	3	0	0	7	0	99	0	0	3	0	0	0	0	0	433	0	0	8	0	0	4	0	0	697
9:00	0	0	0	0	0	0	0	0	0	0	0	132	0	0	4	0	0	4	0	0	5	0	104	0	0	4	0	0	2	0	0	389	0	0	8	0	0	11	0	0	663
9:15	0	0	0	0	0	0	0	0	0	0	0	121	0	0	5	0	0	2	0	0	5	0	115	0	0	1	1	0	2	0	0	352	0	0	7	0	0	16	0	0	627
9:30	0	0	0	0	0	0	0	0	0	0	0	104	0	0	1	0	0	4	0	0	12	0	106	0	0	5	0	0	2	0	0	277	0	0	2	0	0	12	0	0	525
9:45	0	0	0	0	0	0	0	0	0	0	0	152	0	0	2	0	0	11	0	0	6	0	109	1	0	4	2	0	0	0	0	258	0	0	3	0	0	21	0	0	569
10:00	0	0	0	0	0	0	0	0	0	0	0	112	0	0	7	0	0	7	0	0	8	0	93	1	0	5	1	0	0	0	0	266	0	0	7	0	0	16	0	0	523
Period2																																									
14:15	0	0	0	0	0	0	0	0	0	0	0	211	0	0	4	0	0	5	0	0	12	0	86	1	0	6	0	0	2	0	0	208	0	0	10	0	0	6	0	0	551
14:30	0	0	0	0	0	0	0	0	0	0	0	271	0	0	2	0	0	7	0	0	6	0	89	0	0	7	1	0	6	0	0	211	0	0	8	0	0	19	0	0	627
14:45	0	0	0	0	0	0	0	0	0	0	0	278	0	0	10	0	0	8	0	0	7	0	74	0	0	5	0	0	1	0	0	179	0	0	5	0	0	11	0	0	578
15:00	0	0	0	0	0	0	0	0	0	0	0	283	0	0	5	0	0	13	0	0	14	0	84	0	0	5	1	0	0	1	0	209	0	0	6	0	0	3	0	1	625
15:15	0	0	0	0	0	0	0	0	0	0	0	245	0	0	2	0	0	2	0	0	19	0	79	0	0	4	1	0	1	0	0	209	0	0	6	0	0	12	0	0	580
15:30	0	0	0	0	0	0	0	0	0	0	0	215	0	0	3	0	0	4	0	0	2	0	64	0	0	0	0	0	7	0	0	175	0	0	5	0	0	12	0	0	487
15:45	0	0	0	0	0	0	0	0	0	0	0	352	0	0	3	0	0	6	0	0	21	0	74	0	0	3	0	0	9	0	0	233	0	0	3	0	0	12	0	0	716
16:00	0	0	0	0	0	0	0	0	0	0	0	353	0	0	5	0	0	3	0	0	21	0	68	2	0	3	0	0	0	0	0	255	0	0	5	0	0	11	0	0	726
16:15	0	0	0	0	0	0	0	0	0	0	0	323	0	0	3	0	0	6	0	0	15	0	103	0	0	2	0	0	1	0	0	255	0	0	2	0	0	7	0	0	717
16:30	0	0	0	0	0	0	0	0	0	0	0	365	0	0	3	0	0	3	0	0	17	0	92	1	0	2	0	0	1	0	0	209	0	0	5	0	0	12	0	0	710
16:45	0	0	0	0	0	0	0	0	0	0	0	329	0	0	2	0	0	1	0	0	16	0	111	0	0	4	0	0	1	1	0	206	0	0	6	0	0	11	0	0	688
17:00	0	0	0	0	0	0	0	0	0	0	0	334	0	0	1	0	0	0	0	0	17	0	130	0	0	2	0	0	1	0	0	248	0	0	6	0	0	8	0	0	747
17:15	0	0	0	0	0	0	0	0	0	0	0	364	0	0	0	0	0	1	0	0	14	0	108	0	0	1	0	0	3	0	0	239	0	0	1	0	0	8	0	0	739
17:30	0	0	0	0	0	0	0	0	0	0	0	354	0	0	4	0	0	1	0	0	16	0	117	0	0	1	1	0	0	0	0	256	0	0	5	0	0	3	0	0	758
17:45	0	0	0	0	0	0	0	0	0	0	0	309	0	0	2	0	0	0	0	0	15	0	94	0	0	1	0	0	0	0	0	268	0	0	5	0	0	3	0	0	697
18:00	0	0	0	0	0	0	0	0	0	0	0	295	0	0	4	0	0	1	0	0	9	0	126	0	0	2	0	0	0	0	0	245	0	0	2	0	0	4	0	0	688

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

Municipality: Mississauga
Site #: 1405500004
Intersection: Britannia Rd E & Hwy 407 SB off Ra
TFR File #: 2
Count date: 29-Apr-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Britannia Rd E runs W/E

North Leg Total: 45
North Entering: 45
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	0
Trucks	1	3	4
Cars	5	36	41
Totals	6	39	

Heavys	0
Trucks	0
Cars	0
Totals	0

East Leg Total: 1409
East Entering: 378
East Peds: 0
Peds Cross: ⧗

Hwy 407 SB off Ramp

Heavys	Trucks	Cars	Totals
0	7	377	384

Cars	Trucks	Heavys	Totals
0	0	0	0
372	6	0	378
372	6	0	

Britannia Rd E

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
2	7	983	992
2	7	983	

Britannia Rd E

Cars	Trucks	Heavys	Totals
1019	10	2	1031

Peds Cross: ⧗
West Peds: 0
West Entering: 992
West Leg Total: 1376

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 19:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Mississauga
Site #: 1405500004
Intersection: Britannia Rd E & Hwy 407 SB off Ra
TFR File #: 2
Count date: 29-Apr-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Britannia Rd E runs W/E

North Leg Total: 199
North Entering: 198
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	0
Trucks	1	1	2
Cars	30	166	196
Totals	31	167	

Heavys	0
Trucks	1
Cars	0
Totals	1

East Leg Total: 1489
East Entering: 945
East Peds: 0
Peds Cross: ⧗

Hwy 407 SB off Ramp

Heavys	Trucks	Cars	Totals
1	5	969	975

Cars	Trucks	Heavys	Totals
0	1	0	1
939	4	1	944
939	5	1	

Britannia Rd E

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
0	5	372	377
0	5	372	

Britannia Rd E

Cars	Trucks	Heavys	Totals
538	6	0	544

Peds Cross: ⧗
West Peds: 0
West Entering: 377
West Leg Total: 1352

Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Mississauga
Site #: 1405500004
Intersection: Britannia Rd E & Hwy 407 SB off Ra
TFR File #: 2
Count date: 29-Apr-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Britannia Rd E runs W/E

North Leg Total:	544
North Entering:	543
North Peds:	0
Peds Cross:	⋈

Heavys	0	0	0
Trucks	7	14	21
Cars	74	448	522
Totals	81	462	

Heavys	0
Trucks	1
Cars	0
Totals	1

East Leg Total:	6851
East Entering:	3144
East Peds:	0
Peds Cross:	⧗

Hwy 407 SB off Ramp

Heavys	Trucks	Cars	Totals
6	30	3188	3224

Cars	Trucks	Heavys	Totals
0	1	0	1
3114	23	6	3143
3114	24	6	

Britannia Rd E

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
9	36	3200	3245
9	36	3200	

Britannia Rd E

Cars	Trucks	Heavys	Totals
3648	50	9	3707

Peds Cross:	⧗
West Peds:	0
West Entering:	3245
West Leg Total:	6469

Comments

ACCUTR15
E
29/04/14
07:00:05
N
S
W

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

Municipality: Mississauga
Site #: 1405500003
Intersection: Britannia Rd E & Hwy 407 NB off Ra
TFR File #: 1
Count date: 29-Apr-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Britannia Rd E runs W/E

East Leg Total: 1704
East Entering: 460
East Peds: 0
Peds Cross:

Heavys	Trucks	Cars	Totals
0	8	462	470

Britannia Rd E

Cars	Trucks	Heavys	Totals
452	8	0	460
0	0	0	0
452	8	0	

N
W E
S

Heavys	Trucks	Cars	Totals
2	6	956	964
0	0	0	0
2	6	956	

Britannia Rd E

Cars	Trucks	Heavys	Totals
1234	8	2	1244

Hwy 407 NB off Ramp

Peds Cross:
West Peds: 0
West Entering: 964
West Leg Total: 1434

Cars	0		
Trucks	0		
Heavys	0		
Totals	0		

Cars	10	278	288
Trucks	0	2	2
Heavys	0	0	0
Totals	10	280	

Peds Cross:
South Peds: 0
South Entering: 290
South Leg Total: 290

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 19:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Mississauga
Site #: 1405500003
Intersection: Britannia Rd E & Hwy 407 NB off Ra
TFR File #: 1
Count date: 29-Apr-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Britannia Rd E runs W/E

East Leg Total: 1566
East Entering: 960
East Peds: 0
Peds Cross:

N
W E
S

Britannia Rd E

Heavys	Trucks	Cars	Totals
1	7	1025	1033

Cars	Trucks	Heavys	Totals
952	7	1	960
0	0	0	0
952	7	1	

Hwy 407 NB off Ramp

Heavys	Trucks	Cars	Totals
0	5	491	496
0	0	0	0
0	5	491	

Britannia Rd E

Cars	Trucks	Heavys	Totals
600	5	1	606

Peds Cross:
West Peds: 0
West Entering: 496
West Leg Total: 1529

Cars	0		
Trucks	0		
Heavys	0		
Totals	0		

Cars	73	109	182
Trucks	0	0	0
Heavys	0	1	1
Totals	73	110	

Peds Cross:
South Peds: 0
South Entering: 183
South Leg Total: 183

Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Mississauga
Site #: 1405500003
Intersection: Britannia Rd E & Hwy 407 NB off Ra
TFR File #: 1
Count date: 29-Apr-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Britannia Rd E runs W/E

East Leg Total:	7638
East Entering:	3419
East Peds:	0
Peds Cross:	

N
W E
S

Britannia Rd E

Heavys	Trucks	Cars	Totals
12	34	3592	3638

Cars	Trucks	Heavys	Totals
3375	32	12	3419
0	0	0	0
3375	32	12	

Britannia Rd E

Heavys	Trucks	Cars	Totals
7	32	3385	3424
0	0	0	0
7	32	3385	

Cars	Trucks	Heavys	Totals
4170	40	9	4219

Hwy 407 NB off Ramp

Peds Cross:	
West Peds:	0
West Entering:	3424
West Leg Total:	7062

Cars	0
Trucks	0
Heavys	0
Totals	0

Cars	Trucks	Heavys	Totals
217	785	1002	
2	8	10	
0	2	2	
219	795		

Peds Cross:	
South Peds:	1
South Entering:	1014
South Leg Total:	1014

Comments

ACCUTRA1
N
29/04/14
07:00:08
E
W
S

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

Municipality: Mississauga
Site #: 1405500002
Intersection: Derry Rd & Hwy 407 SB off Ramp
TFR File #: 1
Count date: 29-Apr-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total:	55
North Entering:	55
North Peds:	1
Peds Cross:	⋈

Heavys	0	1	1
Trucks	8	0	8
Cars	24	22	46
Totals	32	23	

Heavys	0
Trucks	0
Cars	0
Totals	0

East Leg Total:	2244
East Entering:	422
East Peds:	0
Peds Cross:	⋈

Hwy 407 SB off Ramp

Heavys	Trucks	Cars	Totals
8	22	424	454

Cars	Trucks	Heavys	Totals
0	0	0	0
400	14	8	422
400	14	8	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
7	20	1772	1799
7	20	1772	

Derry Rd

Cars	Trucks	Heavys	Totals
1794	20	8	1822

Peds Cross:	⋈
West Peds:	0
West Entering:	1799
West Leg Total:	2253

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 19:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Mississauga
Site #: 1405500002
Intersection: Derry Rd & Hwy 407 SB off Ramp
TFR File #: 1
Count date: 29-Apr-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total:	660
North Entering:	660
North Peds:	0
Peds Cross:	⋈

Heavys	0	1	1
Trucks	2	2	4
Cars	432	223	655
Totals	434	226	

Heavys	0
Trucks	0
Cars	0
Totals	0

East Leg Total:	2426
East Entering:	1684
East Peds:	0
Peds Cross:	⧗

Hwy 407 SB off Ramp

Heavys	Trucks	Cars	Totals
7	10	2101	2118

Derry Rd

Heavys	Trucks	Cars	Totals
0	0	0	0
5	5	506	516
5	5	506	

N
W E
S

Cars	Trucks	Heavys	Totals
0	0	0	0
1669	8	7	1684
1669	8	7	

Derry Rd

Cars	Trucks	Heavys	Totals
729	7	6	742

Peds Cross:	⧗
West Peds:	0
West Entering:	516
West Leg Total:	2634

Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Mississauga
Site #: 1405500002
Intersection: Derry Rd & Hwy 407 SB off Ramp
TFR File #: 1
Count date: 29-Apr-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

North Leg Total:	1459
North Entering:	1459
North Peds:	1
Peds Cross:	⋈

Heavys	0	6	6
Trucks	21	5	26
Cars	937	490	1427
Totals	958	501	

Heavys	0
Trucks	0
Cars	0
Totals	0

East Leg Total:	11402
East Entering:	5077
East Peds:	0
Peds Cross:	⧗

Hwy 407 SB off Ramp

Heavys	Trucks	Cars	Totals
35	87	5913	6035

Cars	Trucks	Heavys	Totals
0	0	0	0
4976	66	35	5077
4976	66	35	

Derry Rd

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
33	89	5702	5824
33	89	5702	

Derry Rd

Cars	Trucks	Heavys	Totals
6192	94	39	6325

Peds Cross:	⧗
West Peds:	0
West Entering:	5824
West Leg Total:	11859

Comments

ACCUTR02
29/04/14
07:00:07
N
E
W
S

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period		One Hour Peak	
From:	7:00:00	**From:**	7:30:00
To:	10:00:00	**To:**	8:30:00

Municipality: Mississauga
Site #: 1405500001
Intersection: Derry Rd & Hwy 407 NB off Ramp
TFR File #: 1
Count date: 29-Apr-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

East Leg Total: 2391
East Entering: 838
East Peds: 0
Peds Cross: ⧗

Heavys	Trucks	Cars	Totals
10	20	505	535

Derry Rd

Cars	Trucks	Heavys	Totals
492	19	10	521
0	0	0	0
808	20	10	

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Heavys	Trucks	Cars	Totals
5	13	1384	1402
0	0	0	0
5	13	1384	

Derry Rd

Cars	Trucks	Heavys	Totals
1529	18	6	1553

Hwy 407 NB off Ramp

Peds Cross: ⧗
West Peds: 0
West Entering: 1402
West Leg Total: 1937

Cars	0	Cars	13	145	158
Trucks	0	Trucks	1	5	6
Heavys	0	Heavys	0	1	1
Totals	0	Totals	14	151	

Peds Cross: ⋈
South Peds: 1
South Entering: 165
South Leg Total: 165

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 19:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Mississauga
Site #: 1405500001
Intersection: Derry Rd & Hwy 407 NB off Ramp
TFR File #: 1
Count date: 29-Apr-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E

East Leg Total:	2509
East Entering:	1697
East Peds:	1
Peds Cross:	

Derry Rd (West)

Heavys	Trucks	Cars	Totals
10	11	1751	1772

Heavys	Trucks	Cars	Totals
4	5	680	689
0	0	0	0
4	5	680	

Derry Rd (East)

Cars	Trucks	Heavys	Totals
1648	10	10	1668
0	0	0	0
1676	11	10	

Cars	Trucks	Heavys	Totals
800	8	4	812

Hwy 407 NB off Ramp

Peds Cross:	
West Peds:	0
West Entering:	689
West Leg Total:	2461

Cars	0		
Trucks	0		
Heavys	0		
Totals	0		

Cars	103	120	223
Trucks	1	3	4
Heavys	0	0	0
Totals	104	123	

Peds Cross:	
South Peds:	0
South Entering:	227
South Leg Total:	227

Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Mississauga	**Weather conditions:**
Site #: 1405500001	
Intersection: Derry Rd & Hwy 407 NB off Ramp	**Person(s) who counted:**
TFR File #: 1	
Count date: 29-Apr-14	
**** Signalized Intersection ****	**Major Road:** Derry Rd runs W/E

East Leg Total:	11933
East Entering:	6063
East Peds:	1
Peds Cross:	⧗

Heavys	Trucks	Cars	Totals
47	92	5513	5652

Derry Rd

Heavys	Trucks	Cars	Totals
26	66	5097	5189
0	0	0	0
26	66	5097	

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Cars	Trucks	Heavys	Totals
5267	84	47	5398
0	0	0	0
5925	89	49	

Derry Rd

Cars	Trucks	Heavys	Totals
5764	79	27	5870

Hwy 407 NB off Ramp

Peds Cross:	⧗
West Peds:	0
West Entering:	5189
West Leg Total:	10841

Cars	0
Trucks	0
Heavys	0
Totals	0

Cars	246	667	913
Trucks	8	13	21
Heavys	0	1	1
Totals	254	681	

Peds Cross:	⋈
South Peds:	3
South Entering:	935
South Leg Total:	935

Comments

ACCUTR15
29/04/14
07:00:39
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REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**February 21, 2013**		**Prepared Date:**	**February 7, 2014**
Database Rev	**29**		**Completed By:**	**AK**
Timing Card / Field rev	**6**		**Checked By:**	**RC**
Location:	**Derry @ Ninth Line**			

Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Minimum (sec.) WALK	Pedestrian Minimum (sec.) FDWALK	Amber (sec.)	All Red (sec.)	TIME PERIOD (sec.) (Green+Amber+All Red) AM MAX	OFF MAX	PM MAX
1	W/B P.P. LT - Derry	5.0			3.0		11.2	0.0	0.0
2	E/B Green - Derry	8.0	9.0	15.0	4.0	2.1	57.4	51.0	71.4
3	Not in Use								0.0
4	N/B Green - Cawthra	8.0	9.0	14.0	4.0	2.4	71.4	34.0	68.6
5	E/B P.P. LT - Derry	5.0			3.0		0.0	0.0	9.8
6	W/B Green - Derry	8.0	9.0	15.0	4.0	2.1	68.6	51.0	61.6
7	N/B P.P. LT - Cawthra	5.0			3.0		15.4	0.0	15.4
8	S/B Green - Cawthra	8.0	9.0	14.0	4.0	2.4	56.0	34.0	53.2

System Control	YES
Local Control	NO
Semi-Actuated Mode	YES

TIME (M-F)	PEAK	CYCLE LENGTH (sec.)	OFFSET (sec.)
06:00-09:30	AM	140	36.4
09:30-15:00	OFF	85	74.8
19:30-00:00			
15:00-19:30	PM	140	135.8

INT No.: **763**

LOCATION: **Ninth Line @ Osprey**

SCHEDULED DATA

Mode	Cycle Length	OFF No.	Split No.	Spec Func	DUP ISEC
LO	101	2	2	2	

PHASING DATA

PHASE	MIN	MAX	WALK	DON'T WALK	AMBER	ALL-RED
1. SBLT (Arrow)	5	10	-	-	3	-
2. N/S Ninth Line	45	N/A	37	8	5	2
4. E/W Osprey	8	25	8	9	4	2

* ALL VALUES IN SECONDS

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**March 28, 2013**		**Prepared Date:**	**February 7, 2014**
Database Rev	**23**		**Completed By:**	**AK**
Timing Card / Field rev	**5**		**Checked By:**	

Location: **Britannia @ Ninth Line**

Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Minimum (sec.) WALK	Pedestrian Minimum (sec.) FDWALK	Amber (sec.)	All Red (sec.)	TIME PERIOD (sec.) (Green+Amber+All Red) AM (1) MAX	AM (2) MAX	OFF MAX	PM MAX
1	Not in Use									
2	E/B Green - Britannia	12.0	7.0	11.0	4.6	2.0	48.0	56.0	40.0	58.8
3	S/B LT - Ninth Line	5.0			3.0		9.6	11.2	0.0	11.2
4	N/B Green - Ninth Line	12.0	12.0	18.0	4.6	2.0	62.4	72.8	40.0	70.0
5	E/B LT - Britannia	5.0			3.0		0.0	0.0	0.0	11.2
6	W/B Green - Britannia	12.0	7.0	11.0	4.6	2.0	48.0	56.0	40.0	47.6
7	N/B LT - Ninth Line	5.0			3.0		9.6	11.2	0.0	11.2
8	S/B Green - Ninth Line	12.0	12.0	18.0	4.6	2.0	62.4	72.8	40.0	70.0

System Control	YES
Local Control	NO
Semi-Actuated Mode	YES

TIME (M-F)	PEAK	CYCLE LENGTH (sec.)	OFFSET (sec.)
06:00-07:00	**AM (1)**	**120**	**49.2**
07:00-09:30	**AM (2)**	**140**	**0.0**
09:30-15:00	**OFF**	**80**	**5.6**
15:00-19:30	**PM**	**140**	**32.2**

INT No.: **882**

LOCATION: **Ninth Line @ Thomas**

SCHEDULED DATA

Mode	Cycle Length	OFF No.	Split No.	Spec Func	DUP ISEC
LO	101	2	2	2	

PHASING DATA

PHASE	MIN	MAX	WALK	DON'T WALK	AMBER	ALL-RED
1. SBLT (Arrow)	5	10	-	-	3	-
2. N/S Ninth Line	45	N/A	33	12	5	2.5
4. E/W Thomas	8	25	8	11	4	2.5

* ALL VALUES IN SECONDS

INT No.: **300**

LOCATION: **Ninth Line @ Erin Centre**

SCHEDULED DATA

Mode	Cycle Length	OFF No.	Split No.	Spec Func	DUP ISEC
LO	101	2	2	2	

PHASING DATA

PHASE	MIN	MAX	WALK	DON'T WALK	AMBER	ALL-RED
1. SBLT (Arrow)	5	10	-	-	3	-
2. N/S Ninth Line	58	N/A	50	8	4	2
4. E/W Erin Centre	8	20	8	8	4	2.5

* ALL VALUES IN SECONDS

Jaspreet Dhillon

From: Jim Kartsomanis <Jim.Kartsomanis@mississauga.ca>
Sent: Friday, February 14, 2014 9:35 AM
To: Jaspreet Dhillon
Subject: RE: Ninth Line
Attachments: lo_882.xls; lo_891.xls; lo_300.xls; lo_763.xls; lo_645.xls

Hi Jaspreet

Sorry for the delay but we have been in the middle of a move. The intersection of Eglinton and Ninth Line (645) operates fully-actuated under Local Control (see attached excel spreadsheet) under certain times of the day (0:00, 9:30, and 18:30) . Under Computer Control, please refer to the below:

7:00-9:30 Cycle Length 140 seconds

Splits

EW = 44%
SBL = 19%
NB = 37%
SB = 56 %

Offset = 55%

16:00-18:30 Cycle Length 140 seconds

Splits

EW = 44%
SBL = 13%
NB = 43%
SB = 56 %

Offset = 67%

Other information to note:

EW ped clear = 8 seconds, amber = 5 seconds, all-red = 2 seconds
SBL min green arrow = 5 seconds, amber arrow = 3 seconds
NS min green = 8 seconds, ped clear = 8 seconds, amber = 5 seconds, all-red = 2 seconds

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From: Jaspreet Dhillon [mailto:DhillonJ@mmm.ca]
Sent: 2014/02/13 12:24 PM
To: Jim Kartsomanis
Subject: RE: Ninth Line

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

DATE:	**February 5, 2014**		**Completed By:**	**AK**
Database Rev		**20**	**Checked By:**	**RC**
Timing Card / Field rev		**3**		

Location: **Derry Road @ Lisgar/Rosehurst**

Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Minimum (sec.) WALK	Pedestrian Minimum (sec.) FDWALK	Amber (sec.)	All Red (sec.)	TIME PERIOD (sec.) (Green+Amber+All Red) AM MAX	OFF MAX	PM MAX
1									
2	E/B Green - Derry	12.0	12.0	18.0	4.0	2.0	84.0	42.5	98.0
3									
4	N/B Green - Lisgar/Rosehurst	8.0	12.0	20.0	4.0	2.6	56.0	42.5	42.0
5									
6	W/B Green - Derry	12.0	12.0	18.0	4.0	2.0	84.0	42.5	98.0
7									
8	S/B Green - Lisgar/Rosehurst	8.0	12.0	20.0	4.0	2.6	56.0	42.5	42.0

System Control	YES
Local Control	NO
Semi-Actuated Mode	YES

TIME	PEAK	CYCLE LENGTH (sec.)	OFFSET (sec.)
06:00-09:30	AM	140	54.6
9:30 - 15:00	OFF	85	79.9
19:30- 15:00			
15:00 - 19:30	PM	140	113.4

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**November 29, 2012**		**Prepared Date:**	**February 7, 2014**
Database Rev	**11**		**Completed By:**	**AK**
Timing Card / Field rev	**5**		**Checked By:**	**RC**

Location: **Britannia @ Maple Gate/Churchill Meadows**

Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Minimum (sec.) WALK	Pedestrian Minimum (sec.) FDWALK	Amber (sec.)	All Red (sec.)	TIME PERIOD (sec.) (Green+Amber+All Red) AM (1) MAX	AM (2) MAX	OFF MAX	PM MAX
1	Not in Use									
2	East/West - Britannia	12.0	11.0	18.0	4.0	3.0	84.0	98.0	44.8	98.0
3	Not in Use									
4	North/South - Maple Gate/Churchill Meadows	8.0	10.0	15.0	4.2	2.0	36.0	42.0	35.2	42.0

System Control	YES
Local Control	NO
Semi-Actuated Mode	YES

TIME (M-F)	PEAK	CYCLE LENGTH (sec.)	OFFSET (sec.)
06:00-07:00	AM (1)	120	67.2
07:00-09:30	AM (2)	140	127.4
09:30-15:00	OFF	80	40.0
15:00-19:30	PM	140	1.4

INT No.: **891**

LOCATION: **Thomas @ Churchill Meadows**

SCHEDULED DATA

Mode	Cycle Length	OFF No.	Split No.	Spec Func	DUP ISEC
LO	101	2	2	2	

PHASING DATA

PHASE	MIN	MAX	WALK	DON'T WALK	AMBER	ALL-RED
2. E/W Thomas	41	N/A	30	11	4	2
4. E/W Churchill Meadows	8	45	10	14	4	2.5

* ALL VALUES IN SECONDS

14:42 USER 2/3 PRINT DAILY INT REP, INT 597, AS 1-3

DAILY INTERSECTION REPORT FOR ACT SCH 1 (MON TUE WED THU FRI)

INT	TIME	SELECTION PLANS IN USE					ALTERNATES					
		MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC	MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC
597	00:00	/	/	/	/	/	/	LO	101	2	2	2	
597	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1023
597	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1023
597	15:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1023
597	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1023

DAILY INTERSECTION REPORT FOR ACT SCH 2 (SAT)

597	00:00	/	/	/	/	/	/	LO	101	2	2	2	
597	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1023

DAILY INTERSECTION REPORT FOR ACT SCH 3 (SUN HOL)

597	00:00	/	/	/	/	/	/	LO	101	2	2	2	
597	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1023
597	23:00	/	/	/	/	/	/	LO	101	2	2	2	1023

14:35 USER 2/3 PRINT CDT 597

CYCLE DEFINITION TABLE: 597

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1							1		
2	NS		9	12	5	3	1	C	WINSTON C BLVD
3							1		
4	WB	8			4	3	1		401 NORTH TERM
5							1		
6							1		
7							1		
8							1		

VALID SPECIAL FUNCTIONS(Y/N)

1	2	3	1&2	1&3	2&3	ALL
Y	Y	Y	Y	Y	Y	Y

14:41 USER 2/3 PRINT OFFSET 1-32, INT 597

OFFSET TABLE

INTERSECTION 597 WCB @ 401 N TERMINAL

OFFSET #	OFFSET %
1	73
2	79
3	35
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

14:38 USER 2/3 PRINT SPLIT 1-32, INT 597

SPLIT TABLE

INTERSECTION 597 WCB @ 401 N TERMINAL

TABLE	(SPLIT) PHASE NUMBER								(MAX SPLIT) PHASE NUMBER							
NO.	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
		NS		WB												
1		70		30						0		0				
2		65		35						0		0				
3		62		38						0		0				
4		0		0						0		0				
5		0		0						0		0				
6		0		0						0		0				
7		0		0						0		0				
8		0		0						0		0				
9		0		0						0		0				
10		0		0						0		0				
11		0		0						0		0				
12		0		0						0		0				
13		0		0						0		0				
14		0		0						0		0				
15		0		0						0		0				
16		0		0						0		0				
17		0		0						0		0				
18		0		0						0		0				
19		0		0						0		0				
20		0		0						0		0				
21		0		0						0		0				
22		0		0						0		0				
23		0		0						0		0				
24		0		0						0		0				
25		0		0						0		0				
26		0		0						0		0				
27		0		0						0		0				
28		0		0						0		0				
29		0		0						0		0				
30		0		0						0		0				
31		0		0						0		0				
32		0		0						0		0				

14:37 USER 2/3 PRINT SPF 1-32, INT 597

SPECIAL FUNCTIONS

INTERSECTION 597 WCB @ 401 N TERMINAL

SPECIAL IN(Y)/OUT(N)

FUNCTION #	1 NA	2 PED	3 CAL	PHASE OMIT BUT SPF2 Y=ON
1	Y	N	N	
2	Y	N	N	
3	Y	N	N	
4	N	N	N	
5	N	N	N	
6	N	N	N	
7	N	N	N	
8	N	N	N	
9	N	N	N	
10	N	N	N	
11	N	N	N	
12	N	N	N	
13	N	N	N	
14	N	N	N	
15	N	N	N	
16	N	N	N	
17	N	N	N	
18	N	N	N	
19	N	N	N	
20	N	N	N	
21	Y	Y	N	
22	Y	Y	N	
23	Y	Y	N	
24	Y	Y	N	
25	N	N	N	
26	N	N	N	
27	N	N	N	
28	N	N	N	
29	N	N	N	
30	N	N	N	
31	Y	N	N	
32	N	N	N	

14:43 USER 2/3 PRINT DAILY INT REP, INT 596, AS 1-3

DAILY INTERSECTION REPORT FOR ACT SCH 1 (MON TUE WED THU FRI)

INT	TIME	SELECTION PLANS IN USE						ALTERNATES				
		MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC	MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC
596	00:00	/	/	/	/	/	/	LO	101	2	2	2	
596	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1023
596	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1023
596	15:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1023
596	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1023

DAILY INTERSECTION REPORT FOR ACT SCH 2 (SAT)

596	00:00	/	/	/	/	/	/	LO	101	2	2	2	
596	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1023

DAILY INTERSECTION REPORT FOR ACT SCH 3 (SUN HOL)

596	00:00	/	/	/	/	/	/	LO	101	2	2	2	
596	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1023
596	23:00	/	/	/	/	/	/	LO	101	2	2	2	1023

14:35 USER 2/3 PRINT CDT 596

CYCLE DEFINITION TABLE: 596

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1							1		
2	NS		8	10	4	3	1	C	WINSTON C BLVD
3							1		
4	EB	8			4	4	1		401 SOUTH TERM
5							1		
6							1		
7							1		
8							1		

VALID SPECIAL FUNCTIONS(Y/N)

1	2	3	1&2	1&3	2&3	ALL
Y	Y	Y	Y	Y	Y	Y

14:41 USER 2/3 PRINT OFFSET 1-32, INT 596

OFFSET TABLE

INTERSECTION 596 WCB @ 401 S TERMINAL

OFFSET #	OFFSET %
1	66
2	85
3	23
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

14:39 USER 2/3 PRINT SPLIT 1-32, INT 596

SPLIT TABLE

INTERSECTION 596 WCB @ 401 S TERMINAL

TABLE	(SPLIT) PHASE NUMBER								(MAX SPLIT) PHASE NUMBER							
NO.	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
		NS		EB												
1		60		40						0		0				
2		65		35						0		0				
3		72		28						0		0				
4		0		0						0		0				
5		0		0						0		0				
6		0		0						0		0				
7		0		0						0		0				
8		0		0						0		0				
9		0		0						0		0				
10		0		0						0		0				
11		0		0						0		0				
12		0		0						0		0				
13		0		0						0		0				
14		0		0						0		0				
15		0		0						0		0				
16		0		0						0		0				
17		0		0						0		0				
18		0		0						0		0				
19		0		0						0		0				
20		0		0						0		0				
21		0		0						0		0				
22		0		0						0		0				
23		0		0						0		0				
24		0		0						0		0				
25		0		0						0		0				
26		0		0						0		0				
27		0		0						0		0				
28		0		0						0		0				
29		0		0						0		0				
30		0		0						0		0				
31		0		0						0		0				
32		0		0						0		0				

14:37 USER 2/3 PRINT SPF 1-32, INT 596

SPECIAL FUNCTIONS

INTERSECTION 596 WCB @ 401 S TERMINAL

SPECIAL IN(Y)/OUT(N)

FUNCTION #	1 NA	2 PED	3 CAL	PHASE OMIT BUT SPF2 Y=ON
1	Y	N	N	
2	Y	N	N	
3	Y	N	N	
4	Y	Y	N	
5	N	N	N	
6	N	N	N	
7	N	N	N	
8	N	N	N	
9	N	N	N	
10	N	N	N	
11	N	N	N	
12	N	N	N	
13	N	N	N	
14	N	N	N	
15	N	N	N	
16	N	N	N	
17	N	N	N	
18	N	N	N	
19	N	N	N	
20	N	N	N	
21	Y	Y	N	
22	Y	Y	N	
23	Y	Y	N	
24	Y	Y	N	
25	N	N	N	
26	N	N	N	
27	N	N	N	
28	N	N	N	
29	N	N	N	
30	N	N	N	
31	Y	N	N	
32	N	N	N	

14:35 USER 2/3 PRINT CDT 512

CYCLE DEFINITION TABLE: 512

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1							1		
2	NS		8	10	5	3	1	C	WINSTON C BLVD
3							1		
4	WB	8			4	3	1		403 NORTH TERM
5							1		
6							1		
7							1		
8							1		

VALID SPECIAL FUNCTIONS(Y/N)

1	2	3	1&2	1&3	2&3	ALL
Y	Y	Y	Y	Y	Y	Y

14:43 USER 2/3 PRINT DAILY INT REP, INT 512, AS 1-3

DAILY INTERSECTION REPORT FOR ACT SCH 1 (MON TUE WED THU FRI)

INT	TIME	SELECTION PLANS IN USE					ALTERNATES					
		MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC	MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC
512	00:00	/	/	/	/	/	/	LO	101	2	2	2	
512	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1015
512	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1015
512	15:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1015
512	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1015

DAILY INTERSECTION REPORT FOR ACT SCH 2 (SAT)

512	00:00	/	/	/	/	/	/	LO	101	2	2	2	
512	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1015

DAILY INTERSECTION REPORT FOR ACT SCH 3 (SUN HOL)

512	00:00	/	/	/	/	/	/	LO	101	2	2	2	
512	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1015
512	23:00	/	/	/	/	/	/	LO	101	2	2	2	1015

14:41 USER 2/3 PRINT OFFSET 1-32, INT 512

OFFSET TABLE

INTERSECTION 512 WCB @ 403 N TERM

OFFSET #	OFFSET %
1	84
2	34
3	82
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

14:39 USER 2/3 PRINT SPLIT 1-32, INT 512

SPLIT TABLE

INTERSECTION 512 WCB @ 403 N TERM

TABLE	(SPLIT) PHASE NUMBER								(MAX SPLIT) PHASE NUMBER							
NO.	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
		NS		WB												
1		65		35						0		0				
2		60		40						0		0				
3		45		55						0		0				
4		0		0						0		0				
5		0		0						0		0				
6		0		0						0		0				
7		0		0						0		0				
8		0		0						0		0				
9		0		0						0		0				
10		0		0						0		0				
11		0		0						0		0				
12		0		0						0		0				
13		0		0						0		0				
14		0		0						0		0				
15		0		0						0		0				
16		0		0						0		0				
17		0		0						0		0				
18		0		0						0		0				
19		0		0						0		0				
20		0		0						0		0				
21		0		0						0		0				
22		0		0						0		0				
23		0		0						0		0				
24		0		0						0		0				
25		0		0						0		0				
26		0		0						0		0				
27		0		0						0		0				
28		0		0						0		0				
29		0		0						0		0				
30		0		0						0		0				
31		0		0						0		0				
32		0		0						0		0				

14:37 USER 2/3 PRINT SPF 1-32, INT 512

SPECIAL FUNCTIONS

INTERSECTION 512 WCB @ 403 N TERM

SPECIAL FUNCTION #	IN(Y)/OUT(N) 1 NA	2 NA	3 CAL	PHASE OMIT
1	Y	Y	N	
2	Y	Y	N	
3	Y	Y	N	
4	N	N	N	
5	N	N	N	
6	N	N	N	
7	N	N	N	
8	N	N	N	
9	N	N	N	
10	N	N	N	
11	N	N	N	
12	N	N	N	
13	N	N	N	
14	N	N	N	
15	N	N	N	
16	N	N	N	
17	N	N	N	
18	N	N	N	
19	N	N	N	
20	N	N	N	
21	N	N	N	
22	N	N	N	
23	N	N	N	
24	N	N	N	
25	N	N	N	
26	N	N	N	
27	N	N	N	
28	N	N	N	
29	N	N	N	
30	N	N	N	
31	Y	Y	N	
32	N	N	N	

14:36 USER 2/3 PRINT CDT 361

CYCLE DEFINITION TABLE: 361

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1							1		
2	NS		8	11	5	2	1	C	WINSTON C BLVD
3							1		
4	EB	8			4	2	1		403 SOUTH TERM
5							1		
6							1		
7							1		
8							1		

VALID SPECIAL FUNCTIONS(Y/N)

1	2	3	1&2	1&3	2&3	ALL
Y	Y	Y	Y	Y	Y	Y

14:43 USER 2/3 PRINT DAILY INT REP, INT 361, AS 1-3

DAILY INTERSECTION REPORT FOR ACT SCH 1 (MON TUE WED THU FRI)

INT	TIME	SELECTION PLANS IN USE					ALTERNATES					
		MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC	MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC
361	00:00	/	/	/	/	/	/	LO	101	2	2	2	
361	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1015
361	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1015
361	15:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1015
361	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1015

DAILY INTERSECTION REPORT FOR ACT SCH 2 (SAT)

361	00:00	/	/	/	/	/	/	LO	101	2	2	2	
361	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1015

DAILY INTERSECTION REPORT FOR ACT SCH 3 (SUN HOL)

361	00:00	/	/	/	/	/	/	LO	101	2	2	2	
361	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1015
361	23:00	/	/	/	/	/	/	LO	101	2	2	2	1015

14:42 USER 2/3 PRINT OFFSET 1-32, INT 361

OFFSET TABLE

INTERSECTION 361 W C B @ 403 SOUTH T

OFFSET #	OFFSET %
1	36
2	93
3	58
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

14:39 USER 2/3 PRINT SPLIT 1-32, INT 361

SPLIT TABLE

INTERSECTION 361 W C B @ 403 SOUTH T

TABLE	(SPLIT) PHASE NUMBER								(MAX SPLIT) PHASE NUMBER							
NO.	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
		NS		EB												
1		65		35						0		0				
2		65		35						0		0				
3		70		30						0		0				
4		0		0						0		0				
5		0		0						0		0				
6		0		0						0		0				
7		0		0						0		0				
8		0		0						0		0				
9		0		0						0		0				
10		0		0						0		0				
11		0		0						0		0				
12		0		0						0		0				
13		0		0						0		0				
14		0		0						0		0				
15		0		0						0		0				
16		0		0						0		0				
17		0		0						0		0				
18		0		0						0		0				
19		0		0						0		0				
20		0		0						0		0				
21		0		0						0		0				
22		0		0						0		0				
23		0		0						0		0				
24		0		0						0		0				
25		0		0						0		0				
26		0		0						0		0				
27		0		0						0		0				
28		0		0						0		0				
29		0		0						0		0				
30		0		0						0		0				
31		0		0						0		0				
32		0		0						0		0				

14:37 USER 2/3 PRINT SPF 1-32, INT 361

SPECIAL FUNCTIONS

INTERSECTION 361 W C B @ 403 SOUTH T

SPECIAL IN(Y)/OUT(N)

FUNCTION #	1 NA	2 PED	3 CAL
1	Y	N	N
2	Y	N	N
3	Y	N	N
4	N	N	N
5	N	N	N
6	N	N	N
7	N	N	N
8	N	N	N
9	N	N	N
10	N	N	N
11	N	N	N
12	N	N	N
13	N	N	N
14	N	N	N
15	N	N	N
16	N	N	N
17	N	N	N
18	N	N	N
19	N	N	N
20	N	N	N
21	Y	Y	N
22	Y	Y	N
23	Y	Y	N
24	Y	Y	N
25	N	N	N
26	N	N	N
27	N	N	N
28	N	N	N
29	N	N	N
30	N	N	N
31	Y	N	N
32	N	N	N

PHASE OMIT BUT SPF2 Y=ON

14:36 USER 2/3 PRINT CDT 322

CYCLE DEFINITION TABLE: 322

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1							1		
2	EW		8	10	5	2	1	C	DUNDAS ST
3							1		
4	SB	8			4	2	1		403 WEST TERM
5							1		
6							1		
7							1		
8							1		

VALID SPECIAL FUNCTIONS(Y/N)

1	2	3	1&2	1&3	2&3	ALL
Y	Y	Y	Y	Y	Y	Y

14:44 USER 2/3 PRINT DAILY INT REP, INT 322, AS 1-3

DAILY INTERSECTION REPORT FOR ACT SCH 1 (MON TUE WED THU FRI)

INT	TIME	SELECTION PLANS IN USE					ALTERNATES					
		MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC	MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC
322	00:00	/	/	/	/	/	/	LO	101	2	2	2	
322	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1022
322	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1022
322	15:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1022
322	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1022

DAILY INTERSECTION REPORT FOR ACT SCH 2 (SAT)

322	00:00	/	/	/	/	/	/	LO	101	2	2	2	
322	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1022

DAILY INTERSECTION REPORT FOR ACT SCH 3 (SUN HOL)

322	00:00	/	/	/	/	/	/	LO	101	2	2	2	
322	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1022
322	23:00	/	/	/	/	/	/	LO	101	2	2	2	

14:42 USER 2/3 PRINT OFFSET 1-32, INT 322

OFFSET TABLE

INTERSECTION 322 DUNDAS @ 403 W TERM

OFFSET #	OFFSET %
1	16
2	68
3	87
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

14:40 USER 2/3 PRINT SPLIT 1-32, INT 322

SPLIT TABLE

INTERSECTION 322 DUNDAS @ 403 W TERM

TABLE	(SPLIT) PHASE NUMBER								(MAX SPLIT) PHASE NUMBER							
NO.	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
		EW		SB												
1		72		28						0		0				
2		64		36						0		0				
3		56		44						0		0				
4		0		0						0		0				
5		0		0						0		0				
6		0		0						0		0				
7		0		0						0		0				
8		0		0						0		0				
9		0		0						0		0				
10		0		0						0		0				
11		0		0						0		0				
12		0		0						0		0				
13		0		0						0		0				
14		0		0						0		0				
15		0		0						0		0				
16		0		0						0		0				
17		0		0						0		0				
18		0		0						0		0				
19		0		0						0		0				
20		0		0						0		0				
21		0		0						0		0				
22		0		0						0		0				
23		0		0						0		0				
24		0		0						0		0				
25		0		0						0		0				
26		0		0						0		0				
27		0		0						0		0				
28		0		0						0		0				
29		0		0						0		0				
30		0		0						0		0				
31		0		0						0		0				
32		0		0						0		0				

14:38 USER 2/3 PRINT SPF 1-32, INT 322

SPECIAL FUNCTIONS

INTERSECTION 322 DUNDAS @ 403 W TERM

SPECIAL IN(Y)/OUT(N)

FUNCTION #	1 NA	2 PED	3 CAL
1	Y	N	N
2	Y	N	N
3	Y	N	N
4	Y	N	N
5	N	N	N
6	N	N	N
7	N	N	N
8	N	N	N
9	N	N	N
10	N	N	N
11	N	N	N
12	N	N	N
13	N	N	N
14	N	N	N
15	N	N	N
16	N	N	N
17	N	N	N
18	N	N	N
19	N	N	N
20	N	N	N
21	Y	Y	N
22	Y	Y	N
23	Y	Y	N
24	Y	Y	N
25	N	N	N
26	N	N	N
27	N	N	N
28	N	N	N
29	N	N	N
30	N	N	N
31	Y	N	N
32	N	N	N

PHASE OMIT BUT SPF2 Y=ON

14:36 USER 2/3 PRINT CDT 320

CYCLE DEFINITION TABLE: 320

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1							1		
2	EW		8	9	5	2	1	C	DUNDAS ST
3							1		
4	NS	8			4	2	1		403 EAST TERM
5							1		
6							1		
7							1		
8							1		

VALID SPECIAL FUNCTIONS(Y/N)

1	2	3	1&2	1&3	2&3	ALL
Y	Y	Y	Y	Y	Y	Y

14:43 USER 2/3 PRINT DAILY INT REP, INT 320, AS 1-3

DAILY INTERSECTION REPORT FOR ACT SCH 1 (MON TUE WED THU FRI)

INT	TIME	SELECTION PLANS IN USE						ALTERNATES				
		MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC	MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC
320	00:00	/	/	/	/	/	/	LO	101	2	2	2	
320	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1022
320	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1022
320	15:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1022
320	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1022

DAILY INTERSECTION REPORT FOR ACT SCH 2 (SAT)

320	00:00	/	/	/	/	/	/	LO	101	2	2	2	
320	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1022

DAILY INTERSECTION REPORT FOR ACT SCH 3 (SUN HOL)

320	00:00	/	/	/	/	/	/	LO	101	2	2	2	
320	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1022
320	23:00	/	/	/	/	/	/	LO	101	2	2	2	1022

14:42 USER 2/3 PRINT OFFSET 1-32, INT 320

OFFSET TABLE

INTERSECTION 320 DUNDAS @ 403 E TERM

OFFSET #	OFFSET %
1	36
2	6
3	31
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

14:40 USER 2/3 PRINT SPLIT 1-32, INT 320

SPLIT TABLE

INTERSECTION 320 DUNDAS @ 403 E TERM

TABLE	(SPLIT) PHASE NUMBER								(MAX SPLIT) PHASE NUMBER							
NO.	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
		EW		NS												
1		72		28						0		0				
2		70		30						0		0				
3		67		33						0		0				
4		50		50						0		0				
5		0		0						0		0				
6		0		0						0		0				
7		0		0						0		0				
8		0		0						0		0				
9		0		0						0		0				
10		0		0						0		0				
11		0		0						0		0				
12		0		0						0		0				
13		0		0						0		0				
14		0		0						0		0				
15		0		0						0		0				
16		0		0						0		0				
17		0		0						0		0				
18		0		0						0		0				
19		0		0						0		0				
20		0		0						0		0				
21		0		0						0		0				
22		0		0						0		0				
23		0		0						0		0				
24		0		0						0		0				
25		0		0						0		0				
26		0		0						0		0				
27		0		0						0		0				
28		0		0						0		0				
29		0		0						0		0				
30		0		0						0		0				
31		0		0						0		0				
32		0		0						0		0				

14:38 USER 2/3 PRINT SPF 1-32, INT 320

SPECIAL FUNCTIONS

INTERSECTION 320 DUNDAS @ 403 E TERM

SPECIAL IN(Y)/OUT(N)

FUNCTION #	1 NA	2 PED	3 CAL
1	Y	N	N
2	Y	N	N
3	Y	N	N
4	N	N	N
5	N	N	N
6	N	N	N
7	N	N	N
8	N	N	N
9	N	N	N
10	N	N	N
11	N	N	N
12	N	N	N
13	N	N	N
14	N	N	N
15	N	N	N
16	N	N	N
17	N	N	N
18	N	N	N
19	N	N	N
20	N	N	N
21	N	N	N
22	N	N	N
23	N	N	N
24	N	N	N
25	N	N	N
26	N	N	N
27	N	N	N
28	N	N	N
29	N	N	N
30	N	N	N
31	Y	N	N
32	N	N	N

PHASE OMIT BUT SPF2 Y=ON

CITY OF MISSISSAUGA
DATABASE FORM

INTERSECTION NAME: Eglinton Ave West at Churchill Meadows Blvd

NUMBER: 98 (5719)

CONTROLLER TYPE: 8 ph. Semi Actuated CARD/LAMP: ____/____

CYCLE DEFINITION TABLE INFORMATION					CDT NO.			PED MIN.			
DATA BASE PHASE		VEH. MIN. (SEC.)	PED WALK (SEC.)	PED CLEAR (SEC.)	AMBER (SEC.)	ALL RED (SEC.)	FEATURES	PH.2 MIN. (SEC)	PH.4 MIN. (SEC)	CYCLE LENGTH 120 (%)	CYCLE LENGTH 140 (%)
	1										
EB	2		8	10	4	2.0	C	25			18
	3										
NB	4		8	11	4	2.5			29		21
	5										
WB	6		8	10	4	2	C				
	7										
SB	8		8	11	4	2.5					

SPLIT TABLE PERCENT PHASE										
X	1	2	3	4	5	6	7	8	MAX	MAX
		EB		NB		WBL		SB		
1		67		33		67		33		
2										
3		78		22		78		22		
SPLIT TABLE SECONDS PHASE										
1		93.8		46.2		93.8		46.2		
2										
3		109.2		30.8		109.2		30.8		

OFFSET %	
1	64
2	
3	84
OFFSET (s)	
1	89.6
2	
3	117.6

ACTIVITY SCHEDULE INFORMATION								
ACTIVITY SCH. NO.	DAY OF WEEK	TIME PERIOD	MODE OF OPERATION	CYCLE LENGTH	OFFSET NUMBER	SPLIT NUMBER	SPEC. FUNC NUMBER	DUP. INT.
1	MON-FRI	0:00	LO	101	2	2	2	
		7:00	CC	140	1	1	1	
		9:30	LO	101	2	2	2	
		16:00	CC	140	3	3	3	
		19:30	LO	101	2	2	2	
2	SAT	0:00	LO	101	2	2	2	
3	SUN HOL	0:00	LO	101	2	2	2	

SPECIAL FUNCTION ASSIGNMENT			
SF	1	2	3
	PHASE OMIT		
	NA	NA	CAL
1	Y	Y	N
2	Y	Y	N
3	Y	Y	N
5			
6			
7			

COMMENTS: Arterial Review - Eglinton Ave W from Ninth Line

NOTE: SB/SBLT LOOP TIED TO L3P 'LOCAL C' DUE TO CROSSTALK

ISSUES WITH SB & SBRT LOOP. (T-INTERSECTION)

Edited PM Offset by Fadwa Behnam 2015/06/16 2:11 PM

INT No.: **89**

LOCATION: **Ninth Line @ Doug Leavans**

SCHEDULED DATA

Mode	Cycle Length	OFF No.	Split No.	Spec Func	DUP ISEC
LO	101	2	2	2	

PHASING DATA

PHASE	MIN	MAX	WALK	DON'T WALK	AMBER	ALL-RED
2. N/S Ninth Line	45	N/A	35	10	5	2
4. WB Doug Leavans	8	20	8	8	4	2.5

* ALL VALUES IN SECONDS

APPENDIX B

Level of Service Definitions

LEVEL OF SERVICE DEFINITIONS AT SIGNALIZED INTERSECTIONS[1]

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically for a 15-min analysis period. The criteria are given in the table below. Delay may be measured in the field or estimated using software such as Highway Capacity Software. Delay is a complex measure and is dependent upon a number of variables, including quality of progression, the cycle length, the green ratio, and the *v/c* ratio for the lane group in question.

Level of Service	Features	Control Delay per vehicle (sec)
A	LOS A describes operations with very low delay, up to 5 sec per vehicle. This level of service occurs when progression is extremely favourable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10 and ≤ 20
C	LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.	> 20 and ≤ 35
D	LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, of high *v/c* ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35 and ≤ 55
E	LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent occurrences.	> 55 and ≤ 80
F	LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	> 80

(1) Highway Capacity Manual 2000

LEVEL OF SERVICE DEFINITIONS AT UNSIGNALIZED INTERSECTIONS[1]

The level of service criteria for unsignalized intersections are given in the table below. As used here, total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position. The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation.

Level of Service	Features	Average Total Delay (sec/veh)
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.	≤ 10
B	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.	> 10 and ≤ 15
C	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.	> 15 and ≤ 25
D	Long traffic delays occur. Motorists emerging from the minor street experience significant restriction and frustration. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.	> 25 and ≤ 35
E	Very long traffic delays occur. Operations approach the capacity of the intersection.	> 35 and ≤ 50
F	Saturation occurs, with vehicle demand exceeding the available capacity. Very long traffic delays occur.	> 50

(1) Highway Capacity Manual 2000.

APPENDIX C

Intersection Capacity Analysis – Existing Conditions

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	398	2	2	382
Future Volume (vph)	1	0	398	2	2	382
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			
Flt Protected	0.950					
Satd. Flow (prot)	1825	1921	1900	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1921	1900	0	0	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.2		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	3%
Adj. Flow (vph)	1	0	433	2	2	415
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	435	0	0	417
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	398	2	2	382
Future Volume (Veh/h)	1	0	398	2	2	382
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	433	2	2	415
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	853	434			435	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	853	434			435	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	332	626			1135	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	435	417
Volume Left	1	0	2
Volume Right	0	2	0
cSH	249	1700	1135
Volume to Capacity	0.00	0.26	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	19.5	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	19.5	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
2: Ninth Line & Terragar Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	138	40	416	58	23	434
Future Volume (vph)	138	40	416	58	23	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		15.0	40.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1755	1585	1865	1498	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1755	1585	1865	1498	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	287.6		434.9			780.0
Travel Time (s)	20.7		22.4			40.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	3%	9%	0%	2%
Adj. Flow (vph)	150	43	452	63	25	472
Shared Lane Traffic (%)						
Lane Group Flow (vph)	150	43	452	63	25	472
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
2: Ninth Line & Terragar Boulevard

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	138	40	416	58	23	434
Future Volume (Veh/h)	138	40	416	58	23	434
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	150	43	452	63	25	472
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	974	452			515	
vC1, stage 1 conf vol	452					
vC2, stage 2 conf vol	522					
vCu, unblocked vol	974	452			515	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	93			98	
cM capacity (veh/h)	481	605			1061	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	193	452	63	25	472
Volume Left	150	0	0	25	0
Volume Right	43	0	63	0	0
cSH	619	1700	1700	1061	1700
Volume to Capacity	0.31	0.27	0.04	0.02	0.28
Queue Length 95th (m)	10.1	0.0	0.0	0.5	0.0
Control Delay (s)	14.9	0.0	0.0	8.5	0.0
Lane LOS	B			A	
Approach Delay (s)	14.9	0.0		0.4	
Approach LOS	B				

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: Ninth Line & Hazelridge Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	18	469	63	11	533
Future Volume (vph)	46	18	469	63	11	533
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	50.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.984			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1837	0	1674	1865
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1837	0	1674	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	310.4		412.4			434.9
Travel Time (s)	22.3		21.2			22.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	2%	9%	3%
Adj. Flow (vph)	50	20	510	68	12	579
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	20	578	0	12	579
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Hazelridge Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	18	469	63	11	533
Future Volume (Veh/h)	46	18	469	63	11	533
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	20	510	68	12	579
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1147	544			578	
vC1, stage 1 conf vol	544					
vC2, stage 2 conf vol	603					
vCu, unblocked vol	1147	544			578	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.3	
p0 queue free %	89	96			99	
cM capacity (veh/h)	438	543			962	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	70	578	12	579
Volume Left	50	0	12	0
Volume Right	20	68	0	0
cSH	613	1700	962	1700
Volume to Capacity	0.11	0.34	0.01	0.34
Queue Length 95th (m)	2.9	0.0	0.3	0.0
Control Delay (s)	13.6	0.0	8.8	0.0
Lane LOS	B		A	
Approach Delay (s)	13.6	0.0	0.2	
Approach LOS	B			

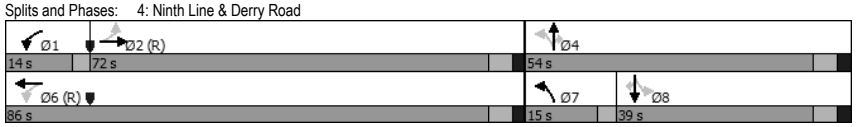
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	1331	120	142	529	30	207	273	241	33	366	171
Future Volume (vph)	177	1331	120	142	529	30	207	273	241	33	366	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1733	3568	0	1716	3489	0	1785	1902	1566	1638	1902	1597
Flt Permitted	0.442			0.061			0.143			0.591		
Satd. Flow (perm)	806	3568	0	110	3489	0	269	1902	1566	1019	1902	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			7				177			141
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	4%	4%	0%	0%	1%	2%	9%	1%	0%
Adj. Flow (vph)	177	1331	120	142	529	30	207	273	241	33	366	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	177	1451	0	142	559	0	207	273	241	33	366	171
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		1	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.1	30.1		8.0	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	72.0	72.0		14.0	86.0		15.0	54.0	54.0	39.0	39.0	39.0
Total Split (%)	51.4%	51.4%		10.0%	61.4%		10.7%	38.6%	38.6%	27.9%	27.9%	27.9%
Maximum Green (s)	65.9	65.9		11.0	79.9		12.0	47.6	47.6	32.6	32.6	32.6
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.1	2.1		0.0	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.1	5.1		2.0	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)	9.0	9.0			9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)	15.0	15.0			15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0			0			0	0	0	0	0
Act Effct Green (s)	70.3	70.3		86.5	83.4		49.5	46.1	46.1	31.1	31.1	31.1
Actuated g/C Ratio	0.50	0.50		0.62	0.60		0.35	0.33	0.33	0.22	0.22	0.22
v/c Ratio	0.44	0.81		0.73	0.27		0.88	0.44	0.38	0.15	0.87	0.37
Control Delay	24.8	31.5		53.2	11.6		68.8	38.8	11.5	44.2	73.0	12.8
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	31.7		53.2	11.6		68.8	38.8	11.5	44.2	73.0	12.8
LOS	C	C		D	B		E	D	B	D	E	B
Approach Delay		30.9			20.0			38.3			53.3	
Approach LOS		C			C			D			D	

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 36.4 (26%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.88		
Intersection Signal Delay: 33.8		Intersection LOS: C
Intersection Capacity Utilization 94.6%		ICU Level of Service F
Analysis Period (min) 15		

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	177	1451	142	559	207	273	241	33	366	171
v/c Ratio	0.44	0.81	0.73	0.27	0.88	0.44	0.38	0.15	0.87	0.37
Control Delay	24.8	31.5	53.2	11.6	68.8	38.8	11.5	44.2	73.0	12.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	31.7	53.2	11.6	68.8	38.8	11.5	44.2	73.0	12.8
Queue Length 50th (m)	33.5	184.4	25.3	32.2	40.5	57.5	12.0	7.2	96.1	6.5
Queue Length 95th (m)	56.6	216.7	#47.3	37.0	#78.1	82.9	32.9	16.7	#140.6	25.8
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	405	1796	205	2082	235	660	659	244	456	490
Starvation Cap Reductn	0	31	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.82	0.69	0.27	0.88	0.41	0.37	0.14	0.80	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	704	85	58	624
Future Volume (vph)	90	47	704	85	58	624
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	1883	1601	1825	1865
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1807	1633	1883	1601	1825	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	765	92	63	678
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	765	92	63	678
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 55.9% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	90	47	704	85	58	624
Future Volume (Veh/h)	90	47	704	85	58	624
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	51	765	92	63	678
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1569	767			857	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1569	767			857	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	13	87			92	
cM capacity (veh/h)	113	405			792	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	149	765	92	63	678
Volume Left	98	0	0	63	0
Volume Right	51	0	92	0	0
cSH	161	1700	1700	792	1700
Volume to Capacity	0.93	0.45	0.05	0.08	0.40
Queue Length 95th (m)	51.5	0.0	0.0	2.0	0.0
Control Delay (s)	109.1	0.0	0.0	9.9	0.0
Lane LOS	F			A	
Approach Delay (s)	109.1	0.0		0.8	
Approach LOS	F				

Intersection Summary			
Average Delay	9.7		
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Ninth Line & Doug Leavens Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	125	172	567	93	75	536
Future Volume (vph)	125	172	567	93	75	536
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	27.0		60.0	115.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1772	1601	1865	1555	1825	1883
Flt Permitted	0.950				0.390	
Satd. Flow (perm)	1772	1564	1865	1555	749	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		187		101		
Link Speed (k/h)	50		70			70
Link Distance (m)	255.0		850.0			603.1
Travel Time (s)	18.4		43.7			31.0
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	3%	5%	0%	2%
Adj. Flow (vph)	136	187	616	101	82	583
Shared Lane Traffic (%)						
Lane Group Flow (vph)	136	187	616	101	82	583
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
6: Ninth Line & Doug Leavens Boulevard

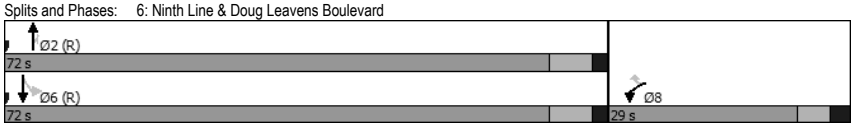
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	45.0	45.0
Minimum Split (s)	23.0	23.0	52.0	52.0	52.0	52.0
Total Split (s)	29.0	29.0	72.0	72.0	72.0	72.0
Total Split (%)	28.7%	28.7%	71.3%	71.3%	71.3%	71.3%
Maximum Green (s)	22.5	22.5	65.0	65.0	65.0	65.0
Yellow Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0	35.0	35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	14.0	14.0	75.5	75.5	75.5	75.5
Actuated g/C Ratio	0.14	0.14	0.75	0.75	0.75	0.75
v/c Ratio	0.55	0.49	0.44	0.09	0.15	0.41
Control Delay	48.5	10.3	14.3	4.9	5.0	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	10.3	14.3	4.9	5.0	6.2
LOS	D	B	B	A	A	A
Approach Delay	26.4		13.0			6.1
Approach LOS	C		B			A

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 12.8 Intersection LOS: B
Intersection Capacity Utilization 85.0% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 6: Ninth Line & Doug Leavens Boulevard



Queues
6: Ninth Line & Doug Leavens Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	136	187	616	101	82	583
v/c Ratio	0.55	0.49	0.44	0.09	0.15	0.41
Control Delay	48.5	10.3	14.3	4.9	5.0	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	10.3	14.3	4.9	5.0	6.2
Queue Length 50th (m)	25.2	0.0	87.5	5.5	3.8	34.9
Queue Length 95th (m)	41.5	17.5	133.2	m11.6	10.0	62.9
Internal Link Dist (m)	231.0		826.0			579.1
Turn Bay Length (m)		27.0		60.0	115.0	
Base Capacity (vph)	412	507	1393	1187	559	1406
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.37	0.44	0.09	0.15	0.41

Intersection Summary

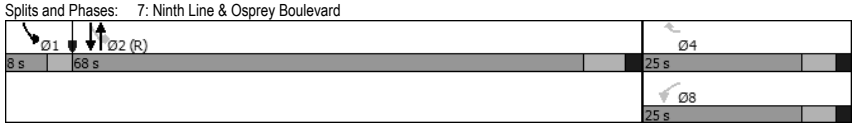
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	199	88	684	148	55	755
Future Volume (vph)	199	88	684	148	55	755
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	13.0	0.0		25.0	270.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	13.0				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1706	1601	1847	1526	1789	1865
Flt Permitted	0.950				0.270	
Satd. Flow (perm)	1706	1564	1847	1526	509	1865
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		96		86		
Link Speed (k/h)	50		70			70
Link Distance (m)	160.0		383.2			301.0
Travel Time (s)	11.5		19.7			15.5
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	4%	7%	2%	3%
Adj. Flow (vph)	216	96	743	161	60	821
Shared Lane Traffic (%)						
Lane Group Flow (vph)	216	96	743	161	60	821
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4		2	2	
Detector Phase	8	4	2	2	1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	5.0	45.0
Minimum Split (s)	25.0	23.0	52.0	52.0	8.0	52.0
Total Split (s)	25.0	25.0	68.0	68.0	8.0	68.0
Total Split (%)	24.8%	24.8%	67.3%	67.3%	7.9%	67.3%
Maximum Green (s)	19.0	19.0	61.0	61.0	5.0	61.0
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	6.0	6.0	2.0	6.0
Lead/Lag			Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	8.0	8.0	37.0	37.0		37.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0		8.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	17.5	17.5	65.7	65.7	74.9	65.7
Actuated g/C Ratio	0.17	0.17	0.65	0.65	0.74	0.65
v/c Ratio	0.73	0.27	0.62	0.16	0.13	0.68
Control Delay	54.0	9.4	14.3	4.4	4.5	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	9.4	14.3	4.4	4.5	15.6
LOS	D	A	B	A	A	B
Approach Delay	40.3		12.5			14.9
Approach LOS	D		B			B

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 65.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Ninth Line & Osprey Boulevard



Queues
7: Ninth Line & Osprey Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	216	96	743	161	60	821
v/c Ratio	0.73	0.27	0.62	0.16	0.13	0.68
Control Delay	54.0	9.4	14.3	4.4	4.5	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	9.4	14.3	4.4	4.5	15.6
Queue Length 50th (m)	39.8	0.0	86.7	5.5	2.3	79.1
Queue Length 95th (m)	63.3	12.8	125.0	13.4	7.2	142.3
Internal Link Dist (m)	136.0		359.2			277.0
Turn Bay Length (m)	13.0			25.0	270.0	
Base Capacity (vph)	337	386	1200	1021	459	1212
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.25	0.62	0.16	0.13	0.68

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Parkgate Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	91	606	6	27	749
Future Volume (vph)	18	91	606	6	27	749
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0	0.0		0.0	35.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				60.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1900	0	1825	1902
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1900	0	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	207.4		254.7			383.2
Travel Time (s)	14.9		13.1			19.7
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	20	99	659	7	29	814
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	99	666	0	29	814
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.7% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Parkgate Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	91	606	6	27	749
Future Volume (Veh/h)	18	91	606	6	27	749
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	99	659	7	29	814
Pedestrians						1
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			255			383
pX, platoon unblocked	0.84	0.71			0.71	
vC, conflicting volume	1534	664			666	
vC1, stage 1 conf vol	662					
vC2, stage 2 conf vol	872					
vCu, unblocked vol	765	323			327	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	81			97	
cM capacity (veh/h)	359	513			884	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	20	99	666	29	814
Volume Left	20	0	0	29	0
Volume Right	0	99	7	0	0
cSH	359	513	1700	884	1700
Volume to Capacity	0.06	0.19	0.39	0.03	0.48
Queue Length 95th (m)	1.3	5.4	0.0	0.8	0.0
Control Delay (s)	15.6	13.7	0.0	9.2	0.0
Lane LOS	C	B		A	
Approach Delay (s)	14.0		0.0	0.3	
Approach LOS	B				

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		49.7%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	988	156	62	427	56	203	548	116	60	723	113
Future Volume (vph)	84	988	156	62	427	56	203	548	116	60	723	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.980				0.850		0.974			0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	3537	0	1767	3579	1372	1785	1831	0	1653	1846	0
Flt Permitted	0.443			0.083			0.063			0.202		
Satd. Flow (perm)	824	3537	0	154	3579	1372	118	1831	0	351	1846	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				75		10			7	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	2%	1%	2%	19%	0%	2%	3%	8%	2%	2%
Adj. Flow (vph)	84	988	156	62	427	56	203	548	116	60	723	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	84	1144	0	62	427	56	203	664	0	60	836	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

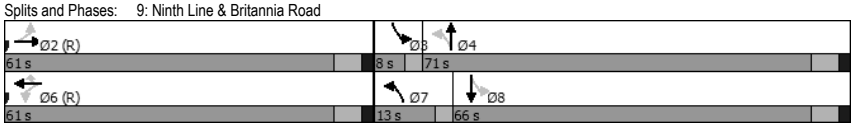
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2			6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0	12.0	5.0	12.0		5.0	12.0	
Minimum Split (s)	24.6	24.6		24.6	24.6	24.6	8.0	36.6		8.0	36.6	
Total Split (s)	61.0	61.0		61.0	61.0	61.0	13.0	71.0		8.0	66.0	
Total Split (%)	43.6%	43.6%		43.6%	43.6%	43.6%	9.3%	50.7%		5.7%	47.1%	
Maximum Green (s)	54.4	54.4		54.4	54.4	54.4	10.0	64.4		5.0	59.4	
Yellow Time (s)	4.6	4.6		4.6	4.6	4.6	3.0	4.6		3.0	4.6	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-2.0	-1.0	-1.0	-2.0	-1.0		-1.0	-3.0	
Total Lost Time (s)	5.6	5.6		4.6	5.6	5.6	1.0	5.6		2.0	3.6	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		12.0			12.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0		18.0			18.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)	55.4	55.4		56.4	55.4	55.4	78.0	67.0		70.0	62.4	
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40	0.56	0.48		0.50	0.45	
v/c Ratio	0.26	0.81		1.00	0.30	0.10	0.98	0.75		0.26	1.01	
Control Delay	23.5	35.5		156.0	25.8	1.9	92.3	36.5		17.8	72.5	
Queue Delay	0.0	0.3		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	23.5	35.8		156.0	25.8	1.9	92.3	36.5		17.8	72.5	
LOS	C	D		F	C	A	F	D		B	E	
Approach Delay		35.0			38.1			49.6			68.8	
Approach LOS		C			D			D			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 47.6 — Intersection LOS: D
Intersection Capacity Utilization 113.6% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	84	1144	62	427	56	203	664	60	836
v/c Ratio	0.26	0.81	1.00	0.30	0.10	0.98	0.75	0.26	1.01
Control Delay	23.5	35.5	156.0	25.8	1.9	92.3	36.5	17.8	72.5
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	35.8	156.0	25.8	1.9	92.3	36.5	17.8	72.5
Queue Length 50th (m)	12.6	156.1	~17.6	40.0	0.0	40.4	148.5	7.5	~234.1
Queue Length 95th (m)	m20.5	182.3	#49.5	36.8	2.4	#90.9	199.1	14.6	#319.2
Internal Link Dist (m)		192.7		445.7			182.5		230.7
Turn Bay Length (m)	63.0		32.0		58.0	52.0		50.0	
Base Capacity (vph)	326	1408	62	1416	588	208	881	231	826
Starvation Cap Reductn	0	34	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.83	1.00	0.30	0.10	0.98	0.75	0.26	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
10: Ninth Line & Freeman Terrace

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	28	785	8	2	912
Future Volume (vph)	21	28	785	8	2	912
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1738	1633	1879	0	1217	1865
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1738	1633	1879	0	1217	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	491.2		170.0			206.5
Travel Time (s)	35.4		8.7			10.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	0%	2%	13%	50%	3%
Adj. Flow (vph)	23	30	853	9	2	991
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	30	862	0	2	991
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.0%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Freeman Terrace

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	21	28	785	8	2	912
Future Volume (Veh/h)	21	28	785	8	2	912
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	30	853	9	2	991
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						206
pX, platoon unblocked	0.56					
vC, conflicting volume	1852	858			862	
vC1, stage 1 conf vol	858					
vC2, stage 2 conf vol	995					
vCu, unblocked vol	2128	858			862	
tC, single (s)	6.4	6.2			4.6	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.7	
p0 queue free %	90	92			100	
cM capacity (veh/h)	234	360			610	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	53	862	2	991
Volume Left	23	0	2	0
Volume Right	30	9	0	0
cSH	540	1700	610	1700
Volume to Capacity	0.10	0.51	0.00	0.58
Queue Length 95th (m)	2.5	0.0	0.1	0.0
Control Delay (s)	18.6	0.0	10.9	0.0
Lane LOS	C		B	
Approach Delay (s)	18.6	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
11: Ninth Line & McDowell Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	24	32	744	31	26	922
Future Volume (vph)	24	32	744	31	26	922
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		30.0	20.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1585	1883	1445	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1585	1883	1445	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	511.9		217.0			170.0
Travel Time (s)	36.9		11.2			8.7
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	2%	13%	0%	2%
Adj. Flow (vph)	26	35	809	34	28	1002
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	35	809	34	28	1002
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.9%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & McDowell Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	24	32	744	31	26	922
Future Volume (Veh/h)	24	32	744	31	26	922
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	35	809	34	28	1002
Pedestrians						1
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						376
pX, platoon unblocked	0.57					
vC, conflicting volume	1867	810			843	
vC1, stage 1 conf vol	809					
vC2, stage 2 conf vol	1058					
vCu, unblocked vol	2138	810			843	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	91			97	
cM capacity (veh/h)	220	378			802	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	61	809	34	28	1002
Volume Left	26	0	0	28	0
Volume Right	35	0	34	0	0
cSH	516	1700	1700	802	1700
Volume to Capacity	0.12	0.48	0.02	0.03	0.59
Queue Length 95th (m)	3.0	0.0	0.0	0.8	0.0
Control Delay (s)	18.9	0.0	0.0	9.7	0.0
Lane LOS	C			A	
Approach Delay (s)	18.9	0.0		0.3	
Approach LOS	C				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	11	833	8	4	903
Future Volume (vph)	19	11	833	8	4	903
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	30.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.951			0.850		
Flt Protected	0.969				0.950	
Satd. Flow (prot)	1714	0	1865	1633	1825	1883
Flt Permitted	0.969				0.950	
Satd. Flow (perm)	1714	0	1865	1633	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	0%	0%	2%
Adj. Flow (vph)	21	12	905	9	4	982
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	905	9	4	982
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.5%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	11	833	8	4	903
Future Volume (Veh/h)	19	11	833	8	4	903
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	12	905	9	4	982
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1895	905			914	
vC1, stage 1 conf vol	905					
vC2, stage 2 conf vol	990					
vCu, unblocked vol	1895	905			914	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.4			2.2	
p0 queue free %	92	96			99	
cM capacity (veh/h)	271	325			754	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	33	905	9	4	982
Volume Left	21	0	0	4	0
Volume Right	12	0	9	0	0
cSH	289	1700	1700	754	1700
Volume to Capacity	0.11	0.53	0.01	0.01	0.58
Queue Length 95th (m)	2.9	0.0	0.0	0.1	0.0
Control Delay (s)	19.1	0.0	0.0	9.8	0.0
Lane LOS	C			A	
Approach Delay (s)	19.1	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	11	746	6	3	940
Future Volume (vph)	6	11	746	6	3	940
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1498	1859	0	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1498	1859	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	33%	0%	2%
Adj. Flow (vph)	7	12	811	7	3	1022
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	12	818	0	3	1022
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 59.5%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	11	746	6	3	940
Future Volume (Veh/h)	6	11	746	6	3	940
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	12	811	7	3	1022
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.73	0.73			0.73	
vC, conflicting volume	1842	814			818	
vC1, stage 1 conf vol	814					
vC2, stage 2 conf vol	1028					
vCu, unblocked vol	1971	557			562	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.4			2.2	
p0 queue free %	97	97			100	
cM capacity (veh/h)	262	376			741	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	19	818	3	1022
Volume Left	7	0	3	0
Volume Right	12	7	0	0
cSH	595	1700	741	1700
Volume to Capacity	0.03	0.48	0.00	0.60
Queue Length 95th (m)	0.8	0.0	0.1	0.0
Control Delay (s)	16.4	0.0	9.9	0.0
Lane LOS	C		A	
Approach Delay (s)	16.4	0.0	0.0	
Approach LOS	C			

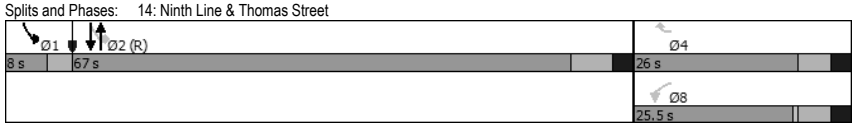
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	204	95	690	179	80	855
Future Volume (vph)	204	95	690	179	80	855
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	28.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				45.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1526	1865	1585	1690	1883
Flt Permitted	0.950				0.261	
Satd. Flow (perm)	1789	1492	1865	1585	464	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		103		130		
Link Speed (k/h)	50		70			70
Link Distance (m)	534.8		346.0			306.2
Travel Time (s)	38.5		17.8			15.7
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Adj. Flow (vph)	222	103	750	195	87	929
Shared Lane Traffic (%)						
Lane Group Flow (vph)	222	103	750	195	87	929
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4		2	2	
Detector Phase	8	4	2	2	1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	5.0	45.0
Minimum Split (s)	25.5	25.5	52.5	52.5	8.0	52.5
Total Split (s)	25.5	26.0	67.0	67.0	8.0	67.0
Total Split (%)	25.2%	25.7%	66.3%	66.3%	7.9%	66.3%
Maximum Green (s)	19.0	19.5	59.5	59.5	5.0	59.5
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.5	6.5	2.0	6.5
Lead/Lag			Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	8.0	8.0	33.0	33.0		33.0
Flash Dont Walk (s)	11.0	11.0	12.0	12.0		12.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	17.6	17.6	64.3	64.3	74.3	64.3
Actuated g/C Ratio	0.17	0.17	0.64	0.64	0.74	0.64
v/c Ratio	0.71	0.30	0.63	0.18	0.21	0.77
Control Delay	53.4	11.6	21.6	6.8	5.0	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	11.6	21.6	6.8	5.0	20.3
LOS	D	B	C	A	A	C
Approach Delay	40.2		18.6			19.0
Approach LOS	D		B			B

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 21.8	Intersection LOS: C
Intersection Capacity Utilization 66.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 14: Ninth Line & Thomas Street



Queues
14: Ninth Line & Thomas Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	222	103	750	195	87	929
v/c Ratio	0.71	0.30	0.63	0.18	0.21	0.77
Control Delay	53.4	11.6	21.6	6.8	5.0	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	11.6	21.6	6.8	5.0	20.3
Queue Length 50th (m)	43.8	1.2	136.8	12.7	3.9	133.7
Queue Length 95th (m)	66.3	15.5	176.2	24.7	8.3	195.1
Internal Link Dist (m)	510.8		322.0			282.2
Turn Bay Length (m)				35.0	28.0	
Base Capacity (vph)	363	384	1188	1056	423	1199
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.27	0.63	0.18	0.21	0.77

Intersection Summary

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	46	732	7	17	1035
Future Volume (vph)	18	46	732	7	17	1035
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1601	1865	1633	1722	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1601	1865	1633	1722	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	3%	0%	6%	2%
Adj. Flow (vph)	20	50	796	8	18	1125
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	50	796	8	18	1125
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 64.5% ICU Level of Service C
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	46	732	7	17	1035
Future Volume (Veh/h)	18	46	732	7	17	1035
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	50	796	8	18	1125
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.46					
vC, conflicting volume	1957	796			804	
vC1, stage 1 conf vol	796					
vC2, stage 2 conf vol	1161					
vCu, unblocked vol	2498	796			804	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.3	
p0 queue free %	89	87			98	
cM capacity (veh/h)	180	387			803	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	70	796	8	18	1125
Volume Left	20	0	0	18	0
Volume Right	50	0	8	0	0
cSH	542	1700	1700	803	1700
Volume to Capacity	0.13	0.47	0.00	0.02	0.66
Queue Length 95th (m)	3.4	0.0	0.0	0.5	0.0
Control Delay (s)	19.0	0.0	0.0	9.6	0.0
Lane LOS	C			A	
Approach Delay (s)	19.0	0.0		0.2	
Approach LOS	C				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	36	72	701	45	36	1042
Future Volume (vph)	36	72	701	45	36	1042
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1617	1865	1498	1722	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1617	1865	1498	1722	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Adj. Flow (vph)	39	78	762	49	39	1133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	78	762	49	39	1133
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 64.8%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	36	72	701	45	36	1042
Future Volume (Veh/h)	36	72	701	45	36	1042
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	78	762	49	39	1133
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1973	762			811	
vC1, stage 1 conf vol	762					
vC2, stage 2 conf vol	1211					
vCu, unblocked vol	1973	762			811	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.3	
p0 queue free %	83	81			95	
cM capacity (veh/h)	235	406			798	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	117	762	49	39	1133
Volume Left	39	0	0	39	0
Volume Right	78	0	49	0	0
cSH	610	1700	1700	798	1700
Volume to Capacity	0.19	0.45	0.03	0.05	0.67
Queue Length 95th (m)	5.4	0.0	0.0	1.2	0.0
Control Delay (s)	18.4	0.0	0.0	9.7	0.0
Lane LOS	C			A	
Approach Delay (s)	18.4	0.0		0.3	
Approach LOS	C				

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Janice Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	18	720	1	8	1074
Future Volume (vph)	9	18	720	1	8	1074
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	70.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.910					
Flt Protected	0.984				0.950	
Satd. Flow (prot)	1720	0	1865	0	1825	1883
Flt Permitted	0.984				0.950	
Satd. Flow (perm)	1720	0	1865	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	113.3		424.8			250.0
Travel Time (s)	8.2		21.8			12.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	0%	2%
Adj. Flow (vph)	10	20	783	1	9	1167
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	0	784	0	9	1167
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.5%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Janice Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	18	720	1	8	1074
Future Volume (Veh/h)	9	18	720	1	8	1074
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	20	783	1	9	1167
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1968	784			784	
vC1, stage 1 conf vol	784					
vC2, stage 2 conf vol	1185					
vCu, unblocked vol	1968	784			784	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	95			99	
cM capacity (veh/h)	246	397			843	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	30	784	9	1167
Volume Left	10	0	9	0
Volume Right	20	1	0	0
cSH	329	1700	843	1700
Volume to Capacity	0.09	0.46	0.01	0.69
Queue Length 95th (m)	2.3	0.0	0.2	0.0
Control Delay (s)	17.0	0.0	9.3	0.0
Lane LOS	C		A	
Approach Delay (s)	17.0	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		66.5%	ICU Level of Service C
Analysis Period (min)		15	

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	74	56	630	45	37	1052
Future Volume (vph)	74	56	630	45	37	1052
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1706	1570	1833	0	1772	1883
Flt Permitted	0.950				0.316	
Satd. Flow (perm)	1706	1570	1833	0	589	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		61	7			
Link Speed (k/h)	50		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	35.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	4%	3%	16%	3%	2%
Adj. Flow (vph)	80	61	685	49	40	1143
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	61	734	0	40	1143
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

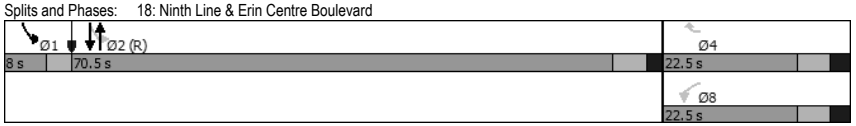
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	22.5	22.5	70.5		8.0	70.5
Total Split (%)	22.3%	22.3%	69.8%		7.9%	69.8%
Maximum Green (s)	16.0	16.0	64.5		5.0	64.5
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	5.0	8.0	50.0			50.0
Flash Dont Walk (s)	11.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	11.4	11.4	77.4		83.8	77.4
Actuated g/C Ratio	0.11	0.11	0.77		0.83	0.77
v/c Ratio	0.41	0.26	0.52		0.07	0.79
Control Delay	47.6	13.3	8.7		3.2	22.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.6	13.3	8.7		3.2	22.3
LOS	D	B	A		A	C
Approach Delay	32.8		8.7			21.6
Approach LOS	C		A			C

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 17.8 — Intersection LOS: B
Intersection Capacity Utilization 70.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	80	61	734	40	1143
v/c Ratio	0.41	0.26	0.52	0.07	0.79
Control Delay	47.6	13.3	8.7	3.2	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	13.3	8.7	3.2	22.3
Queue Length 50th (m)	14.9	0.0	62.7	1.7	239.6
Queue Length 95th (m)	28.0	11.1	107.7	m2.6	#304.5
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	287	314	1406	569	1443
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	0.19	0.52	0.07	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Candlelight Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	17	41	601	8	14	1133
Future Volume (vph)	17	41	601	8	14	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1601	1862	0	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1601	1862	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	216.6		90.1			404.2
Travel Time (s)	15.6		4.6			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	3%	0%	0%	2%
Adj. Flow (vph)	18	45	653	9	15	1232
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	45	662	0	15	1232
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 69.6%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Candlelight Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	41	601	8	14	1133
Future Volume (Veh/h)	17	41	601	8	14	1133
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	45	653	9	15	1232
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			373			
pX, platoon unblocked	0.83	0.83			0.83	
vC, conflicting volume	1920	658			662	
vC1, stage 1 conf vol	658					
vC2, stage 2 conf vol	1262					
vCu, unblocked vol	2005	486			492	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	91			98	
cM capacity (veh/h)	233	483			899	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	63	662	15	1232
Volume Left	18	0	15	0
Volume Right	45	9	0	0
cSH	676	1700	899	1700
Volume to Capacity	0.09	0.39	0.02	0.72
Queue Length 95th (m)	2.3	0.0	0.4	0.0
Control Delay (s)	15.7	0.0	9.1	0.0
Lane LOS	C		A	
Approach Delay (s)	15.7	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	17	636	1	6	1110
Future Volume (vph)	5	17	636	1	6	1110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.894					
Flt Protected	0.989				0.950	
Satd. Flow (prot)	1699	0	1865	0	1217	1902
Flt Permitted	0.989				0.950	
Satd. Flow (perm)	1699	0	1865	0	1217	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	50%	1%
Adj. Flow (vph)	5	18	691	1	7	1207
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	692	0	7	1207
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 68.4%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	17	636	1	6	1110
Future Volume (Veh/h)	5	17	636	1	6	1110
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	18	691	1	7	1207
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.81	0.81			0.81	
vC, conflicting volume	1912	692			692	
vC1, stage 1 conf vol	692					
vC2, stage 2 conf vol	1221					
vCu, unblocked vol	2007	506			507	
tC, single (s)	6.4	6.2			4.6	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.7	
p0 queue free %	98	96			99	
cM capacity (veh/h)	240	464			693	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	23	692	7	1207
Volume Left	5	0	7	0
Volume Right	18	1	0	0
cSH	385	1700	693	1700
Volume to Capacity	0.06	0.41	0.01	0.71
Queue Length 95th (m)	1.4	0.0	0.2	0.0
Control Delay (s)	14.9	0.0	10.2	0.0
Lane LOS	B		B	
Approach Delay (s)	14.9	0.0	0.1	
Approach LOS	B			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Stardust Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	25	566	6	0	1200
Future Volume (vph)	2	25	566	6	0	1200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865	0.998			
Flt Protected	0.950					
Satd. Flow (prot)	0	1662	1859	0	0	1902
Flt Permitted	0.950					
Satd. Flow (perm)	0	1662	1859	0	0	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	245.5		191.7			91.0
Travel Time (s)	17.7		9.9			4.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	17%	0%	1%
Adj. Flow (vph)	2	27	615	7	0	1304
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	27	622	0	0	1304
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Stardust Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	25	566	6	0	1200
Future Volume (Veh/h)	2	25	566	6	0	1200
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	27	615	7	0	1304
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			192			
pX, platoon unblocked	0.80	0.80			0.80	
vC, conflicting volume	1922	618			615	
vC1, stage 1 conf vol	618					
vC2, stage 2 conf vol	1304					
vCu, unblocked vol	2028	398			394	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	95			100	
cM capacity (veh/h)	229	525			941	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	29	622	1304
Volume Left	2	0	0
Volume Right	27	7	0
cSH	482	1700	1700
Volume to Capacity	0.06	0.37	0.77
Queue Length 95th (m)	1.5	0.0	0.0
Control Delay (s)	13.0	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.0	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	671	49	34	177	213	14	289	66	438	562	74
Future Volume (vph)	65	671	49	34	177	213	14	289	66	438	562	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990				0.850		0.972			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	1899	0	1825	1883	1526	1825	1837	0	1789	1886	0
Flt Permitted	0.602			0.065			0.338			0.120		
Satd. Flow (perm)	1145	1899	0	125	1883	1526	649	1837	0	226	1886	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				232		8			6	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	2%	7%	0%	2%	0%	2%	0%	1%
Adj. Flow (vph)	71	729	53	37	192	232	15	314	72	476	611	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	782	0	37	192	232	15	386	0	476	691	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

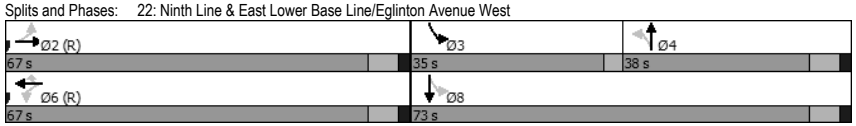
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	67.0	67.0		67.0	67.0	67.0	38.0	38.0		35.0	73.0	
Total Split (%)	47.9%	47.9%		47.9%	47.9%	47.9%	27.1%	27.1%		25.0%	52.1%	
Maximum Green (s)	60.0	60.0		60.0	60.0	60.0	31.0	31.0		32.0	66.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0			0	
Act Effct Green (s)	61.8	61.8		61.8	61.8	61.8	31.2	31.2		70.2	66.2	
Actuated g/C Ratio	0.44	0.44		0.44	0.44	0.44	0.22	0.22		0.50	0.47	
v/c Ratio	0.14	0.93		0.67	0.23	0.29	0.10	0.93		0.99	0.77	
Control Delay	24.7	55.7		89.4	25.5	3.8	45.1	81.8		78.0	37.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	24.7	55.7		89.4	25.5	3.8	45.1	81.8		78.0	37.4	
LOS	C	E		F	C	A	D	F		E	D	
Approach Delay		53.1			19.7			80.4			54.0	
Approach LOS		D			B			F			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 77 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 51.9 — Intersection LOS: D
Intersection Capacity Utilization 106.8% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	782	37	192	232	15	386	476	691
v/c Ratio	0.14	0.93	0.67	0.23	0.29	0.10	0.93	0.99	0.77
Control Delay	24.7	55.7	89.4	25.5	3.8	45.1	81.8	78.0	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.7	55.7	89.4	25.5	3.8	45.1	81.8	78.0	37.4
Queue Length 50th (m)	11.7	204.0	8.1	32.9	0.0	3.3	102.9	113.7	152.9
Queue Length 95th (m)	22.0	#287.1	#29.8	50.1	14.9	9.7	#160.7	#184.1	203.2
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	505	840	55	831	803	148	426	482	905
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.93	0.67	0.23	0.29	0.10	0.91	0.99	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	78	22	159	73	14	33	24	249	21	40	13
Future Volume (vph)	7	78	22	159	73	14	33	24	249	21	40	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.972			0.992			0.890			0.976	
Flt Protected		0.997			0.969			0.995			0.986	
Satd. Flow (prot)	0	1761	0	0	1796	0	0	1664	0	0	1849	0
Flt Permitted		0.997			0.969			0.995			0.986	
Satd. Flow (perm)	0	1761	0	0	1796	0	0	1664	0	0	1849	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	9		16	16		9	10		27	27		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	4%	9%	3%	3%	0%	3%	4%	2%	0%	0%	0%
Adj. Flow (vph)	8	85	24	173	79	15	36	26	271	23	43	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	117	0	0	267	0	0	333	0	0	80	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 49.0%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	78	22	159	73	14	33	24	249	21	40	13
Future Volume (vph)	7	78	22	159	73	14	33	24	249	21	40	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	85	24	173	79	15	36	26	271	23	43	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	117	267	333	80
Volume Left (vph)	8	173	36	23
Volume Right (vph)	24	15	271	14
Hadj (s)	-0.01	0.14	-0.43	-0.05
Departure Headway (s)	5.3	5.3	4.6	5.4
Degree Utilization, x	0.17	0.39	0.43	0.12
Capacity (veh/h)	606	639	722	595
Control Delay (s)	9.5	11.6	11.1	9.1
Approach Delay (s)	9.5	11.6	11.1	9.1
Approach LOS	A	B	B	A

Intersection Summary				
Delay			10.8	
Level of Service			B	
Intersection Capacity Utilization			49.0%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1494	20	104	505	132	95	63	361	224	105	92
Future Volume (vph)	22	1494	20	104	505	132	95	63	361	224	105	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99		0.99		0.96	0.97		0.97
Frt		0.998			0.969				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3606	0	1684	3326	0	1750	1847	1617	1750	1795	1581
Flt Permitted	0.388			0.118			0.668			0.716		
Satd. Flow (perm)	720	3606	0	209	3326	0	1214	1847	1547	1281	1795	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			49				51			92
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	14		3	3		14	12		24	24		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	6%	5%	6%	2%	4%	1%	2%	7%	1%
Adj. Flow (vph)	22	1494	20	104	505	132	95	63	361	224	105	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	1514	0	104	637	0	95	63	361	224	105	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

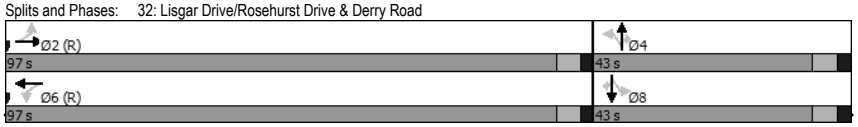
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	97.0	97.0		97.0	97.0		43.0	43.0	43.0	43.0	43.0	43.0
Total Split (%)	69.3%	69.3%		69.3%	69.3%		30.7%	30.7%	30.7%	30.7%	30.7%	30.7%
Maximum Green (s)	91.0	91.0		91.0	91.0		36.4	36.4	36.4	36.4	36.4	36.4
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	96.0	96.0		96.0	96.0		33.4	33.4	33.4	33.4	33.4	33.4
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.24	0.24	0.24	0.24	0.24	0.24
v/c Ratio	0.04	0.61		0.73	0.28		0.33	0.14	0.88	0.73	0.25	0.21
Control Delay	2.1	2.7		48.2	8.6		46.1	41.2	67.0	63.3	43.4	8.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	2.7		48.2	8.6		46.1	41.2	67.0	63.3	43.4	8.5
LOS	A	A		D	A		D	D	E	E	D	A
Approach Delay		2.7			14.2			60.1			46.4	
Approach LOS		A			B			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 54.6 (39%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 20.3 Intersection LOS: C
Intersection Capacity Utilization 93.6% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	1514	104	637	95	63	361	224	105	92
v/c Ratio	0.04	0.61	0.73	0.28	0.33	0.14	0.88	0.73	0.25	0.21
Control Delay	2.1	2.7	48.2	8.6	46.1	41.2	67.0	63.3	43.4	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	2.7	48.2	8.6	46.1	41.2	67.0	63.3	43.4	8.5
Queue Length 50th (m)	0.3	15.6	18.0	32.7	21.2	13.4	82.4	55.9	23.0	0.0
Queue Length 95th (m)	m0.6	16.5	#58.2	42.7	37.0	25.2	#127.9	84.9	38.6	13.4
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	493	2472	143	2295	324	493	450	342	479	478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.61	0.73	0.28	0.29	0.13	0.80	0.65	0.22	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	131	36	53	147	130	65	82	170	223	70	69
Future Volume (vph)	9	131	36	53	147	130	65	82	170	223	70	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.968			0.930			0.928			0.974	
Flt Protected	0.950			0.950				0.990			0.970	
Satd. Flow (prot)	1496	1819	0	1674	1761	0	0	1705	0	0	1777	0
Flt Permitted	0.950			0.950				0.990			0.970	
Satd. Flow (perm)	1496	1819	0	1674	1761	0	0	1705	0	0	1777	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	15		33	33		15	38		42	42		38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	2%	3%	9%	1%	2%	3%	7%	2%	1%	4%	4%
Adj. Flow (vph)	10	142	39	58	160	141	71	89	185	242	76	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	181	0	58	301	0	0	345	0	0	393	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 74.1%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	131	36	53	147	130	65	82	170	223	70	69
Future Volume (vph)	9	131	36	53	147	130	65	82	170	223	70	69
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	142	39	58	160	141	71	89	185	242	76	75

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	10	181	58	301	345	393
Volume Left (vph)	10	0	58	0	71	242
Volume Right (vph)	0	39	0	141	185	75
Hadj (s)	0.87	-0.11	0.65	-0.30	-0.22	0.05
Departure Headway (s)	8.8	7.8	8.2	7.2	6.6	6.7
Degree Utilization, x	0.02	0.39	0.13	0.60	0.63	0.73
Capacity (veh/h)	349	402	409	466	515	510
Control Delay (s)	10.9	14.6	11.2	19.3	20.0	25.6
Approach Delay (s)	14.4		18.0		20.0	25.6
Approach LOS	B		C		C	D

Intersection Summary			
Delay	20.3		
Level of Service	C		
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	57	3	9	44	122	5	16	12	210	11	104
Future Volume (vph)	89	57	3	9	44	122	5	16	12	210	11	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.906			0.950			0.957	
Flt Protected		0.971			0.997			0.993			0.969	
Satd. Flow (prot)	0	1838	0	0	1735	0	0	1812	0	0	1748	0
Flt Permitted		0.971			0.997			0.993			0.969	
Satd. Flow (perm)	0	1838	0	0	1735	0	0	1812	0	0	1748	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	8		6	6		8	2		12	12		2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%
Adj. Flow (vph)	97	62	3	10	48	133	5	17	13	228	12	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	162	0	0	191	0	0	35	0	0	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 55.8%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	57	3	9	44	122	5	16	12	210	11	104
Future Volume (vph)	89	57	3	9	44	122	5	16	12	210	11	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	62	3	10	48	133	5	17	13	228	12	113

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	162	191	35	353
Volume Left (vph)	97	10	5	228
Volume Right (vph)	3	133	13	113
Hadj (s)	0.13	-0.41	-0.19	-0.03
Departure Headway (s)	5.3	4.7	5.1	4.8
Degree Utilization, x	0.24	0.25	0.05	0.47
Capacity (veh/h)	627	698	624	708
Control Delay (s)	9.9	9.3	8.4	12.0
Approach Delay (s)	9.9	9.3	8.4	12.0
Approach LOS	A	A	A	B

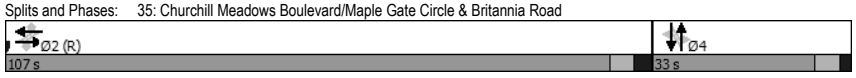
Intersection Summary			
Delay	10.7		
Level of Service	B		
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1088	14	60	499	17	31	3	209	74	19	17
Future Volume (vph)	1	1088	14	60	499	17	31	3	209	74	19	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.97	1.00		0.96	0.99	0.97		0.99	0.99	
Frt			0.850			0.850		0.852			0.929	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3614	1597	1552	3510	1298	1733	1575	0	1785	1721	0
Flt Permitted	0.469			0.243			0.734			0.289		
Satd. Flow (perm)	873	3614	1550	396	3510	1248	1326	1575	0	538	1721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			25			25		148			17	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			101.9			114.1			106.4	
Travel Time (s)		28.2			6.1			8.2			7.7	
Confl. Peds. (#/hr)	8		4	4		8	6		10	10		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	4%	23%	3%	0%	1%	0%	5%	0%
Adj. Flow (vph)	1	1088	14	60	499	17	31	3	209	74	19	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1088	14	60	499	17	31	212	0	74	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Detector Phase	2	2	2	2	2	2	4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	31.2	31.2		31.2	31.2	
Total Split (s)	107.0	107.0	107.0	107.0	107.0	107.0	33.0	33.0		33.0	33.0	
Total Split (%)	76.4%	76.4%	76.4%	76.4%	76.4%	76.4%	23.6%	23.6%		23.6%	23.6%	
Maximum Green (s)	100.0	100.0	100.0	100.0	100.0	100.0	26.8	26.8		26.8	26.8	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-2.0	-1.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	5.2	5.2		4.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)	11.0	11.0	11.0	11.0	11.0	11.0	10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0	15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	109.5	109.5	109.5	109.5	109.5	109.5	19.3	19.3		20.3	19.3	
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78	0.78	0.14	0.14		0.14	0.14	
v/c Ratio	0.00	0.38	0.01	0.19	0.18	0.02	0.17	0.62		0.95	0.14	
Control Delay	2.0	1.8	0.0	6.9	4.6	1.3	52.0	25.2		147.8	31.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	2.0	1.8	0.0	6.9	4.6	1.3	52.0	25.2		147.8	31.7	
LOS	A	A	A	A	A	A	D	C		F	C	
Approach Delay		1.8			4.7			28.6			109.8	
Approach LOS		A			A			C			F	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 127.4 (91%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 80.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	1088	14	60	499	17	31	212	74	36
v/c Ratio	0.00	0.38	0.01	0.19	0.18	0.02	0.17	0.62	0.95	0.14
Control Delay	2.0	1.8	0.0	6.9	4.6	1.3	52.0	25.2	147.8	31.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	1.8	0.0	6.9	4.6	1.3	52.0	25.2	147.8	31.7
Queue Length 50th (m)	0.0	12.3	0.0	3.7	16.1	0.0	7.7	16.1	20.5	4.6
Queue Length 95th (m)	m0.0	15.8	m0.0	11.0	27.4	1.5	16.3	39.8	#43.5	14.0
Internal Link Dist (m)		445.7			77.9			90.1		82.4
Turn Bay Length (m)	33.0		22.0	35.0		22.0	21.0		19.0	
Base Capacity (vph)	682	2826	1217	309	2745	981	263	431	110	355
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.38	0.01	0.19	0.18	0.02	0.12	0.49	0.67	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	16	21	42	26	20	11	181	34	16	103	7
Future Volume (vph)	12	16	21	42	26	20	11	181	34	16	103	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.941			0.969			0.980			0.992	
Flt Protected		0.988			0.977			0.998			0.994	
Satd. Flow (prot)	0	1752	0	0	1737	0	0	1835	0	0	1792	0
Flt Permitted		0.988			0.977			0.998			0.994	
Satd. Flow (perm)	0	1752	0	0	1737	0	0	1835	0	0	1792	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)			13	13			16		13	13		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	0%	5%	4%	5%	0%	3%	0%	0%	7%	0%
Adj. Flow (vph)	13	17	23	46	28	22	12	197	37	17	112	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	0	0	96	0	0	246	0	0	137	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 29.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	16	21	42	26	20	11	181	34	16	103	7
Future Volume (Veh/h)	12	16	21	42	26	20	11	181	34	16	103	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	17	23	46	28	22	12	197	37	17	112	8
Pedestrians		16			13			13				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			1			1				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	442	437	145	447	422	228	136			247		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	442	437	145	447	422	228	136			247		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	96	97	90	94	97	99			99		
cM capacity (veh/h)	469	484	885	462	496	794	1441			1316		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	53	96	246	137
Volume Left	13	46	12	17
Volume Right	23	22	37	8
cSH	597	523	1441	1316
Volume to Capacity	0.09	0.18	0.01	0.01
Queue Length 95th (m)	2.2	5.1	0.2	0.3
Control Delay (s)	11.6	13.4	0.4	1.1
Lane LOS	B	B	A	A
Approach Delay (s)	11.6	13.4	0.4	1.1
Approach LOS	B	B		

Intersection Summary				
Average Delay		4.1		
Intersection Capacity Utilization		29.5%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	174	31	90	61	29	13	205	161	61	152	11
Future Volume (vph)	23	174	31	90	61	29	13	205	161	61	152	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.978			0.943			0.993	
Flt Protected		0.995			0.976			0.998			0.987	
Satd. Flow (prot)	0	1748	0	0	1777	0	0	1767	0	0	1858	0
Flt Permitted		0.995			0.976			0.998			0.987	
Satd. Flow (perm)	0	1748	0	0	1777	0	0	1767	0	0	1858	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	19		71	71		19	20		20	20		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	9%	0%	2%	5%	3%	15%	1%	3%	0%	2%	0%
Adj. Flow (vph)	25	189	34	98	66	32	14	223	175	66	165	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	248	0	0	196	0	0	412	0	0	243	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 73.2%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	174	31	90	61	29	13	205	161	61	152	11
Future Volume (vph)	23	174	31	90	61	29	13	205	161	61	152	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	189	34	98	66	32	14	223	175	66	165	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	248	196	412	243
Volume Left (vph)	25	98	14	66
Volume Right (vph)	34	32	175	12
Hadj (s)	0.06	0.06	-0.21	0.05
Departure Headway (s)	6.4	6.5	5.7	6.2
Degree Utilization, x	0.44	0.36	0.65	0.42
Capacity (veh/h)	499	478	603	516
Control Delay (s)	14.3	13.1	18.6	13.7
Approach Delay (s)	14.3	13.1	18.6	13.7
Approach LOS	B	B	C	B

Intersection Summary				
Delay			15.6	
Level of Service			C	
Intersection Capacity Utilization			73.2%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	316	14	104	258	181	20	244	68	181	189	63
Future Volume (vph)	131	316	14	104	258	181	20	244	68	181	189	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	1.00		0.99	0.97		0.99	0.99		0.98	1.00	
Frt		0.994			0.938			0.967			0.963	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3578	0	1772	3157	0	1825	1794	0	1807	1792	0
Flt Permitted	0.448			0.530			0.517			0.446		
Satd. Flow (perm)	829	3578	0	977	3157	0	988	1794	0	830	1792	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			197			19			23	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	7%	3%	3%	8%	0%	2%	4%	1%	2%	5%
Adj. Flow (vph)	142	343	15	113	280	197	22	265	74	197	205	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	142	358	0	113	477	0	22	339	0	197	273	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	47.0	47.0		47.0	47.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.5%	46.5%		46.5%	46.5%		53.5%	53.5%		53.5%	53.5%	
Maximum Green (s)	40.5	40.5		40.5	40.5		48.0	48.0		48.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	47.7	47.7		47.7	47.7		42.8	42.8		42.8	42.8	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.42	0.42		0.42	0.42	
v/c Ratio	0.36	0.21		0.24	0.30		0.05	0.44		0.56	0.35	
Control Delay	18.8	14.8		18.1	9.9		17.1	21.4		29.2	19.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.8	14.8		18.1	9.9		17.1	21.4		29.2	19.3	
LOS	B	B		B	A		B	C		C	B	
Approach Delay		16.0			11.5			21.1			23.4	
Approach LOS		B			B			C			C	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 17.4 — Intersection LOS: B
Intersection Capacity Utilization 113.1% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	358	113	477	22	339	197	273
v/c Ratio	0.36	0.21	0.24	0.30	0.05	0.44	0.56	0.35
Control Delay	18.8	14.8	18.1	9.9	17.1	21.4	29.2	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	14.8	18.1	9.9	17.1	21.4	29.2	19.3
Queue Length 50th (m)	14.2	17.3	12.5	15.8	2.5	43.8	28.9	32.7
Queue Length 95th (m)	26.8	26.4	25.9	27.9	6.8	62.8	49.3	48.8
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	392	1693	462	1596	479	880	402	881
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.21	0.24	0.30	0.05	0.39	0.49	0.31

Intersection Summary

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	100	20	26	62	39	17	115	26	78	152	19
Future Volume (vph)	21	100	20	26	62	39	17	115	26	78	152	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.959			0.978			0.990	
Flt Protected		0.993			0.990			0.995			0.985	
Satd. Flow (prot)	0	1770	0	0	1783	0	0	1781	0	0	1785	0
Flt Permitted		0.993			0.990			0.995			0.985	
Satd. Flow (perm)	0	1770	0	0	1783	0	0	1781	0	0	1785	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	21		17	17		21	16		16	16		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	4%	3%	0%	6%	5%	4%	1%	7%	5%
Adj. Flow (vph)	23	109	22	28	67	42	18	125	28	85	165	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	154	0	0	137	0	0	171	0	0	271	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	100	20	26	62	39	17	115	26	78	152	19
Future Volume (vph)	21	100	20	26	62	39	17	115	26	78	152	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	109	22	28	67	42	18	125	28	85	165	21

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	154	137	171	271
Volume Left (vph)	23	28	18	85
Volume Right (vph)	22	42	28	21
Hadj (s)	0.04	-0.10	0.01	0.10
Departure Headway (s)	5.3	5.2	5.1	5.0
Degree Utilization, x	0.23	0.20	0.24	0.38
Capacity (veh/h)	617	626	656	674
Control Delay (s)	9.8	9.4	9.7	11.1
Approach Delay (s)	9.8	9.4	9.7	11.1
Approach LOS	A	A	A	B

Intersection Summary			
Delay	10.2		
Level of Service	B		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	173	15	29	102	14	22	122	121	67	162	36
Future Volume (vph)	22	173	15	29	102	14	22	122	121	67	162	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.991			0.987			0.938			0.982	
Flt Protected		0.995			0.990			0.996			0.987	
Satd. Flow (prot)	0	1745	0	0	1766	0	0	1717	0	0	1785	0
Flt Permitted		0.995			0.990			0.996			0.987	
Satd. Flow (perm)	0	1745	0	0	1766	0	0	1717	0	0	1785	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	8%	7%	7%	6%	7%	5%	6%	3%	1%	6%	3%
Adj. Flow (vph)	24	188	16	32	111	15	24	133	132	73	176	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	228	0	0	158	0	0	289	0	0	288	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	173	15	29	102	14	22	122	121	67	162	36
Future Volume (vph)	22	173	15	29	102	14	22	122	121	67	162	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	188	16	32	111	15	24	133	132	73	176	39

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	228	158	289	288
Volume Left (vph)	24	32	24	73
Volume Right (vph)	16	15	132	39
Hadj (s)	0.12	0.09	-0.18	0.04
Departure Headway (s)	6.0	6.1	5.4	5.6
Degree Utilization, x	0.38	0.27	0.44	0.45
Capacity (veh/h)	546	510	611	595
Control Delay (s)	12.6	11.3	12.6	13.2
Approach Delay (s)	12.6	11.3	12.6	13.2
Approach LOS	B	B	B	B

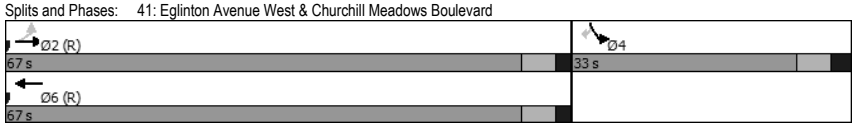
Intersection Summary			
Delay	12.5		
Level of Service	B		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	1415	461	65	215	8
Future Volume (vph)	3	1415	461	65	215	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt			0.981			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	3579	3386	0	1755	1183
Flt Permitted	0.455				0.950	
Satd. Flow (perm)	871	3579	3386	0	1755	1183
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			29			4
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	5%	8%	4%	38%
Adj. Flow (vph)	3	1415	461	65	215	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	1415	526	0	215	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	24.0	24.0	24.0		25.5	25.5
Total Split (s)	67.0	67.0	67.0		33.0	33.0
Total Split (%)	67.0%	67.0%	67.0%		33.0%	33.0%
Maximum Green (s)	61.0	61.0	61.0		26.5	26.5
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	71.0	71.0	71.0		18.5	18.5
Actuated g/C Ratio	0.71	0.71	0.71		0.18	0.18
v/c Ratio	0.00	0.56	0.22		0.66	0.04
Control Delay	5.7	8.6	5.4		47.4	23.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	5.7	8.6	5.4		47.4	23.9
LOS	A	A	A		D	C
Approach Delay		8.6	5.4		46.5	
Approach LOS		A	A		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 11.7		Intersection LOS: B	
Intersection Capacity Utilization 59.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3	1415	526	215	8
v/c Ratio	0.00	0.56	0.22	0.66	0.04
Control Delay	5.7	8.6	5.4	47.4	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.7	8.6	5.4	47.4	23.9
Queue Length 50th (m)	0.2	60.0	14.8	39.1	0.6
Queue Length 95th (m)	1.2	94.5	26.0	58.2	4.2
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	618	2542	2413	482	328
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.56	0.22	0.45	0.02

Intersection Summary

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	992	378	0	39	6
Future Volume (vph)	0	992	378	0	39	6
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3952	3913	0	1847	1524
Flt Permitted					0.950	
Satd. Flow (perm)	0	3952	3913	0	1847	1524
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						6
Link Speed (k/h)		80	80		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		9.3	13.4		15.0	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	0%	1%	2%	7%	16%
Adj. Flow (vph)	0	1002	382	0	39	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1002	382	0	39	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

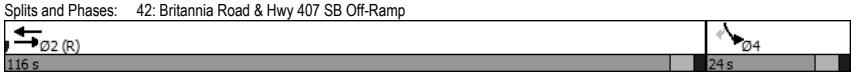
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		116.0	116.0		24.0	24.0
Total Split (%)		82.9%	82.9%		17.1%	17.1%
Maximum Green (s)		110.0	110.0		18.0	18.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		122.9	122.9		9.1	9.1
Actuated g/C Ratio		0.88	0.88		0.06	0.06
v/c Ratio		0.29	0.11		0.33	0.06
Control Delay		2.1	0.4		69.6	34.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		2.1	0.4		69.6	34.8
LOS		A	A		E	C
Approach Delay		2.1	0.4		65.0	
Approach LOS		A	A		E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.33
Intersection Signal Delay: 3.6 — Intersection LOS: A
Intersection Capacity Utilization 50.6% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1002	382	39	6
v/c Ratio	0.29	0.11	0.33	0.06
Control Delay	2.1	0.4	69.6	34.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.1	0.4	69.6	34.8
Queue Length 50th (m)	21.3	1.6	10.6	0.0
Queue Length 95th (m)	30.9	2.0	22.2	4.5
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3470	3436	237	201
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.29	0.11	0.16	0.03

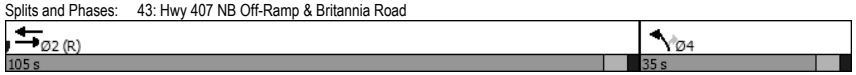
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	964	0	0	460	10	280
Future Volume (vph)	964	0	0	460	10	280
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3952	0	0	3913	1847	1768
Flt Permitted					0.950	
Satd. Flow (perm)	3952	0	0	3913	1847	1768
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	80			80	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	13.4			9.8	11.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	1%	7%	0%
Adj. Flow (vph)	1004	0	0	479	10	292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1004	0	0	479	10	292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	105.0			105.0	35.0	35.0
Total Split (%)	75.0%			75.0%	25.0%	25.0%
Maximum Green (s)	99.0			99.0	29.0	29.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	101.5			101.5	26.5	26.5
Actuated g/C Ratio	0.72			0.72	0.19	0.19
v/c Ratio	0.35			0.17	0.03	0.87
Control Delay	6.3			3.2	44.8	80.5
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	6.3			3.2	44.8	80.5
LOS	A			A	D	F
Approach Delay	6.3			3.2	79.3	
Approach LOS	A			A	E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 50.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1004	479	10	292
v/c Ratio	0.35	0.17	0.03	0.87
Control Delay	6.3	3.2	44.8	80.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.3	3.2	44.8	80.5
Queue Length 50th (m)	32.2	9.8	2.3	77.7
Queue Length 95th (m)	36.5	m11.3	7.2	#120.0
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	2865	2837	382	366
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	47	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.17	0.03	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1799	422	0	23	32
Future Volume (vph)	0	1799	422	0	23	32
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3913	3764	0	3686	1414
Flt Permitted					0.950	
Satd. Flow (perm)	0	3913	3764	0	3686	1414
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						33
Link Speed (k/h)		80	80		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		15.0	13.9		13.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	1%	5%	2%	4%	25%
Adj. Flow (vph)	0	1874	440	0	24	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1874	440	0	24	33
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

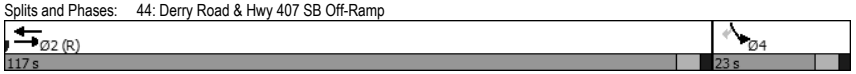
Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		117.0	117.0		23.0	23.0
Total Split (%)		83.6%	83.6%		16.4%	16.4%
Maximum Green (s)		111.0	111.0		17.0	17.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		123.8	123.8		8.2	8.2
Actuated g/C Ratio		0.88	0.88		0.06	0.06
v/c Ratio		0.54	0.13		0.11	0.29
Control Delay		3.1	0.8		63.5	25.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		3.1	0.8		63.5	25.8
LOS		A	A		E	C
Approach Delay		3.1	0.8		41.6	
Approach LOS		A	A		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 3.6		Intersection LOS: A	
Intersection Capacity Utilization 62.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1874	440	24	33
v/c Ratio	0.54	0.13	0.11	0.29
Control Delay	3.1	0.8	63.5	25.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.1	0.8	63.5	25.8
Queue Length 50th (m)	55.8	4.0	3.2	0.0
Queue Length 95th (m)	69.6	4.4	8.1	10.9
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3460	3328	447	200
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.54	0.13	0.05	0.17

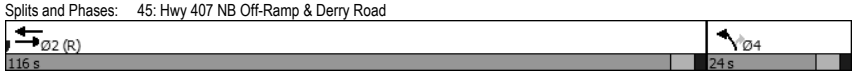
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1402	0	0	521	14	151
Future Volume (vph)	1402	0	0	521	14	151
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3913	0	0	3764	3582	1716
Flt Permitted					0.950	
Satd. Flow (perm)	3913	0	0	3764	3582	1716
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						97
Link Speed (k/h)	80			80	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	13.9			10.3	15.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	2%	2%	5%	7%	3%
Adj. Flow (vph)	1431	0	0	532	14	154
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1431	0	0	532	14	154
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	116.0			116.0	24.0	24.0
Total Split (%)	82.9%			82.9%	17.1%	17.1%
Maximum Green (s)	110.0			110.0	18.0	18.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	116.7			116.7	11.3	11.3
Actuated g/C Ratio	0.83			0.83	0.08	0.08
v/c Ratio	0.44			0.17	0.05	0.68
Control Delay	2.5			2.9	57.2	39.4
Queue Delay	0.0			0.0	0.0	0.1
Total Delay	2.6			2.9	57.2	39.4
LOS	A			A	E	D
Approach Delay	2.6			2.9	40.9	
Approach LOS	A			A	D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 5.7	Intersection LOS: A
Intersection Capacity Utilization 62.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1431	532	14	154
v/c Ratio	0.44	0.17	0.05	0.68
Control Delay	2.5	2.9	57.2	39.4
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	2.6	2.9	57.2	39.4
Queue Length 50th (m)	26.1	16.4	1.9	15.4
Queue Length 95th (m)	28.8	m24.5	5.2	37.1
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3261	3137	460	305
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	136	0	0	3
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.46	0.17	0.03	0.51

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	286	311	1165	0	0	1027
Future Volume (vph)	286	311	1165	0	0	1027
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frt	0.955	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3400	1424	3837	0	0	3764
Flt Permitted	0.966					
Satd. Flow (perm)	3400	1424	3837	0	0	3764
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	47	70				
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	8%	13%	3%	2%	0%	5%
Adj. Flow (vph)	325	353	1324	0	0	1167
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	463	215	1324	0	0	1167
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						

Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

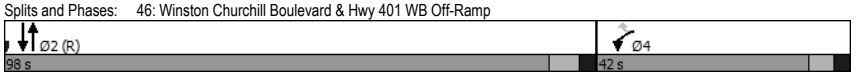
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	42.0	42.0	98.0			98.0
Total Split (%)	30.0%	30.0%	70.0%			70.0%
Maximum Green (s)	35.0	35.0	90.0			90.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	23.3	23.3	101.7			101.7
Actuated g/C Ratio	0.17	0.17	0.73			0.73
v/c Ratio	0.77	0.73	0.48			0.43
Control Delay	58.3	50.9	13.3			8.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	58.3	50.9	13.3			8.6
LOS	E	D	B			A
Approach Delay	55.9		13.3			8.6
Approach LOS	E		B			A

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 102.2 (73%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 20.7 — Intersection LOS: C
Intersection Capacity Utilization 54.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	463	215	1324	1167
v/c Ratio	0.77	0.73	0.48	0.43
Control Delay	58.3	50.9	13.3	8.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	58.3	50.9	13.3	8.6
Queue Length 50th (m)	57.9	42.9	120.0	59.5
Queue Length 95th (m)	69.3	67.3	146.6	85.6
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	885	408	2786	2733
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.53	0.48	0.43

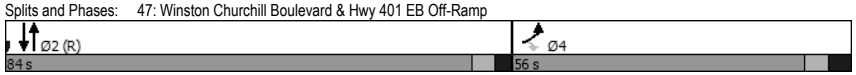
Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	440	231	0	1000	1025	0
Future Volume (vph)	440	231	0	1000	1025	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3684	1593	0	5567	5408	0
Flt Permitted	0.955					
Satd. Flow (perm)	3684	1593	0	5567	5408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	4	64				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	4%	1%	0%	2%	5%	8%
Adj. Flow (vph)	500	263	0	1136	1165	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	526	237	0	1136	1165	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	56.0	56.0		84.0	84.0	
Total Split (%)	40.0%	40.0%		60.0%	60.0%	
Maximum Green (s)	48.0	48.0		77.0	77.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	26.0	26.0		99.0	99.0	
Actuated g/C Ratio	0.19	0.19		0.71	0.71	
v/c Ratio	0.77	0.68		0.29	0.30	
Control Delay	61.2	48.2		8.1	6.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	61.2	48.2		8.1	6.2	
LOS	E	D		A	A	
Approach Delay	57.1			8.1	6.2	
Approach LOS	E			A	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 92.4 (66%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 19.6		Intersection LOS: B	
Intersection Capacity Utilization 44.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	526	237	1136	1165
v/c Ratio	0.77	0.68	0.29	0.30
Control Delay	61.2	48.2	8.1	6.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	61.2	48.2	8.1	6.2
Queue Length 50th (m)	71.2	49.6	39.1	31.0
Queue Length 95th (m)	83.8	75.0	51.0	35.7
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	1265	588	3936	3824
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.40	0.29	0.30

Intersection Summary

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	615	383	1523	0	0	2166
Future Volume (vph)	615	383	1523	0	0	2166
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.984	0.850				
Flt Protected	0.957					
Satd. Flow (prot)	3592	1547	3837	0	0	5513
Flt Permitted	0.957					
Satd. Flow (perm)	3588	1547	3837	0	0	5513
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	9	27				
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	4%	3%	0%	0%	3%
Adj. Flow (vph)	654	407	1620	0	0	2304
Shared Lane Traffic (%)		19%				
Lane Group Flow (vph)	731	330	1620	0	0	2304
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

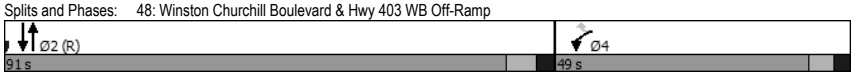
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	49.0	49.0	91.0			91.0
Total Split (%)	35.0%	35.0%	65.0%			65.0%
Maximum Green (s)	42.0	42.0	83.0			83.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	35.1	35.1	89.9			89.9
Actuated g/C Ratio	0.25	0.25	0.64			0.64
v/c Ratio	0.81	0.81	0.66			0.65
Control Delay	55.8	60.6	17.6			17.1
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	55.8	60.6	17.6			17.1
LOS	E	E	B			B
Approach Delay	57.3		17.6			17.1
Approach LOS	E		B			B

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 117.6 (84%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 25.8 — Intersection LOS: C
Intersection Capacity Utilization 104.8% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	731	330	1620	2304
v/c Ratio	0.81	0.81	0.66	0.65
Control Delay	55.8	60.6	17.6	17.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	55.8	60.6	17.6	17.1
Queue Length 50th (m)	97.4	87.9	107.3	135.1
Queue Length 95th (m)	112.1	120.2	136.1	171.9
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1083	483	2464	3541
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.67	0.68	0.66	0.65

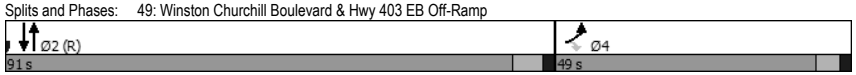
Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	788	283	0	875	1872	0
Future Volume (vph)	788	283	0	875	1872	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.95	1.00
Ped Bike Factor	1.00					
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3795	1733	0	5460	3837	0
Flt Permitted	0.950					
Satd. Flow (perm)	3788	1733	0	5460	3837	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		13				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	0%	4%	3%	0%
Adj. Flow (vph)	821	295	0	911	1950	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	821	295	0	911	1950	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	49.0	49.0		91.0	91.0	
Total Split (%)	35.0%	35.0%		65.0%	65.0%	
Maximum Green (s)	43.0	43.0		84.0	84.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	36.7	36.7		90.3	90.3	
Actuated g/C Ratio	0.26	0.26		0.64	0.64	
v/c Ratio	0.83	0.64		0.26	0.79	
Control Delay	56.1	49.7		11.2	33.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	56.1	49.7		11.2	33.3	
LOS	E	D		B	C	
Approach Delay	54.4			11.2	33.3	
Approach LOS	D			B	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 50.4 (36%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 34.2		Intersection LOS: C	
Intersection Capacity Utilization 104.8%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	821	295	911	1950
v/c Ratio	0.83	0.64	0.26	0.79
Control Delay	56.1	49.7	11.2	33.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	56.1	49.7	11.2	33.3
Queue Length 50th (m)	110.4	69.3	37.3	243.4
Queue Length 95th (m)	126.1	94.5	50.0	301.8
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	1165	541	3522	2475
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.70	0.55	0.26	0.79

Intersection Summary

Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2134	400	0	830	368
Future Volume (vph)	0	2134	400	0	830	368
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.994	0.850
Flt Protected					0.954	
Satd. Flow (prot)	0	5567	5307	0	3635	1449
Flt Permitted					0.954	
Satd. Flow (perm)	0	5567	5307	0	3635	1449
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					3	299
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	134.9		263.0	
Travel Time (s)		5.7	8.1		15.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	7%	0%	5%	11%
Adj. Flow (vph)	0	2200	412	0	856	379
Shared Lane Traffic (%)						10%
Lane Group Flow (vph)	0	2200	412	0	894	341
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

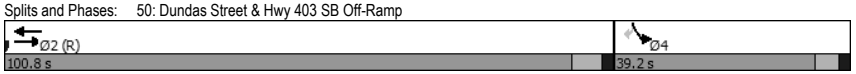
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		100.8	100.8		39.2	39.2
Total Split (%)		72.0%	72.0%		28.0%	28.0%
Maximum Green (s)		93.8	93.8		33.2	33.2
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		-2.5	0.0
Total Lost Time (s)		7.0	7.0		3.5	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		93.8	93.8		35.7	33.2
Actuated g/C Ratio		0.67	0.67		0.26	0.24
v/c Ratio		0.59	0.12		0.96	0.60
Control Delay		13.4	5.0		72.9	12.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		13.4	5.0		72.9	12.5
LOS		B	A		E	B
Approach Delay		13.4	5.0		56.2	
Approach LOS		B	A		E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 22.4 (16%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 26.2 Intersection LOS: C
Intersection Capacity Utilization 72.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2200	412	894	341
v/c Ratio	0.59	0.12	0.96	0.60
Control Delay	13.4	5.0	72.9	12.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.4	5.0	72.9	12.5
Queue Length 50th (m)	113.0	7.3	126.4	10.1
Queue Length 95th (m)	124.8	9.4	#167.2	43.6
Internal Link Dist (m)	70.5	110.9	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	3729	3555	929	571
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.12	0.96	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1999	0	0	624	83	596
Future Volume (vph)	1999	0	0	624	83	596
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Ped Bike Factor					1.00	
Frt					0.883	0.850
Flt Protected					0.989	
Satd. Flow (prot)	5513	0	0	5357	3462	1577
Flt Permitted					0.989	
Satd. Flow (perm)	5513	0	0	5357	3460	1577
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					12	12
Link Speed (k/h)	60			60	60	
Link Distance (m)	126.9			304.9	234.1	
Travel Time (s)	7.6			18.3	14.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	0%	6%	1%	2%
Adj. Flow (vph)	2221	0	0	693	92	662
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	2221	0	0	693	423	331
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	100.8			100.8	39.2	39.2
Total Split (%)	72.0%			72.0%	28.0%	28.0%
Maximum Green (s)	93.8			93.8	33.2	33.2
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	95.8			95.8	31.2	31.2
Actuated g/C Ratio	0.68			0.68	0.22	0.22
v/c Ratio	0.59			0.19	0.54	0.92
Control Delay	7.6			8.4	49.2	81.8
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	7.6			8.4	49.2	81.8
LOS	A			A	D	F
Approach Delay	7.6			8.4	63.5	
Approach LOS	A			A	E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 8.4 (6%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 19.2		Intersection LOS: B	
Intersection Capacity Utilization 72.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street

Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2221	693	423	331
v/c Ratio	0.59	0.19	0.54	0.92
Control Delay	7.6	8.4	49.2	81.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.6	8.4	49.2	81.8
Queue Length 50th (m)	71.5	24.7	51.2	94.1
Queue Length 95th (m)	m76.5	30.1	67.9	#151.2
Internal Link Dist (m)	102.9	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	3773	3667	830	383
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.19	0.51	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	25	40	342	176	104	381
Future Volume (vph)	25	40	342	176	104	381
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	1883	1601	1789	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	1883	1601	1789	1883
Link Speed (k/h)	48		70			70
Link Distance (m)	379.3		780.0			514.0
Travel Time (s)	28.4		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	40	342	176	104	381
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	40	342	176	104	381
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 37.1% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
52: Ninth Line & Argentia Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	40	342	176	104	381
Future Volume (Veh/h)	25	40	342	176	104	381
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	40	342	176	104	381
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	931	342			518	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	931	342			518	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	94			90	
cM capacity (veh/h)	267	701			1048	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	25	40	342	176	104	381
Volume Left	25	0	0	0	104	0
Volume Right	0	40	0	176	0	0
cSH	267	701	1700	1700	1048	1700
Volume to Capacity	0.09	0.06	0.20	0.10	0.10	0.22
Queue Length 95th (m)	2.3	1.4	0.0	0.0	2.5	0.0
Control Delay (s)	19.9	10.4	0.0	0.0	8.8	0.0
Lane LOS	C	B			A	
Approach Delay (s)	14.1		0.0		1.9	
Approach LOS	B					

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
97: Ninth Line & Foxwood Ave

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	772	0	0	661
Future Volume (vph)	0	0	772	0	0	661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				15.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	1883	0	1883	1883
Flt Permitted						
Satd. Flow (perm)	1883	0	1883	0	1883	1883
Link Speed (k/h)	48		70			70
Link Distance (m)	226.1		301.0			850.0
Travel Time (s)	17.0		15.5			43.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	772	0	0	661
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	772	0	0	661
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
97: Ninth Line & Foxwood Ave

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	772	0	0	661
Future Volume (Veh/h)	0	0	772	0	0	661
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	772	0	0	661
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			301			
pX, platoon unblocked	0.75	0.75			0.75	
vC, conflicting volume	1433	772			772	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1410	526			526	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	114	412			778	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	0	772	0	661
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.45	0.00	0.39
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS	A			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
136: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1165	275	0	1169	0	0
Future Volume (vph)	1165	275	0	1169	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	125.7	
Travel Time (s)	15.5			6.8	9.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1165	275	0	1169	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1165	275	0	1169	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	3	404	7	3	437
Future Volume (vph)	11	3	404	7	3	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950					
Satd. Flow (prot)	1825	1633	1880	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1633	1880	0	0	1865
Link Speed (k/h)	48		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.3		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	3%
Adj. Flow (vph)	12	3	439	8	3	475
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	3	447	0	0	478
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	3	404	7	3	437
Future Volume (Veh/h)	11	3	404	7	3	437
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	3	439	8	3	475
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	924	443			447	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	924	443			447	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	100			100	
cM capacity (veh/h)	301	619			1124	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	15	447	478
Volume Left	12	0	3
Volume Right	3	8	0
cSH	376	1700	1124
Volume to Capacity	0.04	0.26	0.00
Queue Length 95th (m)	0.9	0.0	0.1
Control Delay (s)	16.1	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	16.1	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
2: Ninth Line & Terragar Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	42	29	537	72	36	465
Future Volume (vph)	42	29	537	72	36	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		15.0	40.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1526	1902	1585	1722	1865
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1526	1902	1585	1722	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	287.6		434.9			780.0
Travel Time (s)	20.7		22.4			40.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	7%	1%	3%	6%	3%
Adj. Flow (vph)	46	32	584	78	39	505
Shared Lane Traffic (%)						
Lane Group Flow (vph)	46	32	584	78	39	505
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
2: Ninth Line & Terragar Boulevard

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	42	29	537	72	36	465
Future Volume (Veh/h)	42	29	537	72	36	465
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	32	584	78	39	505
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1167	584			662	
vC1, stage 1 conf vol	584					
vC2, stage 2 conf vol	583					
vCu, unblocked vol	1167	584			662	
tC, single (s)	6.4	6.3			4.2	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.4			2.3	
p0 queue free %	89	94			96	
cM capacity (veh/h)	425	502			908	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	78	584	78	39	505
Volume Left	46	0	0	39	0
Volume Right	32	0	78	0	0
cSH	720	1700	1700	908	1700
Volume to Capacity	0.11	0.34	0.05	0.04	0.30
Queue Length 95th (m)	2.8	0.0	0.0	1.0	0.0
Control Delay (s)	13.7	0.0	0.0	9.1	0.0
Lane LOS	B			A	
Approach Delay (s)	13.7	0.0		0.7	
Approach LOS	B				

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: Ninth Line & Hazelridge Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	28	17	475	45	35	545
Future Volume (vph)	28	17	475	45	35	545
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	50.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.988			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1541	1844	0	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1541	1844	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	310.4		412.4			434.9
Travel Time (s)	22.3		21.2			22.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	3%	2%	0%	2%
Adj. Flow (vph)	30	18	516	49	38	592
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	18	565	0	38	592
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Hazelridge Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	28	17	475	45	35	545
Future Volume (Veh/h)	28	17	475	45	35	545
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	18	516	49	38	592
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1208	540			565	
vC1, stage 1 conf vol	540					
vC2, stage 2 conf vol	668					
vCu, unblocked vol	1208	540			565	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.4			2.2	
p0 queue free %	93	97			96	
cM capacity (veh/h)	411	534			1017	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	48	565	38	592
Volume Left	30	0	38	0
Volume Right	18	49	0	0
cSH	657	1700	1017	1700
Volume to Capacity	0.07	0.33	0.04	0.35
Queue Length 95th (m)	1.8	0.0	0.9	0.0
Control Delay (s)	13.5	0.0	8.7	0.0
Lane LOS	B		A	
Approach Delay (s)	13.5	0.0	0.5	
Approach LOS	B			

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	467	200	162	1365	25	107	350	158	27	248	128
Future Volume (vph)	139	467	200	162	1365	25	107	350	158	27	248	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt		0.955			0.997				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3404	0	1785	3600	0	1767	1921	1597	1733	1921	1597
Flt Permitted	0.089			0.398			0.266			0.445		
Satd. Flow (perm)	167	3404	0	748	3600	0	495	1921	1597	812	1921	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65			2				158			128
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	4%	1%	0%	0%	3%	0%	0%
Adj. Flow (vph)	139	467	200	162	1365	25	107	350	158	27	248	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	139	667	0	162	1390	0	107	350	158	27	248	128
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

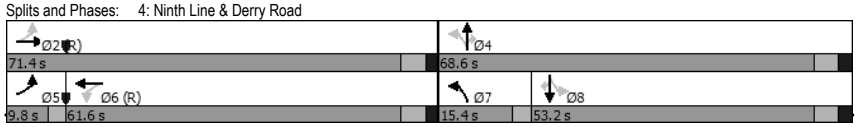
Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		6	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	30.1		30.1	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	9.8	71.4		61.6	61.6		15.4	68.6	68.6	53.2	53.2	53.2
Total Split (%)	7.0%	51.0%		44.0%	44.0%		11.0%	49.0%	49.0%	38.0%	38.0%	38.0%
Maximum Green (s)	6.8	65.3		55.5	55.5		12.4	62.2	62.2	46.8	46.8	46.8
Yellow Time (s)	3.0	4.0		4.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.1		2.1	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.1		5.1	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead			Lag	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0		9.0	9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0		15.0	15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0		0	0			0	0	0	0	0
Act Effct Green (s)	93.6	90.5		74.9	74.9		42.4	39.0	39.0	24.8	24.8	24.8
Actuated g/C Ratio	0.67	0.65		0.54	0.54		0.30	0.28	0.28	0.18	0.18	0.18
v/c Ratio	0.52	0.30		0.41	0.72		0.41	0.66	0.28	0.19	0.73	0.33
Control Delay	34.7	7.0		21.6	24.2		39.3	49.8	6.0	49.5	66.5	9.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	7.0		21.6	24.2		39.3	49.8	6.0	49.5	66.5	9.4
LOS	C	A		C	C		D	D	A	D	E	A
Approach Delay		11.8			23.9			36.7			47.2	
Approach LOS		B			C			D			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 114.8 (82%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 26.1	Intersection LOS: C
Intersection Capacity Utilization 87.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	139	667	162	1390	107	350	158	27	248	128
v/c Ratio	0.52	0.30	0.41	0.72	0.41	0.66	0.28	0.19	0.73	0.33
Control Delay	34.7	7.0	21.6	24.2	39.3	49.8	6.0	49.5	66.5	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	7.0	21.6	24.2	39.3	49.8	6.0	49.5	66.5	9.4
Queue Length 50th (m)	15.3	24.3	19.2	116.5	21.8	85.0	0.0	6.5	65.7	0.0
Queue Length 95th (m)	38.5	33.2	40.1	217.4	33.5	107.8	15.0	14.6	88.4	16.1
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	269	2224	400	1926	271	867	807	277	655	629
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.30	0.41	0.72	0.39	0.40	0.20	0.10	0.38	0.20

Intersection Summary

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	606	67	49	660
Future Volume (vph)	46	47	606	67	49	660
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	1847	1617	1825	1865
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1585	1847	1617	1825	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	659	73	53	717
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	659	73	53	717
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.2% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	47	606	67	49	660
Future Volume (Veh/h)	46	47	606	67	49	660
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	51	659	73	53	717
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1482	661			732	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1482	661			732	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	61	89			94	
cM capacity (veh/h)	130	460			882	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	101	659	73	53	717
Volume Left	50	0	0	53	0
Volume Right	51	0	73	0	0
cSH	262	1700	1700	882	1700
Volume to Capacity	0.39	0.39	0.04	0.06	0.42
Queue Length 95th (m)	13.2	0.0	0.0	1.5	0.0
Control Delay (s)	31.4	0.0	0.0	9.3	0.0
Lane LOS	D			A	
Approach Delay (s)	31.4	0.0		0.6	
Approach LOS	D				

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Ninth Line & Doug Leavens Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	61	55	640	98	75	546
Future Volume (vph)	61	55	640	98	75	546
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	27.0		60.0	115.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	1883	1633	1825	1883
Flt Permitted	0.950				0.366	
Satd. Flow (perm)	1789	1564	1883	1633	703	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		60		107		
Link Speed (k/h)	50		70			70
Link Distance (m)	255.0		1151.0			603.1
Travel Time (s)	18.4		59.2			31.0
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	2%
Adj. Flow (vph)	66	60	696	107	82	593
Shared Lane Traffic (%)						
Lane Group Flow (vph)	66	60	696	107	82	593
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
6: Ninth Line & Doug Leavens Boulevard

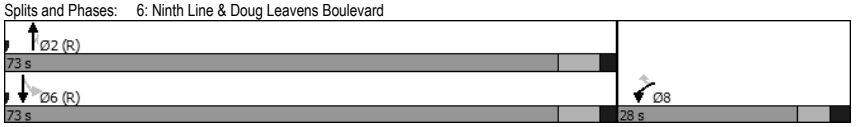
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	45.0	45.0
Minimum Split (s)	25.5	25.5	53.0	53.0	53.0	53.0
Total Split (s)	28.0	28.0	73.0	73.0	73.0	73.0
Total Split (%)	27.7%	27.7%	72.3%	72.3%	72.3%	72.3%
Maximum Green (s)	21.5	21.5	66.0	66.0	66.0	66.0
Yellow Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0	35.0	35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	10.6	10.6	83.0	83.0	83.0	83.0
Actuated g/C Ratio	0.10	0.10	0.82	0.82	0.82	0.82
v/c Ratio	0.35	0.28	0.45	0.08	0.14	0.38
Control Delay	46.8	14.1	10.9	2.8	3.6	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	14.1	10.9	2.8	3.6	4.2
LOS	D	B	B	A	A	A
Approach Delay	31.2		9.9			4.1
Approach LOS	C		A			A

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.45
Intersection Signal Delay: 9.1 Intersection LOS: A
Intersection Capacity Utilization 85.0% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 6: Ninth Line & Doug Leavens Boulevard



Queues
6: Ninth Line & Doug Leavens Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	66	60	696	107	82	593
v/c Ratio	0.35	0.28	0.45	0.08	0.14	0.38
Control Delay	46.8	14.1	10.9	2.8	3.6	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	14.1	10.9	2.8	3.6	4.2
Queue Length 50th (m)	12.3	0.0	85.3	4.0	3.1	28.6
Queue Length 95th (m)	24.3	11.1	154.1	m6.3	7.9	50.1
Internal Link Dist (m)	231.0		1127.0			579.1
Turn Bay Length (m)		27.0		60.0	115.0	
Base Capacity (vph)	398	395	1547	1360	577	1547
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.15	0.45	0.08	0.14	0.38

Intersection Summary

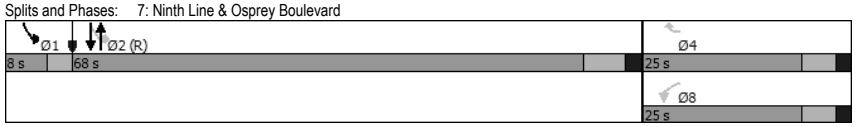
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	133	44	814	147	71	735
Future Volume (vph)	133	44	814	147	71	735
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	13.0	0.0		25.0	270.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	13.0				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1738	1526	1865	1570	1825	1847
Flt Permitted	0.950				0.204	
Satd. Flow (perm)	1738	1491	1865	1570	392	1847
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		48		72		
Link Speed (k/h)	50		70			70
Link Distance (m)	160.0		383.2			1151.0
Travel Time (s)	11.5		19.7			59.2
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	7%	3%	4%	0%	4%
Adj. Flow (vph)	145	48	885	160	77	799
Shared Lane Traffic (%)						
Lane Group Flow (vph)	145	48	885	160	77	799
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4		2	2	
Detector Phase	8	4	2	2	1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	5.0	45.0
Minimum Split (s)	22.0	23.0	52.0	52.0	8.0	52.0
Total Split (s)	25.0	25.0	68.0	68.0	8.0	68.0
Total Split (%)	24.8%	24.8%	67.3%	67.3%	7.9%	67.3%
Maximum Green (s)	19.0	19.0	61.0	61.0	5.0	61.0
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	6.0	6.0	2.0	6.0
Lead/Lag			Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	5.0	8.0	37.0	37.0		37.0
Flash Dont Walk (s)	11.0	9.0	8.0	8.0		8.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	14.7	14.7	68.0	68.0	77.7	68.0
Actuated g/C Ratio	0.15	0.15	0.67	0.67	0.77	0.67
v/c Ratio	0.58	0.19	0.70	0.15	0.19	0.64
Control Delay	48.8	12.1	15.7	4.5	4.1	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	12.1	15.7	4.5	4.1	13.5
LOS	D	B	B	A	A	B
Approach Delay	39.7		14.0			12.7
Approach LOS	D		B			B

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 15.8	Intersection LOS: B
Intersection Capacity Utilization 67.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Ninth Line & Osprey Boulevard



Queues
7: Ninth Line & Osprey Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	145	48	885	160	77	799
v/c Ratio	0.58	0.19	0.70	0.15	0.19	0.64
Control Delay	48.8	12.1	15.7	4.5	4.1	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	12.1	15.7	4.5	4.1	13.5
Queue Length 50th (m)	26.8	0.0	103.4	5.8	2.5	76.0
Queue Length 95th (m)	43.6	9.2	170.9	14.5	7.1	134.7
Internal Link Dist (m)	136.0		359.2			1127.0
Turn Bay Length (m)	13.0			25.0	270.0	
Base Capacity (vph)	344	333	1256	1080	401	1244
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.14	0.70	0.15	0.19	0.64

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Parkgate Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	14	19	754	20	32	486
Future Volume (vph)	14	19	754	20	32	486
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0	0.0		0.0	35.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				60.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.996			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1895	0	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1895	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	207.4		254.7			383.2
Travel Time (s)	14.9		13.1			19.7
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	2%
Adj. Flow (vph)	15	21	820	22	35	528
Shared Lane Traffic (%)						
Lane Group Flow (vph)	15	21	842	0	35	528
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 51.2% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Parkgate Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	19	754	20	32	486
Future Volume (Veh/h)	14	19	754	20	32	486
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	21	820	22	35	528
Pedestrians						1
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			255			383
pX, platoon unblocked	0.58	0.56			0.56	
vC, conflicting volume	1429	832			842	
vC1, stage 1 conf vol	831					
vC2, stage 2 conf vol	598					
vCu, unblocked vol	1195	300			318	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	95			95	
cM capacity (veh/h)	339	414			698	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	15	21	842	35	528
Volume Left	15	0	0	35	0
Volume Right	0	21	22	0	0
cSH	339	414	1700	698	1700
Volume to Capacity	0.04	0.05	0.50	0.05	0.31
Queue Length 95th (m)	1.1	1.2	0.0	1.2	0.0
Control Delay (s)	16.1	14.2	0.0	10.4	0.0
Lane LOS	C	B		B	
Approach Delay (s)	15.0		0.0	0.6	
Approach LOS	B				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	479	156	94	798	83	171	814	78	50	598	65
Future Volume (vph)	113	479	156	94	798	83	171	814	78	50	598	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.963				0.850		0.987			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	3463	0	1767	3650	1601	1767	1891	0	1684	1874	0
Flt Permitted	0.134			0.361			0.156			0.063		
Satd. Flow (perm)	249	3463	0	672	3650	1601	290	1891	0	112	1874	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34				98		5			5	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	1%	0%	2%	1%	0%	3%	6%	1%	1%
Adj. Flow (vph)	113	479	156	94	798	83	171	814	78	50	598	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	113	635	0	94	798	83	171	892	0	50	663	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

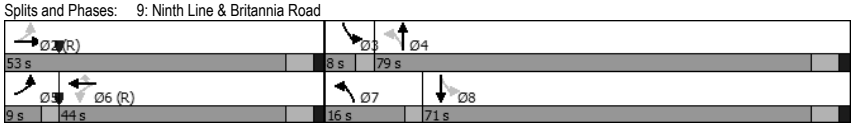
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0	12.0	5.0	12.0		5.0	12.0	
Minimum Split (s)	8.0	24.6		24.6	24.6	24.6	8.0	36.6		8.0	36.6	
Total Split (s)	9.0	53.0		44.0	44.0	44.0	16.0	79.0		8.0	71.0	
Total Split (%)	6.4%	37.9%		31.4%	31.4%	31.4%	11.4%	56.4%		5.7%	50.7%	
Maximum Green (s)	6.0	46.4		37.4	37.4	37.4	13.0	72.4		5.0	64.4	
Yellow Time (s)	3.0	4.6		4.6	4.6	4.6	3.0	4.6		3.0	4.6	
All-Red Time (s)	0.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	2.0	5.6		5.6	5.6	5.6	2.0	5.6		2.0	5.6	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0		12.0			12.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0		18.0			18.0	
Pedestrian Calls (#/hr)		0		0	0	0		0			0	
Act Effct Green (s)	55.0	51.4		41.5	41.5	41.5	81.0	71.0		72.8	63.2	
Actuated g/C Ratio	0.39	0.37		0.30	0.30	0.30	0.58	0.51		0.52	0.45	
v/c Ratio	0.62	0.49		0.47	0.74	0.15	0.58	0.93		0.40	0.78	
Control Delay	52.7	41.1		49.6	48.1	5.7	21.0	48.1		22.1	39.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	52.7	41.1		49.6	48.1	5.7	21.0	48.1		22.1	39.5	
LOS	D	D		D	D	A	C	D		C	D	
Approach Delay		42.8			44.6			43.8			38.3	
Approach LOS		D			D			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 32.2 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 42.7 — Intersection LOS: D
Intersection Capacity Utilization 97.3% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	635	94	798	83	171	892	50	663
v/c Ratio	0.62	0.49	0.47	0.74	0.15	0.58	0.93	0.40	0.78
Control Delay	52.7	41.1	49.6	48.1	5.7	21.0	48.1	22.1	39.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	41.1	49.6	48.1	5.7	21.0	48.1	22.1	39.5
Queue Length 50th (m)	26.1	81.6	22.4	109.3	0.7	19.6	214.8	5.3	143.7
Queue Length 95th (m)	#47.9	100.8	42.0	133.5	9.8	30.4	#304.1	10.8	196.6
Internal Link Dist (m)		192.7		445.7			182.5		230.7
Turn Bay Length (m)	63.0		32.0		58.0	52.0		50.0	
Base Capacity (vph)	182	1291	199	1082	543	315	993	125	884
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.49	0.47	0.74	0.15	0.54	0.90	0.40	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Freeman Terrace

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	13	13	934	22	26	792
Future Volume (vph)	13	13	934	22	26	792
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.997			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1879	0	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1879	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	491.2		170.0			206.5
Travel Time (s)	35.4		8.7			10.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	14	14	1015	24	28	861
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	14	1039	0	28	861
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.5%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Freeman Terrace

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	13	13	934	22	26	792
Future Volume (Veh/h)	13	13	934	22	26	792
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	14	1015	24	28	861
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						206
pX, platoon unblocked	0.68					
vC, conflicting volume	1944	1027			1039	
vC1, stage 1 conf vol	1027					
vC2, stage 2 conf vol	917					
vCu, unblocked vol	2157	1027			1039	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	95			96	
cM capacity (veh/h)	236	287			677	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	28	1039	28	861
Volume Left	14	0	28	0
Volume Right	14	24	0	0
cSH	473	1700	677	1700
Volume to Capacity	0.06	0.61	0.04	0.51
Queue Length 95th (m)	1.4	0.0	1.0	0.0
Control Delay (s)	19.7	0.0	10.5	0.0
Lane LOS	C		B	
Approach Delay (s)	19.7	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
11: Ninth Line & McDowell Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	8	17	1010	35	18	760
Future Volume (vph)	8	17	1010	35	18	760
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		30.0	20.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1902	1498	1825	1902
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1902	1498	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	511.9		217.0			170.0
Travel Time (s)	36.9		11.2			8.7
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	9%	0%	1%
Adj. Flow (vph)	9	18	1098	38	20	826
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	18	1098	38	20	826
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.5%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & McDowell Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	17	1010	35	18	760
Future Volume (Veh/h)	8	17	1010	35	18	760
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	18	1098	38	20	826
Pedestrians						1
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						376
pX, platoon unblocked	0.71					
vC, conflicting volume	1964	1099			1136	
vC1, stage 1 conf vol	1098					
vC2, stage 2 conf vol	866					
vCu, unblocked vol	2151	1099			1136	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	93			97	
cM capacity (veh/h)	237	261			622	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	27	1098	38	20	826
Volume Left	9	0	0	20	0
Volume Right	18	0	38	0	0
cSH	391	1700	1700	622	1700
Volume to Capacity	0.07	0.65	0.02	0.03	0.49
Queue Length 95th (m)	1.7	0.0	0.0	0.8	0.0
Control Delay (s)	20.1	0.0	0.0	11.0	0.0
Lane LOS	C			B	
Approach Delay (s)	20.1	0.0		0.3	
Approach LOS	C				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	5	1015	20	12	778
Future Volume (vph)	9	5	1015	20	12	778
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		35.0	30.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1883	1633	1825	1902
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1883	1633	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	1%
Adj. Flow (vph)	10	5	1103	22	13	846
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	5	1103	22	13	846
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.4%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	5	1015	20	12	778
Future Volume (Veh/h)	9	5	1015	20	12	778
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	5	1103	22	13	846
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1975	1103			1125	
vC1, stage 1 conf vol	1103					
vC2, stage 2 conf vol	872					
vCu, unblocked vol	1975	1103			1125	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			98	
cM capacity (veh/h)	253	259			628	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	15	1103	22	13	846
Volume Left	10	0	0	13	0
Volume Right	5	0	22	0	0
cSH	379	1700	1700	628	1700
Volume to Capacity	0.04	0.65	0.01	0.02	0.50
Queue Length 95th (m)	0.9	0.0	0.0	0.5	0.0
Control Delay (s)	19.6	0.0	0.0	10.9	0.0
Lane LOS	C			B	
Approach Delay (s)	19.6	0.0		0.2	
Approach LOS	C				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	9	1014	13	6	727
Future Volume (vph)	3	9	1014	13	6	727
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1899	0	1825	1902
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1899	0	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	3	10	1102	14	7	790
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	10	1116	0	7	790
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 64.2%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	9	1014	13	6	727
Future Volume (Veh/h)	3	9	1014	13	6	727
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	10	1102	14	7	790
Pedestrians	1					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.37	0.37			0.37	
vC, conflicting volume	1914	1110			1117	
vC1, stage 1 conf vol	1110					
vC2, stage 2 conf vol	804					
vCu, unblocked vol	2617	448			467	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	96			98	
cM capacity (veh/h)	199	228			409	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	13	1116	7	790
Volume Left	3	0	7	0
Volume Right	10	14	0	0
cSH	296	1700	409	1700
Volume to Capacity	0.04	0.66	0.02	0.46
Queue Length 95th (m)	1.0	0.0	0.4	0.0
Control Delay (s)	22.0	0.0	13.9	0.0
Lane LOS	C		B	
Approach Delay (s)	22.0	0.0	0.1	
Approach LOS	C			

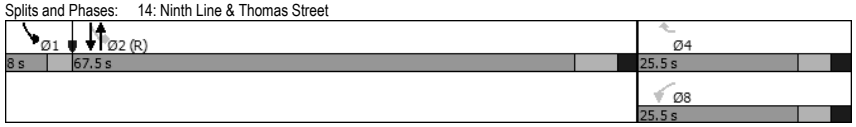
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	110	92	984	145	85	667
Future Volume (vph)	110	92	984	145	85	667
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	28.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				45.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1555	1902	1633	1807	1883
Flt Permitted	0.950				0.103	
Satd. Flow (perm)	1807	1555	1902	1607	196	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		100		74		
Link Speed (k/h)	50		70			70
Link Distance (m)	534.8		346.0			306.2
Travel Time (s)	38.5		17.8			15.7
Confl. Peds. (#/hr)				6	6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	5%	1%	0%	1%	2%
Adj. Flow (vph)	120	100	1070	158	92	725
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	100	1070	158	92	725
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4		2	2	
Detector Phase	8	4	2	2	1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	5.0	45.0
Minimum Split (s)	25.5	25.5	52.5	52.5	8.0	52.5
Total Split (s)	25.5	25.5	67.5	67.5	8.0	67.5
Total Split (%)	25.2%	25.2%	66.8%	66.8%	7.9%	66.8%
Maximum Green (s)	19.0	19.0	60.0	60.0	5.0	60.0
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.5	6.5	2.0	6.5
Lead/Lag			Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	8.0	8.0	33.0	33.0		33.0
Flash Dont Walk (s)	11.0	11.0	12.0	12.0		12.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	13.1	13.1	68.0	68.0	78.8	68.0
Actuated g/C Ratio	0.13	0.13	0.67	0.67	0.78	0.67
v/c Ratio	0.51	0.35	0.84	0.14	0.34	0.57
Control Delay	44.3	13.7	28.4	6.2	6.0	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	13.7	28.4	6.2	6.0	12.3
LOS	D	B	C	A	A	B
Approach Delay	30.4		25.6			11.6
Approach LOS	C		C			B

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 21.0	Intersection LOS: C
Intersection Capacity Utilization 76.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 14: Ninth Line & Thomas Street



Queues
14: Ninth Line & Thomas Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	120	100	1070	158	92	725
v/c Ratio	0.51	0.35	0.84	0.14	0.34	0.57
Control Delay	44.3	13.7	28.4	6.2	6.0	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	13.7	28.4	6.2	6.0	12.3
Queue Length 50th (m)	22.9	0.0	220.3	9.7	3.0	71.0
Queue Length 95th (m)	39.7	16.6	#287.2	m13.7	7.4	121.3
Internal Link Dist (m)	510.8		322.0			282.2
Turn Bay Length (m)				35.0	28.0	
Base Capacity (vph)	357	388	1280	1105	274	1267
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.26	0.84	0.14	0.34	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	6	1024	27	19	700
Future Volume (vph)	9	6	1024	27	19	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1902	1633	1825	1902
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1902	1633	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	10	7	1113	29	21	761
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	7	1113	29	21	761
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 63.9% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	6	1024	27	19	700
Future Volume (Veh/h)	9	6	1024	27	19	700
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	7	1113	29	21	761
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.77					
vC, conflicting volume	1916	1113			1142	
vC1, stage 1 conf vol	1113					
vC2, stage 2 conf vol	803					
vCu, unblocked vol	2042	1113			1142	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	97			97	
cM capacity (veh/h)	246	256			619	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	17	1113	29	21	761
Volume Left	10	0	0	21	0
Volume Right	7	0	29	0	0
cSH	419	1700	1700	619	1700
Volume to Capacity	0.04	0.65	0.02	0.03	0.45
Queue Length 95th (m)	1.0	0.0	0.0	0.8	0.0
Control Delay (s)	19.9	0.0	0.0	11.0	0.0
Lane LOS	C			B	
Approach Delay (s)	19.9	0.0		0.3	
Approach LOS	C				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	30	27	1104	71	47	765
Future Volume (vph)	30	27	1104	71	47	765
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1883	1633	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1883	1633	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	33	29	1200	77	51	832
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	29	1200	77	51	832
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 68.1%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	27	1104	71	47	765
Future Volume (Veh/h)	30	27	1104	71	47	765
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	29	1200	77	51	832
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2134	1200			1277	
vC1, stage 1 conf vol	1200					
vC2, stage 2 conf vol	934					
vCu, unblocked vol	2134	1200			1277	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	87			91	
cM capacity (veh/h)	221	228			550	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	62	1200	77	51	832
Volume Left	33	0	0	51	0
Volume Right	29	0	77	0	0
cSH	415	1700	1700	550	1700
Volume to Capacity	0.15	0.71	0.05	0.09	0.49
Queue Length 95th (m)	4.0	0.0	0.0	2.3	0.0
Control Delay (s)	23.7	0.0	0.0	12.2	0.0
Lane LOS	C			B	
Approach Delay (s)	23.7	0.0		0.7	
Approach LOS	C				

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Janice Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	6	1129	5	10	745
Future Volume (vph)	0	6	1129	5	10	745
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	70.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865		0.999			
Flt Protected					0.950	
Satd. Flow (prot)	1662	0	1900	0	1825	1883
Flt Permitted					0.950	
Satd. Flow (perm)	1662	0	1900	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	113.3		424.8			250.0
Travel Time (s)	8.2		21.8			12.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	2%
Adj. Flow (vph)	0	7	1227	5	11	810
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	0	1232	0	11	810
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 69.7%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Janice Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	6	1129	5	10	745
Future Volume (Veh/h)	0	6	1129	5	10	745
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	7	1227	5	11	810
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2062	1230			1232	
vC1, stage 1 conf vol	1230					
vC2, stage 2 conf vol	832					
vCu, unblocked vol	2062	1230			1232	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			98	
cM capacity (veh/h)	233	219			573	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	7	1232	11	810
Volume Left	0	0	11	0
Volume Right	7	5	0	0
cSH	219	1700	573	1700
Volume to Capacity	0.03	0.72	0.02	0.48
Queue Length 95th (m)	0.8	0.0	0.4	0.0
Control Delay (s)	22.0	0.0	11.4	0.0
Lane LOS	C		B	
Approach Delay (s)	22.0	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	62	1075	51	44	631
Future Volume (vph)	46	62	1075	51	44	631
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	1876	0	1825	1883
Flt Permitted	0.950				0.074	
Satd. Flow (perm)	1789	1585	1876	0	142	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		67	5			
Link Speed (k/h)	50		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	35.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	1%	18%	0%	2%
Adj. Flow (vph)	50	67	1168	55	48	686
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	67	1223	0	48	686
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

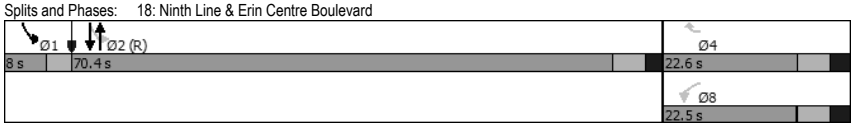
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	22.5	22.6	70.4		8.0	70.4
Total Split (%)	22.3%	22.4%	69.7%		7.9%	69.7%
Maximum Green (s)	16.0	16.1	64.4		5.0	64.4
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	5.0	8.0	50.0			50.0
Flash Dont Walk (s)	11.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	10.0	10.0	77.2		84.8	77.2
Actuated g/C Ratio	0.10	0.10	0.76		0.84	0.76
v/c Ratio	0.28	0.31	0.85		0.20	0.48
Control Delay	46.1	14.5	19.5		5.2	14.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.1	14.5	19.5		5.2	14.0
LOS	D	B	B		A	B
Approach Delay	28.0		19.5			13.4
Approach LOS	C		B			B

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 17.8 Intersection LOS: B
Intersection Capacity Utilization 75.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	50	67	1223	48	686
v/c Ratio	0.28	0.31	0.85	0.20	0.48
Control Delay	46.1	14.5	19.5	5.2	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	14.5	19.5	5.2	14.0
Queue Length 50th (m)	9.3	0.0	167.1	2.3	90.8
Queue Length 95th (m)	19.9	11.9	#316.4	m4.3	146.0
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	302	324	1434	235	1438
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.21	0.85	0.20	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Candlelight Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	11	1019	15	23	617
Future Volume (vph)	5	11	1019	15	23	617
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1899	0	1825	1902
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1899	0	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	216.6		90.1			404.2
Travel Time (s)	15.6		4.6			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	5	12	1108	16	25	671
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	12	1124	0	25	671
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 64.5%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Candlelight Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	11	1019	15	23	617
Future Volume (Veh/h)	5	11	1019	15	23	617
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	12	1108	16	25	671
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			373			
pX, platoon unblocked	0.70	0.70			0.70	
vC, conflicting volume	1837	1116			1124	
vC1, stage 1 conf vol	1116					
vC2, stage 2 conf vol	721					
vCu, unblocked vol	1983	950			961	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	95			95	
cM capacity (veh/h)	225	222			505	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	17	1124	25	671
Volume Left	5	0	25	0
Volume Right	12	16	0	0
cSH	315	1700	505	1700
Volume to Capacity	0.05	0.66	0.05	0.39
Queue Length 95th (m)	1.3	0.0	1.2	0.0
Control Delay (s)	21.9	0.0	12.5	0.0
Lane LOS	C		B	
Approach Delay (s)	21.9	0.0	0.4	
Approach LOS	C			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	1052	2	16	640
Future Volume (vph)	1	1	1052	2	16	640
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932					
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1748	0	1902	0	1825	1902
Flt Permitted	0.976				0.950	
Satd. Flow (perm)	1748	0	1902	0	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	1	1	1143	2	17	696
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1145	0	17	696
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 65.5%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	1	1052	2	16	640
Future Volume (Veh/h)	1	1	1052	2	16	640
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	1143	2	17	696
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.69	0.69			0.69	
vC, conflicting volume	1874	1144			1145	
vC1, stage 1 conf vol	1144					
vC2, stage 2 conf vol	730					
vCu, unblocked vol	2039	987			989	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			97	
cM capacity (veh/h)	217	210			491	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	2	1145	17	696
Volume Left	1	0	17	0
Volume Right	1	2	0	0
cSH	214	1700	491	1700
Volume to Capacity	0.01	0.67	0.03	0.41
Queue Length 95th (m)	0.2	0.0	0.8	0.0
Control Delay (s)	22.0	0.0	12.6	0.0
Lane LOS	C		B	
Approach Delay (s)	22.0	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Stardust Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	2	1126	5	3	651
Future Volume (vph)	0	2	1126	5	3	651
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865	0.999			
Flt Protected						
Satd. Flow (prot)	0	1662	1900	0	0	1902
Flt Permitted						
Satd. Flow (perm)	0	1662	1900	0	0	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	245.5		191.7			91.0
Travel Time (s)	17.7		9.9			4.7
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	0	2	1224	5	3	708
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2	1229	0	0	711
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 69.6%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Stardust Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	2	1126	5	3	651
Future Volume (Veh/h)	0	2	1126	5	3	651
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	1224	5	3	708
Pedestrians	1					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			192			
pX, platoon unblocked	0.69	0.69			0.69	
vC, conflicting volume	1942	1228			1225	
vC1, stage 1 conf vol	1228					
vC2, stage 2 conf vol	714					
vCu, unblocked vol	2142	1103			1100	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			99	
cM capacity (veh/h)	196	178			441	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	2	1229	711
Volume Left	0	0	3
Volume Right	2	5	0
cSH	178	1700	441
Volume to Capacity	0.01	0.72	0.01
Queue Length 95th (m)	0.3	0.0	0.2
Control Delay (s)	25.5	0.0	0.2
Lane LOS	D		A
Approach Delay (s)	25.5	0.0	0.2
Approach LOS	D		

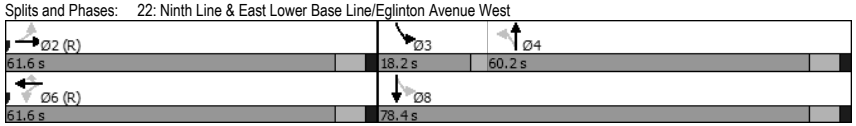
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	220	18	39	574	412	178	527	32	188	300	64
Future Volume (vph)	48	220	18	39	574	412	178	527	32	188	300	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850		0.991			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1855	0	1789	1812	1458	1825	1868	0	1807	1828	0
Flt Permitted	0.174			0.527			0.528			0.090		
Satd. Flow (perm)	334	1855	0	993	1812	1458	1014	1868	0	171	1828	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				337		3			11	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	6%	2%	6%	12%	0%	2%	1%	1%	1%	8%
Adj. Flow (vph)	52	239	20	42	624	448	193	573	35	204	326	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	259	0	42	624	448	193	608	0	204	396	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			4		3	8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	61.6	61.6		61.6	61.6	61.6	60.2	60.2		18.2	78.4	
Total Split (%)	44.0%	44.0%		44.0%	44.0%	44.0%	43.0%	43.0%		13.0%	56.0%	
Maximum Green (s)	54.6	54.6		54.6	54.6	54.6	53.2	53.2		15.2	71.4	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0			0	
Act Effct Green (s)	60.8	60.8		60.8	60.8	60.8	50.5	50.5		71.2	67.2	
Actuated g/C Ratio	0.43	0.43		0.43	0.43	0.43	0.36	0.36		0.51	0.48	
v/c Ratio	0.36	0.32		0.10	0.79	0.54	0.53	0.90		0.79	0.45	
Control Delay	38.5	28.3		26.8	44.3	10.3	40.6	59.4		49.7	24.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	38.5	28.3		26.8	44.3	10.3	40.6	59.4		49.7	24.5	
LOS	D	C		C	D	B	D	E		D	C	
Approach Delay		30.0			30.0			54.9			33.1	
Approach LOS		C			C			D			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 93.8 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 37.7	Intersection LOS: D
Intersection Capacity Utilization 93.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	259	42	624	448	193	608	204	396
v/c Ratio	0.36	0.32	0.10	0.79	0.54	0.53	0.90	0.79	0.45
Control Delay	38.5	28.3	26.8	44.3	10.3	40.6	59.4	49.7	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	28.3	26.8	44.3	10.3	40.6	59.4	49.7	24.5
Queue Length 50th (m)	9.9	47.7	7.1	153.4	19.7	40.6	152.8	33.7	66.0
Queue Length 95th (m)	24.0	71.5	15.6	#223.6	54.1	64.6	#206.3	#64.3	88.9
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	144	807	431	786	823	392	725	276	950
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.32	0.10	0.79	0.54	0.49	0.84	0.74	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	98	27	135	156	14	16	13	72	10	15	9
Future Volume (vph)	9	98	27	135	156	14	16	13	72	10	15	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.973			0.994			0.903			0.964	
Flt Protected		0.997			0.978			0.992			0.985	
Satd. Flow (prot)	0	1864	0	0	1859	0	0	1673	0	0	1824	0
Flt Permitted		0.997			0.978			0.992			0.985	
Satd. Flow (perm)	0	1864	0	0	1859	0	0	1673	0	0	1824	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	2		10	10		2	5		3	3		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	10	107	29	147	170	15	17	14	78	11	16	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	146	0	0	332	0	0	109	0	0	37	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 43.3% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	98	27	135	156	14	16	13	72	10	15	9
Future Volume (vph)	9	98	27	135	156	14	16	13	72	10	15	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	107	29	147	170	15	17	14	78	11	16	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	146	332	109	37
Volume Left (vph)	10	147	17	11
Volume Right (vph)	29	15	78	10
Hadj (s)	-0.11	0.07	-0.35	-0.10
Departure Headway (s)	4.5	4.5	4.7	5.1
Degree Utilization, x	0.18	0.42	0.14	0.05
Capacity (veh/h)	755	769	692	631
Control Delay (s)	8.6	10.7	8.5	8.3
Approach Delay (s)	8.6	10.7	8.5	8.3
Approach LOS	A	B	A	A

Intersection Summary				
Delay			9.7	
Level of Service			A	
Intersection Capacity Utilization			43.3%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	515	52	335	1482	185	47	36	160	99	37	45
Future Volume (vph)	57	515	52	335	1482	185	47	36	160	99	37	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99	1.00		0.99		0.99	1.00		0.98
Frt		0.986			0.983				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3490	0	1785	3541	0	1785	1921	1617	1785	1830	1566
Flt Permitted	0.119			0.438			0.733			0.734		
Satd. Flow (perm)	224	3490	0	818	3541	0	1362	1921	1593	1376	1830	1529
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			20				160			45
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	4		6	6		4	9		2	2		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	1%	0%	0%	1%	0%	5%	2%
Adj. Flow (vph)	57	515	52	335	1482	185	47	36	160	99	37	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	567	0	335	1667	0	47	36	160	99	37	45
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

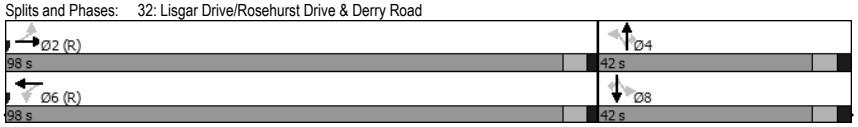
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	98.0	98.0		98.0	98.0		42.0	42.0	42.0	42.0	42.0	42.0
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Maximum Green (s)	92.0	92.0		92.0	92.0		35.4	35.4	35.4	35.4	35.4	35.4
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	113.0	113.0		113.0	113.0		16.4	16.4	16.4	16.4	16.4	16.4
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.12	0.12	0.12	0.12	0.12	0.12
v/c Ratio	0.32	0.20		0.51	0.58		0.30	0.16	0.49	0.61	0.17	0.21
Control Delay	7.0	1.7		8.3	6.3		59.3	54.8	12.7	74.0	55.2	16.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	1.7		8.3	6.3		59.3	54.8	12.7	74.0	55.2	16.2
LOS	A	A		A	A		E	D	B	E	E	B
Approach Delay		2.2			6.6			28.0			55.8	
Approach LOS		A			A			C			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 113.4 (81%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 10.3 Intersection LOS: B
Intersection Capacity Utilization 85.8% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	567	335	1667	47	36	160	99	37	45
v/c Ratio	0.32	0.20	0.51	0.58	0.30	0.16	0.49	0.61	0.17	0.21
Control Delay	7.0	1.7	8.3	6.3	59.3	54.8	12.7	74.0	55.2	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	1.7	8.3	6.3	59.3	54.8	12.7	74.0	55.2	16.2
Queue Length 50th (m)	1.6	7.5	25.1	72.6	12.1	9.1	0.0	26.5	9.4	0.0
Queue Length 95th (m)	3.7	10.5	55.4	111.7	23.7	18.8	19.5	43.7	19.3	11.1
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	180	2819	660	2860	354	499	532	357	475	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.20	0.51	0.58	0.13	0.07	0.30	0.28	0.08	0.10

Intersection Summary

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	118	56	92	111	133	43	60	86	142	93	46
Future Volume (vph)	43	118	56	92	111	133	43	60	86	142	93	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.952			0.918			0.939			0.978	
Flt Protected	0.950			0.950				0.989			0.975	
Satd. Flow (prot)	1738	1627	0	1772	1643	0	0	1596	0	0	1668	0
Flt Permitted	0.950			0.950				0.989			0.975	
Satd. Flow (perm)	1738	1627	0	1772	1643	0	0	1596	0	0	1668	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	12		31	31		12	39		40	40		39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	14%	9%	3%	9%	6%	9%	22%	6%	6%	15%	11%
Adj. Flow (vph)	47	128	61	100	121	145	47	65	93	154	101	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	189	0	100	266	0	0	205	0	0	305	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 59.7%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	43	118	56	92	111	133	43	60	86	142	93	46
Future Volume (vph)	43	118	56	92	111	133	43	60	86	142	93	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	128	61	100	121	145	47	65	93	154	101	50

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	47	189	100	266	205	305
Volume Left (vph)	47	0	100	0	47	154
Volume Right (vph)	0	61	0	145	93	50
Hadj (s)	0.58	-0.02	0.55	-0.26	-0.03	0.17
Departure Headway (s)	7.5	6.9	7.2	6.4	6.3	6.3
Degree Utilization, x	0.10	0.36	0.20	0.47	0.36	0.53
Capacity (veh/h)	443	475	470	524	513	538
Control Delay (s)	10.1	12.4	10.8	13.8	12.9	16.2
Approach Delay (s)	12.0		13.0		12.9	16.2
Approach LOS	B		B		B	C

Intersection Summary			
Delay		13.6	
Level of Service		B	
Intersection Capacity Utilization		59.7%	ICU Level of Service B
Analysis Period (min)		15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Future Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.907			0.940			0.953	
Flt Protected		0.979			0.996			0.986			0.971	
Satd. Flow (prot)	0	1814	0	0	1735	0	0	1781	0	0	1683	0
Flt Permitted		0.979			0.996			0.986			0.971	
Satd. Flow (perm)	0	1814	0	0	1735	0	0	1781	0	0	1683	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	10		4	4		10	1		46	46		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	6%
Adj. Flow (vph)	46	55	5	12	34	102	5	5	8	117	12	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	106	0	0	148	0	0	18	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 40.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Future Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	55	5	12	34	102	5	5	8	117	12	70

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	106	148	18	199
Volume Left (vph)	46	12	5	117
Volume Right (vph)	5	102	8	70
Hadj (s)	0.11	-0.40	-0.21	0.00
Departure Headway (s)	4.7	4.2	4.5	4.5
Degree Utilization, x	0.14	0.17	0.02	0.25
Capacity (veh/h)	718	813	736	754
Control Delay (s)	8.4	8.0	7.6	9.0
Approach Delay (s)	8.4	8.0	7.6	9.0
Approach LOS	A	A	A	A

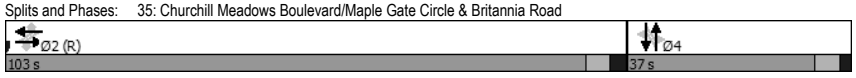
Intersection Summary			
Delay	8.5		
Level of Service	A		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	552	32	219	943	78	35	15	102	30	11	7
Future Volume (vph)	16	552	32	219	943	78	35	15	102	30	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.97	1.00	0.99		1.00	0.99	
Frt			0.850			0.850		0.869			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3614	1597	1552	3650	1581	1733	1645	0	1785	1746	0
Flt Permitted	0.297			0.446			0.746			0.443		
Satd. Flow (perm)	557	3614	1597	729	3650	1535	1356	1645	0	829	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			32			51		102			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			97.9			114.1			106.4	
Travel Time (s)		28.2			5.9			8.2			7.7	
Confl. Peds. (#/hr)	4					4	2		3	3		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	0%	1%	3%	0%	0%	0%	5%	0%
Adj. Flow (vph)	16	552	32	219	943	78	35	15	102	30	11	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	552	32	219	943	78	35	117	0	30	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Detector Phase	2	2	2	2	2	2	4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	31.2	31.2		31.2	31.2	
Total Split (s)	103.0	103.0	103.0	103.0	103.0	103.0	37.0	37.0		37.0	37.0	
Total Split (%)	73.6%	73.6%	73.6%	73.6%	73.6%	73.6%	26.4%	26.4%		26.4%	26.4%	
Maximum Green (s)	96.0	96.0	96.0	96.0	96.0	96.0	30.8	30.8		30.8	30.8	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	5.2	5.2		5.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)	11.0	11.0	11.0	11.0	11.0	11.0	10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0	15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	118.0	118.0	118.0	118.0	118.0	118.0	10.8	10.8		10.8	10.8	
Actuated g/C Ratio	0.84	0.84	0.84	0.84	0.84	0.84	0.08	0.08		0.08	0.08	
v/c Ratio	0.03	0.18	0.02	0.36	0.31	0.06	0.34	0.53		0.47	0.13	
Control Delay	0.9	0.9	0.1	4.4	2.7	1.0	69.3	23.7		85.0	44.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	0.9	0.9	0.1	4.4	2.7	1.0	69.3	23.7		85.0	44.2	
LOS	A	A	A	A	A	A	E	C		F	D	
Approach Delay		0.9			2.9			34.2			69.7	
Approach LOS		A			A			C			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 1.4 (1%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 6.2	Intersection LOS: A
Intersection Capacity Utilization 60.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	552	32	219	943	78	35	117	30	18
v/c Ratio	0.03	0.18	0.02	0.36	0.31	0.06	0.34	0.53	0.47	0.13
Control Delay	0.9	0.9	0.1	4.4	2.7	1.0	69.3	23.7	85.0	44.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.9	0.9	0.1	4.4	2.7	1.0	69.3	23.7	85.0	44.2
Queue Length 50th (m)	0.2	3.9	0.2	10.1	21.5	0.9	9.4	4.0	8.2	2.9
Queue Length 95th (m)	m0.5	m5.6	m0.0	21.9	33.0	3.7	20.4	22.5	18.8	10.6
Internal Link Dist (m)		445.7			73.9			90.1		82.4
Turn Bay Length (m)	33.0		22.0	35.0		22.0	21.0		19.0	
Base Capacity (vph)	469	3046	1351	614	3076	1301	308	452	188	402
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.18	0.02	0.36	0.31	0.06	0.11	0.26	0.16	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	9	8	9	7	12	12	136	15	18	178	15
Future Volume (vph)	12	9	8	9	7	12	12	136	15	18	178	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.962			0.943			0.988			0.991	
Flt Protected		0.980			0.984			0.996			0.996	
Satd. Flow (prot)	0	1747	0	0	1720	0	0	1853	0	0	1871	0
Flt Permitted		0.980			0.984			0.996			0.996	
Satd. Flow (perm)	0	1747	0	0	1720	0	0	1853	0	0	1871	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)	6		3	3		6	11		10	10		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	13%	0%	14%	0%	0%	1%	13%	0%	1%	7%
Adj. Flow (vph)	13	10	9	10	8	13	13	148	16	20	193	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	31	0	0	177	0	0	229	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	9	8	9	7	12	12	136	15	18	178	15
Future Volume (Veh/h)	12	9	8	9	7	12	12	136	15	18	178	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	10	9	10	8	13	13	148	16	20	193	16
Pedestrians		11			10			3			6	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	457	452	215	450	452	172	220			174		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	457	452	215	450	452	172	220			174		
tC, single (s)	7.1	6.5	6.3	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	97	98	99	98	98	98	99			99		
cM capacity (veh/h)	480	485	789	487	466	865	1348			1403		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	32	31	177	229
Volume Left	13	10	13	20
Volume Right	9	13	16	16
cSH	541	588	1348	1403
Volume to Capacity	0.06	0.05	0.01	0.01
Queue Length 95th (m)	1.4	1.3	0.2	0.3
Control Delay (s)	12.1	11.5	0.6	0.8
Lane LOS	B	B	A	A
Approach Delay (s)	12.1	11.5	0.6	0.8
Approach LOS	B	B		

Intersection Summary				
Average Delay		2.2		
Intersection Capacity Utilization		27.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	57	23	69	77	24	16	119	62	17	82	22
Future Volume (vph)	10	57	23	69	77	24	16	119	62	17	82	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.966			0.981			0.958			0.975	
Flt Protected		0.994			0.980			0.996			0.993	
Satd. Flow (prot)	0	1598	0	0	1727	0	0	1725	0	0	1776	0
Flt Permitted		0.994			0.980			0.996			0.993	
Satd. Flow (perm)	0	1598	0	0	1727	0	0	1725	0	0	1776	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	20		92	92		20	33		36	36		33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	19%	9%	6%	10%	0%	6%	7%	5%	0%	7%	0%
Adj. Flow (vph)	11	62	25	75	84	26	17	129	67	18	89	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	98	0	0	185	0	0	213	0	0	131	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	57	23	69	77	24	16	119	62	17	82	22
Future Volume (vph)	10	57	23	69	77	24	16	119	62	17	82	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	62	25	75	84	26	17	129	67	18	89	24

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	98	185	213	131
Volume Left (vph)	11	75	17	18
Volume Right (vph)	25	26	67	24
Hadj (s)	0.13	0.12	-0.07	0.00
Departure Headway (s)	5.2	5.0	4.8	4.9
Degree Utilization, x	0.14	0.26	0.28	0.18
Capacity (veh/h)	636	668	713	675
Control Delay (s)	9.0	9.7	9.6	9.0
Approach Delay (s)	9.0	9.7	9.6	9.0
Approach LOS	A	A	A	A

Intersection Summary				
Delay			9.4	
Level of Service			A	
Intersection Capacity Utilization			36.8%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	145	17	114	272	204	7	71	27	109	70	26
Future Volume (vph)	26	145	17	114	272	204	7	71	27	109	70	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		0.99	0.97		0.99	0.99		0.97	0.99	
Frt		0.985			0.936			0.959			0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3456	0	1789	3241	0	1601	1638	0	1789	1692	0
Flt Permitted	0.424			0.641			0.690			0.689		
Satd. Flow (perm)	764	3456	0	1189	3241	0	1155	1638	0	1255	1692	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			222			27			26	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	2%	18%	2%	2%	2%	14%	11%	11%	2%	6%	15%
Adj. Flow (vph)	28	158	18	124	296	222	8	77	29	118	76	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	176	0	124	518	0	8	106	0	118	104	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	46.0	46.0		46.0	46.0		55.0	55.0		55.0	55.0	
Total Split (%)	45.5%	45.5%		45.5%	45.5%		54.5%	54.5%		54.5%	54.5%	
Maximum Green (s)	39.5	39.5		39.5	39.5		49.0	49.0		49.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.5	48.5		48.5	48.5		42.0	42.0		42.0	42.0	
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.42	0.42		0.42	0.42	
v/c Ratio	0.08	0.11		0.22	0.31		0.02	0.15		0.23	0.14	
Control Delay	15.1	13.1		16.5	9.3		17.6	14.3		20.5	14.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.1	13.1		16.5	9.3		17.6	14.3		20.5	14.3	
LOS	B	B		B	A		B	B		C	B	
Approach Delay		13.4			10.7			14.5			17.6	
Approach LOS		B			B			B			B	

Intersection Summary

Area Type:	Other
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 12.8	Intersection LOS: B
Intersection Capacity Utilization 74.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	176	124	518	8	106	118	104
v/c Ratio	0.08	0.11	0.22	0.31	0.02	0.15	0.23	0.14
Control Delay	15.1	13.1	16.5	9.3	17.6	14.3	20.5	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.1	13.1	16.5	9.3	17.6	14.3	20.5	14.3
Queue Length 50th (m)	2.3	6.8	13.6	16.8	0.9	9.3	14.6	9.1
Queue Length 95th (m)	6.9	12.7	25.0	27.2	3.7	19.7	27.1	19.5
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	366	1666	570	1671	571	824	621	850
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.11	0.22	0.31	0.01	0.13	0.19	0.12

Intersection Summary

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	33	7	29	57	35	17	96	26	22	114	13
Future Volume (vph)	8	33	7	29	57	35	17	96	26	22	114	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.980			0.961			0.975			0.988	
Flt Protected		0.992			0.988			0.994			0.993	
Satd. Flow (prot)	0	1757	0	0	1717	0	0	1707	0	0	1716	0
Flt Permitted		0.992			0.988			0.994			0.993	
Satd. Flow (perm)	0	1757	0	0	1717	0	0	1707	0	0	1716	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	14		19	19		14	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	6%	0%	3%	5%	11%	6%	11%	4%	5%	11%	8%
Adj. Flow (vph)	9	36	8	32	62	38	18	104	28	24	124	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	0	0	132	0	0	150	0	0	162	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	33	7	29	57	35	17	96	26	22	114	13
Future Volume (vph)	8	33	7	29	57	35	17	96	26	22	114	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	36	8	32	62	38	18	104	28	24	124	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	53	132	150	162
Volume Left (vph)	9	32	18	24
Volume Right (vph)	8	38	28	14
Hadj (s)	0.05	-0.02	0.07	0.15
Departure Headway (s)	4.9	4.7	4.6	4.7
Degree Utilization, x	0.07	0.17	0.19	0.21
Capacity (veh/h)	676	711	739	727
Control Delay (s)	8.3	8.7	8.7	8.9
Approach Delay (s)	8.3	8.7	8.7	8.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay		8.7	
Level of Service		A	
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)		15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	68	15	40	81	26	35	142	54	24	111	35
Future Volume (vph)	18	68	15	40	81	26	35	142	54	24	111	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.980			0.976			0.968			0.972	
Flt Protected		0.991			0.987			0.992			0.993	
Satd. Flow (prot)	0	1665	0	0	1776	0	0	1769	0	0	1756	0
Flt Permitted		0.991			0.987			0.992			0.993	
Satd. Flow (perm)	0	1665	0	0	1776	0	0	1769	0	0	1756	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	12%	0%	0%	5%	8%	9%	4%	2%	8%	4%	9%
Adj. Flow (vph)	20	74	16	43	88	28	38	154	59	26	121	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	110	0	0	159	0	0	251	0	0	185	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	68	15	40	81	26	35	142	54	24	111	35
Future Volume (vph)	18	68	15	40	81	26	35	142	54	24	111	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	74	16	43	88	28	38	154	59	26	121	38

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	110	159	251	185
Volume Left (vph)	20	43	38	26
Volume Right (vph)	16	28	59	38
Hadj (s)	0.15	0.02	-0.04	0.00
Departure Headway (s)	5.4	5.2	4.8	5.0
Degree Utilization, x	0.16	0.23	0.34	0.26
Capacity (veh/h)	601	632	702	672
Control Delay (s)	9.5	9.7	10.3	9.7
Approach Delay (s)	9.5	9.7	10.3	9.7
Approach LOS	A	A	B	A

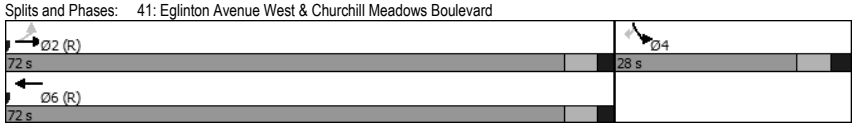
Intersection Summary			
Delay	9.9		
Level of Service	A		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	611	1581	191	123	8
Future Volume (vph)	13	611	1581	191	123	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			1.00			
Frt			0.984			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1690	3579	3544	0	1789	1089
Flt Permitted	0.072				0.950	
Satd. Flow (perm)	128	3579	3544	0	1789	1089
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			28			7
Link Speed (k/h)		50	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		36.2	10.0		13.9	
Confl. Peds. (#/hr)	4			4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	2%	1%	1%	2%	50%
Adj. Flow (vph)	13	611	1581	191	123	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	611	1772	0	123	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.5	25.5
Total Split (s)	72.0	72.0	72.0		28.0	28.0
Total Split (%)	72.0%	72.0%	72.0%		28.0%	28.0%
Maximum Green (s)	66.0	66.0	66.0		21.5	21.5
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	67.0	67.0	67.0		22.5	22.5
Actuated g/C Ratio	0.67	0.67	0.67		0.22	0.22
v/c Ratio	0.15	0.25	0.74		0.31	0.03
Control Delay	11.0	6.9	13.1		34.8	19.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	11.0	6.9	13.1		34.8	19.1
LOS	B	A	B		C	B
Approach Delay		7.0	13.1		33.8	
Approach LOS		A	B		C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 12.7		Intersection LOS: B	
Intersection Capacity Utilization 65.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	13	611	1772	123	8
v/c Ratio	0.15	0.25	0.74	0.31	0.03
Control Delay	11.0	6.9	13.1	34.8	19.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	6.9	13.1	34.8	19.1
Queue Length 50th (m)	0.8	22.1	104.4	20.0	0.2
Queue Length 95th (m)	3.8	29.4	130.7	35.7	3.9
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	85	2397	2383	402	250
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.15	0.25	0.74	0.31	0.03

Intersection Summary

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	377	944	0	167	31
Future Volume (vph)	0	377	944	0	167	31
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3935	3975	0	1987	1726
Flt Permitted					0.950	
Satd. Flow (perm)	0	3935	3975	0	1987	1726
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (k/h)		60	60		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		12.4	17.9		15.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	0%	2%	0%	3%
Adj. Flow (vph)	0	419	1049	0	186	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	419	1049	0	186	34
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

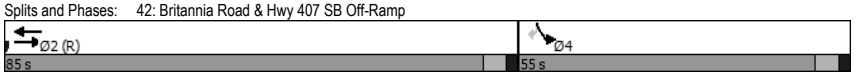
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		85.0	85.0		55.0	55.0
Total Split (%)		60.7%	60.7%		39.3%	39.3%
Maximum Green (s)		79.0	79.0		49.0	49.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		109.4	109.4		18.6	18.6
Actuated g/C Ratio		0.78	0.78		0.13	0.13
v/c Ratio		0.14	0.34		0.71	0.15
Control Delay		4.2	16.3		72.1	52.9
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		4.2	16.3		72.1	52.9
LOS		A	B		E	D
Approach Delay		4.2	16.3		69.1	
Approach LOS		A	B		E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 20.2 Intersection LOS: C
Intersection Capacity Utilization 42.5% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	419	1049	186	34
v/c Ratio	0.14	0.34	0.71	0.15
Control Delay	4.2	16.3	72.1	52.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.2	16.3	72.1	52.9
Queue Length 50th (m)	12.8	115.1	50.0	8.5
Queue Length 95th (m)	21.1	142.5	71.9	18.1
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3074	3106	695	604
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.14	0.34	0.27	0.06

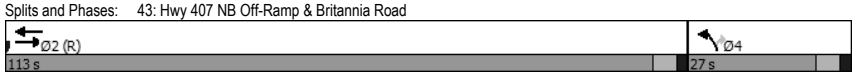
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	496	0	0	960	73	110
Future Volume (vph)	496	0	0	960	73	110
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3935	0	0	3975	1987	1778
Flt Permitted					0.950	
Satd. Flow (perm)	3935	0	0	3975	1987	1778
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	17.9			13.0	11.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	0%	0%	0%
Adj. Flow (vph)	551	0	0	1067	81	122
Shared Lane Traffic (%)						
Lane Group Flow (vph)	551	0	0	1067	81	122
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	113.0			113.0	27.0	27.0
Total Split (%)	80.7%			80.7%	19.3%	19.3%
Maximum Green (s)	107.0			107.0	21.0	21.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	113.1			113.1	14.9	14.9
Actuated g/C Ratio	0.81			0.81	0.11	0.11
v/c Ratio	0.17			0.33	0.39	0.65
Control Delay	7.4			2.3	62.4	75.2
Queue Delay	0.0			0.1	0.0	0.0
Total Delay	7.4			2.4	62.4	75.2
LOS	A			A	E	E
Approach Delay	7.4			2.4	70.1	
Approach LOS	A			A	E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 42.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	551	1067	81	122
v/c Ratio	0.17	0.33	0.39	0.65
Control Delay	7.4	2.3	62.4	75.2
Queue Delay	0.0	0.1	0.0	0.0
Total Delay	7.4	2.4	62.4	75.2
Queue Length 50th (m)	34.5	16.9	21.2	33.0
Queue Length 95th (m)	50.0	21.3	36.2	51.9
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3180	3212	298	266
Starvation Cap Reductn	0	822	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.45	0.27	0.46

Intersection Summary

Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	516	1684	0	226	434
Future Volume (vph)	0	516	1684	0	226	434
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3935	3975	0	3817	1778
Flt Permitted					0.950	
Satd. Flow (perm)	0	3935	3975	0	3817	1778
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						34
Link Speed (k/h)		60	60		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		20.0	18.5		13.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%
Adj. Flow (vph)	0	549	1791	0	240	462
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	549	1791	0	240	462
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

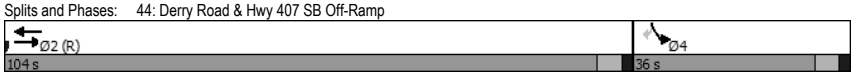
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		104.0	104.0		36.0	36.0
Total Split (%)		74.3%	74.3%		25.7%	25.7%
Maximum Green (s)		98.0	98.0		30.0	30.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	-2.9
Total Lost Time (s)		6.0	6.0		6.0	3.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		98.0	98.0		30.0	32.9
Actuated g/C Ratio		0.70	0.70		0.21	0.24
v/c Ratio		0.20	0.64		0.29	1.04
Control Delay		7.5	3.7		47.3	101.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		7.5	3.7		47.3	101.8
LOS		A	A		D	F
Approach Delay		7.5	3.7		83.2	
Approach LOS		A	A		F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 22.7 Intersection LOS: C
Intersection Capacity Utilization 75.8% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	549	1791	240	462
v/c Ratio	0.20	0.64	0.29	1.04
Control Delay	7.5	3.7	47.3	101.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.5	3.7	47.3	101.8
Queue Length 50th (m)	25.5	26.7	28.9	~130.4
Queue Length 95th (m)	32.3	35.4	41.1	#197.4
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	2754	2782	817	443
Starvation Cap Reductn	0	44	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.20	0.65	0.29	1.04

Intersection Summary

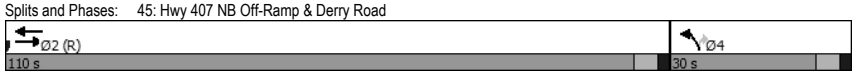
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	689	0	0	1668	104	123
Future Volume (vph)	689	0	0	1668	104	123
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						0.99
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3935	0	0	3935	3856	1743
Flt Permitted					0.950	
Satd. Flow (perm)	3935	0	0	3935	3856	1719
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						129
Link Speed (k/h)	60			60	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	18.5			13.8	15.5	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	2%	1%	0%	2%
Adj. Flow (vph)	725	0	0	1756	109	129
Shared Lane Traffic (%)						
Lane Group Flow (vph)	725	0	0	1756	109	129
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	110.0			110.0	30.0	30.0
Total Split (%)	78.6%			78.6%	21.4%	21.4%
Maximum Green (s)	104.0			104.0	24.0	24.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	118.4			118.4	9.6	9.6
Actuated g/C Ratio	0.85			0.85	0.07	0.07
v/c Ratio	0.22			0.53	0.41	0.54
Control Delay	2.3			1.4	67.0	18.6
Queue Delay	0.0			0.3	0.0	0.0
Total Delay	2.3			1.6	67.0	18.6
LOS	A			A	E	B
Approach Delay	2.3			1.6	40.8	
Approach LOS	A			A	D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 5.3		Intersection LOS: A	
Intersection Capacity Utilization 75.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	725	1756	109	129
v/c Ratio	0.22	0.53	0.41	0.54
Control Delay	2.3	1.4	67.0	18.6
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	2.3	1.6	67.0	18.6
Queue Length 50th (m)	7.0	6.6	15.2	0.0
Queue Length 95th (m)	25.7	9.0	24.5	19.7
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3329	3329	661	401
Starvation Cap Reductn	0	771	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.22	0.69	0.16	0.32

Intersection Summary

Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	727	690	1118	0	0	1205
Future Volume (vph)	727	690	1118	0	0	1205
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Ped Bike Factor	1.00					
Frt	0.963	0.850				
Flt Protected	0.964					
Satd. Flow (prot)	3740	1571	3822	0	0	3859
Flt Permitted	0.964					
Satd. Flow (perm)	3735	1571	3822	0	0	3859
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	36	67				
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	4%	1%	0%	3%
Adj. Flow (vph)	765	726	1177	0	0	1268
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	1019	472	1177	0	0	1268
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				

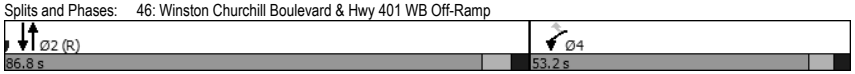
Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	53.2	53.2	86.8			86.8
Total Split (%)	38.0%	38.0%	62.0%			62.0%
Maximum Green (s)	46.2	46.2	78.8			78.8
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	43.3	43.3	81.7			81.7
Actuated g/C Ratio	0.31	0.31	0.58			0.58
v/c Ratio	0.86	0.89	0.53			0.56
Control Delay	52.2	58.6	17.8			19.8
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	52.2	58.6	17.8			19.8
LOS	D	E	B			B
Approach Delay	54.2		17.8			19.8
Approach LOS	D		B			B

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 49 (35%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 32.2	Intersection LOS: C
Intersection Capacity Utilization 68.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1019	472	1177	1268
v/c Ratio	0.86	0.89	0.53	0.56
Control Delay	52.2	58.6	17.8	19.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.2	58.6	17.8	19.8
Queue Length 50th (m)	128.7	116.7	121.5	115.8
Queue Length 95th (m)	154.7	#179.0	142.1	136.1
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1258	563	2230	2252
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.81	0.84	0.53	0.56

Intersection Summary

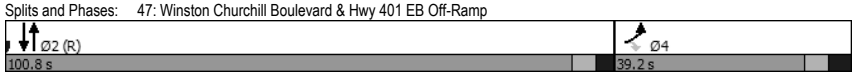
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	271	296	0	1209	1708	0
Future Volume (vph)	271	296	0	1209	1708	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.955	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3457	1586	0	5545	5599	0
Flt Permitted	0.966					
Satd. Flow (perm)	3457	1586	0	5545	5599	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	27	27				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	2%	0%	3%	2%	7%
Adj. Flow (vph)	291	318	0	1300	1837	0
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	415	194	0	1300	1837	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	39.2	39.2		100.8	100.8	
Total Split (%)	28.0%	28.0%		72.0%	72.0%	
Maximum Green (s)	31.2	31.2		93.8	93.8	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	21.7	21.7		103.3	103.3	
Actuated g/C Ratio	0.16	0.16		0.74	0.74	
v/c Ratio	0.74	0.72		0.32	0.44	
Control Delay	60.8	63.3		6.9	4.4	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	60.8	63.3		6.9	4.4	
LOS	E	E		A	A	
Approach Delay	61.6			6.9	4.4	
Approach LOS	E			A	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 32.2 (23%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 54.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	415	194	1300	1837
v/c Ratio	0.74	0.72	0.32	0.44
Control Delay	60.8	63.3	6.9	4.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	60.8	63.3	6.9	4.4
Queue Length 50th (m)	53.9	49.4	39.5	33.4
Queue Length 95th (m)	67.1	73.9	57.3	57.6
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	791	374	4091	4131
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.52	0.32	0.44

Intersection Summary

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	692	1035	1510	0	0	1450
Future Volume (vph)	692	1035	1510	0	0	1450
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.91
Frt	0.942	0.850				
Flt Protected	0.970					
Satd. Flow (prot)	3694	1602	3935	0	0	5655
Flt Permitted	0.970					
Satd. Flow (perm)	3694	1602	3935	0	0	5655
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	12	12				
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Peak Hour Factor	0.89	0.96	0.93	0.93	0.89	0.89
Heavy Vehicles (%)	0%	1%	1%	0%	0%	1%
Adj. Flow (vph)	778	1078	1624	0	0	1629
Shared Lane Traffic (%)		45%				
Lane Group Flow (vph)	1263	593	1624	0	0	1629
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

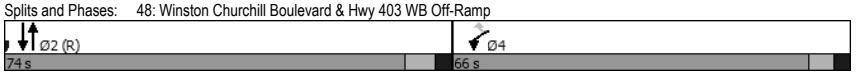
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	66.0	66.0	74.0			74.0
Total Split (%)	47.1%	47.1%	52.9%			52.9%
Maximum Green (s)	59.0	59.0	66.0			66.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	-2.9	-2.9			0.0
Total Lost Time (s)	7.0	4.1	5.1			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	56.1	59.0	71.8			68.9
Actuated g/C Ratio	0.40	0.42	0.51			0.49
v/c Ratio	0.85	0.87	0.80			0.59
Control Delay	43.9	50.6	37.3			26.9
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	43.9	50.6	37.3			26.9
LOS	D	D	D			C
Approach Delay	46.1		37.3			26.9
Approach LOS	D		D			C

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 2.8 (2%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 37.2 — Intersection LOS: D
Intersection Capacity Utilization 85.2% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1263	593	1624	1629
v/c Ratio	0.85	0.87	0.80	0.59
Control Delay	43.9	50.6	37.3	26.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	43.9	50.6	37.3	26.9
Queue Length 50th (m)	155.0	154.0	200.3	120.3
Queue Length 95th (m)	179.8	#213.2	242.4	133.3
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1563	715	2018	2783
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.81	0.83	0.80	0.59

Intersection Summary

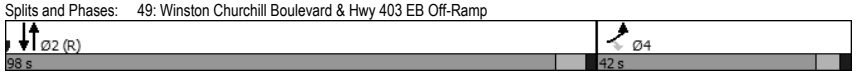
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	323	128	0	1467	1693	0
Future Volume (vph)	323	128	0	1467	1693	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.95	1.00
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3817	1726	0	5655	3935	0
Flt Permitted	0.950					
Satd. Flow (perm)	3817	1726	0	5655	3935	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		22				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	3%	0%	1%	1%	0%
Adj. Flow (vph)	355	141	0	1612	1860	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	355	141	0	1612	1860	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	42.0	42.0		98.0	98.0	
Total Split (%)	30.0%	30.0%		70.0%	70.0%	
Maximum Green (s)	36.0	36.0		91.0	91.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	18.4	18.4		108.6	108.6	
Actuated g/C Ratio	0.13	0.13		0.78	0.78	
v/c Ratio	0.71	0.58		0.37	0.61	
Control Delay	66.2	57.1		5.4	16.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	66.2	57.1		5.4	16.9	
LOS	E	E		A	B	
Approach Delay	63.6			5.4	16.9	
Approach LOS	E			A	B	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 81.2 (58%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 18.1	Intersection LOS: B
Intersection Capacity Utilization 85.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	355	141	1612	1860
v/c Ratio	0.71	0.58	0.37	0.61
Control Delay	66.2	57.1	5.4	16.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	66.2	57.1	5.4	16.9
Queue Length 50th (m)	49.2	31.4	44.3	167.4
Queue Length 95th (m)	63.4	51.8	58.6	194.0
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	981	460	4388	3053
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.31	0.37	0.61

Intersection Summary

Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1198	1174	0	329	939
Future Volume (vph)	0	1198	1174	0	329	939
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Ped Bike Factor						
Frt					0.912	0.850
Flt Protected					0.980	
Satd. Flow (prot)	0	5338	5599	0	3412	1571
Flt Permitted					0.980	
Satd. Flow (perm)	0	5338	5599	0	3412	1571
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					46	46
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	134.9		263.0	
Travel Time (s)		5.7	8.1		15.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	7%	2%	0%	11%	3%
Adj. Flow (vph)	0	1222	1198	0	336	958
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	0	1222	1198	0	815	479
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		78.4	78.4		61.6	61.6
Total Split (%)		56.0%	56.0%		44.0%	44.0%
Maximum Green (s)		71.4	71.4		55.6	55.6
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			

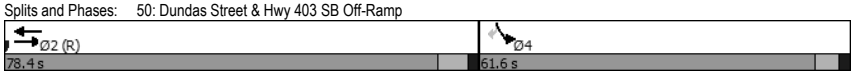
Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Act Effct Green (s)		71.4	71.4		55.6	55.6
Actuated g/C Ratio		0.51	0.51		0.40	0.40
v/c Ratio		0.45	0.42		0.59	0.74
Control Delay		22.5	36.1		33.3	40.3
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		22.5	36.1		33.3	40.3
LOS		C	D		C	D
Approach Delay		22.5	36.1		35.9	
Approach LOS		C	D		D	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 4.2 (3%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 31.5	Intersection LOS: C
Intersection Capacity Utilization 67.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1222	1198	815	479
v/c Ratio	0.45	0.42	0.59	0.74
Control Delay	22.5	36.1	33.3	40.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	22.5	36.1	33.3	40.3
Queue Length 50th (m)	76.6	93.3	85.7	112.4
Queue Length 95th (m)	88.6	110.4	106.0	160.3
Internal Link Dist (m)	70.5	110.9	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	2722	2855	1382	651
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.42	0.59	0.74

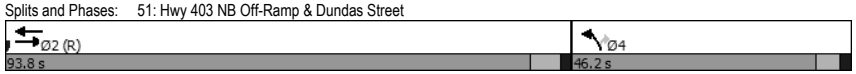
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1093	0	0	1426	66	477
Future Volume (vph)	1093	0	0	1426	66	477
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Frt					0.882	0.850
Flt Protected					0.989	
Satd. Flow (prot)	5491	0	0	5655	3471	1586
Flt Permitted					0.989	
Satd. Flow (perm)	5491	0	0	5655	3471	1586
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					98	98
Link Speed (k/h)	60			60	60	
Link Distance (m)	126.9			304.9	234.1	
Travel Time (s)	7.6			18.3	14.0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	4%	0%	0%	1%	2%	2%
Adj. Flow (vph)	1127	0	0	1470	68	492
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	1127	0	0	1470	314	246
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	93.8			93.8	46.2	46.2
Total Split (%)	67.0%			67.0%	33.0%	33.0%
Maximum Green (s)	86.8			86.8	40.2	40.2
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	86.8			86.8	40.2	40.2
Actuated g/C Ratio	0.62			0.62	0.29	0.29

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
v/c Ratio	0.33			0.42	0.29	0.47
Control Delay	10.7			14.1	27.1	27.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.7			14.1	27.1	27.4
LOS	B			B	C	C
Approach Delay	10.7			14.1	27.2	
Approach LOS	B			B	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 43.4 (31%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 40	
Control Type: Pretimed	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 67.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street



Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1127	1470	314	246
v/c Ratio	0.33	0.42	0.29	0.47
Control Delay	10.7	14.1	27.1	27.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.7	14.1	27.1	27.4
Queue Length 50th (m)	71.7	72.4	23.5	36.4
Queue Length 95th (m)	87.8	82.1	36.1	64.9
Internal Link Dist (m)	102.9	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	3404	3506	1066	525
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.42	0.29	0.47

Intersection Summary

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	196	149	484	53	19	407
Future Volume (vph)	196	149	484	53	19	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	1883	1601	1789	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	1883	1601	1789	1883
Link Speed (k/h)	48		70			70
Link Distance (m)	273.4		780.0			514.0
Travel Time (s)	20.5		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	196	149	484	53	19	407
Shared Lane Traffic (%)						
Lane Group Flow (vph)	196	149	484	53	19	407
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 43.0% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
52: Ninth Line & Argentia Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	196	149	484	53	19	407
Future Volume (Veh/h)	196	149	484	53	19	407
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	196	149	484	53	19	407
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	929	484			537	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	929	484			537	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	33	74			98	
cM capacity (veh/h)	292	583			1031	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	196	149	484	53	19	407
Volume Left	196	0	0	0	19	0
Volume Right	0	149	0	53	0	0
cSH	292	583	1700	1700	1031	1700
Volume to Capacity	0.67	0.26	0.28	0.03	0.02	0.24
Queue Length 95th (m)	34.0	7.7	0.0	0.0	0.4	0.0
Control Delay (s)	39.4	13.3	0.0	0.0	8.6	0.0
Lane LOS	E	B			A	
Approach Delay (s)	28.1		0.0		0.4	
Approach LOS	D					

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
97: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1118	362	0	1820	0	0
Future Volume (vph)	1118	362	0	1820	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	120.9	
Travel Time (s)	15.5			6.8	9.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1118	362	0	1820	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1118	362	0	1820	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 68.8%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection Sign configuration not allowed in HCM analysis.

APPENDIX D

Truck Inventory

EXISTING TRUCK CONDITIONS

ID	Intersection	A.M. Peak Hour				P.M. Peak Hour			
		NB Approach Volume (%)	SB Approach Volume (%)	EB Approach Volume (%)	WB Approach Volume (%)	NB Approach Volume (%)	SB Approach Volume (%)	EB Approach Volume (%)	WB Approach Volume (%)
Primary Study Area Intersections									
1	Ninth Line at Golf Club Access	4 (1%)	11 (3%)	--	0 (0%)	8 (2%)	13 (3%)	--	0 (0%)
2	Ninth Line at Terragar Blvd	17 (4%)	9 (2%)	--	7 (4%)	7 (1%)	16 (3%)	--	2 (3%)
3	Ninth Line at Hazelridge Rd	15 (3%)	17 (3%)	--	0 (0%)	15 (3%)	11 (2%)	--	1 (2%)
4	Ninth Line at Derry Road	5 (1%)	7 (1%)	21 (1%)	20 (3%)	1 (0%)	1 (0%)	10 (1%)	15 (1%)
5	Ninth Line at Beacham St	16 (2%)	19 (3%)	--	1 (1%)	25 (4%)	20 (3%)	--	2 (2%)
6	Ninth Line at Doug Leavens Blvd	22 (3%)	11 (2%)	--	7 (2%)	13 (2%)	11 (2%)	--	2 (2%)
7	Ninth Line at Osprey Blvd	34 (4%)	24 (3%)	--	14 (5%)	28 (3%)	29 (4%)	--	7 (4%)
8	Ninth Line at Parkgate Dr	3 (0%)	5 (1%)	--	0 (0%)	6 (1%)	7 (1%)	--	0 (0%)
9	Ninth Line at Britannia Rd W	17 (2%)	28 (3%)	17 (1%)	23 (4%)	9 (1%)	12 (2%)	16 (2%)	9 (1%)
10	Ninth Line at Freeman Terr	17 (2%)	28 (3%)	--	1 (2%)	19 (2%)	16 (2%)	--	0 (0%)
11	Ninth Line at McDowell Dr	15 (2%)	18 (2%)	--	1 (2%)	10 (1%)	8 (1%)	--	0 (0%)
12	Ninth Line at Lacman Trail	21 (2%)	18 (2%)	--	1 (3%)	17 (2%)	8 (1%)	--	0 (0%)
13	Ninth Line at Brinwood Gate	20 (3%)	19 (2%)	--	1 (6%)	7 (1%)	7 (1%)	--	0 (0%)
14	Ninth Line at Thomas St	26 (3%)	23 (2%)	--	7 (2%)	10 (1%)	14 (2%)	--	3 (1%)
15	Ninth Line at Deepwood Heights	22 (3%)	22 (2%)	--	1 (2%)	10 (1%)	7 (1%)	--	0 (0%)
16	Ninth Line at Tacc Dr	25 (3%)	23 (2%)	--	1 (1%)	22 (2%)	15 (2%)	--	0 (0%)
17	Ninth Line at Janice Drive	22 (3%)	21 (2%)	--	0 (0%)	11 (1%)	15 (2%)	--	0 (0%)
18	Ninth Line at Erin Centre	20 (3%)	22 (2%)	--	7 (5%)	13 (1%)	13 (2%)	--	3 (3%)
19	Ninth Line at Candlelight Dr	12 (2%)	23 (2%)	--	1 (2%)	3 (0%)	6 (1%)	--	0 (0%)
20	Ninth Line at Skyview St	13 (2%)	14 (1%)	--	0 (0%)	4 (0%)	6 (1%)	--	0 (0%)
21	Ninth Line at Stardust Dr	12 (2%)	12 (1%)	--	0 (0%)	4 (0%)	7 (1%)	--	0 (0%)
22	Ninth Line at Eglinton Ave	3 (1%)	9 (1%)	2 (0%)	5 (1%)	1 (0%)	4 (1%)	2 (1%)	4 (0%)
31	Terragar Blvd at Rosehurst Dr	2 (1%)	0 (0%)	6 (6%)	7 (3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
32	Derry Road at Rosehurst Dr/Lisgar Dr	1 (0%)	0 (0%)	19 (1%)	19 (3%)	0 (0%)	1 (1%)	7 (1%)	13 (1%)
33	Doug Leavens Blvd at Lisgar Dr	9 (3%)	6 (2%)	6 (3%)	7 (2%)	20 (11%)	23 (8%)	24 (11%)	21 (6%)
34	Osprey Blvd at Lisgar Dr	0 (0%)	4 (1%)	0 (0%)	0 (0%)	0 (0%)	8 (4%)	1 (1%)	0 (0%)
35	Britannia Rd W at Maple Gate Circle/Churchill Meadows Blvd	4 (2%)	1 (1%)	16 (1%)	33 (6%)	1 (1%)	1 (2%)	11 (2%)	9 (1%)
36	Freeman Terr at Churchill Meadows Blvd	5 (2%)	7 (6%)	1 (2%)	4 (5%)	3 (2%)	3 (1%)	1 (3%)	1 (4%)
37	McDowell Dr at Churchill Meadows Boulevard	9 (2%)	3 (1%)	13 (6%)	2 (1%)	12 (6%)	6 (5%)	11 (12%)	9 (5%)
38	Thomas St at Churchill Meadows Blvd	5 (2%)	5 (1%)	5 (1%)	21 (4%)	9 (9%)	7 (3%)	7 (4%)	8 (1%)
39	Tacc Dr at Churchill Meadows Blvd	4 (3%)	10 (4%)	8 (6%)	3 (2%)	10 (7%)	12 (8%)	3 (6%)	8 (7%)
40	Erin Centre at Churchill Meadows Blvd	12 (5%)	8 (3%)	15 (7%)	9 (6%)	10 (4%)	6 (4%)	9 (9%)	6 (4%)
41	Eglinton Ave at Churchill Meadows Blvd	--	8 (4%)	28 (2%)	25 (5%)	--	2 (2%)	13 (2%)	14 (1%)
42	Hwy 407 at Britannia Rd - SB Off Ramp	--	4 (9%)	7 (1%)	6 (2%)	--	2 (1%)	5 (1%)	5 (1%)
43	Hwy 407 at Britannia Rd - NB Off Ramp	2 (1%)	--	7 (1%)	8 (2%)	0 (0%)	--	5 (1%)	7 (1%)
44	Hwy 407 at Derry Rd - SB Off Ramp	--	8 (15%)	20 (1%)	14 (3%)	--	4 (1%)	5 (1%)	8 (0%)
45	Hwy 407 at Derry Rd - NB Off Ramp	6 (4%)	--	13 (1%)	20 (4%)	4 (2%)	--	5 (1%)	11 (1%)
Secondary Study Area Intersections									
46	Hwy 401 at Winston Churchill Blvd - WB Off Ramp	35 (3%)	51 (5%)	--	63 (11%)	45 (4%)	36 (3%)	--	21 (1%)
47	Hwy 401 at Winston Churchill Blvd - EB Off Ramp	20 (2%)	51 (5%)	20 (3%)	--	36 (3%)	34 (2%)	36 (6%)	--
48	Hwy 403 at Winston Churchill Blvd - WB Off Ramp	46 (3%)	65 (3%)	--	52 (5%)	15 (1%)	15 (1%)	--	10 (1%)
49	Hwy 403 at Winston Churchill Blvd - EB Off Ramp	35 (4%)	56 (3%)	14 (1%)	--	15 (1%)	17 (1%)	7 (2%)	--
50	Hwy 403 at Dundas St - SB Off Ramp	--	82 (7%)	48 (2%)	28 (7%)	--	64 (5%)	87 (7%)	23 (2%)
51	Hwy 403 at Dundas St - NB Off Ramp	13 (2%)	--	60 (3%)	37 (6%)	11 (2%)	--	44 (4%)	14 (1%)

APPENDIX E

Bus Stop Locations

Bus Stop Locations in Ninth Line Corridor Study Area

Street 1	Street 2	Street 3	Direction	Location	Routes Served[1]
Terragar Blvd	Rosehurst Dr	--	Northbound	Near-side	90, 32
Terragar Blvd	Rosehurst Dr	--	Southbound	Far-side	90, 32
Rosehurst Dr	Sandhurst Dr	--	Northbound	Near-side	90, 32
Rosehurst Dr	Hazelridge Rd	--	Southbound	Near-side	32
Rosehurst Dr	Laurenclaire Dr	Stoneham Way	Northbound	Near-side	32, 90
Rosehurst Dr	Laurenclaire Dr	Stoneham Way	Southbound	Far-side	32, 90
Rosehurst Dr	Lisgar Dr	Derry Rd W	Northbound	Near-side	39, 32, GO 27, GO 21, GO 48
Rosehurst Dr	Lisgar Dr	Derry Rd W	Westbound	Near-side	39, 32, GO 27, GO 21, GO 48
Ninth Line	Derry Rd W	--	Westbound	Near-side	GO 27, GO 21, GO 48
Lisgar Dr	Dillingwood Dr	Allcroft Road	Southbound	Near-side	39, 32
Lisgar Dr	Yarrow Ave	--	Northbound	Near-side	39, 32
Lisgar Dr	Beacham St	--	Southbound	Near-side	39, 32
Lisgar Dr	Berryman Trail	--	Southbound	Near-side	39, 32
Lisgar Dr	Doug Leavens Blvd	--	Northbound	Near-side	39, 32
Lisgar Dr	Doug Leavens Blvd	--	Southbound	Near-side	39, 32
Lisgar Dr	Beechnut Row	Cedar Hedge Rise	Southbound	Near-side	39
Lisgar Dr	Alderwood Trail	--	Northbound	Near-side	39
Lisgar Dr	Saratoga Way	Forest Bluff Crescent	Southbound	Near-side	39
Lisgar Dr	Foxwood Ave	--	Southbound	Near-side	39
Lisgar Dr	Osprey Blvd	--	Southbound	Near-side	39
Ninth Line	Osprey Blvd	--	Northbound	Near-side	39
Ninth Line	Parkgate Dr	--	Northbound	Near-side	39
Ninth Line	Parkgate Dr	--	Southbound	Near-side	39
Ninth Line	Britannia Rd W	--	Westbound	Near-side	39
Ninth Line	Britannia Rd W	--	Eastbound	Far-side	39
Britannia Rd W	Maple Gate Cir	Churchill Meadows Blvd	Westbound	Near-side	39
Britannia Rd W	Maple Gate Cir	Churchill Meadows Blvd	Eastbound	Near-side	39
Churchill Meadows Blvd	McDowell Dr	--	Westbound	Near-side	49
McDowell Dr	Yachtsman Crossing	--	Eastbound	Near-side	49
McDowell Dr	Swordsman Dr	--	Eastbound	Near-side	49
Ninth Line	Lacman Trail	--	Northbound	Near-side	49
Churchill Meadows Blvd	Brinwood Gate	--	Southbound	Far-side	49
Churchill Meadows Blvd	Thomas St	--	Northbound	Far-side	49, 41, 321
Churchill Meadows Blvd	Thomas St	--	Southbound	Near-side	49, 41, 321
Thomas St	Longford Dr	Dolmite Heights	Westbound	Mid-block	49
Ninth Line	Thomas St	--	Westbound	Near-side	49
Churchill Meadows Blvd	Bala Dr	Swiftdale Dr	Southbound	Mid-block	41
Churchill Meadows Blvd	Deepwood Heights	--	Northbound	Near-side	41
Churchill Meadows Blvd	Tacc Dr	--	Northbound	Near-side	41
Churchill Meadows Blvd	Rosanna Dr	Placid Pl	Northbound	Mid-block	41
Churchill Meadows Blvd	Rosanna Dr	Placid Pl	Southbound	Mid-block	41
Churchill Meadows Blvd	Erin Centre Blvd	--	Southbound	Near-side	41
Churchill Meadows Blvd	Erin Centre Blvd	--	Eastbound	Near-side	41, 35
Erin Centre Blvd	Longford Dr	--	Eastbound	Near-side	41, 35
Ninth Line	Erin Centre Blvd	Candlelight Dr	Northbound	Mid-block	41, 35
Ninth Line	Skyview St	--	Northbound	Near-side	41, 35
Eglinton Ave W	Intrepid Dr	--	Westbound	Far-side	41, 35
Eglinton Ave W	Churchill Meadows Blvd	--	Southbound	Near-side	41
Eglinton Ave W	Churchill Meadows Blvd	--	Westbound	Near-side	35
Churchill Meadows Blvd	Quiet Creek Dr	Mocha Mews	Southbound	Far-side	41
Churchill Meadows Blvd	Stardust Dr	--	Southbound	Near-side	41

Note: 1. All routes are operated by MiWay, unless noted otherwise.

APPENDIX F

MiWay Transit Ridership Information

Transit Day Periods					
Period Code	**Period Type**	**Start**	**End**	**Start MPM**	**End MPM**
1	Early AM	3:30 AM	5:59 AM	210	359
2	AM Rush	6:00 AM	8:59 AM	360	539
3	Midday	9:00 AM	3:29 PM	540	929
4	PM Rush	3:30 PM	6:29 PM	930	1109
5	Evening	6:30 PM	9:59 PM	1110	1319
6	Late Evening	10:00 PM	3:29 AM	1320	1649

WEEKDAY

2012 NINTH LINE CORRIDOR RIDERSHIP DATA PER PERIOD

ROUTE	DESIGNATION	PERIOD 1 EARLY MORNING	PERIOD 2 AM PEAK	PERIOD 3 MIDDAY	PERIOD 4 PM PEAK	PERIOD 5 EVENING	PERIOD 6 NIGHT	NINTH LINE SEGMENT DAILY TOTAL	ROUTE DAILY TOTAL
35	Eglinton-Tenth Line	2	6	3	2	0	0	13	6,397
39	Britannia	0	21	19	6	0	1	47	2,072
49	McDowell	2	37	23	10	9	2	83	778
	Total Boarding Counts by Period	**4**	**64**	**45**	**18**	**9**	**3**	**143**	**9,247**
	% Percentage	**2.8%**	**44.8%**	**31.5%**	**12.6%**	**6.3%**	**2.1%**		

SATURDAY

2012 NINTH LINE CORRIDOR RIDERSHIP DATA PER PERIOD

ROUTE	DESIGNATION	PERIOD 1 EARLY MORNING	PERIOD 2 AM PEAK	PERIOD 3 MIDDAY	PERIOD 4 PM PEAK	PERIOD 5 EVENING	PERIOD 6 NIGHT	NINTH LINE SEGMENT DAILY TOTAL	ROUTE DAILY TOTAL
35	Eglinton-Tenth Line	0	1	2	0	0	0	3	1,931
39	Britannia	0	2	6	4	1	0	13	842
49	McDowell	0	0	19	2	0	0	21	141
	Total Boarding Counts by Period	**0**	**3**	**27**	**6**	**1**	**0**	**37**	**2,914**
	% Percentage	**0.0%**	**8.1%**	**73.0%**	**16.2%**	**2.7%**	**0.0%**		

SUNDAY

2012 NINTH LINE CORRIDOR RIDERSHIP DATA PER PERIOD

ROUTE	DESIGNATION	PERIOD 1 EARLY MORNING	PERIOD 2 AM PEAK	PERIOD 3 MIDDAY	PERIOD 4 PM PEAK	PERIOD 5 EVENING	PERIOD 6 NIGHT	NINTH LINE SEGMENT DAILY TOTAL	ROUTE DAILY TOTAL
39	Britannia	0	1	6	2	0	0	9	645
49	McDowell	0	0	13	3	2	0	18	129
	Total Boarding Counts by Period	**0**	**1**	**19**	**5**	**2**	**0**	**27**	**774**
	% Percentage	**0.0%**	**3.7%**	**70.4%**	**18.5%**	**7.4%**	**0.0%**		

APPENDIX G

Collision Data

Peel Region Collision Data Summary

Ninth Line Lands Study																	
Traffic Safety / Collision History Review																	
Peel Region Data - 5 Years (January 2008 - December 2012)																	
Location	Control Type	Incident Type				Pedestrian	Bike	Rear End[1]					Angle[1]				
		Property Damage	Personal Injury	Fatal	Total			N	S	E	W	Total	N	S	E	W	Total
Derry Road at Ninth Line	Signalized	20	5	0	25	0	0	2	3	4	2	11	3	0	4	0	7
Britannia Road at Ninth Line	Signalized	25	2	0	27	0	0	6	7	2	2	17	1	1	1	0	3
Derry Road at Rosehurst Drive/Lisgar Drive	Signalized	23	2	0	25	2	0	1	0	2	8	11	0	0	0	2	2
Britannia Road at Maple Gate Circle/Churchill Meadows Boulevard	Signalized	2	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0
	Overall Total:	70	10	0	80	3	0	9	10	8	12	39	4	1	5	2	12

Note: 1. 'Initial Direction of Travel 1' was Utilized

For the collision data collected at Peel Region intersections between January 2008 and December 2012, the following items were noted:

- At the intersection of Derry Road at Ninth Line, there have been five collisions resulting in personal injury;
- At the intersection of Britannia Road at Ninth Line, there have been seven collisions involving a rear-end impact between vehicles travelling south;
- At the intersection of Britannia Road at Ninth Line, there have been eight collisions involving a rear-end impact between vehicles travelling west; and
- No discernable pattern was found for any one of these occurrences.

City of Mississauga Collision Data Summary

Ninth Line Lands Study																			
Traffic Safety / Collision History Review																			
Mississauga Data - 5 Years + 11 Months (January 2008 - November 2013)																			
Corridor	From	To	Incident Type				Pedestrian	Bike	Rear End[1]					Angle[1]					
			Property Damage	Personal Injury	Fatal	Total			N	S	E	W	Total	N	S	E	W	Total
Erin Centre Boulevard	Ninth Line	Placid Place	14	1	0	15	0	0	0	0	0	1	1	0	1	1	2	4
Thomas Street	Ninth Line	Lila Trail	23	2	0	25	3	0	0	1	1	2	4	1	1	3	3	9
Eglinton Avenue West	Ninth Line	Churchill Meadows Boulevard	26	3	0	29	0	0	0	1	1	0	2	0	10	1	2	13
Ninth Line	Eglinton Avenue West	"North Limit" (Assumed as Hwy 401)	71	6	0	77	0	0	25	20	4	1	51	5	2	0	6	14
		Overall Total:	134	12	0	146	3	0	25	22	6	4	58	6	14	5	13	40

Note: 1. 'Direction of Travel (Vehicle 1)' was Utilized

Collisions per km per Year for Each Corridor				
Corridor	From	To	Length of Segment[1] (km)	Collisions /km/yr.
Erin Centre Boulevard	Ninth Line	Placid Place	0.65	3.9
Thomas Street	Ninth Line	Lila Trail	0.61	6.9
Eglinton Avenue West	Ninth Line	Churchill Meadows Boulevard	0.49	10
Ninth Line	Eglinton Avenue West	"North Limit" (Assumed as Hwy 401)	8.6	2.1

Note: 1. Distances estimated using Google Earth

For the collision data collected along Mississauga corridors between January 2008 and November 2013, the following items were noted:

- The Erin Centre Boulevard corridor, between Ninth Line and Placid Place, experiences an average of 3.9 collisions/km/year;
- The Thomas Street corridor, between Ninth Line and Lila Trail, experiences an average of 6.9 collisions/km/year;
- The Eglinton Avenue West corridor, between Ninth Line and Churchill Meadows Boulevard, experiences an average of 10 collisions/km/year;
- The Ninth Line corridor, between Eglinton Avenue West and Highway 401, experiences an average of 2.1 collisions/km/year; and
- No discernable pattern was found based on these calculated average collision rates.

Ninth Line Lands Study																		
Traffic Safety / Collision History Review																		
Mississauga Data - 5 Years + 11 Months (January 2008 - November 2013)																		
Location		Control Type	Incident Type				Pedestrian	Bike	Rear End[1]					Angle[1]				
Road 1	Road 2		Property Damage	Personal Injury	Fatal	Total			N	S	E	W	Total	N	S	E	W	Total
Erin Centre Boulevard	Churchill Meadows Boulevard	AWSC	7	0	0	7	0	0	0	0	0	1	1	0	1	1	0	2
Erin Centre Boulevard	Placid Place	TWSC	3	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0
Erin Centre Boulevard	Roadside Way	TWSC	3	0	0	3	0	0	0	0	0	0	0	0	0	0	2	2
Thomas Street	Churchill Meadows Boulevard	Signalized	18	1	0	19	2	0	0	1	1	2	4	1	1	2	3	8
Thomas Street	Longford Drive	TWSC	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Eglinton Avenue West	Churchill Meadows Boulevard	TWSC	21	1	0	22	0	0	0	1	0	0	1	0	8	1	1	10
Eglinton Avenue West	Intrepid Drive	TWSC	4	2	0	6	0	0	0	0	1	0	1	0	2	0	0	2
Ninth Line	Doug Leavens Boulevard	TWSC	2	1	0	3	0	0	1	0	0	0	1	1	0	0	0	1
Ninth Line	Eglinton Avenue West	Signalized	26	2	0	28	0	0	4	7	3	1	15	1	2	0	0	4
Ninth Line	Erin Centre Boulevard	Signalized	9	0	0	9	0	0	5	2	0	0	7	0	0	0	1	1
Ninth Line	Foxwood Avenue	TWSC	3	0	0	3	0	0	0	0	0	0	0	0	0	0	1	1
Ninth Line	Osprey Boulevard	Signalized	4	0	0	4	0	0	1	1	0	0	2	1	0	0	0	1
Ninth Line	Skyview Street	TWSC	1	0	0	1	0	0	0	2	0	0	2	0	0	0	0	0
Ninth Line	Thomas Street	Signalized	0	0	0	0	0	0	5	4	0	0	9	0	0	0	2	2
		Overall Total:	134	12	0	146	3	0	25	22	6	4	58	6	14	5	13	40

Note: 1. 'Direction of Travel (Vehicle 1)' was Utilized

For the collision data collected at Mississauga intersections between January 2008 and November 2013, the following items were noted:

- At the intersection of Thomas Street at Churchill Meadows Boulevard, there have been 18 collisions resulting in property damage;
- At the intersection of Eglinton Avenue West at Churchill Meadows Boulevard, there have been 21 collisions resulting in property damage and eight collisions involving an angle (T-bone) impact with Vehicle 1 travelling south;
    - For the collisions involving property damage, no discernable pattern was found;
    - For the collisions involving an angle impact, the majority occurred in clear and dry conditions with daylight.
- At the intersection of Ninth Line at Eglinton Avenue West, there have been 26 collisions resulting in property damage and seven collisions involving a rear-end impact between vehicles travelling south

Region of Peel

ACCIDENT ANALYSIS BY LOCATION REPORT

AAA Concise Report

FROM: January 01, 2008 TO: December 31, 2012

INTERSECTION ID: INT_12282 MUNICIPALITY:MISSISSAUGA DESCRIPTION:DERRY RD W @ NINTH LINE WEST

Accident ID	Date & Time	Light	Environment Condition 1	Road 1 Surface Condition	Initial Impact Type	Classification of Accident
08016712	27-Jan-08 9:15a	Daylight	Clear	Wet	Rear end	P.D. only
08068405	16-Apr-08 11:00a	Daylight	Clear	Dry	Angle (t-bone)	P.D. only
08192927	05-Oct-08 5:56p	Daylight	Clear	Dry	Rear end	Non-fatal injury
09077482	07-May-09 4:00p	Daylight	Clear	Dry	Rear end	P.D. only
09226647	11-Dec-09 4:35p	Dark, artificial	Clear	Wet	Sideswipe	P.D. only
10069484	26-Apr-10 2:50p	Daylight	Clear	Dry	Turning movement	P.D. only
10142725	12-Aug-10 5:49p	Daylight	Clear	Dry	Angle (t-bone)	P.D. only
10175703	01-Oct-10 1:40p	Daylight	Clear	Dry	Angle (t-bone)	Non-fatal injury
10188098	21-Oct-10 3:05p	Daylight	Rain	Wet	Rear end	Non-fatal injury
10219247s	09-Dec-10 7:20a	Dark	Clear	Wet	Rear end	P.D. only
10218150s	09-Dec-10 7:20a	Dawn	Clear	Dry	Rear end	P.D. only
10224463	20-Dec-10 6:24a	Dark	Clear	Dry	Rear end	P.D. only
11025782s	09-Feb-11 7:30a	Daylight	Clear	Dry	Rear end	P.D. only
11073095s	25-Mar-11 9:30a	Other	Snow	Packed snow	Angle (t-bone)	P.D. only
11242860	06-Aug-11 8:37a	Daylight	Clear	Dry	Approaching (head on)	P.D. only
11269058	26-Aug-11 5:17p	Daylight	Clear	Dry	Angle (t-bone)	Non-fatal injury
11332505	15-Oct-11 3:16p	Daylight, artificial	Rain	Wet	Sideswipe	P.D. only
11407480	15-Dec-11 7:44a	Daylight	Rain	Wet	Rear end	P.D. only
12001770	16-Jan-12 11:44p	Dark, artificial	Rain	Wet	Turning movement	P.D. only
12144192s	07-May-12 1:00a	Dark, artificial	Clear	Dry	SMV - animal or pedestrian	P.D. only
12164839s	22-May-12 6:34p	Daylight	Clear	Dry	Sideswipe	P.D. only
12185533	09-Jun-12 12:00a	Dark	Rain	Wet	Angle (t-bone)	Non-fatal injury
12324873	25-Sep-12 4:07a	Daylight	Clear	Dry	Angle (t-bone)	P.D. only
12409910s	30-Nov-12 5:30p	Dark	Snow	Loose snow	Rear end	P.D. only
12419684	06-Dec-12 5:43p	Dark, artificial	Clear	Dry	Rear end	P.D. only

LOCATION TOTAL COLLISIONS: 25

Region of Peel

ACCIDENT ANALYSIS BY LOCATION REPORT

AAA Detailed Direction Report

FROM: January 01, 2008 TO: December 31, 2012

INTERSECTION ID: INT_12282 MUNICIPALITY:MISSISSAUGA DESCRIPTION:DERRY RD W @ NINTH LINE WEST

Accident ID	Date & Time	Vehicle 1 Manoeuver	Vehicle 2 Manoeuver	Initial Direction of Travel 1	Initial Direction of Travel 2	Initial Impact Type
08016712	27-Jan-08 9:15a	Stopped	Reversing	South	South	Rear end
08068405	16-Apr-08 11:00a	Going ahead	Going ahead	East	North	Angle (t-bone)
08192927	05-Oct-08 5:56p	Going ahead	Stopped	East	East	Rear end
09077482	07-May-09 4:00p	Slowing or stopping	Going ahead	North	North	Rear end
09226647	11-Dec-09 4:35p	Making "U" turn	Going ahead	West	West	Sideswipe
10069484	26-Apr-10 2:50p	Turning left	Going ahead	South	East	Turning movement
10142725	12-Aug-10 5:49p	Going ahead	Going ahead	East	North	Angle (t-bone)
10175703	01-Oct-10 1:40p	Going ahead	Going ahead	North	East	Angle (t-bone)
10188098	21-Oct-10 3:05p	Going ahead	Going ahead	West	West	Rear end
10219247s	09-Dec-10 7:20a	Slowing or stopping	Slowing or stopping	East	East	Rear end
10218150s	09-Dec-10 7:20a	Stopped	Slowing or stopping	East	East	Rear end
10224463	20-Dec-10 6:24a	Slowing or stopping	Stopped	East	East	Rear end
11025782s	09-Feb-11 7:30a	Stopped	Other	South	South	Rear end
11073095s	25-Mar-11 9:30a	Going ahead	Other	North	West	Angle (t-bone)
11242860	06-Aug-11 8:37a	Going ahead	Going ahead	South	North	Approaching (head on)
11269058	26-Aug-11 5:17p	Going ahead	Going ahead	North	West	Angle (t-bone)
11332505	15-Oct-11 3:16p	Going ahead	Changing lanes	East	East	Sideswipe
11407480	15-Dec-11 7:44a	Going ahead	Stopped	South	South	Rear end
12001770	16-Jan-12 11:44p	Turning left	Going ahead	North	South	Turning movement
12144192s	07-May-12 1:00a	Going ahead	Other	East	Other	SMV - animal or pedestrian
12164839s	22-May-12 6:34p	Slowing or stopping	Going ahead	East	East	Sideswipe
12185533	09-Jun-12 12:00a	Going ahead	Turning left	East	North	Angle (t-bone)
12324873	25-Sep-12 4:07a	Going ahead	Going ahead	East	North	Angle (t-bone)
12409910s	30-Nov-12 5:30p	Slowing or stopping	Slowing or stopping	West	West	Rear end
12419684	06-Dec-12 5:43p	Going ahead	Stopped	North	North	Rear end

LOCATION TOTAL COLLISIONS: 25

Region of Peel

ACCIDENT ANALYSIS BY LOCATION REPORT

AAA Concise Report

FROM: January 01, 2008 TO: December 31, 2012

INTERSECTION ID: INT_13755 MUNICIPALITY:MISSISSAUGA DESCRIPTION:BRITANNIA RD W @ NINTH LINE WEST

Accident ID	Date & Time	Light	Environment Condition 1	Road 1 Surface Condition	Initial Impact Type	Classification of Accident
08136688	18-Mar-08 9:15a	Dusk	Clear	Dry	Rear end	P.D. only
08099140	29-May-08 7:30a	Daylight	Clear	Dry	Angle (t-bone)	P.D. only
08117193	23-Jun-08 6:00p	Daylight	Rain	Wet	Sideswipe	P.D. only
09002368	05-Jan-09 3:20p	Daylight	Clear	Dry	Rear end	P.D. only
09088370	23-May-09 10:02a	Daylight	Clear	Dry	Rear end	Non-fatal injury
09101588	11-Jun-09 8:22p	Daylight	Rain	Wet	Rear end	P.D. only
09110897	24-Jun-09 4:28p	Daylight	Clear	Dry	Angle (t-bone)	P.D. only
09151291S	05-Aug-09 8:40a	Daylight	Clear	Dry	Rear end	P.D. only
09203105	03-Nov-09 8:49a	Daylight	Clear	Dry	Rear end	P.D. only
10032212	24-Feb-10 10:00a	Daylight	Clear	Wet	Angle (t-bone)	P.D. only
10037275S	26-Feb-10 11:50a	Daylight	Clear	Dry	Sideswipe	P.D. only
10078193	09-May-10 6:00p	Daylight	Clear	Dry	Rear end	P.D. only
10211439	28-Nov-10 1:07p	Daylight	Clear	Dry	Rear end	P.D. only
11149519A	29-May-11 3:08a	Other	Other	Other	Other	P.D. only
11150451	29-May-11 10:00p	Dark, artificial	Rain	Wet	Turning movement	Non-fatal injury
11238379s	02-Aug-11 6:05p	Daylight	Clear	Dry	Rear end	P.D. only
11302224	21-Sep-11 5:07a	Daylight	Rain	Wet	Rear end	P.D. only
11308325	26-Sep-11 3:10p	Daylight	Clear	Dry	Rear end	P.D. only
11410559	17-Dec-11 3:00p	Daylight	Clear	Dry	Rear end	P.D. only
12016594	15-Jan-12 11:00a	Dark	Clear	Dry	SMV - Other	P.D. only
12072114	05-Mar-12 8:30p	Dark	Clear	Dry	Rear end	P.D. only
12098232s	26-Mar-12 4:45p	Daylight	Clear	Dry	Rear end	P.D. only
12220396	05-Jul-12 12:03p	Daylight	Clear	Dry	Rear end	P.D. only
12357771	23-Oct-12 6:47p	Dark	Rain	Wet	Rear end	P.D. only
12398785s	27-Nov-12 6:30a	Dark	Clear	Dry	Rear end	P.D. only
12402529	28-Nov-12 11:20p	Dark, artificial	Clear	Ice	SMV - Other	P.D. only
12420770	07-Dec-12 8:49a	Daylight	Clear	Dry	Turning movement	P.D. only

LOCATION TOTAL COLLISIONS: 27

Region of Peel

ACCIDENT ANALYSIS BY LOCATION REPORT

AAA Detailed Direction Report

FROM: January 01, 2008 TO: December 31, 2012

INTERSECTION ID: INT_13755 MUNICIPALITY:MISSISSAUGA DESCRIPTION:BRITANNIA RD W @ NINTH LINE WEST

Accident ID	Date & Time	Vehicle 1 Manoeuver	Vehicle 2 Manoeuver	Initial Direction of Travel 1	Initial Direction of Travel 2	Initial Impact Type
08136688	18-Mar-08 9:15a	Slowing or stopping	Slowing or stopping	South	South	Rear end
08099140	29-May-08 7:30a	Going ahead	Going ahead	South	West	Angle (t-bone)
08117193	23-Jun-08 6:00p	Changing lanes	Going ahead	West	West	Sideswipe
09002368	05-Jan-09 3:20p	Going ahead	Stopped	North	North	Rear end
09088370	23-May-09 10:02a	Slowing or stopping	Stopped	North	North	Rear end
09101588	11-Jun-09 8:22p	Going ahead	Slowing or stopping	East	East	Rear end
09110897	24-Jun-09 4:28p	Going ahead	Going ahead	North	West	Angle (t-bone)
09151291S	05-Aug-09 8:40a	Slowing or stopping	Slowing or stopping	South	South	Rear end
09203105	03-Nov-09 8:49a	Going ahead	Going ahead	North	North	Rear end
10032212	24-Feb-10 10:00a	Going ahead	Going ahead	East	South	Angle (t-bone)
10037275S	26-Feb-10 11:50a	Going ahead	Changing lanes	North	North	Sideswipe
10078193	09-May-10 6:00p	Going ahead	Slowing or stopping	West	West	Rear end
10211439	28-Nov-10 1:07p	Going ahead	Stopped	South	South	Rear end
11149519A	29-May-11 3:08a	Other	Other	Other	Other	Other
11150451	29-May-11 10:00p	Turning left	Going ahead	North	South	Turning movement
11238379s	02-Aug-11 6:05p	Stopped	Slowing or stopping	South	South	Rear end
11302224	21-Sep-11 5:07a	Slowing or stopping	Slowing or stopping	North	North	Rear end
11308325	26-Sep-11 3:10p	Going ahead	Stopped	South	South	Rear end
11410559	17-Dec-11 3:00p	Going ahead	Stopped	East	East	Rear end
12016594	15-Jan-12 11:00a	Going ahead	Other	West	Other	SMV - Other
12072114	05-Mar-12 8:30p	Slowing or stopping	Stopped	North	North	Rear end
12098232s	26-Mar-12 4:45p	Going ahead	Slowing or stopping	South	South	Rear end
12220396	05-Jul-12 12:03p	Turning right	Turning right	West	West	Rear end
12357771	23-Oct-12 6:47p	Going ahead	Going ahead	South	South	Rear end
12398785s	27-Nov-12 6:30a	Going ahead	Slowing or stopping	North	North	Rear end
12402529	28-Nov-12 11:20p	Going ahead	Other	West	Other	SMV - Other
12420770	07-Dec-12 8:49a	Turning left	Going ahead	South	North	Turning movement

LOCATION TOTAL COLLISIONS: 27

Region of Peel

ACCIDENT ANALYSIS BY LOCATION REPORT

AAA Concise Report

FROM: January 01, 2008 TO: December 31, 2012

INTERSECTION ID: INT_11974 MUNICIPALITY:MISSISSAUGA DESCRIPTION:DERRY RD W @ ROSEHURST DR/LISGAR DR

Accident ID	Date & Time	Light	Environment Condition 1	Road 1 Surface Condition	Initial Impact Type	Classification of Accident
08035313	25-Feb-08 8:20a	Daylight	Clear	Dry	Turning movement	P.D. only
08223209	19-Nov-08 5:20p	Dark	Snow	Ice	Rear end	P.D. only
09016017	28-Jan-09 7:05p	Dusk, artificial	Snow	Loose snow	Rear end	P.D. only
09018589	02-Feb-09 8:30a	Daylight	Clear	Dry	Turning movement	P.D. only
09212897	19-Nov-09 8:17a	Daylight	Rain	Wet	SMV - animal or pedestrian	Non-fatal injury
09223794	07-Dec-09 9:22a	Daylight	Clear	Dry	Sideswipe	P.D. only
10139623	07-Aug-10 11:10p	Dark, artificial	Clear	Dry	Turning movement	P.D. only
10181565	10-Oct-10 8:47p	Dark	Clear	Dry	Turning movement	P.D. only
10199951	09-Nov-10 2:54p	Daylight	Clear	Dry	Rear end	Non-fatal injury
11009192	17-Jan-11 2:15p	Daylight	Clear	Dry	SMV - animal or pedestrian	Non-fatal injury
11026816	10-Feb-11 8:11a	Daylight	Clear	Dry	Turning movement	P.D. only
11075609	26-Mar-11 1:50p	Daylight	Clear	Dry	SMV - Other	P.D. only
11269100	26-Aug-11 5:40p	Daylight	Clear	Dry	Rear end	Non-reportable
11386171s	27-Nov-11 5:30p	Dark	Rain	Wet	Angle (t-bone)	P.D. only
11396380	06-Dec-11 8:21a	Daylight	Clear	Wet	Sideswipe	P.D. only
11417471s	22-Dec-11 2:30a	Daylight	Clear	Dry	Rear end	P.D. only
12026552s	24-Jan-12 12:20p	Daylight	Other	Wet	Rear end	P.D. only
12031129s	28-Jan-12 6:00p	Dusk	Strong wind	Ice	Sideswipe	P.D. only
12051908s	16-Feb-12 7:45p	Dark	Clear	Dry	Rear end	P.D. only
12066565	01-Mar-12 12:20a	Dark	Snow	Slush	Approaching (head on)	P.D. only
12086363A	18-Mar-12 12:20p	Daylight	Clear	Dry	Angle (t-bone)	P.D. only
12091248s	21-Mar-12 5:30a	Daylight	Clear	Dry	Rear end	P.D. only
12249046	27-Jul-12 5:57p	Daylight	Clear	Dry	Rear end	P.D. only
12257475	03-Aug-12 1:20a	Dark, artificial	Clear	Dry	Rear end	P.D. only
12280429	21-Aug-12 10:40a	Daylight	Clear	Dry	Rear end	P.D. only
12399246	27-Nov-12 1:42p	Daylight	Clear	Dry	Turning movement	P.D. only

LOCATION TOTAL COLLISIONS: 26

Region of Peel

ACCIDENT ANALYSIS BY LOCATION REPORT

AAA Detailed Direction Report

FROM: January 01, 2008 TO: December 31, 2012

INTERSECTION ID: INT_11974 MUNICIPALITY:MISSISSAUGA DESCRIPTION:DERRY RD W @ ROSEHURST DR/LISGAR DR

Accident ID	Date & Time	Vehicle 1 Manoeuver	Vehicle 2 Manoeuver	Initial Direction of Travel 1	Initial Direction of Travel 2	Initial Impact Type
08035313	25-Feb-08 8:20a	Turning left	Going ahead	South	East	Turning movement
08223209	19-Nov-08 5:20p	Slowing or stopping	Slowing or stopping	West	West	Rear end
09016017	28-Jan-09 7:05p	Going ahead	Going ahead	West	West	Rear end
09018589	02-Feb-09 8:30a	Turning left	Going ahead	South	East	Turning movement
09212897	19-Nov-09 8:17a	Turning right	Going ahead	Other	Other	SMV - animal or pedestrian
09223794	07-Dec-09 9:22a	Changing lanes	Going ahead	East	East	Sideswipe
10139623	07-Aug-10 11:10p	Turning left	Going ahead	North	West	Turning movement
10181565	10-Oct-10 8:47p	Going ahead	Turning left	East	South	Turning movement
10199951	09-Nov-10 2:54p	Going ahead	Stopped	West	West	Rear end
11009192	17-Jan-11 2:15p	Going ahead	Other	East	Other	SMV - animal or pedestrian
11026816	10-Feb-11 8:11a	Going ahead	Turning left	North	East	Turning movement
11075609	26-Mar-11 1:50p	Going ahead	Other	East	Other	SMV - Other
11269100	26-Aug-11 5:40p	Stopped	Going ahead	West	West	Rear end
11386171s	27-Nov-11 5:30p	Going ahead	Turning left	West	South	Angle (t-bone)
11396380	06-Dec-11 8:21a	Changing lanes	Going ahead	East	East	Sideswipe
11417471s	22-Dec-11 2:30a	Going ahead	Going ahead	West	West	Rear end
12026552s	24-Jan-12 12:20p	Going ahead	Changing lanes	West	West	Rear end
12031129s	28-Jan-12 6:00p	Turning left	Turning right	South	South	Sideswipe
12051908s	16-Feb-12 7:45p	Slowing or stopping	Slowing or stopping	West	West	Rear end
12066565	01-Mar-12 12:20a	Making "U" turn	Going ahead	North	South	Approaching (head on)
12086363A	18-Mar-12 12:20p	Going ahead	Turning left	West	South	Angle (t-bone)
12091248s	21-Mar-12 5:30a	Slowing or stopping	Reversing	East	East	Rear end
12249046	27-Jul-12 5:57p	Going ahead	Slowing or stopping	West	West	Rear end
12257475	03-Aug-12 1:20a	Going ahead	Parked	North	North	Rear end
12280429	21-Aug-12 10:40a	Going ahead	Parked	East	East	Rear end
12399246	27-Nov-12 1:42p	Turning left	Going ahead	West	East	Turning movement

LOCATION TOTAL COLLISIONS: 26

Region of Peel

Working for you

Region of Peel

ACCIDENT ANALYSIS BY LOCATION REPORT

AAA Concise Report

FROM: January 01, 2008 TO: December 31, 2012

INTERSECTION ID: INT_13554 MUNICIPALITY:MISSISSAUGA DESCRIPTION:BRITANNIA RD W @ MAPLE GATE CIRCLE/CHURCHILL MEADOW

Accident ID	Date & Time	Light	Environment Condition 1	Road 1 Surface Condition	Initial Impact Type	Classification of Accident
10073125	30-Apr-10 2:34a	Dark	Clear	Dry	SMV - Other	P.D. only
11029854	12-Feb-11 8:35p	Dark, artificial	Clear	Dry	Turning movement	P.D. only
12114760	12-Apr-12 7:16a	Daylight	Clear	Dry	SMV - animal or pedestrian	Non-fatal injury

LOCATION TOTAL COLLISIONS: 3

Region of Peel

ACCIDENT ANALYSIS BY LOCATION REPORT

AAA Detailed Direction Report

FROM: January 01, 2008 TO: December 31, 2012

INTERSECTION ID: INT_13554 MUNICIPALITY:MISSISSAUGA DESCRIPTION:BRITANNIA RD W @ MAPLE GATE CIRCLE/CHURCHILL MEADOW

Accident ID	Date & Time	Vehicle 1 Manoeuver	Vehicle 2 Manoeuver	Initial Direction of Travel 1	Initial Direction of Travel 2	Initial Impact Type
10073125	30-Apr-10 2:34a	Going ahead	Other	East	Other	SMV - Other
11029854	12-Feb-11 8:35p	Turning right	Going ahead	North	East	Turning movement
12114760	12-Apr-12 7:16a	Turning left	Other	South	Other	SMV - animal or pedestrian

LOCATION TOTAL COLLISIONS: 3

MISSISSAUGA
Leading today for tomorrow

Erin Centre Road
between Ninth Line and Placid Pl.
January 1, 2008 to November 30, 2013

	Accident #	Date	Time	Distance	Unit	Direction	Road	Enviroment Condition	Light	Acident Classification	Road Surface Condition	Direction of Travel (Vehicle 1)	Direction of Travel (Vehicle 2)	Initial Impact	Vehicle Manoeuver (Vehicle 1)	Vehicle Manoeuver (Vehicle 2)
1	10145789	17-Aug-10	754	100	M	E	Churchill Meadows	Clear	Daylight	Property	Dry	East	East	Sideswipe	Going Ahead	Parked
2	8181448	19-Sep-08	1153		@		Churchill Meadows	Clear	Daylight	Property	Dry	East	East	Sideswipe	Pulling onto shoulder	Going Ahead
3	11004693	9-Jan-11	1330		@		Churchill Meadows	Clear	Daylight	Property	Dry	East	North	Angle	Going Ahead	Going Ahead
4	11048712	2-Mar-11	617		@		Churchill Meadows	Clear	Daylight	Property	Dry	East	#N/A	Approaching	Left Turn	#N/A
5	11180455	20-Jun-11	1521		@		Churchill Meadows	Clear	Daylight	Property	Dry	West	West	Rear end	Stopped	Going Ahead
6	12134802	29-Apr-12	1209		@		Churchill Meadows	Clear	Daylight	Property	Dry	East	South	Angle	Going Ahead	Going Ahead
7	13109065	22-Feb-13	1740		@		Churchill Meadows	Snow	Dark	Property	Packed Snow	South	North	Approaching	Going Ahead	Left Turn
8	13166931	22-Mar-13	1845		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	South	Approaching	Slowing or Stopping	Going Ahead
9	10197040	4-Nov-10	1900		@		Placid	Clear	Dark	Property	Dry	West	#N/A	Approaching	Going Ahead	#N/A
10	12006653	6-Jan-12	2307		@		Placid	Clear	Dark	Property	Wet	East	#N/A	SMV other	Going Ahead	#N/A
11	12013412	13-Jan-12	836		@		Placid	Snow	Daylight	Non-fatal	Ice	South	West	Turning Movement	Going Ahead	Left Turn
12	13360919	22-Jun-13	1230		@		Placid	Rain	Daylight	Property	Wet	North	North	Turning Movement	Left Turn	Going Ahead
13	8020228	1-Feb-08	2200		@		Roadside	Snow	Daylight	Property	Slush	West	South	Angle	Going Ahead	Reversing
14	8158746	18-Aug-08	1248		@		Roadside	Clear	Daylight	Property	Dry	West	South	Angle	Going Ahead	Going Ahead
15	12320027	21-Sep-12	1830		@		Roadside	Clear	Daylight	Property	Dry	North	#N/A	Approaching	Going Ahead	#N/A

MISSISSAUGA
Leading today for tomorrow

Thomas Street
between Ninth Line and Lila Tr.
January 1, 2008 to November 30, 2013

	Accident #	Date	Time	Distance	Unit	Direction	Road	Enviroment Condition	Light	Acident Classification	Road Surface Condition	Direction of Travel (Vehicle 1)	Direction of Travel (Vehicle 2)	Initial Impact	Vehicle Manoeuver (Vehicle 1)	Vehicle Manoeuver (Vehicle 2)
1	10220209	13-Dec-10	843	100	M	E	Churchill Meadows	Snow	Daylight	Property	Loose Snow	West	#N/A	Other	Going Ahead	Other
2	10220209	13-Dec-10	843	100	M	E	Churchill Meadows	Snow	Daylight	Property	Loose Snow	West	#N/A	Other	Going Ahead	Other
3	8108035	11-Jun-08	1616		@		Churchill Meadows	Clear	Daylight	Property	Dry	West	West	Rear end	Going Ahead	Slowing or Stopping
4	8156737	15-Aug-08	2000		@		Churchill Meadows	Rain	Dark	Property	Wet	East	West	Angle	Going Ahead	Left Turn
5	9069599	25-Apr-09	1635		@		Churchill Meadows	Clear	Daylight	Property	Dry	North	North	Turning Movement	Right Turn	Going Ahead
6	9182702	2-Oct-09	1255		@		Churchill Meadows	Rain	Daylight	Property	Wet	West	South	Angle	Right Turn	Stopped
7	10023826	10-Feb-10	1927		@		Churchill Meadows	Clear	Dark	Property	Wet	West	North	Turning Movement	Going Ahead	Left Turn
8	10082678	17-May-10	739		@		Churchill Meadows	Clear	Daylight	Property	Dry	East	South	Angle	Going Ahead	Going Ahead
9	10083466S	18-May-10	1430		@		Churchill Meadows	Clear	Daylight	Property	Other	North	#N/A	Sideswipe	Going Ahead	#N/A
10	10087242	24-May-10	1313		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	East	Rear end	Going Ahead	Parked
11	10119377	9-Jul-10	1109		@		Churchill Meadows	Rain	Daylight	Non-fatal	Wet	West	#N/A	Angle	#N/A	#N/A
12	10121077S	11-Jul-10	1500		@		Churchill Meadows	Clear	Daylight	Property	Wet	West	#N/A	Rear end	Slowing or Stopping	#N/A
13	11004914	9-Jan-11	1022		@		Churchill Meadows	Clear	Dark	Property	Wet	South	North	Angle	Left Turn	Going Ahead
14	11007884	14-Jan-11	2220		@		Churchill Meadows	Clear	Dark	Property	Wet	West	#N/A	Turning Movement	Left Turn	#N/A
15	11009358	16-Jan-11	1100		@		Churchill Meadows	Snow	Daylight	Property	Ice	East	#N/A	Rear end	Going Ahead	#N/A
16	12184627	8-Jun-12	0		@		Churchill Meadows	Clear	Daylight	Property	Dry	North	North	Angle	Changing Lanes	Left Turn
17	13188976	2-Apr-13	1919		@		Churchill Meadows	Clear	Daylight	Property	Dry	West	#N/A	Angle	Left Turn	#N/A
18	13207433	11-Apr-13	1750		@		Churchill Meadows	Freezing Rain	Daylight	Property	Wet	West	South	Turning Movement	Right Turn	Stopped
19	13410340	13-Jul-13	800		@		Churchill Meadows	Clear	Daylight	Property	Dry	#N/A	#N/A	Angle	Parked	#N/A
20	13438090	28-Jul-13	642		@		Churchill Meadows	Clear	Daylight	Property	Dry	East	#N/A	Approaching	Going Ahead	#N/A
21	13606345	20-Oct-13	733		@		Churchill Meadows	Clear	Dawn	Property	Dry	South	#N/A	Turning Movement	Left Turn	#N/A
22	11325493	9-Oct-11	1853		@		Longford	Clear	Dawn	Property	Dry	North	West	Approaching	Going Ahead	Going Ahead

MISSISSAUGA
Leading today for tomorrow

Thomas Street
between Ninth Line and Lila Tr.
January 1, 2008 to November 30, 2013

	Accident #	Date	Time	Distance	Unit	Direction	Road	Enviroment Condition	Light	Acident Classification	Road Surface Condition	Direction of Travel (Vehicle 1)	Direction of Travel (Vehicle 2)	Initial Impact	Vehicle Manoeuver (Vehicle 1)	Vehicle Manoeuver (Vehicle 2)
23	12217760	3-Jul-12	1330		@		Longford	Clear	Daylight	Property	Dry	East	East	Approaching	Left Turn	Going Ahead
24	12434877	13-Dec-12	810		@		Ruby Walk	Clear	Daylight	Property	Dry	East	#N/A	Angle	Going Ahead	#N/A
25	12322291	23-Sep-12	1413		@		Topaz	Clear	Daylight	Non-fatal	Dry	East	East	Turning Movement	Changing Lanes	Going Ahead
26	12360316	5-Oct-12	2030		@		Topaz	Clear	Dark	Property	Dry	East	West	Turning Movement	Left Turn	Going Ahead

MISSISSAUGA
Leading today for tomorrow

Eglinton Avenue West
between Ninth Line and Churchill Meadows
January 1, 2008 to November 30, 2013

	Accident #	Date	Time	Distance	Unit	Direction	Road	Enviroment Condition	Light	Acident Classification	Road Surface Condition	Direction of Travel (Vehicle 1)	Direction of Travel (Vehicle 2)	Initial Impact	Vehicle Manoeuver (Vehicle 1)	Vehicle Manoeuver (Vehicle 2)
1	8216961	10-Nov-08	815	100	M	E	Ninth Line	Clear	Daylight	Property	Dry	West	West	Angle	Going Ahead	Overtaking
2	8108817	12-Jun-08	1604		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	West	Angle	Left Turn	Going Ahead
3	9070478	27-Apr-09	952		@		Churchill Meadows	Clear	Daylight	Property	Dry	East	West	Turning Movement	Left Turn	Going Ahead
4	9214347	21-Nov-09	1413		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	East	Turning Movement	Left Turn	Going Ahead
5	10057490	8-Apr-10	1233		@		Churchill Meadows	Rain	Daylight	Property	Wet	South	West	Angle	Left Turn	Going Ahead
6	10162598	11-Sep-10	948		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	West	Approaching	Left Turn	Going Ahead
7	11001246	2-Jan-11	1630		@		Churchill Meadows	Clear	Dusk	Property	Dry	North	East	Sideswipe	Reversing	Other
8	11070168	21-Mar-11	1718		@		Churchill Meadows	Clear	Daylight	Property	Dry	#N/A	#N/A	Sideswipe	Going Ahead	#N/A
9	11155829	2-Jun-11	805		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	#N/A	Rear end	Stopped	#N/A
10	11157113	3-Jun-11	1801		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	West	Turning Movement	Left Turn	Going Ahead
11	11166652	10-Jun-11	1723		@		Churchill Meadows	Clear	Daylight	Non-fatal	Dry	South	West	Angle	Left Turn	Going Ahead
12	11290908	11-Sep-11	2330		@		Churchill Meadows	Clear	Dusk	Property	Dry	West	West	Angle	Going Ahead	Slowing or Stopping
13	11355576	3-Nov-11	844		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	West	Angle	Left Turn	Going Ahead
14	11390938	1-Dec-11	1500		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	West	Angle	Left Turn	Going Ahead
15	12043095	8-Feb-12	1600		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	West	Angle	Left Turn	Going Ahead
16	12192177	14-Jun-12	830		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	West	Angle	Left Turn	Going Ahead
17	12198684	19-Jun-12	853		@		Churchill Meadows	Clear	Daylight	Property	Dry	East	West	Angle	Left Turn	Going Ahead
18	12393984	24-Nov-12	1315		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	West	Turning Movement	Left Turn	Going Ahead
19	13162790	20-Mar-13	2037		@		Churchill Meadows	Clear	Dawn	Property	Dry	West	West	Turning Movement	Right Turn	Going Ahead
20	13313802	31-May-13	627		@		Churchill Meadows	Rain	Daylight	Property	Wet	South	West	Turning Movement	Left Turn	Going Ahead
21	13313802	31-May-13	627		@		Churchill Meadows	Rain	Daylight	Property	Wet	South	West	Turning Movement	Left Turn	Going Ahead
22	13468417	12-Aug-13	355		@		Churchill Meadows	Rain	Daylight	Property	Other	South	West	Turning Movement	Left Turn	Going Ahead

MISSISSAUGA
Leading today for tomorrow

Eglinton Avenue West
between Ninth Line and Churchill Meadows
January 1, 2008 to November 30, 2013

	Accident #	Date	Time	Distance	Unit	Direction	Road	Enviroment Condition	Light	Acident Classification	Road Surface Condition	Direction of Travel (Vehicle 1)	Direction of Travel (Vehicle 2)	Initial Impact	Vehicle Manoeuver (Vehicle 1)	Vehicle Manoeuver (Vehicle 2)
23	13524106	9-Sep-13	832		@		Churchill Meadows	Clear	Daylight	Property	Dry	West	South	Turning Movement	Going Ahead	Going Ahead
24	13651653	12-Nov-13	814		@		Churchill Meadows	Clear	Daylight	Property	Dry	South	West	Angle	Left Turn	Going Ahead
25	10127437	20-Jul-10	2020		@		Intrepid	Clear	Daylight	Non-fatal	Dry	South	West	Angle	Left Turn	Going Ahead
26	10147864	20-Aug-10	1215		@		Intrepid	Clear	Daylight	Property	Dry	West	East	Turning Movement	Left Turn	Going Ahead
27	10147901	20-Aug-10	1140		@		Intrepid	Clear	Daylight	Property	Dry	East	East	Rear end	Going Ahead	Disabled
28	10158858	5-Sep-10	1250		@		Intrepid	Clear	Daylight	Property	Dry	South	West	Angle	Right Turn	Going Ahead
29	11022523	5-Feb-11	2344		@		Intrepid	Drifting Snow	Dark	Non-fatal	Slush	South	West	Approaching	Going Ahead	Going Ahead
30	13177412	27-Mar-13	2105		@		Intrepid	Rain	Dark	Property	Wet	North	South	Turning Movement	Right Turn	Stopped

MISSISSAUGA
Leading today for tomorrow

Ninth Line
between Eglinton and North Limit
January 1, 2008 to November 30, 2013

	Accident #	Date	Time	Distance	Unit	Direction	Road	Enviroment Condition	Light	Acident Classification	Road Surface Condition	Direction of Travel (Vehicle 1)	Direction of Travel (Vehicle 2)	Initial Impact	Vehicle Manoeuver (Vehicle 1)	Vehicle Manoeuver (Vehicle 2)
1	13102779	19-Feb-13	830	150	M	S	Beachem	Clear	Dark	Property	Other	South	#N/A	SMV other	Slowing or Stopping	#N/A
2	13102781	19-Feb-13	2037	100	M	S	Beachem	Clear	Dark	Property	Ice	South	#N/A	Sideswipe	Going Ahead	#N/A
3	11181905	21-Jun-11	1702	25	M	N	Candlelight	Clear	Daylight	Property	Dry	North	North	Rear end	Going Ahead	Going Ahead
4	11212775	14-Jul-11	854	1000	M	N	Derry	Clear	Daylight	Property	Dry	North	North	Rear end	Going Ahead	Slowing or Stopping
5	13391928	7-Jul-13	232	200	M	N	Derry	Rain	Dark	Property	Wet	South	#N/A	Approaching	Going Ahead	#N/A
6	11022346	5-Feb-11	1940	508	M	S	Doug Leavens	Snow	Dark	Property	Loose Snow	North	#N/A	SMV other	Going Ahead	#N/A
7	11041246	23-Feb-11	1345	10	M	N	Eglinton	Clear	Daylight	Property	Dry	West	South	Turning Movement	Right Turn	Stopped
8	12151296	12-May-12	2122	10	M	N	Eglinton	Clear	Dark	Property	Dry	South	South	Rear end	Going Ahead	Going Ahead
9	13252529	3-May-13	850	500	M	S	Eglinton	Clear	Daylight	Property	Dry	North	#N/A	Angle	Going Ahead	#N/A
10	13385644	4-Jul-13	720	100	M	S	Eglinton	Rain	Dark	Property	Wet	North	#N/A	SMV other	Going Ahead	#N/A
11	13654853	13-Nov-13	1730	100	M	N	Eglinton	Clear	Dusk	Non-fatal	Dry	South	South	Rear end	Going Ahead	Stopped
12	12096100	26-Mar-12	1559	10	M	N	Erin Centre	Clear	Daylight	Property	Dry	East	East	Rear end	Going Ahead	Slowing or Stopping
13	13430123	24-Jul-13	1048	50	M	S	Erin Centre	Clear	Daylight	Property	Dry	North	North	Rear end	Slowing or Stopping	Slowing or Stopping
14	13520430	7-Sep-13	1242	75	M	S	Erin Centre	Rain	Daylight	Property	Wet	North	North	Rear end	Slowing or Stopping	Slowing or Stopping
15	13524996	9-Sep-13	1808	200	M	S	Erin Centre	Clear	Daylight	Property	Dry	North	North	Rear end	Slowing or Stopping	Going Ahead
16	11161124	6-Jun-11	1704	500	M	N	Foxwood	Clear	Daylight	Property	Dry	South	#N/A	SMV other	Going Ahead	#N/A
17	9170392	14-Sep-09	1839	10	M	S	Manatee	Clear	Daylight	Property	Dry	North	North	Rear end	Going Ahead	Going Ahead
18	12288757	27-Aug-12	1517	5	M	0	Osprey	Clear	Daylight	Property	Dry	South	South	Rear end	Going Ahead	Going Ahead
19	12343156	11-Oct-12	724	30	M	S	Osprey	Clear	Daylight	Property	Dry	North	North	Rear end	Slowing or Stopping	Going Ahead
20	11053182	6-Mar-11	332	10	M	S	Parkgate	Snow	Dark	Property	Loose Snow	South	#N/A	SMV other	Going Ahead	#N/A
21	11111849	28-Apr-11	814	30	M	N	Parkgate	Rain	Daylight	Property	Wet	South	#N/A	SMV other	Going Ahead	#N/A
22	11215951	16-Jul-11	1152	0	M	0	Skyview	Clear	Daylight	Property	Dry	South	South	Rear end	Slowing or Stopping	Slowing or Stopping

MISSISSAUGA
Leading today for tomorrow

Ninth Line
between Eglinton and North Limit
January 1, 2008 to November 30, 2013

	Accident #	Date	Time	Distance	Unit	Direction	Road	Enviroment Condition	Light	Acident Classification	Road Surface Condition	Direction of Travel (Vehicle 1)	Direction of Travel (Vehicle 2)	Initial Impact	Vehicle Manoeuver (Vehicle 1)	Vehicle Manoeuver (Vehicle 2)
23	8229239	29-Nov-08	131	12	M	E	Thomas	Clear	Dark	Property	Wet	East	#N/A	Turning Movement	Left Turn	#N/A
24	11011523	21-Jan-11	1313	100	M	S	Thomas	Snow	Daylight	Property	Wet	South	South	Rear end	Slowing or Stopping	Going Ahead
25	13560706	27-Sep-13	821		@		Beachem	Clear	Daylight	Non-fatal	Dry	West	North	Approaching	Stopped	Going Ahead
26	13638993	5-Nov-13	830		@		Candlelight	Clear	Daylight	Property	Dry	North	West	Approaching	Going Ahead	Left Turn
27	9021524	4-Feb-09	710		@		Churchill Meadows	Clear	Daylight	Property	Loose Snow	East	#N/A	Sideswipe	Going Ahead	#N/A
28	8097046	27-May-08	2130		@		Doug Leavens	Clear	Dark	Property	Dry	North	North	Rear end	Stopped	Going Ahead
29	13012778	7-Jan-13	1600		@		Doug Leavens	Clear	Daylight	Non-fatal	Dry	North	East	Turning Movement	Going Ahead	Left Turn
30	13079060	8-Feb-13	716		@		Doug Leavens	Snow	Daylight	Property	Wet	North	South	Angle	Going Ahead	Going Ahead
31	8137737	20-Jul-08	2356		@		Eglinton	Clear	Dark	Property	Dry	East	East	Rear end	Stopped	Going Ahead
32	8177629	13-Sep-08	1039		@		Eglinton	Rain	Dark	Property	Wet	South	South	Rear end	Going Ahead	Going Ahead
33	9028672	18-Feb-09	1630		@		Eglinton	Snow	Daylight	Property	Slush	West	West	#N/A	Right Turn	Stopped
34	10124235	16-Jul-10	759		@		Eglinton	Clear	Daylight	Property	Dry	East	East	Rear end	Slowing or Stopping	Stopped
35	10214110	1-Dec-10	2045		@		Eglinton	Clear	Dark	Property	Dry	South	#N/A	Rear end	Stopped	#N/A
36	10218846	6-Dec-10	1735		@		Eglinton	Clear	Dark	Non-reportable	Wet	West	#N/A	#N/A	Slowing or Stopping	#N/A
37	10219832	6-Dec-10	630		@		Eglinton	Rain	Dark	Property	Wet	West	#N/A	Rear end	Slowing or Stopping	#N/A
38	10216983	7-Dec-10	1839		@		Eglinton	Clear	Dusk	Property	Dry	South	North	Turning Movement	Left Turn	Going Ahead
39	11000665	2-Jan-11	130		@		Eglinton	Clear	Dark	Property	Dry	North	#N/A	Turning Movement	Going Ahead	#N/A
40	11003236	6-Jan-11	1740		@		Eglinton	Snow	Dark	Property	Packed Snow	#N/A	North	Angle	Going Ahead	Going Ahead
41	11133465	16-May-11	948		@		Eglinton	Rain	Daylight	Property	Wet	South	North	Angle	Left Turn	Going Ahead
42	11220197	18-Jul-11	1730		@		Eglinton	Clear	Daylight	Property	Dry	North	#N/A	Rear end	Stopped	#N/A
43	11252979	14-Aug-11	837		@		Eglinton	Clear	Daylight	Property	Dry	North	North	Rear end	Slowing or Stopping	Stopped
44	11365113	10-Nov-11	2040		@		Eglinton	Clear	Dark	Property	Dry	South	North	Angle	Left Turn	Going Ahead

MISSISSAUGA
Leading today for tomorrow

Ninth Line
between Eglinton and North Limit
January 1, 2008 to November 30, 2013

	Accident #	Date	Time	Distance	Unit	Direction	Road	Enviroment Condition	Light	Acident Classification	Road Surface Condition	Direction of Travel (Vehicle 1)	Direction of Travel (Vehicle 2)	Initial Impact	Vehicle Manoeuver (Vehicle 1)	Vehicle Manoeuver (Vehicle 2)
45	11370463	15-Nov-11	753		@		Eglinton	Clear	Daylight	Non-fatal	Dry	North	South	Angle	Going Ahead	Left Turn
46	12013538	13-Jan-12	830		@		Eglinton	Snow	Daylight	Property	Loose Snow	North	#N/A	SMV other	Going Ahead	#N/A
47	12021407	20-Jan-12	718		@		Eglinton	Clear	Daylight	Non-fatal	Wet	South	North	Turning Movement	Left Turn	Going Ahead
48	12074613	8-Mar-12	844		@		Eglinton	Rain	Daylight	Property	Wet	South	South	Rear end	Going Ahead	Slowing or Stopping
49	12155985	16-May-12	430		@		Eglinton	Clear	Daylight	Property	Dry	South	#N/A	Turning Movement	Left Turn	#N/A
50	12162714	22-May-12	845		@		Eglinton	Clear	Daylight	Property	Dry	North	North	Rear end	Going Ahead	Stopped
51	12333983	3-Oct-12	730		@		Eglinton	Rain	Dawn	Property	Wet	South	South	Rear end	Slowing or Stopping	Stopped
52	12334152	3-Oct-12	830		@		Eglinton	Clear	Daylight	Property	Dry	South	#N/A	Rear end	Stopped	#N/A
53	12351201	18-Oct-12	639		@		Eglinton	#N/A	Daylight	Property	Dry	South	South	Turning Movement	Left Turn	Going Ahead
54	12356418	22-Oct-12	1605		@		Eglinton	Clear	Daylight	Property	Dry	South	South	Rear end	Stopped	Going Ahead
55	13069303	3-Feb-13	0		@		Eglinton	Clear	Dusk	Property	Dry	North	North	Rear end	Slowing or Stopping	Stopped
56	13278492	15-May-13	852		@		Eglinton	Clear	Daylight	Property	Dry	North	South	Turning Movement	Going Ahead	Slowing or Stopping
57	13278492	15-May-13	852		@		Eglinton	Clear	Daylight	Property	Dry	North	South	Turning Movement	Going Ahead	Slowing or Stopping
58	13308639	29-May-13	1509		@		Eglinton	Clear	Daylight	Property	Dry	South	South	Rear end	Slowing or Stopping	Slowing or Stopping
59	13308639	29-May-13	1509		@		Eglinton	Clear	Daylight	Property	Dry	South	South	Rear end	Slowing or Stopping	Slowing or Stopping
60	13409587	15-Jul-13	809		@		Eglinton	Clear	Daylight	Property	Dry	East	East	Rear end	Going Ahead	Stopped
61	13643740	3-Nov-13	1000		@		Eglinton	Clear	Dark	Property	Dry	North	#N/A	Approaching	Stopped	#N/A
62	13643740	3-Nov-13	1000		@		Eglinton	Clear	Dark	Property	Dry	North	#N/A	Approaching	Stopped	#N/A
63	8045305	11-Mar-08	950		@		Erin Centre	Clear	Daylight	Property	Dry	West	South	Angle	Left Turn	Left Turn
64	9040217	10-Mar-09	58		@		Erin Centre	Clear	Dark	Property	Dry	South	#N/A	SMV other	Left Turn	#N/A
65	11386692	28-Nov-11	945		@		Erin Centre	Clear	Daylight	Property	Dry	North	South	Rear end	Stopped	Going Ahead
66	12236990	17-Jul-12	500		@		Erin Centre	Clear	Daylight	Other	Dry	North	North	Rear end	Going Ahead	Stopped

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Ninth Line
between Eglinton and North Limit
January 1, 2008 to November 30, 2013

	Accident #	Date	Time	Distance	Unit	Direction	Road	Enviroment Condition	Light	Acident Classification	Road Surface Condition	Direction of Travel (Vehicle 1)	Direction of Travel (Vehicle 2)	Initial Impact	Vehicle Manoeuver (Vehicle 1)	Vehicle Manoeuver (Vehicle 2)
67	13298291	24-May-13	1523		@		Erin Centre	Clear	Daylight	Property	Dry	South	South	Rear end	Going Ahead	Slowing or Stopping
68	13298291	24-May-13	1523		@		Erin Centre	Clear	Daylight	Property	Dry	South	South	Rear end	Going Ahead	Slowing or Stopping
69	13365988	25-Jun-13	324		@		Erin Centre	Clear	Dark	Property	Dry	North	#N/A	Approaching	Going Ahead	#N/A
70	13462536	9-Aug-13	400		@		Erin Centre	Clear	Daylight	Property	Dry	South	South	Rear end	Slowing or Stopping	Slowing or Stopping
71	13568740	30-Aug-13	445		@		Erin Centre	Clear	Daylight	Property	Dry	North	North	Rear end	Stopped	Going Ahead
72	13539329	16-Sep-13	1813		@		Erin Centre	Clear	Daylight	Property	Dry	North	North	Rear end	Going Ahead	Slowing or Stopping
73	13631609	31-Oct-13	500		@		Erin Centre	Rain	Dawn	Property	Wet	North	#N/A	Rear end	Slowing or Stopping	#N/A
74	8229457	28-Nov-08	1830		@		Foxwood	Clear	Dark	Property	Dry	West	South	Angle	Going Ahead	Left Turn
75	11251942	13-Aug-11	1335		@		Foxwood	Clear	Daylight	Property	Dry	West	#N/A	Turning Movement	Left Turn	#N/A
76	13117611	26-Feb-13	2229		@		Foxwood	Drifting Snow	Dark	Property	Slush	North	South	Sideswipe	Going Ahead	Going Ahead
77	12423775	8-Dec-12	1757		@		Hazelridge	Clear	Dusk	#N/A	Dry	South	North	Turning Movement	Left Turn	Going Ahead
78	13469518	13-Aug-13	851		@		Henrietta	Clear	Daylight	Non-fatal	Dry	South	South	Rear end	Going Ahead	Stopped
79	11129218	12-May-11	1610		@		Lacman	Clear	Daylight	Property	Dry	#N/A	#N/A	#N/A	Going Ahead	#N/A
80	13629542	31-Oct-13	1625		@		Manatee	Rain	Daylight	Property	Wet	North	North	Rear end	Going Ahead	Slowing or Stopping
81	10213401	1-Dec-10	1748		@		McDowell	Clear	Dark	Property	Dry	North	North	Rear end	Going Ahead	Slowing or Stopping
82	8111154	15-Jun-08	1435		@		Osprey	Clear	Daylight	Property	Wet	North	West	Angle	Right Turn	Stopped
83	8133534	15-Jul-08	645		@		Osprey	Clear	Daylight	#N/A	Dry	West	#N/A	Approaching	Left Turn	#N/A
84	11013068	24-Feb-11	856		@		Osprey	Snow	Daylight	Property	Ice	South	#N/A	Approaching	Slowing or Stopping	#N/A
85	11043211	25-Feb-11	939		@		Osprey	Snow	Daylight	Property	Loose Snow	North	West	Approaching	Right Turn	Slowing or Stopping
86	13431597	25-Jul-13	840		@		Osprey	Clear	Daylight	#N/A	Dry	North	North	Rear end	Going Ahead	Going Ahead
87	8175064	10-Sep-08	945		@		Parkgate	Clear	Daylight	#N/A	Dry	West	East	Sideswipe	Left Turn	Left Turn
88	10213550	1-Dec-10	2220		@		Parkgate	Clear	Dark	#N/A	Dry	West	North	Angle	U-Turn	Going Ahead

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	Accident #	Date	Time	Distance	Unit	Direction	Road	Enviroment Condition	Light	Acident Classification	Road Surface Condition	Direction of Travel (Vehicle 1)	Direction of Travel (Vehicle 2)	Initial Impact	Vehicle Manoeuver (Vehicle 1)	Vehicle Manoeuver (Vehicle 2)
89	11013115	24-Jan-11	915		@		Roadside	Snow	Daylight	#N/A	Wet	North	East	Angle	Going Ahead	Left Turn
90	12244020	23-Jul-12	245		@		Skyview	Clear	Daylight	#N/A	Dry	East	East	SMV unattended vehicle	Reversing	Parked
91	12342196	10-Oct-12	800		@		Skyview	Rain	Daylight	#N/A	Wet	South	#N/A	Rear end	Slowing or Stopping	#N/A
92	13513330	4-Sep-13	828		@		Stargazer	Clear	Daylight	#N/A	Dry	South	#N/A	Turning Movement	Left Turn	#N/A
93	8036584	26-Feb-08	1945		@		Tacc	#N/A	Dark	#N/A	Ice	East	West	Approaching	Right Turn	Slowing or Stopping
94	13091462	14-Feb-13	802		@		Tacc	Clear	Daylight	#N/A	Dry	West	North	Angle	Left Turn	Going Ahead
95	12165714	24-May-12	1230		@		Terragar	Clear	Daylight	#N/A	Dry	#N/A	#N/A	Rear end	Going Ahead	Stopped
96	8145727	31-Jul-08	320		@		Thomas	Clear	Daylight	#N/A	Dry	East	#N/A	Turning Movement	Right Turn	#N/A
97	8176915	12-Sep-08	2100		@		Thomas	Clear	Dark	#N/A	Dry	South	South	Rear end	Going Ahead	Stopped
98	10218130	9-Dec-10	0		@		Thomas	Clear	Dawn	#N/A	Dry	South	North	Turning Movement	Left Turn	Going Ahead
99	10223690	16-Dec-10	1725		@		Thomas	Clear	Dark	#N/A	Dry	South	#N/A	Rear end	Going Ahead	#N/A
100	10224162	16-Dec-10	1730		@		Thomas	Other	Dark	#N/A	Wet	South	#N/A	Rear end	Going Ahead	#N/A
101	11013484	24-Jan-11	1937		@		Thomas	#N/A	Dark	#N/A	Loose Snow	West	#N/A	Angle	Right Turn	#N/A
102	11014588	26-Jan-11	2103		@		Thomas	Clear	Dark	#N/A	Dry	West	North	Approaching	Going Ahead	Going Ahead
103	11029338	11-Feb-11	1800		@		Thomas	Clear	Dark	#N/A	Dry	North	North	Rear end	Slowing or Stopping	Slowing or Stopping
104	11032727	15-Feb-11	1725		@		Thomas	Clear	Dusk	#N/A	Dry	North	North	Rear end	Going Ahead	Stopped
105	11134666	17-May-11	730		@		Thomas	Rain	Daylight	#N/A	Wet	South	#N/A	Approaching	Going Ahead	#N/A
106	11397124	6-Dec-11	1800		@		Thomas	Clear	Dark	#N/A	Dry	South	#N/A	Rear end	Stopped	#N/A
107	12048918	13-Feb-12	830		@		Thomas	Clear	Daylight	#N/A	Dry	North	#N/A	Rear end	Slowing or Stopping	#N/A
108	12182748	6-Jun-12	1138		@		Thomas	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
109	12406643	30-Nov-12	1630		@		Thomas	Snow	Dusk	#N/A	Loose Snow	West	West	#N/A	#N/A	Stopped
110	12442717	17-Dec-12	1630		@		Thomas	Clear	Daylight	#N/A	Dry	North	#N/A	Rear end	Going Ahead	#N/A

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111	13354909	19-Jun-13	510		@		Thomas	Clear	Daylight	#N/A	Dry	#N/A	#N/A	Turning Movement	Stopped	Reversing
112	13441521	30-Jul-13	830		@		Thomas	Clear	Daylight	#N/A	Dry	West	West	Angle	Going Ahead	Left Turn
113	13678770	12-Nov-13	1730		@		Thomas	Clear	Dusk	#N/A	Dry	North	#N/A	Rear end	Stopped	#N/A
114	13678770	12-Nov-13	1730		@		Thomas	Clear	Dusk	#N/A	Dry	North	#N/A	Rear end	Stopped	#N/A

APPENDIX H

Future Background Development Information

1. Introduction

AECOM was retained to undertake a Traffic Impact Study (TIS) of the proposed draft plan of subdivisions located at the northeast corner of the Highway 403 and Highway 407 interchange as shown in **Figure** 1. This report provides a summary of the transportation assessment for the proposed mixed-use development. The subject development will include a total of approximately 112,630 m^2 of industrial park, 6,762 m^2 of retail (including 433 m^2 of highway commercial) and 8,074 m^2 of office building. The site plan of the proposed development is depicted in **Figure 2.**

This report provides an overview of the analysis that was undertaken to determine the potential traffic impact of the proposed development on the highway ramp terminals adjacent to the subject site. The study examined nine traffic scenarios: existing conditions, future background and future total traffic conditions at year 2018, 2023, 2028 and 2033 (2018 at interim, 2023 at opening day, 2028 at five years after the opening, and 2033 at 10 years after the opening). The analyses were completed for weekday morning and afternoon peak periods using the Synchro software version 7.0 which is developed based on Highway Capacity Manual (2000). The conclusions and recommendations are presented in **Section 5**.

Figure 1. Site Location Map

112 630 m^2
↳ 1 212 339 ft^2
6 762 m^2
↳ 72 785 ft^2
8 074 m^2
↳ 86 907 ft^2

Figure 5. Site Traffic Volume in Ultimate Year (2023)

APPENDIX I

Assessment Methodology Documentation (407 Transitway and overall approach)

Confirmation on trip generation of 407 Transitway Stations

Yu, Peter

From: Norbert Orzel <Norbert.Orzel@mississauga.ca>
Sent: October-28-16 11:08 AM
To: Yu, Peter
Cc: Liz Howson (howson@mshplan.ca); Bumstead, Greig; Mel Kayama; Frank Marzo; Susan Tanabe; Tyler Xuereb
Subject: RE: Ninth Line - Status Update and Information Request - MMM Request

Hi Peter:

We had a meeting this morning to discuss your approach for modelling the trips related to the parking lots and we are okay with you in proceeding with the methodology you described below (i.e. assuming 85% of the parking capacity utilized in the peak period and assuming a uniform arrival rate). Please ensure that this methodology in addition to the other assumptions used in the analysis are well documented in the reports that you will be preparing.

Please let me know if you have any questions. Thanks,

Norbert

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2016/10/24 4:37 PM
To: Norbert Orzel
Cc: Liz Howson (howson@mshplan.ca); Bumstead, Greig; Mel Kayama; Frank Marzo; Susan Tanabe
Subject: Ninth Line - Status Update and Information Request - MMM Request
Importance: High

Hi Norbert,

Thanks again for the in-depth discussion on the various 407 Transitway trip generation/distribution scenarios. Please see my comments below in red.
Please confirm these are acceptable.
Thx
Peter

From: Norbert Orzel [mailto:Norbert.Orzel@mississauga.ca]
Sent: October-19-16 8:35 AM
To: Yu, Peter
Cc: Liz Howson (howson@mshplan.ca); Bumstead, Greig; Mel Kayama; Frank Marzo; Susan Tanabe
Subject: RE: Ninth Line - Status Update and Information Request

Hi Peter:

Thank you for developing the below methodology, we have a few questions/ comments regarding your proposal.

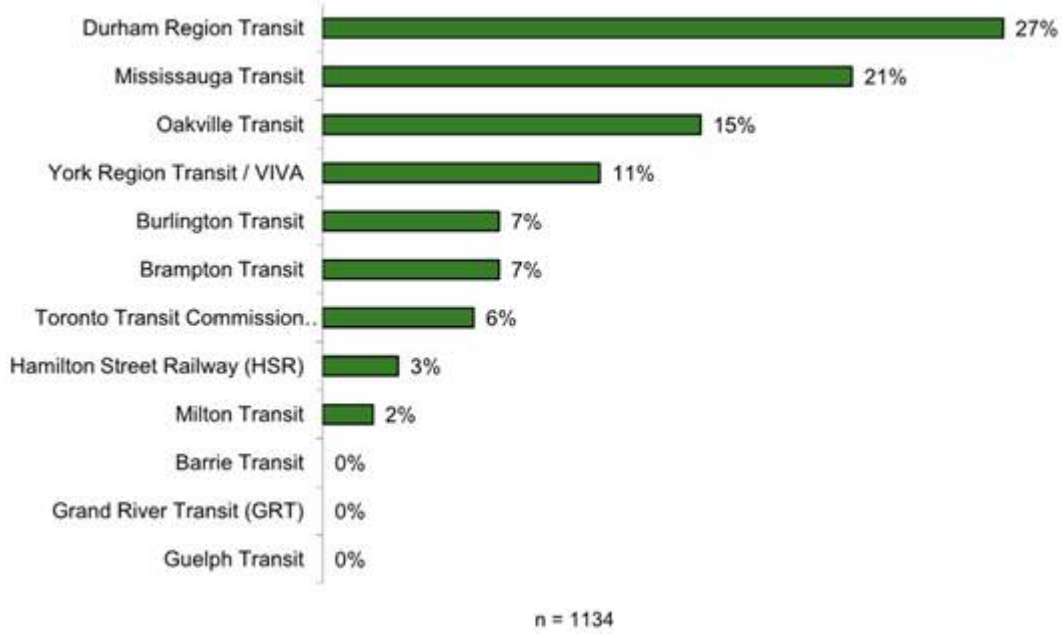
- How will the proposed trip rates be applied for inbound vs outbound trips for the two peak hours? The previous studies indicate that it would 100% inbound trips in the morning and 90% outbound during the afternoon peak. These are in line with typical transit stations that are closely correlated with in/out patterns for work/commercial-related trips.

- We suggest using the same parking capacity for both scenarios (preferably the worst case parking scenario). Using a different parking scenario for the BAU scenario vs the other scenario would not allow us to evaluate/ compare the impact of only the land uses. Noted, we will proceed on this basis.
- Could you please explain your methodology in choosing the 80% pass-by/ diversion rate adjustment? As the study area is located at the western boundary of the City it is our understanding that a large percentage of the traffic in that area originates outside the City of Mississauga with a significant amount destined to the Meadowvale Business Park. As such we question the theory that such a large percentage of the existing traffic in the area would divert to the stations.
  In addition to the scenarios we discussed (i.e., no adjustment but risking significantly over capacity conditions in the BAU scenario VS. some form of diversion adjustment), there is another case to be made – **the concept of peak hour spreading arrival or departure rate**. If we assume that the 4,000 parking spaces are 85% filled by the end of the morning rush period, then it makes sense to spread out the 0.85 trips/space over the extended morning peak period of 5:30 a.m. to 9:30 a.m. So this would result in an average arrival rate of 0.2125 trips/space or a total of 850 trips/hour. Similarly, in the afternoon, the 85% full lot would dissipate over an extended period of 3:00 p.m. to 7:00 p.m. and a departure rate of 0.2125 trips/space or a total of 850 outbound trips/hour. While it is recognized that the trip rates may vary hour by hour, we have already identified that both the morning afternoon peak hours are near or at capacity, so it makes sense for motorists to want to avoid the rush by leaving earlier or later.

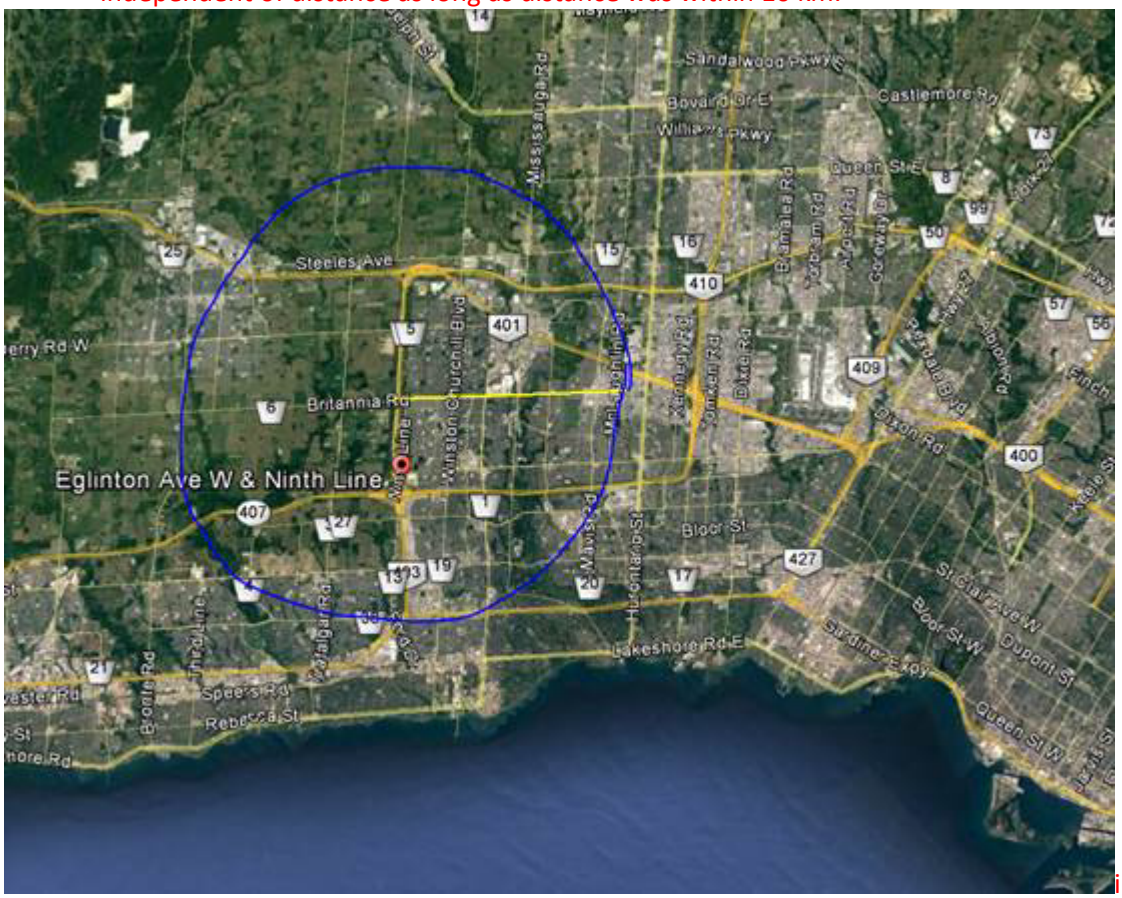
I've also reviewed the GO Transit 2013 Rail Survey report, which provided some interesting insight that **supports** our proposed peak hour spreading approach:

- 66% of respondents reported that they had adjusted both a.m. and p.m. commute times;
- Of the respondents who had the flexibility to adjust their schedule, 33% reported half an hour to less than 45 minutes of schedule adjustments;
- Of the respondents who had the flexibility to adjust their commute times, 24% indicate that their employee allowed them, 19% wanted to avoid crowds or congestion, and 9% wanted to get a better parking spot.
- Driving to a station in a single occupant vehicle remains the most prevalent mode – 61%, 15% as passenger in a vehicle and 17% via walking or local transit;
- Local transit used indicate that Mississauga transit is a popular tool to bridge the gap to/from a rail/higher order transit system;

EXHIBIT 42. Chart Illustrating Local Transit Used to Arrive at Boarding Station



- Respondents who drove to GO Train stations were spread heavily from 1km to 10km range. The pattern indicate that for some passengers to travel from the origin to the boarding station, driving was a convenient mode independent of distance as long as distance was within 10 km.



indicating 10km radius of key attraction area for the transitway stations

Thanks,

Norbert Orzel
Transportation Modelling Specialist
T 905-615-3200 ext.3636
norbert.orzel@mississauga.ca

City of Mississauga | Transportation and Works Department,
Transportation and Infrastructure Division

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From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2016/10/13 4:25 PM
To: Mel Kayama; Norbert Orzel; Frank Marzo; Susan Tanabe
Cc: Liz Howson (howson@mshplan.ca); Bumstead, Greig
Subject: RE: Ninth Line - Status Update and Information Request

Hi everyone,

Confirmation of 407 Transitway Station parking capacities

Yu, Peter

From: Scale, Jim <jim.scale@amecfw.com>
Sent: May-24-16 5:19 PM
To: Mel Kayama; Liz Howson; Yu, Peter; Frank Marzo; Norbert Orzel
Cc: Hillier, Peter; Scheckenberger, Ron; Susan Tanabe
Subject: RE: Ninth Line Transportation Evaluation

Follow Up Flag: Follow up
Flag Status: Flagged

Peter,

As discussed, we have not undertaken any additional traffic studies as part of our Transitway assessment.

The 1998 Transitway Corridor Protection Study prepared by MRC included forecasted, stated and protected parking capacities of 1,430, 1,700 and 2,415 respectively within the Ninth Line corridor. The variation in the above capacities was not outlined in the report. In discussions with MTO, the MTO felt the previously developed capacities were underestimated and in the absence of a more detailed assessment (to be completed as part of the Hwy 407 Transitway EA), MTO requested an interim parking capacity of 2,800 and an ultimate parking capacity of 4,000.

Based on our parking assessment, we have allocated the following parking capacities to the Britannia and Derry stations:

Station	Interim Capacity (spaces)	Ultimate Capacity (spaces)
Britannia	640	640
Derry	2,160	3,360
Totals	2,800	4,000

The Britannia station has limited capacity given proximity to the floodplain to the west, Britannia Road to the north, the Ninth Line right-of-way to the east and the existing stormwater management systems to the south.

MTO has requested that the capacities be accommodated at-grade as opposed to parking structures. Concerns were expressed to the MTO that the requested parking capacities were significantly greater than the Transitway station capacities being provided outside the Ninth Line Corridor, and that the capacities and requirement for at-grade facilities were not compatible with current land use planning policies and guidelines as it relates to the associated land requirements and promotion of alternative modes of transportation (i.e. pedestrian, bicycle and transit) to access the Transitway itself.

Assuming the parking capacities above are realized these would be vehicular trips generated to and from the stations supplemented with trips generated by local MiWay buses and passenger drop-off and pick-up.

If you have any questions or require any additional information, please contact me.

James Scale, P.Eng.
Associate Engineer, Transportation, Amec Foster Wheeler
3215 North Service Road, Burlington, ON L7N 3G2, Canada

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jim.scale@amecfw.com amecfw.com

Be more sustainable - think before you print.

From: Mel Kayama [mailto:Mel.Kayama@mississauga.ca]
Sent: May-24-16 12:10 PM
To: Liz Howson <howson@mshplan.ca>; 'Yu, Peter' <YuP@mmm.ca>; Frank Marzo <Frank.Marzo@mississauga.ca>; Norbert Orzel <Norbert.Orzel@mississauga.ca>
Cc: 'Hillier, Peter' <HillierP@mmm.ca>; Scale, Jim <jim.scale@amec.com>; Scheckenberger, Ron <Ron.Scheckenberger@amec.com>; Susan Tanabe <Susan.Tanabe@mississauga.ca>
Subject: RE: Ninth Line Transportation Evaluation

Peter,

The Corridor Protection Study (1998) although outdated may have information of use.

From: Liz Howson [mailto:howson@mshplan.ca]
Sent: 2016/05/24 11:46 AM
To: 'Yu, Peter'; Frank Marzo; Mel Kayama; Norbert Orzel
Cc: 'Hillier, Peter'; 'Scale, Jim'; 'Scheckenberger, Ron'; Susan Tanabe
Subject: RE: Ninth Line Transportation Evaluation

I am not sure what information you require but I would think that Amec Foster Wheeler in their work on the transitway alignment may have some information which you could use for instance I know they had ongoing discussions with MTO on the amount of parking that would be required and also the design of same and access. I have copied Jim Scale and Ron Scheckenberger so they are aware of this issue but perhaps you could call Jim directly and discuss with him what information you need to determine whether he has anything that would be useful.

I remain very concerned that the entire land use plan is based on the assumption of the transitway and to do a traffic evaluation without recognizing it frankly will in my view produce misleading results which will not give us the information we need to do a meaningful evaluation of the plan. Liz

---

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: Tuesday, May 24, 2016 11:32 AM
To: Liz Howson; 'Frank Marzo'; 'Mel Kayama'; 'Norbert Orzel'
Cc: Hillier, Peter
Subject: RE: Ninth Line Transportation Evaluation

Hi Liz,

I agree, however, when I asked Adrian from MTO for input as to what kind of assumption we should be making to account for the project, his response was that MTO cannot any information at this time – making it difficult for us to grasp its impact, particularly for the early June PICs. Alternatively, we can leave a place holder for the 407 Transiway project for when the EA is completed later this year, but for the purpose of the June PICs not include them. Look forward to everyone's thoughts.

Peter

From: Liz Howson [mailto:howson@mshplan.ca]
Sent: May-24-16 11:22 AM
To: Yu, Peter; 'Frank Marzo'; 'Mel Kayama'; 'Norbert Orzel'
Cc: Hillier, Peter
Subject: RE: Ninth Line Transportation Evaluation

Hi Peter – Frank is away until Thursday. However, I am very concerned about not including the transitway in your analysis. The City has been assured that the EA will be going ahead this year and the Emerging Land Use Plan includes the transitway. I think your analysis has to reflect the assumption that it will proceed. Liz

---

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: Tuesday, May 24, 2016 11:11 AM
To: Frank Marzo; Mel Kayama; Norbert Orzel; Liz Howson (howson@mshplan.ca)
Cc: Hillier, Peter
Subject: RE: Ninth Line Transportation Evaluation
Importance: High

Hi Frank,

We will proceed with the mid-point development density. I finally heard back this morning from Adrian re 407 Transitway. Unfortunately, he said that MTO has not started the EA and has no information to share with us. He mentioned that the City will be included as a key advisory member for the EA and will be closely consulted for the project. On this basis and due to the uncertainty of the EA's timing, a more conservative approach of not including the 407 Transitway project in our analysis is recommended.

Pending your response, I can circulate the final study approach/assumption memo and fully commence in our assessment. Given that there is now less than 2 weeks left before the PIC's, what is the City/project team's preference in terms of internal team circulation of presentation material both in terms of content and methodology.

Thanks

Peter

Peter Yu, P.Eng.
Project Engineer
Transportation Planning

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Yup@mmm.ca

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From: Frank Marzo [mailto:Frank.Marzo@mississauga.ca]
Sent: May-19-16 2:39 PM
To: Yu, Peter; Mel Kayama; Norbert Orzel; Liz Howson (howson@mshplan.ca)
Cc: Hillier, Peter
Subject: RE: Ninth Line Transportation Evaluation

Hi Peter,
The City's preference is to in fact use the mid-point as developed based on the concept rather than the minimum. Please proceed on this basis.

Thanks
Frank

Frank Marzo
Planner, Policy Planning
T 905-615-3200 ext.5609|
Frank.Marzo@mississauga.ca
City of Mississauga | Planning and Building Department,
Policy Planning Division

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From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2016/05/18 4:19 PM
To: Mel Kayama; Norbert Orzel; Frank Marzo; Liz Howson (howson@mshplan.ca)
Cc: Hillier, Peter
Subject: RE: Ninth Line Transportation Evaluation
Importance: High

Dear team members,

Here is a summary of where things are at with regards to the traffic work:

-Adrian (MTO) and I are playing telephone tag so I'm hoping I can get the insight from him soon.

-It is my understanding that the two PIC's are scheduled for June 6 and 8. With these dates quickly approaching (approx. 9 days left only, not to mention the need to circulate findings internally prior to the PIC), we need to finish data and background information collection by this week. Liz, regarding the PIC presentation material, we need to understand what material is required at these PICs. Given the tight time line, a condensed/simplified version of the material should be considered.

-We have received the emerging land use concept from Hemson/MSH. In the concept there are min, mid and max ranges. It's our understanding that min is the one that the City prefers. Can you please confirm that we should proceed on this basis?

-As per your voicemail, we are arranging to have one of our staff pass-by and pick up the background TIS reports.

-I am hoping to find out by end of this week whether the growth rates provided by the City can be accommodated by the road network or not. As I mentioned, there may be cases where a toned down or tapered growth need to be considered so as not to overburden the network before even the application of the land use concept.

-We are still awaiting the trip distribution information from the City that will allow us to most appropriately assign the site-generated traffic to the study area.

Thanks

Peter

Peter Yu, P.Eng.
Project Engineer
Transportation Planning

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From: Yu, Peter
Sent: May-13-16 2:53 PM
To: 'Mel Kayama'
Cc: Norbert Orzel; Frank Marzo; Liz Howson (howson@mshplan.ca); Hillier, Peter
Subject: Re: Ninth Line Transportation Evaluation
Importance: High

Hi Mel,

The information that require from the background development TIS studies are the trip generation table, assumptions made on modal splits and most importantly the figure illustrating the site-generated traffic volumes. An sample is attached of what we usually require.

Regarding your previous email about study assumptions (below) – please see my comments in red.

City and Region staff provide the following comments on MMM's Key Assumption Confirmation:

- The analysis should be based on the 2041 traffic growth forecasts + the full built out of the Ninth Line Lands (analyze the worst case scenario). Noted

- The focus of MMM's effort at this time should be to develop Scenario 1 - ~~Preferred land use scenario~~ Emerging land use Concept without GTA West and without Argentia Road in time for the June PIC's. (please make revision to MMM memo). Noted

- The other sensitivity scenarios are still required and should incorporate the comments received from the June PIC (and consider the results of Scenario 1). In addition the exact approach for modelling the other sensitivity scenarios still needs to be discussed and any information required for that work still has to be prepared (for example providing the City model results for the scenarios which include the GTAW and the Argentia Road extension). Can you clarify what you are expecting in terms of a model (i.e., Synchro or another program)? What we had in mind on the onset was to get City and Region input on the potential impacts of the various road improvement/background developments and modify our traffic assignment, background assumptions accordingly to generate new traffic volumes. We can then circulate the modified volumes and associated information to the City for confirmation. We had not anticipated on actually running models per say. An excerpt from the original RFP is below:

4. Trip distribution assumptions must be supported by one or more of the following:
   - Transportation Tomorrow Survey;
   - Origin-destination surveys;
   - Comprehensive travel surveys;
   - Existing/anticipated travel patterns;
   - Output from the Regional or City of Mississauga EMME transportation planning model.

- The March 23rd Revised Proposal prepared by MMM included the development and analysis of a BAU scenario, this is not identified in the assumptions memo and as such we want to insure that this scenario will be included. This scenario should also be developed for the June PIC's. Noted and confirmed, BAU will be included. Please confirm that BAU represents the existing volumes with the City's growth rates applied to 2041 as well as the background development TIS volumes.

- Please ensure that the transportation analysis work makes reference to the Halton-Peel Boundary Area Transportation Study and the results/ findings of that study are considered in the work. This study wasn't noted in the RFP and having looked at it briefly, we require clarity as to which components of the 300 page document MMM needs to incorporate so as to improve efficiency and misunderstanding. For instance, do you want us to cross referene growth rates, or actual volume projections or both from this study? https://www.brampton.ca/en/Business/planning-development/transportation/Documents/HPBATS%20Amended%20Final%20120510.pdf

- As previously indicated it will be the responsibility of MMM to acquire the assumptions from MTO/ develop the assumptions as related to the impact of the 407 Transitway on the study area. Noted

- The City will notify MTO that MMM will be contacting them for information regarding the 407 Transitway. Noted

In response to the information required by MMM we are gathering whatever information is available and should be able to provide the requested information over the next couple days. Noted

For completion, we will modify our assumptions memo based on the comments above and circulate to the project team once more.

Thanks

Peter

Peter Yu, P.Eng.
Project Engineer
Transportation Planning

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From: Mel Kayama [mailto:Mel.Kayama@mississauga.ca]
Sent: May-12-16 12:01 PM
To: Yu, Peter
Cc: Norbert Orzel; Frank Marzo
Subject: FW: Ninth Line Transportation Evaluation

Hi Peter,

In reference to MMM's attached memo, Item 1 Information Required, 6th bullet

Please specify the information you require from the TIS's (we can forward the pages containing the required info rather than arranging a copy of the complete study).

Thanks
Mel

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2016/05/05 7:16 PM
To: Mel Kayama; Kataure, Virpal (Virpal.Kataure@peelregion.ca); Frank Marzo; Norbert Orzel; Susan Tanabe
Cc: Liz Howson (howson@mshplan.ca); Hillier, Peter
Subject: RE: Ninth Line Transportation Evaluation

All,

Please find attached our assumption/study approach summary memo. We look forward to the consensus from the Region and the City.

Thanks

Peter

Peter Yu, P.Eng.
Project Engineer
Transportation Planning

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From: Mel Kayama [mailto:Mel.Kayama@mississauga.ca]
Sent: May-05-16 10:22 AM
To: Yu, Peter
Cc: Kataure, Virpal (Virpal.Kataure@peelregion.ca); Frank Marzo; Norbert Orzel; Susan Tanabe; Liz Howson (howson@mshplan.ca); Hillier, Peter
Subject: RE: Ninth Line Transportation Evaluation

Hi Peter,

City and Region staff are meeting next week to discuss growth rates and the GTA West. In addition to this, we will discuss MTO's involvement.

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2016/05/05 9:25 AM
To: Kataure, Virpal; Mel Kayama; Frank Marzo; howson@mshplan.ca
Cc: Hillier, Peter
Subject: RE: Ninth Line Transportation Evaluation

Good morning all,

I will be sending out the approach summary today for Ninth Line. Before I do that, I was wondering if MTO has provided input or if there is a plan in place to have them involved in the comment/review process. For the existing conditions assessment back in 2013/2014, MTO staff reviewed and commented on the off-ramp intersections. Just thinking down the road here.

Thanks

Peter

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Project Engineer
Transportation Planning

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From: Kataure, Virpal [mailto:virpal.kataure@peelregion.ca]
Sent: May-03-16 1:57 PM
To: Yu, Peter
Cc: Mel Kayama; Frank Marzo; howson@mshplan.ca; Smith, Adrian; Chan, Eric; Detaramani, Tina; Carrick, Sean; Norbert Orzel
Subject: RE: Ninth Line Transportation Evaluation

Good afternoon,
Peter please find below comments from Peel with respect to the email chain below.

3. Future Conditions with respect to GTA West: Please conduct two scenarios 1) with the GTA West as a "what if" scenario and 2) one without the GTA West. Please include discussion in the second scenario around the Halton Peel Boundary Area Transportation Study (HPBATS, 2010).

Growth Rates determined by Hemson: Confirm with Hemson the population and employment growth rates for ultimate build out and whether the ultimate build out scenario is considered to be a 2041 horizon year (is this year feasible?). This could impact the MMM analysis done to date vs. implications on the ultimate network.

Conflicts with comments received from Peel and Mississauga: Please bring this to the immediate attention of Project Leads Virpal Kataure and Frank Marzo, and staff will ensure conflicting comments are resolved at a staff level within a reasonable amount of time.

Norbert's comments: Peel transportation staff note that growth rates appear to be okay. We agree that a memo summarising the assumptions would be very helpful in our review of the transportation analysis.

Please get in touch with me if there are still outstanding matters that need to be addressed with respect to the transportation study.

Virpal Kataure | B. U. R. Pl., M. A.
Planner, Policy Development
Integrated Planning
905-791-7800 x 4358

From: Norbert Orzel [mailto:Norbert.Orzel@mississauga.ca]
Sent: April 28, 2016 11:56 AM
To: YuP@mmm.ca; Kataure, Virpal
Cc: Mel Kayama; Frank Marzo
Subject: RE: Ninth Line Transportation Evaluation

Hi Peter:

Mel asked me to respond to your inquiry as I developed the provided growth rates.

It is our preference to apply the sectional growth rates as they will be more reflective of the network changes that are occurring between the base and future horizon years.

Second I agree that some of the growth rates seem significant but please keep in mind that those rates represent certain sections of roads which have been widen (and should be reflected in your analysis). Also the total growth calculation would be (1.029)^28 – 1 so 122% instead of the 222%.

Virpal does the Region have any concerns with the provided growth rates, some of rates provided are for roads under the Region's jurisdiction. We should ensure that the Region is comfortable with using those numbers in the analysis prior to MMM initiating the traffic work.

Related to the above the City requested MMM (April 8th email from Liz to Peter Hillier) to prepare a memo documenting the key assumptions (trip rates, modal splits, trip distribution, treatment of 407 Transitway, etc.) which will be used in the traffic analysis work prior to MMM actually commencing the work. This would insure that we all agree on the assumptions used in the analysis prior to MMM initiating that work and avoid having to go back and re-due any work as a result of a misunderstanding of the assumptions used in the analysis.

Please let me know if you have any questions. Thanks,

From: Mel Kayama
Sent: 2016/04/28 10:21 AM
To: Norbert Orzel
Subject: FW: Ninth Line Transportation Evaluation

Please provide response to Peter Yu.

Thanks

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2016/04/28 9:52 AM
To: Mel Kayama
Cc: Hillier, Peter
Subject: RE: Ninth Line Transportation Evaluation

Hi Mel,

Thanks for the City's input. Regarding the growth information you attached, I note that the growth rates are noted as compounded annual growth rates.
First, would it be the City's preference to apply sectional growth rates or the average rates shown below.
Second, some of the growth rates are very significant. For instance, our existing data are from 2013 so we would have to grow it by approximately 28 years. For the NB section along Ninth Line during the a.m., this would represent a total growth of 222%. (1.029^28). Is this what the City had in mind?

Compounded Annual Growth Rate (Based on 2011 and 2041 Scenario)

No GTAW

NORTH/ SOUTH DEMAND

	AM PEAK HOUR		PM PEAK HOUR	
	2011 vs 2041 No GTAW		2011 vs 2041 No GTAW	
Ninth Line	**NB**	**SB**	**NB**	**SB**
-btwn Britannia Rd and Eglinton Ave	3.2%	2.2%	2.4%	2.8%
-btwn Derry Rd and Britannia Rd	3.0%	1.9%	2.1%	2.9%
-btwn 401 and Derry Rd	2.6%	1.9%	1.7%	2.6%
Average	**2.9%**	**2.0%**	**2.1%**	**2.8%**

	2011 vs 2041 No GTAW		2011 vs 2041 No GTAW	
Winston Churchill Blvd	**NB**	**SB**	**NB**	**SB**
-btwn Britannia Rd and Eglinton Ave	1.6%	0.9%	1.1%	1.5%
-btwn Derry Rd and Britannia Rd	1.6%	1.6%	1.8%	1.7%
-btwn 401 and Derry Rd	0.6%	3.0%	3.0%	1.1%
Average	**1.2%**	**1.5%**	**1.8%**	**1.4%**

EAST/ WEST DEMAND

	AM PEAK HOUR		PM PEAK HOUR	
	2011 vs 2041 No GTAW		2011 vs 2041 No GTAW	
	EB	**WB**	**EB**	**WB**
Derry Rd btwn Eight Ln and Tenth Ln	2.0%	2.3%	1.8%	1.4%
Britannia Rd btwn Eight Ln and Tenth Ln	2.7%	1.9%	1.8%	2.4%
Eglinton Ave btwn Eight Ln and Tenth Ln	1.3%	2.6%	1.8%	1.2%
Dundas St btwn just west of 9th Ln to WCB	1.3%	1.7%	1.5%	1.6%
Average	**1.8%**	**2.0%**	**1.7%**	**1.7%**

Thanks

Peter

Peter Yu, P.Eng.
Project Engineer
Transportation Planning

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From: Mel Kayama [mailto:Mel.Kayama@mississauga.ca]
Sent: April-27-16 11:06 AM
To: Yu, Peter; Kataure, Virpal (Virpal.Kataure@peelregion.ca)
Cc: Liz Howson (howson@mshplan.ca); Frank Marzo; Norbert Orzel; Susan Tanabe
Subject: FW: Ninth Line Transportation Evaluation

Peter / Virpal,

Please find the City's response (in blue) to comments below.

Mel

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2016/04/25 12:11 PM
To: Liz Howson; Frank Marzo; Mel Kayama
Cc: Hillier, Peter; Medic, Ismet
Subject: Re: Ninth Line Transportation Evaluation

Good morning Liz, Frank, Mel,

We've reviewed Peel Region's comments attached and our feedback is as follow in red, some of the comments require the City's input.

- Part A: Transportation Assessment
  - 1. Background Information:
    - Consider impacts on traffic demand from adjacent growth rates (including population and employment forecasts) in Halton Region (i.e. beyond the study area).
      Our scope includes the confirmation of background growth from the City's model and other background developments. Will the City's model include background growth that the Region is looking to include as well?

      The City's Model includes future population and employment growth both within the Regions of Peel and surrounding areas. Should the Region require further clarification, please contact the City.

  - 3. Future Conditions:
    - Under a) please add "that the project team will coordinate with MTO, 407, and Halton/Milton on future highway, transit, road/intersection and active transportation improvements to ensure that existing information and assumptions of future transportation projects are appropriately considered in the analysis (e.g. GTA West Corridor)."
      This comment is noted. Similar to item 1 above, it is expected that collaboration is required between the City staff, as well as other stakeholders to inform MMM the appropriate basis to proceed on. GTA West Corridor is already included in our scope.

      City's updated comments (April 19/16) mentioned:
      "As part of the Lakeshore Road and Dundas Street studies, T&W had requested MTO to provide a list of future network assumptions to be included in the model for those studies. Transportation Planning has received a list of MTO's network

assumptions and the GTA West was not included in their list. In view of MTO not identifying the GTA West in their future network, Transportation Planning suggest the same and not include the GTA West as part of the future network for the Ninth Line transportation assessment."

Attached are revised (without the GTA West) recommended traffic growth rates and 2011 vs 2041 network comparison to be used as part of the traffic study.

- The team should consider other relevant transportation studies being undertaken, including the Halton Region Class EA for transportation corridor improvements on Ninth Line from Dundas Street to the 407 ETR being conducted by CIMA+.
  With the expectation that transportation deliverables for the Ninth Line project are required by late May this year, the timing of receiving information from CIMA+ regarding the Halton Region Class EA is a concern. Once again, it would be advisable for City staff to coordinate with the Region to determine the appropriate next steps.

  The Halton Region Class EA for corridor improvements in Ninth Line from Dundas Street to the 407 ETR are included in the travel demand model (refer to attachment)

- Growth rates are being determined by Hemson Consulting in consultation with the Ninth Line project team. Please retain necessary data from the appropriate source. The transportation analysis will include up to 2031 forecasts, with the provision to include other horizon years subject to data availability from Hemson Consulting.
  Our scope includes on future horizon analysis (build-out of preferred land use scenario), the horizon which will be determined in collaboration with the project team and the key stakeholder (City). The assessment of additional horizon years will be additional scope. How does the City consider the growth rates from Hemson Consulting fit into the Ninth Line project (i.e., will there be conflicting growth assumptions?)

  We are assuming that the "Growth rates" are not traffic growth rates but rather population/employment growth rates?

  The original RFP scope of work called for a 2041 analysis, with additional land use sensitivity analysis. In view that the study is now focusing on one scenario, we feel a 2041 scenario is appropriate.

- The team needs to consider the strategic implications of the 407 Transitway and how it can be integrated into the study.
  This item relates to the modal split assumptions to be made in the future horizon. MTO's input and data from the parking projections at 407 Transitway facilities would be required.

  MMM will be required to consult directly with MTO for these modal split assumptions (City does not have this data).

- 6. Documentation:

- Staff will need to review a second draft of final report, before it is considered final to ensure comments have been appropriately incorporated.
  Noted, however, in instances where Region and City's interest conflict, how should MMM proceed.

  The report should be reviewed by both City and Region.

- The final report should consider the Region's Road Characterisation Study and Peel's Active Transportation Plan, as per comments on December 4, 2014.

If you have any questions, please let us know.

Thanks

Peter Yu, P.Eng.
Project Engineer
Transportation Planning

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Confirmation of modal split to apply for the sensitivity assessment of the 407 Tranistway Stations

Yu, Peter

From: Norbert Orzel <Norbert.Orzel@mississauga.ca>
Sent: September-16-16 11:25 AM
To: Yu, Peter
Cc: Bumstead, Greig; Smith, Adrian; Mel Kayama; Kataure, Virpal; Susan Tanabe; Frank Marzo; Liz Howson (howson@mshplan.ca); Chan, Eric
Subject: RE: Ninth Line Transportation Assessment - Modelling results for Argentia Road extension and GTAW

Hi Peter:

Thank you for your email and for looking into the modal split issue in more detail.

While staff are okay with your proposed methodology we have some concerns regarding the high modal split assumptions that you will be testing and how they will be used in the decision making process. Specifically what adjustments would take precedence if we get to a point where the transportation analysis indicates traffic issues in the study area, for example do you adjust the land use or do you assume that you will achieve a 20% non-auto modal split increase (or do you assume network improvements)? With no technical justification behind the modal split assumptions we would need the consulting team to develop a policy framework through Mississauga Official Plan and/or the Zoning By-law that would guarantee those modal splits in the Ninth Line area. Without the accompanying policy framework, it would be difficult for City staff to base decision making on the higher modal split scenarios.

If this is not possible then land use and densities should be revised to ensure that the transportation network can accommodate the trips generated from the Ninth Line lands. Adjusting land use and densities may not be the only option to address traffic issues and as such we are looking to the consultant team to propose potential solutions.

Also in terms of your calculation for existing modal split could you confirm that the afternoon peak modal split for non-auto trips originating in the area is only 6%. We looked at the 2011 TTS and based on our analysis the number is closer to what you calculated for the morning peak.

Thanks,

MISSISSAUGA

Norbert Orzel
Transportation Modelling Specialist
T 905-615-3200 ext.3636
norbert.orzel@mississauga.ca

City of Mississauga | Transportation and Works Department,
Transportation and Infrastructure Division

Please consider the environment before printing.

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2016/09/13 2:50 PM
To: Norbert Orzel; Smith, Adrian; Mel Kayama; Kataure, Virpal; Susan Tanabe; Frank Marzo; Liz Howson (howson@mshplan.ca); Chan, Eric

Cc: Bumstead, Greig
Subject: RE: Ninth Line Transportation Assessment - Modelling results for Argentia Road extension and GTAW

Afternoon everyone,

We've revisited the ITE trip generation manual and based on our research, the ITE trip generation rates incorporate a non-auto modal split of approximately 10 percent. So for instance, if 90 trips are projected by the ITE methodology, it really reflects 100 total trips – with 90 auto and 10 non-auto. We understand that the surveys for the ITE trip generation rates are primarily conducted in locations where it is auto dominant to fully capture the extent of auto trip generation. Therefore, with the inclusion of the 10% non-auto modal split, all of the trips are captured.

Accordingly, we will calculate the **total # of trips** projected by dividing the ITE trip generation by 0.9. This will account for the 10% non-auto modal split assumed by ITE.

Regarding the non-auto modal split (only transit, school bus, and active transportation – not including carpooling) we will assume that the 407 Transitway initiative by 2041 will result in 10%, 15% and 20% growths. An example of the **outbound modal split** is as follow:

Morning peak hour:

Existing non-auto: 24%
407 Scenario 1 non-auto: 34%
407 Scenario 2 non-auto: 39%
407 Scenario 3 non-auto: 44%

Afternoon peak hour:

Existing non-auto: 6%%
407 Scenario 1 non-auto: 16%
407 Scenario 2 non-auto: 21%
407 Scenario 3 non-auto: 26%

The resulting auto trip generation would be developed by **applying the non-auto mode split** (i.e., 39%) to the **total # of trips.**

If there are any questions, please let me know.

Regards,

Peter

Peter Yu, P.Eng.
Project Engineer
Transportation Planning

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From: Norbert Orzel [mailto:Norbert.Orzel@mississauga.ca]
Sent: September-12-16 9:39 AM
To: Yu, Peter
Cc: Smith, Adrian; Mel Kayama; Kataure, Virpal; Susan Tanabe; Frank Marzo; Bumstead, Greig; Liz Howson (howson@mshplan.ca); Chan, Eric
Subject: Ninth Line Transportation Assessment - Modelling results for Argentia Road extension and GTAW

Hi Peter:

As discussed at our conference call last week please find attached the model results related to the network sensitivity testing for the Argentia Road extension and the inclusion of the GTAW. Within the zipped file you will find the following folders:

1. **2041BAU_NoArgentia_NoGTAW_NinthLine2Lanes** – contains the EMME plots which represent the auto volume for the 2041 BAU scenario (Ninth Line 2 lanes) which were used to derive the background growth rates previously provided.

2. **2041WithArgentia_NoGTAW_NinthLine2Lanes –** contains the EMME plots which represent the auto volume for the 2041 BAU scenario (Ninth Line 2 lanes) + the extension of Argentia Road over the 407. In addition this folder contains plots which show a volume comparison between the 2041 BAU scenario (the first folder) and the 2041 BAU + Argentia Road Extension scenario. Within this scenario Argentia Road was assumed to have ultimately 2 through lanes in each direction (4 lane cross-section), this assumption is different from the drawings that we provided to you previously which show that Argentia Road between Ninth Line and Tenth Line would only be a 2 lane cross-section. As such when you are analyzing the scenario which includes the extension of Argentia Road over the 407 please remember to ensure that your Synchro model assumes a 4 lane cross-section along Argentia Road.

3. **2041WithGTAW_NoArgentia_NinthLine2Lanes -** contains the EMME plots which represent the auto volume for the 2041 BAU scenario (Ninth Line 2 lanes) + the inclusion of the GTAW. In addition this folder contains plots which show a volume comparison between the 2041 BAU scenario (the first folder) and the 2041 BAU + the inclusion of the GTAW scenario.

Please let me know if you have any questions. Thanks,

Norbert Orzel
Transportation Modelling Specialist
T 905-615-3200 ext.3636
norbert.orzel@mississauga.ca

City of Mississauga | Transportation and Works Department,
Transportation and Infrastructure Division

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Growth rates received from City

Compounded Annual Growth Rate (Based on 2011 and 2041 Scenario)
No GTAW
Ninth Line Not Widen (within Mississauga)

NORTH/ SOUTH DEMAND

	AM PEAK HOUR		PM PEAK HOUR	
	2011 vs 2041 Without		2011 vs 2041 Without	
Ninth Line	**NB**	**SB**	**NB**	**SB**
-btwn Britannia Rd and Eglinton Ave	1.2%	0.3%	0.5%	1.0%
-btwn Derry Rd and Britannia Rd	1.0%	0.0%	0.0%	1.1%
-btwn 401 and Derry Rd	1.4%	1.1%	0.8%	1.3%
Average	**1.2%**	**0.5%**	**0.5%**	**1.1%**

	2011 vs 2041 Without		2011 vs 2041 Without	
Winston Churchill Blvd	**NB**	**SB**	**NB**	**SB**
-btwn Britannia Rd and Eglinton Ave	1.7%	0.9%	1.2%	1.5%
-btwn Derry Rd and Britannia Rd	1.6%	1.6%	1.9%	1.9%
-btwn 401 and Derry Rd	1.2%	2.8%	3.4%	1.3%
Average	**1.5%**	**1.6%**	**2.0%**	**1.5%**

EAST/ WEST DEMAND

	AM PEAK HOUR		PM PEAK HOUR	
	2011 vs 2041 Without		2011 vs 2041 Without	
	EB	**WB**	**EB**	**WB**
Derry Rd btwn Eight Ln and Tenth Ln	1.9%	2.0%	1.7%	1.5%
Britannia Rd btwn Eight Ln and Tenth Ln	2.7%	2.0%	1.8%	2.4%
Eglinton Ave btwn Eight Ln and Tenth Ln	1.1%	2.1%	1.8%	1.1%
Dundas St btwn just west of 9th Ln to WCB	1.3%	1.7%	1.6%	1.6%
Average	**1.7%**	**2.0%**	**1.7%**	**1.7%**

Confirmation on Argentia Road extension

Yu, Peter

From: Norbert Orzel <Norbert.Orzel@mississauga.ca>
Sent: May-25-17 8:47 AM
To: Yu, Peter
Subject: RE: Ninth Line and Argentia Volume Confirmation

Thanks Peter, I agree with your thought process, especially for the WB movements along Argentia Road where the high v/c for the left turn at Argentia Rd. will probably discourage people from making that movement. When I was thinking about the attractiveness of Argentia Road it's for the trips that are destined to both the Lisgar GO Station (located at Argentia Road and Tenth Line) and the heavy employment areas in the north-west part of the City where Argentia Road can play an important role in facilitating movements to these areas. Saying that if you believe from your analysis that trips from the Ninth Line lands will be discouraged to use Argentia Road due to some of the critical movements at the Ninth Line @ Argentia Road intersections I am okay with this assumption.

Please ensure you document your assumption and decision process in the report. Thanks,

Norbert

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2017/05/24 7:32 PM
To: Norbert Orzel
Subject: RE: Ninth Line and Argentia Volume Confirmation

Hi Norbert,

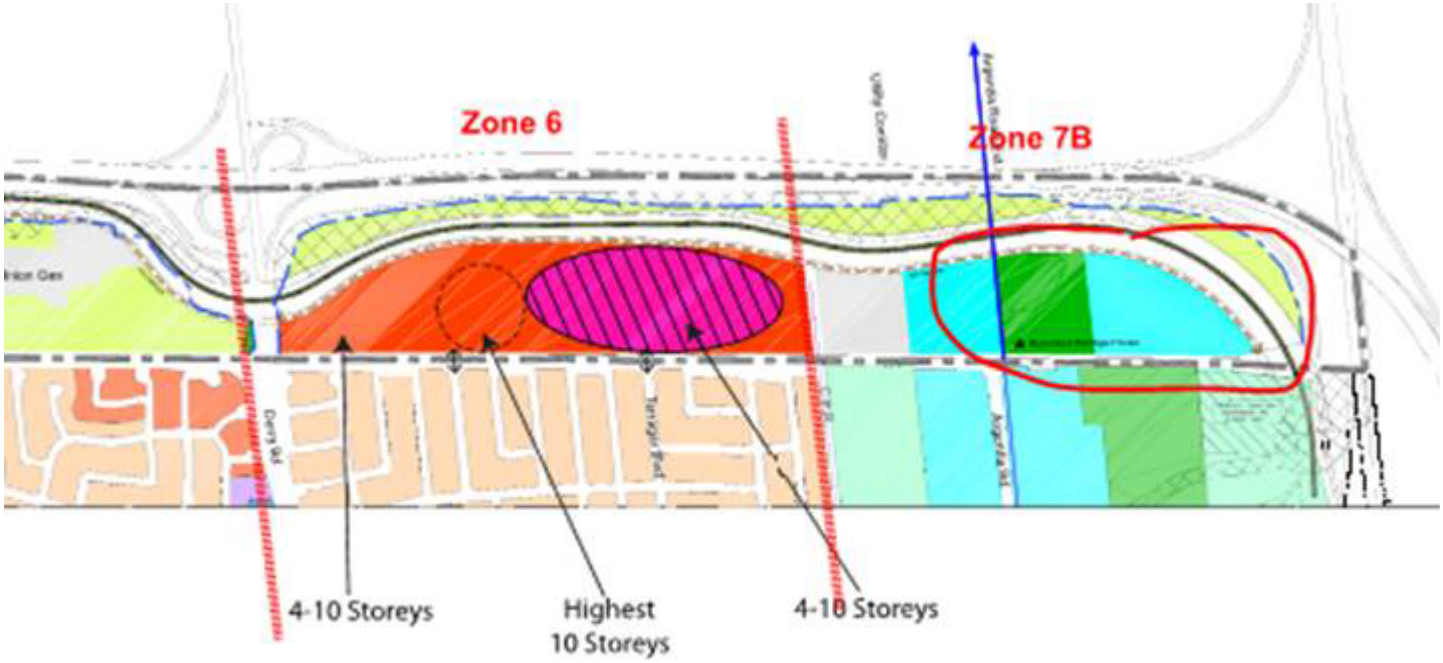
Stepping back and looking at Argentia Road as it is today (extended to Ninth Line), my thoughts are as follow:

Without the extension of Argentia Road over 407, the intersection does not meet the signal warrants as a 3 legged intersection. As an unsignalized intersection, the westbound left turn is already at v/c 0.97. As such, this will be a limiting factor on how effective it will be to wait for a westbound left-turn down Ninth Line as opposed to one of the other routes.

In general, I think Argentia Road would be a fairly limited option in terms of attractiveness for the Ninth Line lands. The reason being, Argentia Road is a rather windy road east of Winston Churchill Boulevard and so for those from the east, taking Derry Road or Britannia would be a more direct route. I can only see Argentia Road serving a small portion of the zones in and around Argentia Road – as shown below in red. The reason for this is left turns from Argentia Road would not be easy, whereas a right turn at Derry would be easier.

For the above reasons, as well as the fact that Derry/Ninth Line works adequately, I think it'd be reasonable to leave the traffic assignment we have for the without Argentia extension over 407. Once this extension does take place and the signal warrant is met, we are assuming the intersection will help carry some of the Ninth Line traffic.

As a side note, I have confirmed and will provide the scenario in the report, that even with the Argentia Road extension to Ninth Line or over 407, the widening of Britannia, Derry and Eglinton are still required.



Look forward to your thoughts, please give me a call to chat.

Thanks

Peter

Peter Yu, P.Eng.
Project Engineer
Transportation Planning

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Thornhill, Ontario
L3T 0A1 Canada

wsp.com

From: Norbert Orzel [mailto:Norbert.Orzel@mississauga.ca]
Sent: May-24-17 1:06 PM
To: Yu, Peter <YuP@mmm.ca>
Subject: RE: Ninth Line and Argentia Volume Confirmation

Hi Peter:

Yu, Peter

From: Norbert Orzel <Norbert.Orzel@mississauga.ca>
Sent: April-12-17 10:21 AM
To: Yu, Peter
Cc: Mel Kayama; Frank Marzo
Subject: RE: Ninth Line and Argentia Volume Confirmation

Hi Peter:

I'm okay with the numbers you are proposing to use for the scenarios which have the Argentia Road extended over the 407. Please ensure that your methodology is well documented in the final report.

Also when you prepare the numbers for the other scenarios can you send me those for review?

Thanks,

Norbert

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2017/04/12 9:57 AM
To: Norbert Orzel
Cc: Mel Kayama; Frank Marzo
Subject: RE: Ninth Line and Argentia Volume Confirmation

Hi Norbert,

Correct, the future volumes represent the scenario where Argentia is extended over 407. For the scenario where it is not extended, I plan on using the existing volumes and adding on the appropriate growth rates based on the BAU and the GTA West modifications. The future volumes I have shown do not include the future traffic associated with the Ninth Line land uses, that would be my next step. It is likely that it would draw east-west trips away from Derry and Britannia. I wanted to confirm that these base volumes are appropriate before proceeding further. A signal warrant would also be completed at this intersection as per the final comment table.

Thanks

Peter

From: Norbert Orzel [mailto:Norbert.Orzel@mississauga.ca]
Sent: April-12-17 9:53 AM
To: Yu, Peter <YuP@mmm.ca>
Cc: Mel Kayama <Mel.Kayama@mississauga.ca>; Frank Marzo <Frank.Marzo@mississauga.ca>
Subject: RE: Ninth Line and Argentia Volume Confirmation

Hi Peter:

I have a few questions regarding the figures:

-What scenario do these numbers represent? Is this the scenario which has Argentia Road extended over 407?
-If yes what numbers will you be using at this intersection for the scenario that does not have the extension in place.

-Was there any assumption made in regards to trips using this roadway that are generated from the Ninth Line Lands?

Thanks, Norbert

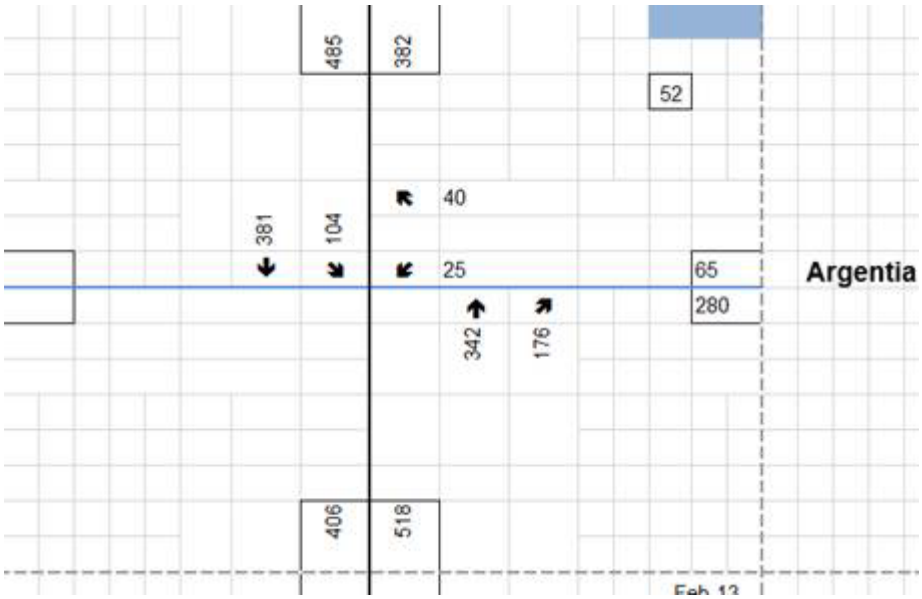
From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2017/04/12 9:44 AM
To: Norbert Orzel
Cc: Mel Kayama; Frank Marzo
Subject: Ninth Line and Argentia Volume Confirmation

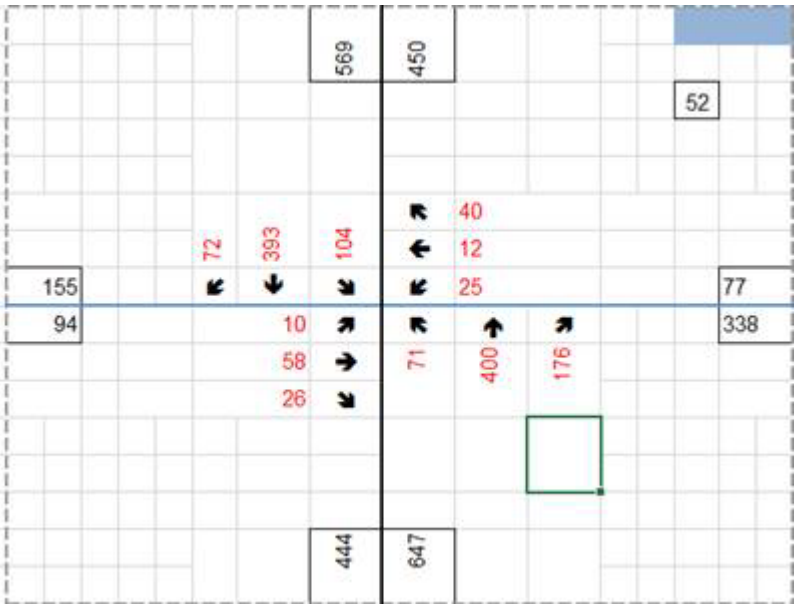
Hi Norbert,

Based on the EMME information and existing patterns, I have established the future volumes at the Ninth Line/Argentia Road intersection (with Argentia Road extension).
Below are the comparison between existing and future volumes. Please confirm that the City is ok with this before I proceed with these volumes.

AM

Existing Future (Argentia Extension)

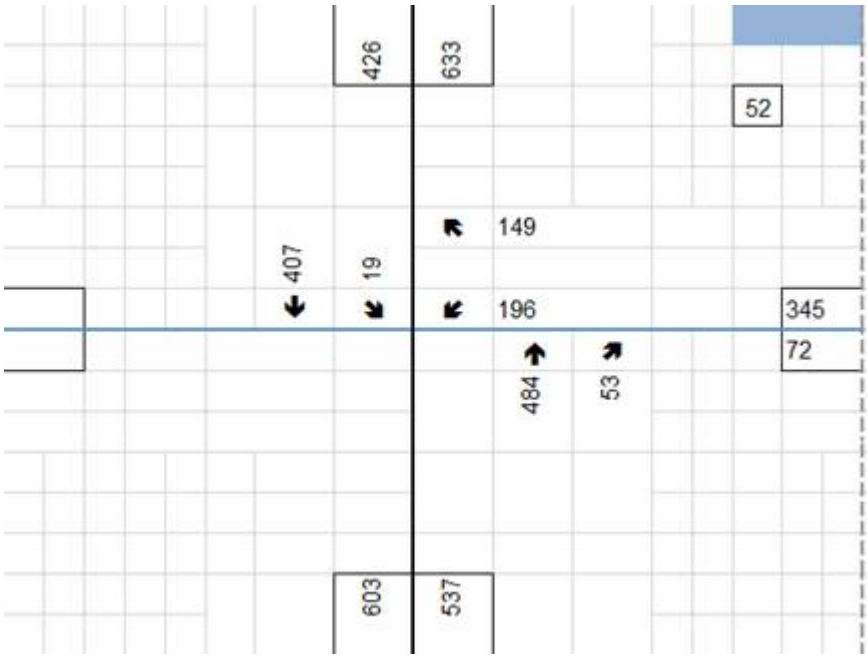


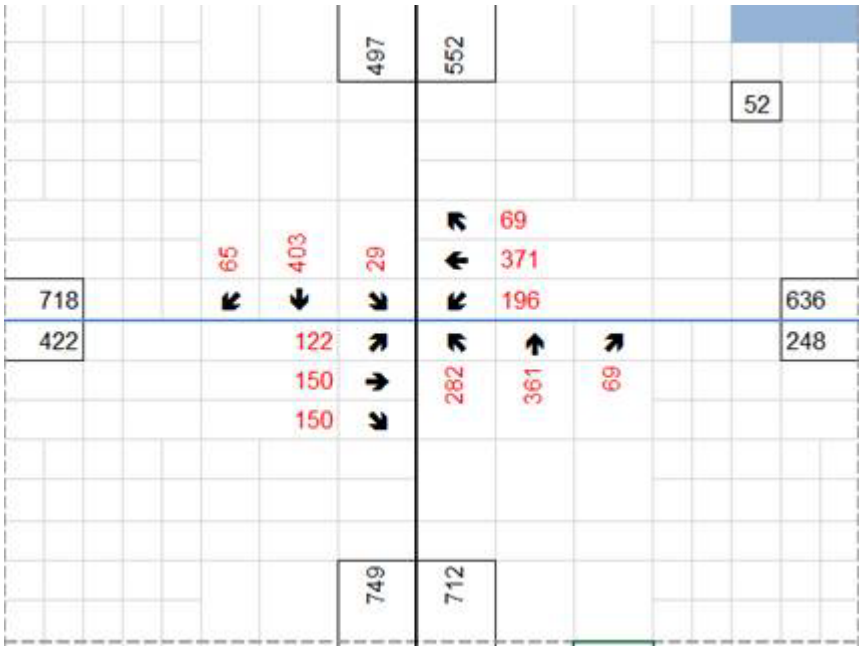


PM

Existing

Future (Argentia Extension)





Thanks

Peter

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Confirmation on background development and growth

Yu, Peter

From: Norbert Orzel <Norbert.Orzel@mississauga.ca>
Sent: July-14-16 2:53 PM
To: Yu, Peter
Cc: Kataure, Virpal; Mel Kayama; Frank Marzo; Susan Tanabe; howson@mshplan.ca; Chan, Eric; Smith, Adrian
Subject: RE: Ninth Line Transportation Evaluation - Follow up Items for 407 Transitway

Hi Peter:

As discussed over the phone we spoke to the City's traffic planning staff and based on that they indicated that the TIS submitted for the Erin Mills Development has been accepted by the City. As such please continue to use that information in your analysis.

Just to confirm I'm going to be running a scenario in the City's model which assumes a 2 lane cross-section for Ninth Line but assumes 2041 land-use growth. For the Erin Mills Development I will assume zero population and employment as this will be captured though the TIS, for the Prologis development I will use the land use data as per our Hemson Forecasts and therefore you will not need to include that development in your analysis. This should solve the issue of any double counting.

In terms of your question regarding running the model for 2014 we are not able run the model for that specific year, saying that the results we provided previously were on an annual basis so therefore you should be able to directly apply them to the 2014 numbers.

Please let me know if you have any questions or concerns. Thanks,

Norbert Orzel
Transportation Modelling Specialist
T 905-615-3200 ext.3636
norbert.orzel@mississauga.ca

City of Mississauga | Transportation and Works Department,
Transportation and Infrastructure Division

Please consider the environment before printing.

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2016/07/13 8:47 AM
To: Kataure, Virpal; Mel Kayama; Frank Marzo; Susan Tanabe; howson@mshplan.ca; Chan, Eric; Smith, Adrian; Norbert Orzel
Subject: RE: Ninth Line Transportation Evaluation - Follow up Items for 407 Transitway

Good morning everyone,

Further to our conference call this morning, here are the key takeaways and action items:

Part 1: Background Traffic Growth

Norbert and I will discuss specifically what needs to be modeled in EMME, but essentially it would be a scenario where:

- Several business as usual (future background) intersections are already at or significantly over capacity, even with the road improvements advised from the City. This is mainly because of the aggressive background growth that we are applying for a 25 year period, some of which result in an increase of double the existing traffic volumes.

- The growth rate along Ninth Line should be based on a model that does not include the widening of Ninth Line. Norbert, can the model start from 2014 to 2041? (since our existing year is 2014). As was discussed, the timing of the widening of Ninth Line should be tied with the contemplated land-use scenario and not as something that will be readily available short-term to serve more general through traffic. This scenario is a more realistic representation of business as usual and would not result in general background growth filling up Ninth Line to overcapacity conditions. Otherwise, it is impossible to complete a meaningful assessment of the contemplated land use scenario along Ninth Line.

- The future total conditions would then incorporate the contemplated land use scenario, the widening of Ninth Line in place, and the above growth rate (based on the existing Ninth Line configuration). This captures the point that there will be no residual capacity along Ninth Line to attract general through traffic (i.e., from other municipalities) to divert and take Ninth Line.

- Norbert please confirm that the EMME model does not double count the Erin Mills development near the south-east quadrant of Eglinton and Ninth Line. This is a very significant background development that generates 1,775 and 1,704 trips during the weekday a.m. and p.m. peak hours, respectively.

- Region staff asked whether the driveway intersections would be assessed and where they are generally located. Based on the latest version of the contemplated land use plan, the main driveways to the Ninth Line land use scenario are generally aligned with existing streets. These intersections will be assessed as part of the future total assessment. In addition, signal warrants may be conducted at existing unsignalized locations. MMM understands that the intersection of Ninth Line and Doug Leavans will be signalized in the future horizon.

Part 2: 407 Transitway Assumptions

Scope: to undertake future total assessments with sensitivity modal splits of 25%, 35% and 45%. The point is to have a better understanding of whether the contemplated land use scenario could be accommodated with various modal splits and degree success from the 407 Transitway initiative. This will feed into MZH's planning policy derivation as to how aggressive the TDM strategies need to be to accommodate the growth. However, should the initial assessment indicate that the study intersections cannot accommodate the contemplated land use scenario *even with a 45% modal split*, MMM will advise the project team immediately. MMM will also periodically monitor the process of MTO's 407 project and make necessary revisions depending on the outcome of MTO's study, if time permits with the deadline of this Ninth Line study.

The second component of the 407 Transitway project that I didn't mention yesterday is the trips generated from the parking spaces at the two potential transitway stations at Derry and Britannia. Our goal is to review the existing peak

hour ridership at the Transitway stations and relate that to the parking supply at these stations to develop a rate. This rate will be applied to the estimated total parking supply at the two proposed stations within the study area. In the case where the amount of traffic generated as a result of the transitway stations is prohibitively high, we will inform the project team and advise on the assumption of longer-term planning/transit strategies (i.e., last mile solution so that not everyone is driving themselves to the station).

Cost: Based on the additional scenarios and traffic work that are required, along with the associated documentation/iterative nature of the assessment, **an additional fee of $3,200** is required. We propose to increase the fixed fee component by this amount.

Norbert, I'll contact you to discuss the modeling items that we need prior to your vacation.

Thanks very much

Peter

Peter Yu, P.Eng.
Project Engineer
Transportation Planning

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From: Yu, Peter
Sent: July-12-16 9:54 AM
To: 'Kataure, Virpal'; Mel Kayama; Frank Marzo; Susan Tanabe; howson@mshplan.ca; Chan, Eric; Smith, Adrian; 'Norbert Orzel'
Subject: RE: Ninth Line Transportation Evaluation - Follow up Items for 407 Transitway

Good morning everyone,

These two documents present the approximate future background – Business as Usual conditions. As you can see, the ones I have highlighted in red are significantly over capacity. These conditions incorporate the continued growth as provided by City staff up to 2041, the Erin Mills and Park 459 developments full built-out, but *no 407 Transitway yet*.

<< File: BAU AM Conditions.pdf >> << File: BAU PM Conditions.pdf >>

We will base some of our discussion today on this material.

Thanks

Comment documentation summary table

Ninth Line Response (April, 2017):

<table>
<tr><th>ID</th><th>Key comments (page #, staff#)</th><th>MMM Response</th><th>Action</th></tr>
<tr><td colspan="4">City Comments</td></tr>
<tr><td>1</td><td>Have consultants reviewed the 407 Transitway Planning and Preliminary Design from E of Hwy 400 to Kennedy in 2011? As a result of the study MTO is recommending a 60m Transitway ROW width to be considered along with a 14m buffer to adjacent development. Also were findings documented in the AMEC report titled highway 407 Transitway Corridor Assessment within the Ninth Line lands reviewed and taken into consideration? If so, this needs to be referenced (page 14 FM13 and DL14)</td><td>MMM has reviewed the 407 Transitway Planning and Preliminary Design study dated 2011 at a high level. The 2011 study resulting in the recommended ROW and buffer width are important but not directly relevant to the traffic impact assessment of the Ninth Line corridor.

MMM was advised by AMEC on May 2016 that a total of up to 4,000 spaces are being protected in the two transitway stations. This is reiterated in the October 2016 AMEC report titled Highway 407 Transitway Corridor Assessment within the Ninth Line Lands. City staff instructed MMM to use the 4,000 as the ultimate capacity.

<table>
<tr><th>Station</th><th>Interim Capacity (spaces)</th><th>Ultimate Capacity (spaces)</th></tr>
<tr><td>Britannia</td><td>640</td><td>640</td></tr>
<tr><td>Derry</td><td>2,160</td><td>3,360</td></tr>
<tr><td>Totals</td><td>2,800</td><td>4,000</td></tr>
</table>

The 407 Transitway from East of Highway 400 to Kennedy Road study on the other hand suggests that the seven stations will generate a need for 4,600 spaces. This suggests that the assumptions made by MMM in our traffic assessment is conservative in the sense that almost the similar parking capacity is being protected for only for 2 stations.</td><td>Additional clarification in the report Section 7.1.3 that the ultimate parking capacities assumed for Derry and Britannia Stations are conservative.

Car-sharing and carpool parking facilities will also be added as part of the TDM section of the report.

MMM will note in the 407 Transitway section that the key findings from the applicable Transitway studies have been taken into consideration.</td></tr>
</table>

<table>
<tr><th>ID</th><th>Key comments (page #, staff#)</th><th>MMM Response</th><th>Action</th></tr>
<tr><td></td><td></td><td>Table 2-7: Predicted Park-and-Ride Demand of 407 Transitway in 2031 (Daily Parking Demands)
<table>
<tr><th>Station</th><th>2031 Demand</th><th>2031 Demand + Carpool Spaces</th></tr>
<tr><td>Jane Station</td><td>310</td><td>510</td></tr>
<tr><td>GO Barrie (Concord) Station</td><td>430</td><td>630</td></tr>
<tr><td>Bathurst Station</td><td>900</td><td>1,100</td></tr>
<tr><td>Yonge Station</td><td>0</td><td>0</td></tr>
<tr><td>Leslie Station</td><td>1,090</td><td>1,290</td></tr>
<tr><td>Woodbine/Rodick Station</td><td>750</td><td>950</td></tr>
<tr><td>Kennedy Station</td><td>1,120</td><td>1,320</td></tr>
<tr><td>Total</td><td>4,600</td><td>5,800</td></tr>
</table></td><td></td></tr>
<tr><td>2</td><td>Based on Figure 7.3A it seems like there are inbound trips assigned to the Transitway in the PM time period. Please explain how this was determined (page 15 NO17)</td><td>There are indeed inbound trips during the PM period. Further clarification will be added to the report. Based on the TTC Traffic Impact Study for the Downsview Subway Station, site surveys determined that during the AM period, all of the trips were inbound to the station parking lot. During the PM period, 90% were outbound while 10% were inbound.</td><td>Clarification and report reference to be provided.</td></tr>
<tr><td>3</td><td>Add the new intersection of Argentia Rd @ Ninth Line (page 16 NO19)</td><td>This future intersection is not included in the scope for study area intersections. The understanding from the terms of reference is that this would only be looked at in the TF Scenario 4 – with Argentia Road.

The City has provided the TMC and lane configurations at this intersection.</td><td>MMM will add this intersection to the study area.</td></tr>
<tr><td>4</td><td>How far is road widening (Britannia and Derry) proposed to extend? (page 17 FM21 and MK22)</td><td>In the context of the study area, it makes sense to widen to Winston Churchill Boulevard, since this road represents an alternative route to Ninth Line.</td><td>Clarification be provided in the report.</td></tr>
<tr><td>5</td><td>Widening of Eglinton Avenue – is this just in the EB direction (page 17 NO24)</td><td>Yes, just in the eastbound direction to provide additional EB capacity.</td><td>Will clarify in the report that this is in the EB direction only.</td></tr>
</table>

ID	Key comments (page #, staff#)	MMM Response	Action
6	Was signal optimization completed for all intersections? (page 18 – NO25)	Yes, signal optimization was completed at all of the signalized intersections. However, the minimum walk times, pedestrian walk times and cycle lengths were not altered.	This will be noted in the text of the report.
7	Incomplete sentence, please reword and complete thought – regarding Beacham Street/Ninth Line intersection operations (page 18 – FM27)	The sentence is meant to read: A sensitivity scenario where this intersection is modeled as a signalized intersection indicates that it will operate at very good level of service 'B' with no capacity constraints. Further monitoring of this intersection in the interim is recommended as signal warrants are not yet met.	Clarification will be provided in the text of the assessment, along with the sensitivity analysis in Table 7.2.
8	Please add the results for all horizon year scenarios for the intersection of Argentia Road/Ninth Line (page 19 – NO28)	Ditto the response to comment #3.	MMM will add this intersection to the study area.
9	Why are the results not the same as BAU for this intersection – between Table 7.2 and 7.3 (page 25 – NO31)	The results are the same. Additional detail was provided for one table and not the other, thus creating the misconception.	The tables will be modified so that they are consistent.
10	States that all intersections are forecast to operate as acceptable levels…Beacham is identified as having delays of 352 seconds (page 25 – MK32)	Please see response to item #7 above. The intent is that if this intersection was to be signalized, it would operate very well. However, the intersection does not yet meet signal warrants and it is expected that some of the trips previously made from the side street (Beacham) will divert to a downstream or upstream signalized intersection onto Ninth Line. Since these intersections operate well, it does not make sense of motorists to wait excessively long at Beacham/Ninth Line.	Clarification will be provided in the text of the assessment, along with the sensitivity analysis.
11	This number does not represent the site statistics as per the September 18th tables. Double check numbers. (page 26 – NO33 and FM34)	Noted. This correction (+7,169 ft^2 of commercial retail) will result in slightly higher trips in the order of 5 to 20 trips per hour depending on the peak	The site statistics for Area 6 will be fixed to match the September 18th table.

ID	Key comments (page #, staff#)	MMM Response	Action
		period and scenario evaluated.	And the subsequent analyses in the future total scenarios will be updated. The conclusion of the report does not change.
12	Is this statement true considering the adjustment below – no additional non-auto modal split increase have been considered (page 27 – NO36)	Yes, the adjustments in Section 8.4 represent multi-use adjustments, which is independent of non-auto modal splits. Non-auto modal splits relate to the proportion of travel that is completed via modes that are not auto. On the other hand, multi-use is to capture those who make one trip, but visit multiple uses within the same development.	No action required.
13	The future conditions presented in Section 9.0 and therefore on the conservative end of the spectrum – while this may be true for the 5% low scenario it is not true for the scenario which assumes 20% increase. (page 27 – NO37)	Noted and agreed.	The last sentence will be removed to avoid confusion.
14	Should this be multi-use or multi-purpose (it's identified as multi-use in section 8.5)? (page 27 – NO38)	Multi-use and multi-purpose are intended to be one of the same.	For consistency, **multi-use** wording will be used exclusively in the report.
15	Would this not already be captured in the increase made to non-auto trips (which includes walking/cycling trips)? This adjustment was not included in the methodology memo prepared by MMM previously. How was 10% developed? (page 27 – NO39)	Multi-use trips are independent of non-auto trips. A multi-use trip is one that visits multiple uses but is made by the same person in the internal network. For example, in Area 5, there is both residential and retail use. Naturally, there will be a percentage of people who visit the retail use before going home after work. Even though both uses generate a trip, both trips are internal to the study area – since the person does not have to leave the area onto the external road network. The 10% applied is a nominal adjustment to at least acknowledge potential multi-	Additional clarification will be provided in the trip generation section. The multi-use trips are the trips that enter the site from the external but have more than one purpose. The 10% applied to the uses where there are mixed-uses in the land use blocks are to

ID	Key comments (page #, staff#)	MMM Response	Action
		use trips. In MMM's experience, multi-use percentages of 20% and greater is not uncommon and 10% is a conservative assumption. The 10% was applied to all of the uses in the mixed-use site because the one could use the restaurant first before going home, or vice versa. Overall, only Areas 4, 5, 6 and 7 resulted in multi-use adjustments. The mutli-use adjustments for Areas 4 and 6 are also to account for those living within walking/cycling proximity to the station and would also be considered internal trips.	capture these trips. Applying such adjustments is very standard in the evaluation of mixed-use sites.
16	Please confirm these numbers. Using the formula shown in table 8.4 we calculate different numbers. (page 29 – NO40)	As noted in the description, the trip generations were completed for each area individually (as provided in Appendix X). The numbers presented in Tables 8.5A, B and C represent the sum of the trip generation of each of the individual areas. The approach of completing the trip generation for each block is typical for area studies because it allows an understanding of the trip generation contribution from each area. Furthermore, some ITE trip generation rates are logarithmic equations. Thus, completing an overall trip generation based on higher land use area may underestimate each study area.	Clarification of the trip generation process will be explained. Sample calculation may be added in the Appendices. Any discrepancy between Table 8.5A and the appendix will be resolved.
17	Should this adjustment (non-auto modal split) not be made to the original trip total versus making the adjustment after reducing the trips using the multi-purpose adjustment? (page 29 – NO44)	The logic of trip generation is as follow: 1) Start with all of the trips being made 2) Exclude the trips that are multiuse since they overlap and does not contribute new auto trips to the study road network 3) Of the remaining unique trips, exclude the trips that are via non-auto modes	Explanation and sample calculation will be provided in the Appendix.

ID	Key comments (page #, staff#)	MMM Response	Action
		4) The remaining trips represent new auto trips	
18	Please articulate what considerations were made in this "route logic"… such as levels of existing congestion, etc. (page 30, DL47)	The following will be added: Route logic is based on the consideration of how the study intersections are operating under existing and future background conditions. For example, if a study intersection is already dealing with at, or near capacity turning constraints under BAU conditions, then drivers will likely gravitate to another route/movement that is less congested, while recognizing that drivers will not opt for an overly circuitous route.	Clarification will be added to the report.
19	Please provide additional analysis/rationale for how 5%, 10% and 20% were chosen as representations of success of the ridership levels. For example, why does low ridership suggest a 5% increase in non-auto modal split? There were previous discussions with transportation staff via emails and it is important to capture those discussions in this report. (page 31, DL48)	Through discussion with City staff, it was agreed that due to the lack of information related to the 407 Transitway project, it would be most efficient to proceed with three non-auto modal split adjustments. The 5%, 10% and 20% represent potential influence related to the degree of the 407 Transitway success. Transit staff from various agencies have also not been able to provide substantive non-auto adjustment information to use.	All of the correspondences with transit staff will be documented in the appendix of the report.
20	Can consultant recommend policies or other future transit projects that would help increase the non-auto modal split from 5% to 20%, as they have done so for TDM strategies? (page 31, DL49)	Generally speaking, the transit section in the TDM section already encompass the majority of strategies that can help to achieve higher non-auto modal splits. In the context of this study, we have only been made aware of the 407 Transitway improvements.	No action required.
21	If the non-auto modal split is increased by 20%, is there still a need for the Ninth Line, Derry Road or Britannia Road widening? (page 31, DL50)	Yes, we have demonstrated through the assessment of the BAU scenario without any road widening improvements (Table 7.2) that many of the key study intersections operate at poor levels of service and beyond movement capacity. This suggests that the road widening is associated already with the future background conditions.	Additional discussion will be provided to ensure that this conclusion is clear.

ID	Key comments (page #, staff#)	MMM Response	Action
		The non-auto modal splits of 5%, 10% or 20% was only applied to the future total site-generated trips from the Ninth Line corridor. It is not expected that the 407 Transitway transit improvements alone will mitigate the east-west capacity constraints on Derry Road, Britannia Road and Eglinton Avenue.	
22	Just to confirm was a signal warrant completed for all non-signalized intersection in the study area? (page 31, NO51)	A signal warrant was only completed at unsignalized intersections where there was capacity constraints or longer than desirable delays. As shown in the traffic analyses, only the Ninth Line and Beacham Road unsignalized intersection had this condition. MMM understands that the City would like signal warrants completed at the Argentia/Ninth Line intersection for the future horizons.	This will be clarified in the report. MMM will complete the signal warrant at Argentia/Ninth Line.
23	What is LR? (page 40, NO53) What is TR? (page 5, NO6)	LR means a shared left-right turn lane. TR means a through-right turn lane.	Additional clarification will be provided.
24	Was there any assumptions made on whether the new connection would impact trip assignment for the trips generated from the Ninth Line Lands? Please document. (page 41, NO54)	While it is acknowledged that some of the site trips may divert to the new Argentia Road extension, the trip assignment has been maintained in all of the different scenarios. This results in a conservative assessment and also allow for an “apples to apples” comparison between Scenario 4 and other scenarios. It is important to note that the results in Table 9.4 indicate that all of the study intersections continue to operate at acceptable levels of service, even without adjustments to the trip assignment. Thus, the provision of the Argentia Road extension would only help improve the operation of the study area. MMM will review the results of the Argentia/Ninth Line intersection and take it into consideration. The key will be to evaluate whether the extension will preclude the need for the Derry/Britannia/Eglinton	Additional clarification will be provided. MMM will evaluate and comment on how the Argentia Road extension impacts the assignment of site-generated traffic, particularly along the other east-west roads.

ID	Key comments (page #, staff#)	MMM Response	Action
		widenings.	
25	Would the extension of Argentia Road have any impact on the need to widen some of the other roadways within the City which have been identified as part of the BAU analysis (i.e., Derry, Britannia and Eglinton) (page 44, NO55)	The EMME files provided by the City already capture the potential impact on the Derry, Britannia and Eglinton corridors with the extension of Argentia Road. Under future total conditions (Scenario 4), the results in Table 9.4 suggests that the Ninth Line intersections at Derry, Britannia and Eglinton are operating at or near capacity. Thus, the removal of lane widening in the east-west direction would result in over-capacity conditions. This indicates that the extension of Argentia Road does not preclude the need for the other east-west road widenings.	Additional clarification will be added. Please see response to item #24.
26	GTA West? (page 44, NO56)	Yes – will be fixed.	Text will be fixed.
27	Was there any assumptions made on a change in trip distribution/assignment for the trips generated from the Ninth Line Lands as a result of the GTA West? Please document (page 44, NO 57)	Similar to item 24 above, while it is acknowledged that some of the site trip assignment may change as a result of GTA West, the trip assignment has been maintained in all of the different scenarios. This results in a conservative assessment and also allow for an “apples to apples” comparison between Scenario 5 and other scenarios. Furthermore, it is important to note that the results in Table 9.5 indicate that all of the study intersections continue to operate at acceptable levels of service, even without adjustments to the trip assignment. Thus, drivers will likely self-regulate and adopt the route that results in the least delay once the GTA West is in place.	Additional clarification will be added.
28	Provide examples that have been implemented elsewhere. (page 48, MK58) I am suggesting that you include at least two best practice examples of where TDM was successfully implemented in other transit-supportive communities in the GTA. This would	The concept of TDM measures and implementation is relatively new in the GTA. At this point in time, there has not been consistent monitoring and tracking of TDM influence on the non-auto modal split.	Include referenced TDM – Case Studies (previously sent Jan. 30/17)

ID	Key comments (page #, staff#)	MMM Response	Action
	provide specific examples of how TDM can work and not just explaining what it is meant to achieve.	Recent major land use developments such as Oakville Green and Buttonville Airport redevelopment both include regular monitoring of TDM success and refinement to the TDM plan on an as-needed basis. Examples of TDM successes elsewhere in North America are attached in a separate cover (TDM – Case Studies)	
29	Include comment on possibility of dedicated Uber-car sharing service parking Add smart commute Mississauga Reference Mississauga Cycling Master Plan Awkward sentence please reword. (page 50, FM59, NO60, MK61 and FM62)	These requests/comments have been noted. The awkward sentence will be reworded to read: *To encourage the use of bike share programs and longer-term participation, the discounted fees for memberships could be provided.*	Will include language and discussion/revise accordingly.
30	Add a sentence about max parking standards to reduce the number of auto trips generated from the site. (page 51, NO63)	Noted, clarification will be added: *In addition to the implementation of minimum by-law parking requirements for the Ninth Line study corridor, a maximum parking standard should also be implemented. This is an important tool to limit the number of auto trips from the study area and have a positive influence on non-auto modes.*	Will include language and discussion
31	Is this specific to just the site? The City already has a TDM coordinator (page 51, NO64)	In general, the more dedicated a TDM coordinator can be to a specific area, the better the performance of the TDM achievements. The practical operations of a City will dictate the allocation of TDM staff.	The report will note that the City already has a TDM coordinator.
32	The original SOW indicated that the consultant shall identify how the proposed land use may impact safety in the study area. Please add this to the report (page i, NO2)	Noted, from a safety perspective, the following factors will be discussed: • The implementation of two 407 Transitway stations within the study area increases the frequency and proportion of heavy vehicles (buses). The implication of this should be communicated to stakeholders.	A section on safety will be added, while recognizing that there is limited information on certain aspects such as the actual operation of the 407 Transitway stations.

ID	Key comments (page #, staff#)	MMM Response	Action
		• Driving patterns may change as the characteristics of the Ninth Line corridor evolves with additional lanes and intensification. Speed adherence monitoring may be considered. • At the detailed design and site plan application stages, the sightlines from the proposed driveways/roads onto Ninth Line should be included, especially with the speed differential from the driveway onto Ninth Line. • With the intensification of residential uses on the west side of Ninth Line, there will be a need to ensure pedestrian and student safety to and from uses such as parks and school sites. For residential developments, a pedestrian assessment should be required to understand the provision of how students will safely get to school without necessarily being driven. For example, pedestrian crossing times at signalized intersections should be based on the appropriate walk speed so that there is sufficient time to cross Ninth Line safely. • Right now, the collision rate along Ninth Line within the study area is relatively low. As the road is widened, ongoing monitoring of the collisions along the corridor should be undertaken. • After the implementation of certain improvements, ensure that turning movement counts be done to see if turning patterns warrant the need for pavement	

ID	Key comments (page #, staff#)	MMM Response	Action
		marking changes. For example, if the number of left-turns drastically exceed the number of through, then a dedicated left-turn storage should be considered to avoid last minute lane changes. • Cycling operations will be evaluated based on the intended plan for cyclist either to have dedicated lanes, multi-use path or on-road. (i.e., sufficient signage and buffer). • Areas where increased weaving and merging may take place will be identified where possible based on the latest information. In certain instances, improvements have been made where the widening of roadways reduces the need to merge or weave since the number of receiving lanes matches the through lanes (to prevent lane drops). In addition, as there will be buses servicing stops along Ninth Line, it is important to consider how the bus stops will be serviced. (i.e., lay-by, curbside or if transit signal priority is required particularly with additional Transitway vehicles).	
33	Please add a section which shows the traffic operations for the BAU scenario prior to the improvements assumed for Derry Road, Britannia Road and Eglinton Ave. We need this information to justify those improvements. (page i, NO1)	Noted, the widening of Derry Road, Britannia Road and Eglinton Ave. only has impacts on the operation of the study intersections along these roads.	The operation of the study intersections along these three roadways will be provided in the BAU section (Tables 7.2 and 7.3) so as to illustrate the level of operation that would justify the need for the improvements with

ID	Key comments (page #, staff#)	MMM Response	Action
			and without the Ninth Line widening scenarios.
34	Please document the requirements that MTO requested as part of the traffic analysis, i.e. sat flow studies, etc. (page 2, NO3)	Noted.	This information will be provided in the appendix.
35	What does the 4 represent? (page 7, NO5)	This was a placeholder from before and does not mean anything.	The 4's will be removed from the tables.
36	Could this also be Miway buses? (page 9, NO7)	Noted, yes Miway routes 32 and 39 both operate in the vicinity of the intersection of Doug Leavens Boulevard at Lisgar Drive.	This information will be added to the section.
37	Comments regarding Figure 7.1A: How was the background growth calculated, is it for 28 years of annual compounded growth? Using the growth rates shown in the report (pg 13) we do not calculate the same background growth. 1331*(1+0.019/1)^28 = 2255 2255-1331 = 627 Please clarify methodology	Background growth percentages were based on the information provided by the City (2016 – Norbert excel table). As noted in Section X, existing 2014 conditions from the Existing conditions report, dated X 2015, was grown to 2041. This represents a period of 27 years. It should also be noted that there are additional decimals in the growth percentages provided, which is why the City's calculation may not match. For example the movement of note was grown based on this method: 1331*(1+0.0194/1)^27= 2255 - =	An additional decimal place will be shown in the growth summary table. Additional clarification will be provided of the fact that the background growth is for the period between 2014 and 2041.
38	Comments regarding Figure 7.2A: What does the volumes at the Golf Club access represent?	This was a placeholder from another figure and should not be included.	This carryover will be removed.
39	Comments regarding Figure 7.3A: Do all the trips from the Britannia Station Enter/ Exit from this location? Using the 640 spaces and multiplying it by 0.2125 results in 136 trips. The figures in this diagram do not indicate this.	All of the trips related to the Britannia Station are modeled to enter/exit from the Freeman Terrace driveway. There were issues with the figure depiction which should have shown a total of 136 inbound/outbound trips.	The figure and any associated traffic assessments will be updated to reflect the 136 trips.

ID	Key comments (page #, staff#)	MMM Response	Action
	What does this number represent? Within the report it indicates that all trips for the 407 Transitway in the pm time period are outbound while this figure shows inbound trips. Please clarify.	There are inbound trips during the PM period. Based on the TTC Traffic Impact Study for the Downsview Subway Station, site surveys determined that during the AM period, all of the trips were inbound to the station parking lot. During the PM period, 90% were outbound while 10% were inbound.	
40	Comments regarding Figure 7.5B: Are these backwards?	Yes, this will be addressed.	Yes, this will be addressed.
41	Comments regarding Figure 8.2A: How is this 33 calculated? (164+9+41 = 214) Please add the intersection of Argentia Rd @ Ninth Line to figures.	The driveway associated for Area 7B is located between the Golf Club Access and the Terragar Boulevard along Ninth Line. In the a.m. peak hour, there are approximately 182 inbound trips (associated with the Area 7B land use) along Ninth Line that enter at the Area 7B driveway. Thus, on the diagram, the volume does not appear to balance.	A diagram will be provided specifically to illustrate all of the assumed driveway locations and the site-generated traffic volumes respectively. This intersection of Argentia Road and Ninth Line will be added to the study area intersections.
42	Comments regarding Figure 9.4A: Figure should show Argentia Road	This intersection of Argentia Road and Ninth Line will be added to the study area intersections.	This intersection of Argentia Road and Ninth Line will be added to the study area intersections.
43	Should this say four-lane cross-section? (page 2, NO4)	Yes	This will be modified in the report.
44	How was this determined? Based on the above bullet it indicates that there are 8 T-bone collisions at Eglinton Ave. and Churchill Meadows Blvd. is this not a pattern? (page 12, NO10)	This intersection was previously an unsignalized minor-street stop-controlled intersection during the collision reporting. This intersection has since been signalized. This may be due to the minor approach seeking a gap and thus conflicting with the major street approach. The City's collision reports does not provide additional information such as causes such	No change required.

ID	Key comments (page #, staff#)	MMM Response	Action
		as distracted driving, weather condition, to allow MMM to comment further on reasons for certain collision types. It would be recommended that the City continue to monitor the collision reporting at the signalized intersection.	
45	What assumptions was made in regards to distribution/ assigning the trips from the Transitway? (page 15, NO16)	The Transitway trips were assigned based on a combined consideration of the distribution information extracted from the City's EMME model for the 2041 horizon year for both AM and PM peak periods, as well as assumptions made on the demographics of rider. For instance, the majority of riders were assumed to enter the study area via the easterly and westerly gateways of Derry /Britannia, the northerly and southerly gateways of Ninth Line, the residential uses directly east of Ninth Line. The rationale is that the station would attract riders from residential uses within a manageable distance of the station. For example, residents in the City living closer to Oakville would not likely access this station because there would probably be another more convenient Transitway station to use. A conservative multi-use of 10% has been applied to account for the Ninth Line study area residents who walk to and from the Transitway Stations without adding another new vehicular trip to the road network.	Additional discussion will be added.
46	Suggest removing this as no other improvements currently identified for the area (page 16, NO18)	Noted.	The comment will be removed.
47	This is not illustrated in Figure 7.5A (page 17, NO23)	Noted.	This will be shown in Figure 7.5A
48	Indicate that this is Non-auto modal split increase	This row, previously noted as modal split (existing	Wording will be discussed

ID	Key comments (page #, staff#)	MMM Response	Action
	(page 29, NO43)	+5%), is intended to show the adjustment arising from the modal split % under this scenario. In this case it would be the existing non-auto modal split plus 5%. So to indicate this row as Non-auto modal split increase may not be adequate, rather it should be something along the lines of: Future Increased Non-auto modal split.	and clarified in the tables.
49	The original RFP/SOW requested queues for individual movements if they exceed available lane storage capacity, can this information be added to the analysis findings of the report?	The appendix of the Synchro assessment will provide the 95th percentile queues of the critical movements, which are typically the movements with longer queues. It should be noted that because the exact dimensions of the turning lanes at the new or improved intersections have not been established, the more meaningful assessment will be for the key arterial and arterial intersections (i.e., Ninth Line and Derry, Britannia and Eglinton).	The queuing information will be documented in the appendix and the critical queues at the major arterial intersections will be discussed in the report.
50	For Ninth Line in the NB and SB direction what assumption was made in regards to the left turn lanes. While there is no formal study that has identified the future cross-section of Ninth Line (other than the section north of Derry Rd. where an EA was completed and identified an ultimate 5 lane cross-section) the current thinking is that the roadway would have 4 through lanes with a continuous centre-left turn lane (5 lanes total) in the future, would this impact the results/findings of the analysis?	The future analysis is based on the addition of a through lane along Ninth Line. It is currently modeled as a 5 lane cross-section, with the exception of the major arterial road intersections where a 6 lane cross-section is needed for a dedicated right-turn lane. Also, at some of the minor intersections, where there is an existing right-turn lane, we have not removed it. Please advise if the City would like this to be modified to be a through and a shared through-right lane.	A figure of the future lane configuration with the Ninth Line widening will be provided. Maintain the existing right-turn lanes.
MTO Comments			
51	Please update all the Appendices and provide all the missing figures.	Noted.	Will provide all appendix and figures in next

ID	Key comments (page #, staff#)	MMM Response	Action
			iteration (however, once all comments have been received and methodology to respond to comments confirmed)
52	Please provide more detail information on the source of data, such as when the Turning Movement Count information was collected.	Noted.	This information will be provided in the appendix.
53	Please confirm if all developments within the study area have been identified by year 2014? including those under construction, approved and/or in the approval process that have the potential to impact the study area?	The City's model captures all of the background developments also the approved major developments have been captured in the future background development traffic volumes. The City has also provided the applicable background developments to incorporate.	No action required.
54	Please provide more detail of the truck percentage on the highway off-ramps. Did the study compare the truck percentage at the 400 series highway off-ramp terminals with MTO data?	Heavy vehicle percentages at the ramps were taking directly based on the MTO data, which is the standard practice for traffic studies.	No action required.
55	Section 7.1.1, General Growth, Figures 7.1.A and 7.1B. Study does not identify any background traffic volume growth on the highway off-ramps from 2011 to 2041, but there is local road traffic volume growth. Please explain.	The growth applied were for arterials as per City provided growth rates.	See comment #61
56	Figure 7.2A and 7.2B. Please describe in more detail the methods and assumptions for the distribution and route assignment of traffic, and provide Appendix H.	Erin Mills background development traffic assignment will be explained. It is primarily based on the limited information available from the study provided by the City, which only shows the assignment of site-generated traffic at the MTO ramps.	No action required.
57	Section 7.1.3, 407 Transitway Initiative. This section assumes 85% auto trips per parking space, trips that are equally distributed over 4 hours peak periods for	Method as agreed with City staff, there is a lack of information from 407 Transitway project. Describe logic behind 85% assumption. Good rule of thumb in	The 85% assumption used was reasonable, due to the fact that there was no

ID	Key comments (page #, staff#)	MMM Response	Action
	AM and PM, which comes to 0.2125 auto trips per parking space. How did you come up with this number? Note that this does not match other transit station parking studies/TMC data. Please explain.	transportation industry to design for the 85th percentile. First principles.	available MTO data.
58	Table 2.1 Existing Traffic Conditions. Derry Road at Hwy 407 SB Off-ramp, the PM peak hour SB right turn movement V/C is 1.04, but PM peak volume is only 434vph. Please explain.	As noted in the report, we have not optimized the timing for under existing conditions as shown in Table 2.1. With a slight optimization to the timing, the intersection works well.	No action required.
59	Please conduct new and update TMC's for all freeway off-ramp terminals, and update traffic analysis accordingly: 401 WB/ Winston Churchill Blvd. 401 EB/ Winston Churchill Blvd. 403 WB/ Winston Churchill Blvd. 403 EB/ Winston Churchill Blvd. 403 NB/ Dundas St. 403 SB/ Dundas St.	The MTO ramps were added as part of the secondary study area. MTO provided all of the counts used in this study, which initiated in 2013. City provided updated counts at the off-ramps on March 7, 2017. At the on-set of the project and as part of the SOW, MMM confirmed with City staff that the Existing Traffic conditions from the January 2015 study will be carried forward for this study. On this basis, MMM has not included the budget to update the assessment of all of the off-ramps, which requires an update to existing, future background and all 3 of the future total horizons. In addition, it is uncertain whether additional calibration studies would be needed to calibrate the existing MTO results.	No change required.
60	Please update lane configuration for Synchro Model: 403 WB/ Winston Churchill Blvd. off-ramp – 4 legs intersection, channelized RT with newly built transit way and carpool lot. (Existing and Future) 401 WB/ Winston Churchill Blvd. off-ramp – proposed 4 legs intersection with road widening and carpool lot. (Future)	MMM do not have budget/scope to perform turning movements counts for the revised 4 leg ramp configuration and updating the Synchro Model. The focus will be on the incremental impact the Ninth Line study area has at these locations. It is expected that with the improvements of these locations, traffic conditions will only improve from the existing operations assumed in study.	No action required.

ID	Key comments (page #, staff#)	MMM Response	Action
61	Please apply 2% per year growth rate to all volumes of freeway off-ramp approaches for future scenarios analysis: 401 WB/ Winston Churchill Blvd. 401 EB/ Winston Churchill Blvd. 403 WB/ Winston Churchill Blvd. 403 EB/ Winston Churchill Blvd. 403 NB/ Dundas St. 403 SB/ Dundas St.	Noted, this growth rate will be applied to the off-ramp intersections. It should be noted that the growth will only be applied to the off-ramp movements, and not the through traffic. The growth for these movements have already been based on the City's EMME model.	MMM will update ramp conditions based on the assumed growth rates.
62	As per MTO's guideline, requires all v/c ratios for terminal ramp approaches with a value greater than 0.75 would be deemed critical and should be evaluated for possible operational improvements.	The MTO ramps were added as part of the secondary study area. The focus will be to document the incremental change of the v/c ratio and delay based on the Ninth Line uses. The future background conditions will be used as the bench mark.	Where necessary, improvements to the off-ramps will be noted in the report for each of the horizon years.
63	Please provide analysis for worst scenario - 0% Increase in Non-Auto Modal Split, due to uncertainty to implementation of 407 transit way and/or GTA west corridor.	MMM response: The study looks at a 2041 horizon, a 5% increase in non-auto modal split is already very conservative. City response: The change in modal split in the analysis is not intended to only represent the impact that the 407 Transitway will have on modal splits in the area but it is intended to represent an increase in non-auto modal splits, which includes walking and cycling (and potential for other local transit improvements). Considering the 2041 horizon year for analysis and the City's vision to increase non-auto modal splits in the City in the future, we believe a 5% increase in non-auto modal splits is reasonable to present a "worst case" 2041 scenario.	No change required.

ID	Key comments (page #, staff#)	MMM Response	Action
64	The study notes that future improvements include additional lanes on Winston Churchill Boulevard/Highways 403/401 and Dundas Street/Highway 403. These improvements will affect existing MTO ramps configurations, bridges and highways. The study needs to include design details on how these improvements will affect these bridges, highways and interchanges. All MTO required improvements, as a result of the widening of Nine Line, will be 100% the financial responsibility of the City.	City response: • Winston Churchill Boulevard @ Highway 401 • Winston Churchill Boulevard @ Highway 403, the road widening of Winston Churchill Boulevard over Hwy 403 has been included in the City's Development Charges Study (which represents a 2041 scenario). At this time the City has not completed an EA and as such a formal design has not been completed for this corridor. For the purpose of this analysis we have assumed additional through lanes on Winston Churchill Boulevard in this section. • Dundas Street @ Highway 403, the widening of Dundas Street across Highway 403 has been already completed (see attached aerial photo). It is identified in the traffic analysis report due to the definition of the base year which represents a scenario before the widening was completed.	No change required. Region's response to bullet 1: No comments from the Region of Peel with regards to the first bullet.
Region Comments			
65	The 9th Line Lands Study: Transportation Assessment currently identifies additional required improvements to Regional roads to accommodate future background traffic volumes. These additional improvements include the widening of Derry Road and Britannia Road from 2 lanes in each direction to 3 lanes. These recommendations were based on findings that showed	The Region's comments are noted. There does not appear to be any immediate action items. Region comments - We recommend including this statement in the report.	Region comments - We recommend including this statement in the report.

ID	Key comments (page #, staff#)	MMM Response	Action
	that future forecasted traffic volumes would exceed the current capacity and without these widenings, there would be significant over-capacitated movements. The Region of Peel takes a more strategic and holistic approach to addressing regional road improvements such as road widening issues, and this is articulated in the Long Range Transportation Plan (LRTP). This approach includes exploring if the Ninth Line Lands Study recommendations support particular overarching goals such as the movement of goods and sustainable modes of travel, transit strategies and using physical space effectively. The Study meets minimal, technical understanding of the transportation requirements for servicing Ninth Line Lands. Its recommendations will be used as an input to the Region's 2017 Update of the LRTP, and subsequently to the upcoming Transportation ROPA. Until such analysis has been undertaken, Regional staff does not propose any amendments to the Regional Official Plan as it relates to transportation.		

MTO Correspondences on methodologies

Yu, Peter

From:	Lagakos, Ted (MTO) <Ted.Lagakos@ontario.ca>
Sent:	May-04-17 7:39 AM
To:	Mel Kayama
Cc:	Yu, Peter; Liz Howson (howson@mshplan.ca); Lawrence, Morgan (MTO); Zivkovic, Branko (MTO); Lau, Wes (MTO); adrian.smith@peelregion.ca; Frank Marzo; Susan Tanabe; Norbert Orzel; DaSilva, Liliana (liliana.dasilva@peelregion.ca) (liliana.dasilva@peelregion.ca)
Subject:	RE: Re; Ninth Line Lands Study - Transportation Assessment (Dec. 2016)

Good morning Mel,

Thank you for the update on this assessment. The ministry acknowledges that the city/MMM Group cannot comply with all our comments/concerns at this time. Having said this, the ministry will still require the City of Mississauga to address all the relevant traffic issues contributed by future developments along this Ninth Line corridor. Regarding its traffic conditions and impacts, which were identified and analyzed in the transportation analysis, the following MTO ramp terminals deemed improvements:

- Highway 401/Winston Churchill Boulevard
- Highway 403/Winston Churchill Boulevard
- Highway 403/Dundas Street

I trust that this explains our position on this matter. Please contact me at the number below if you have any further questions.

Take care,
Ted Lagakos
Senior Project Manager
Highway Corridor Management Section – Central Region

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Highway Corridor Management

From: Mel Kayama [mailto:Mel.Kayama@mississauga.ca]
Sent: April-27-17 3:48 PM
To: Lagakos, Ted (MTO); DaSilva, Liliana (liliana.dasilva@peelregion.ca) (liliana.dasilva@peelregion.ca); adrian.smith@peelregion.ca; Frank Marzo; Susan Tanabe; Norbert Orzel; Mel Kayama
Cc: YuP@mmm.ca; Liz Howson (howson@mshplan.ca)
Subject: Re; Ninth Line Lands Study - Transportation Assessment (Dec. 2016)

All,

For your information please find attached a response table, addressing all comments provided by MTO, Region of Peel and City of Mississauga on the Ninth Line Lands Transportation Assessment.

Please note that the consultant carrying out the transportation assessment has indicated that additional budget would be required to address all of the comments provided by MTO. The City does not have this additional budget available for the study and as such we will not be able to address all of the comments provided by MTO.

In addition we wanted to highlight that the scope of the transportation assessment was to understand what impact the proposed land uses in the Ninth Line Lands will have on the transportation network. While it is acknowledged that in the 2041 horizon year scenarios traffic conditions are forecasted to deteriorate at some of the MTO interchanges. A large part of this is related to traffic background growth which is mainly beyond the City's control and beyond the scope of analyzing / addressing within this study.

Regards,
Mel

We have updated our existing conditions assessment at the intersection of Winston Churchill Boulevard at Highway 403 WB Off-Ramp based on the requested Saturation Flow Survey and Lost time observations. The Synchro output sheets are also attached. For reference purposes, the existing intersection assessment at this intersection during the p.m. peak hour (critical period) without any calibration parameters are shown below:

INTERSECTION LEVELS OF SERVICE
BASE - 2014 EXISTING TRAFFIC CONDITIONS

INTERSECTION	WEEKDAY P.M. PEAK HOUR	
	LOS (Average delay per vehicle in seconds)	Critical Movements (v/c ratio)
Winston Churchill Boulevard at Highway 403 WB Off-Ramp	F (98 sec)	WB-L (0.43) WB-R (1.30) NB-T (1.19)

Based on the calibration surveys conducted on the NB lane on Tuesday, September 23, 2014 during the a.m. (7-9) and p.m. (4-6) peak hours, we have determined that the 85th percentile lost time adjustments for the a.m. and p.m. peak periods are 2.5 seconds and 2.9 seconds, respectively. On the other hand, the 85th percentile saturation flow rates for the a.m. and p.m. peak periods are 2,057 veh/hr/lane and 2,069 veh/hr/lane, respectively. Detailed lost time and sat flow rate sheets are attached for your information. Our findings indicate that even with the application of these 85th percentile calibration parameters, the intersection is still projected to operate beyond capacity during the p.m. peak hour based on the existing traffic conditions (2011 counts provided by MTO and grown to 2014). The intersection levels of service with the application of the calibration parameters are show below:

INTERSECTION LEVELS OF SERVICE
CALIBRATED - 2014 EXISTING TRAFFIC CONDITIONS

INTERSECTION	WEEKDAY P.M. PEAK HOUR	
	LOS (Average delay per vehicle in seconds)	Critical Movements (v/c ratio)
Winston Churchill Boulevard at Highway 403 WB Off-Ramp	E (67 sec)	WB-L (0.38) WB-R (1.10) NB-T (1.09)

To further investigate the issue of overcapacity movements, we have completed additional video surveys at this intersection on Wednesday, October 29, 2014. Our hypothesis is that given the ratio of WB right-turns (1,035) to WB left-turns (692) at the ramp during the p.m. peak hour, some drivers would be opting to use the centre left-turn lane as a right-turn lane. The video footage of the intersection during the p.m. peak hour indicates that our hypothesis is correct. By modeling the WB centre left-turn lane as a shared left-right turn lane, they are no longer any capacity issues as shown below:

INTERSECTION LEVELS OF SERVICE
ADJUSTED LANE CONFIGURATIONS - 2014 EXISTING TRAFFIC CONDITIONS

INTERSECTION	WEEKDAY P.M. PEAK HOUR

	LOS (Average delay per vehicle in seconds)	Critical Movements (v/c ratio)
Winston Churchill Boulevard at Highway 403 WB Off-Ramp	C (35 sec)	WB-L (0.81) WB-R (0.83) NB-T (0.84)

The results in the above table indicates that with the adjustment in the lane configuration to better reflect the driving characteristics, it provides the intersection with sufficient capacity for the turning movements to self-regulate/balance so that capacity is not an issue.

Based on the findings above, it is recommended that the centre WB left-turn lane at the intersection of Winston Churchill Boulevard at Highway 403 WB Off-Ramp be modeled as a shared left-right turn lane. Notably, this type of lane configuration has already been implemented upstream at the intersection of Winston Churchill Boulevard at Highway 401 WB Off-Ramp.

If you have any questions, please do not hesitate to contact us.

Regards,

Nixon

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100 Commerce Valley Drive West
Thornhill, Ontario, Canada L3T 0A1
t: 905.882.4211 x6306 | f: 905.882.0055
ChanN@mmm.ca | www.mmmgrouplimited.com

From: Hussain, Kashif (MTO) [mailto:Kashif.Hussain@ontario.ca]
Sent: September 12, 2014 9:19 AM
To: Nixon Chan
Subject: RE: Ninth Line Corridor Study - MTO Additional Items

ok

From: Nixon Chan [mailto:ChanN@mmm.ca]
Sent: September 12, 2014 9:17 AM
To: Hussain, Kashif (MTO)
Cc: Mel Kayama (Mel.Kayama@mississauga.ca); Peter Hillier; Jaspreet Dhillon; Peter Yu
Subject: RE: Ninth Line Corridor Study - MTO Additional Items

Hi Kashif:

Thanks for your response. If that's the case, we will conduct both AM and PM study based on the NB lane as follows:

- Saturation Flow Rate Study at Winston Churchill/403 WB Off Ramp (7-9am and 4-6pm for 1 NB lane)

- Lost Time Adjustment Study at Winston Churchill/403 WB Off Ramp (7-9am and 4-6pm for 1 NB lane)

Thanks,

Nixon

Nixon Chan, M.A.Sc., P.Eng., PTOE, PMP
Project Manager
Associate
Transportation Planning
MMM Group Limited
t: 905.882.4211 x6306 | ChanN@mmm.ca

From: Hussain, Kashif (MTO) [mailto:Kashif.Hussain@ontario.ca]
Sent: September 12, 2014 9:14 AM
To: Nixon Chan
Cc: Mel Kayama (Mel.Kayama@mississauga.ca); Peter Hillier; Jaspreet Dhillon; Peter Yu
Subject: RE: Ninth Line Corridor Study - MTO Additional Items

Hi Nixon,
I think we can go with Northbound Lanes. The lane is closed in the southbound direction and have minimum impact on the northbound traffic. You can select any lane in Northbound direction for you study. If you still have any question please let me know.
Thanks
Kashif

From: Nixon Chan [mailto:ChanN@mmm.ca]
Sent: September 10, 2014 10:14 AM
To: Hussain, Kashif (MTO)
Cc: Mel Kayama (Mel.Kayama@mississauga.ca); Peter Hillier; Jaspreet Dhillon; Peter Yu
Subject: RE: Ninth Line Corridor Study - MTO Additional Items

Hi Kashif:

MMM was preparing to conduct the requested Saturation Flow Survey and Lost time observations today (September 10, 2014) at the intersection of Hwy 403 WB off-ramp terminal at Winston Churchill. The location was based on your request back on May 21, 2014 and the date was based on your recommendation of the second week of September. Unfortunately there are construction activities near the intersection and the southbound curb lane is currently closed. We have attached a few pictures of this.

Given this unforeseen closure, please advise on how you would like us to proceed. Whether you would like to continue surveying at the intersection but use another through lane or pick another location.

Please advise at your soonest convenience.

Regards,

Nixon

Nixon Chan, M.A.Sc., P.Eng., PTOE, PMP
Project Manager
Associate

Transportation Planning
MMM Group Limited
t: 905.882.4211 x6306 | ChanN@mmm.ca

From: Hussain, Kashif (MTO) [mailto:Kashif.Hussain@ontario.ca]
Sent: June 24, 2014 3:39 PM
To: Nixon Chan
Cc: Peter Hillier; Mel Kayama (Mel.Kayama@mississauga.ca); Jaspreet Dhillon
Subject: RE: Ninth Line Corridor Study - MTO Additional Items

Hi Nixon,
We are ok with it.
Thanks
Kashif

From: Nixon Chan [mailto:ChanN@mmm.ca]
Sent: June 24, 2014 3:19 PM
To: Hussain, Kashif (MTO)
Cc: Peter Hillier; Mel Kayama (Mel.Kayama@mississauga.ca); Jaspreet Dhillon
Subject: Ninth Line Corridor Study - MTO Additional Items
Importance: High

Hi Kashif:

Further to our discussion regarding the additional items by MTO (attached for your reference), here is a summary of all MTO's additional items that were identified outside of the original scope during our meeting on May 13, 2014:

- Additional MTO ramps to be included in the analysis:
  - Highway 401 at Winston Churchill Boulevard - NB Off Ramp
  - Highway 401 at Winston Churchill Boulevard - SB Off Ramp
  - Highway 403 at Winston Churchill Boulevard - NB Off Ramp
  - Highway 403 at Winston Churchill Boulevard - SB Off Ramp
  - Highway 403 at Dundas Street - SB Off Ramp
  - Highway 403 at Dundas Street - NB Off Ramp
- Saturation Flow Rate Study at Winston Churchill/403 WB Off Ramp (7-9am for 1 SB lane; and 4-6pm for 1 NB lane)
- Lost Time Adjustment Study at Winston Churchill/403 WB Off Ramp (7-9am for 1 SB lane; and 4-6pm for 1 NB lane)

The two noted studies will have to be conducted in the 2nd week of September since we are now in the summer off-peak season. We will continue with the expanded study area since we already have the turning movement counts from MTO. We will continue to use the default values until the additional studies are completed in September.

Please confirm that the items and the condition listed above satisfy all MTO's needs so we can proceed with our analysis and prepare the paperwork to formalize this added work program. Thanks very much.

Regards,

Nixon

Nixon Chan, M.A.Sc., P.Eng., PTOE, PMP
Project Manager
Associate
Transportation Planning
MMM Group Limited

Yu, Peter

From: Hussain, Kashif (MTO) <Kashif.Hussain@ontario.ca>
Sent: April-04-14 10:14 AM
To: Nixon Chan
Cc: Peter Hillier; Peter Yu; Jaspreet Dhillon; Zivkovic, Branko (MTO)
Subject: RE: Ninth Line Corridor - Traffic Data
Attachments: 401 Winston Churchill.zip; 403 Dundas.zip; 403 Winston Churchill.zip

Hi Nixon,

Please find attached available data for the interchanges as requested in your last email. Please contact 407 ETR for any data required for Highway 407 interchanges.

For analysis, ministry recommends following assumptions to be considered (particularly for off-ramp terminals within the project limits);

1. Default value for Saturation Flow Rate is not recommended to use within the analysis. Please carryout saturation flow rate study at the ramp terminals and use that value within Synchro analysis. Also submit the SFR study for the ministry review.
2. Please calculate PHF value from existing volume counts and use it within the analysis for existing as well as for all the future scenarios. Use of PHF=1 value within the analysis is not recommended.
3. Please include results of 95th queue lengths from Sim Traffic analysis within the report. Sim Traffic model should be calibrated as per the existing before using it for analysis of any future scenario. The analysis should be carried out with 10min seeding and 60 min recording for at least 3 iterations. The calibrated model should be used for all the future scenarios.
4. Ministry recommends use of 2% growth rate for traffic at all the interchanges within the analysis limits. Otherwise, please justify use of any other value.
5. For Synchro Analysis, value of lost time adjustment should be observed from the field as per the existing condition, and use it for existing as well as for all future scenarios.
6. If required, weekend peak hour should also be included within the analysis.
7. The study should also address heavy vehicle traffic impacts on the ramp terminals.
8. As outlined in MTO guidelines for Traffic impact studies, v/c ratio of 0.75 for ramp approaches and 0.85 for others are deemed to be critical in terms of operations and considered for geometric improvements. In report please provide recommendations for improvements if required by existing or any future scenario.
9. Please follow MTO general guidelines for traffic impact studies while doing analysis of the off-ramp terminals.
10. Please also submit digital files of Synchro Analysis along with final report for ministry review.

If you have any question or require further information, please feel free to contact me.

Thanks

Kashif Hussain
Senior Project Manager, Peel-Halton Section
Ministry of Transportation, Central Region Traffic Office
1201 Wilson Avenue, 6th Floor, Downsview
T: (416) 235-5519

From: Zivkovic, Branko (MTO)
Sent: April 2, 2014 10:10 AM
To: Nixon Chan; Hussain, Kashif (MTO)
Cc: Peter Hillier; Peter Yu; Jaspreet Dhillon; Zivkovic, Branko (MTO)
Subject: RE: Ninth Line Corridor - Traffic Data

Hi Kashif:

For our interchanges, could you please gather up whatever data we have regarding the request below and send to Nixon Chan at MMM. Could you also provide them some Synchro assumptions and growth rates to be used that we will insist on for the TIS.

Thanks

Branko Zivkovic
Traffic Supervisor (Peel & Halton)

Ministry of Transportation, Ontario
Central Region, Traffic Office

6th Floor, Building D
1201 Wilson Avenue
Toronto, Ontario
M3M 1J8

Tel. 416-235-5598
Fax. 416-235-4097
E-mail: Branko.Zivkovic@ontario.ca

From: Nixon Chan [mailto:ChanN@mmm.ca]
Sent: April 1, 2014 1:57 PM
To: Zivkovic, Branko (MTO); rbruno@407ETR.com; dmrkela@407etr.com
Cc: Peter Hillier; Peter Yu; Jaspreet Dhillon
Subject: Ninth Line Corridor - Traffic Data

Hi everyone:

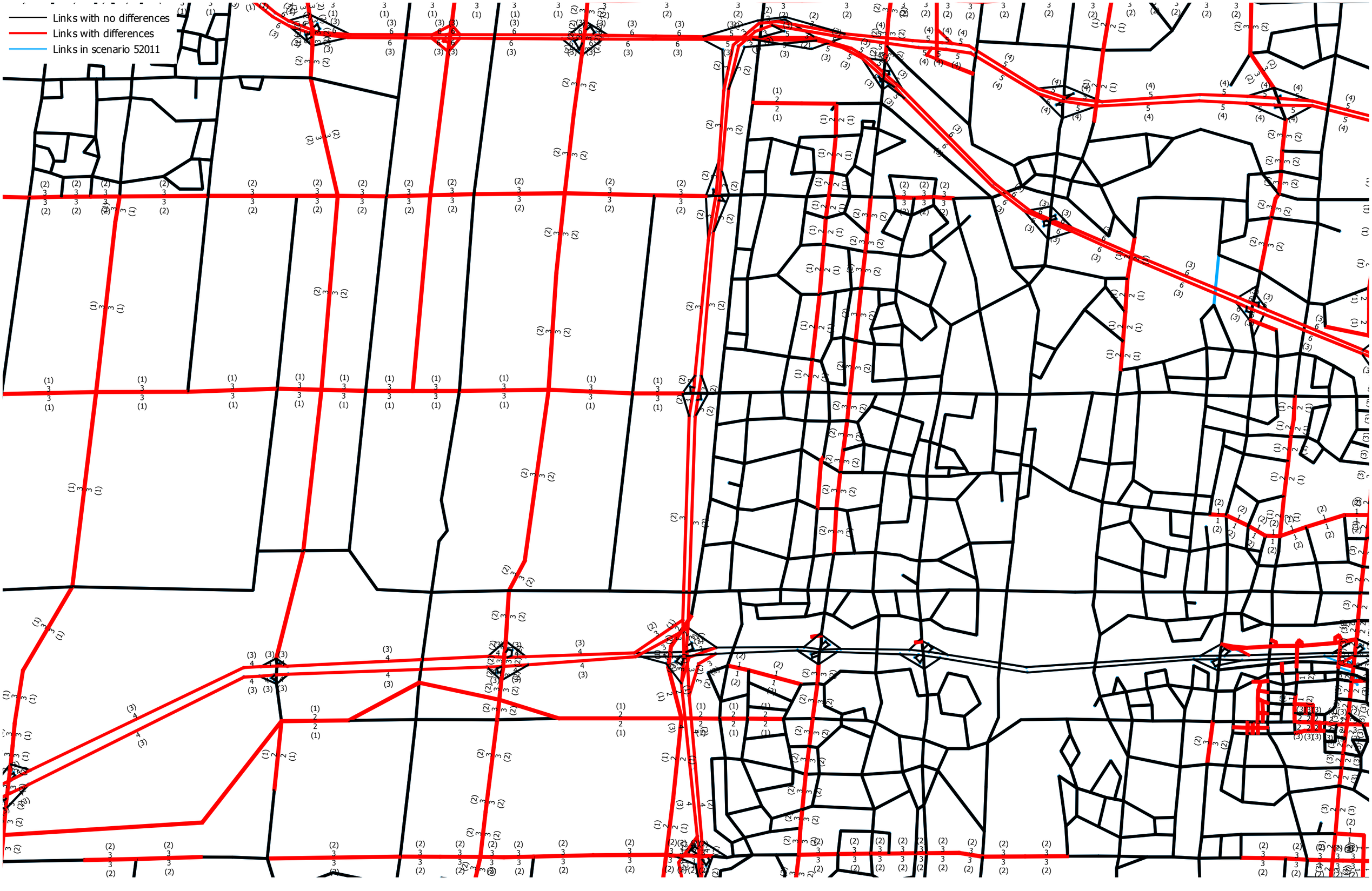
Further to our meeting on Friday, March 28, 2014, we would like to obtain the traffic data for the following interchanges:

- Hwy 407/Derry
- Hwy 407/Britannia
- Hwy 401/Winston Churchill
- Hwy 403/Winston Churchill
- Hwy 403/Dundas

Please send us the on and off ramps data for the past five years. If you also have the full intersection turning movement count at the interchanges noted (especially for the three MTO interchanges that are outside of the study area), please send them to us as well. We will establish our transportation terms of reference accordingly. Thanks very much.

APPENDIX J

City EMME Files


Links with no differences
Links with differences
Links in scenario 52011

Compounded Annual Growth Rate (Based on 2011 and 2041 Scenario)
No GTAW
Ninth Line Not Widen (within Mississauga)

NORTH/ SOUTH DEMAND

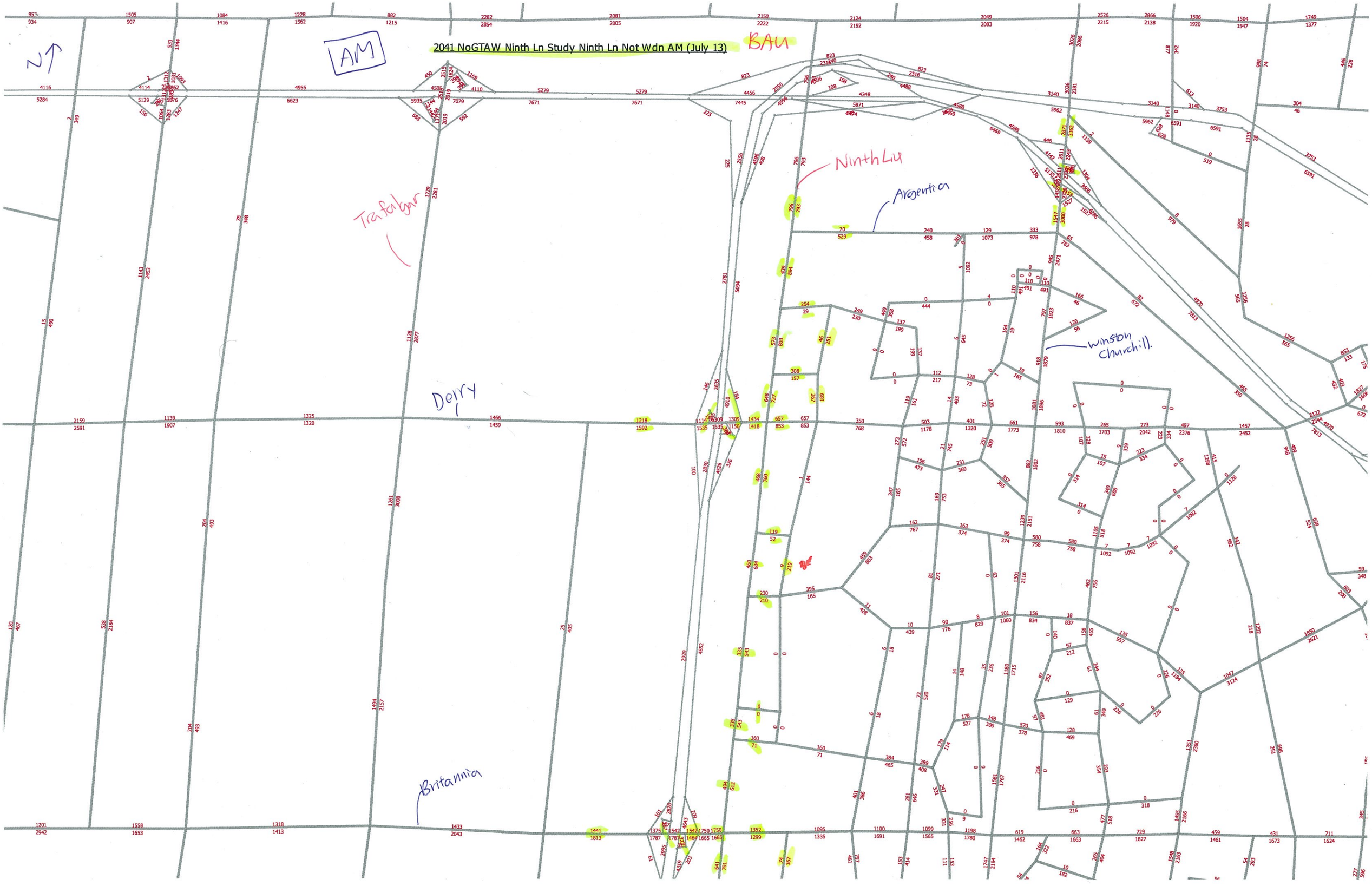
	AM PEAK HOUR		PM PEAK HOUR	
	2011 vs 2041 Without		2011 vs 2041 Without	
Ninth Line	**NB**	**SB**	**NB**	**SB**
-btwn Britannia Rd and Eglinton Ave	1.2%	0.3%	0.5%	1.0%
-btwn Derry Rd and Britannia Rd	1.0%	0.0%	0.0%	1.1%
-btwn 401 and Derry Rd	1.4%	1.1%	0.8%	1.3%
Average	**1.2%**	**0.5%**	**0.5%**	**1.1%**

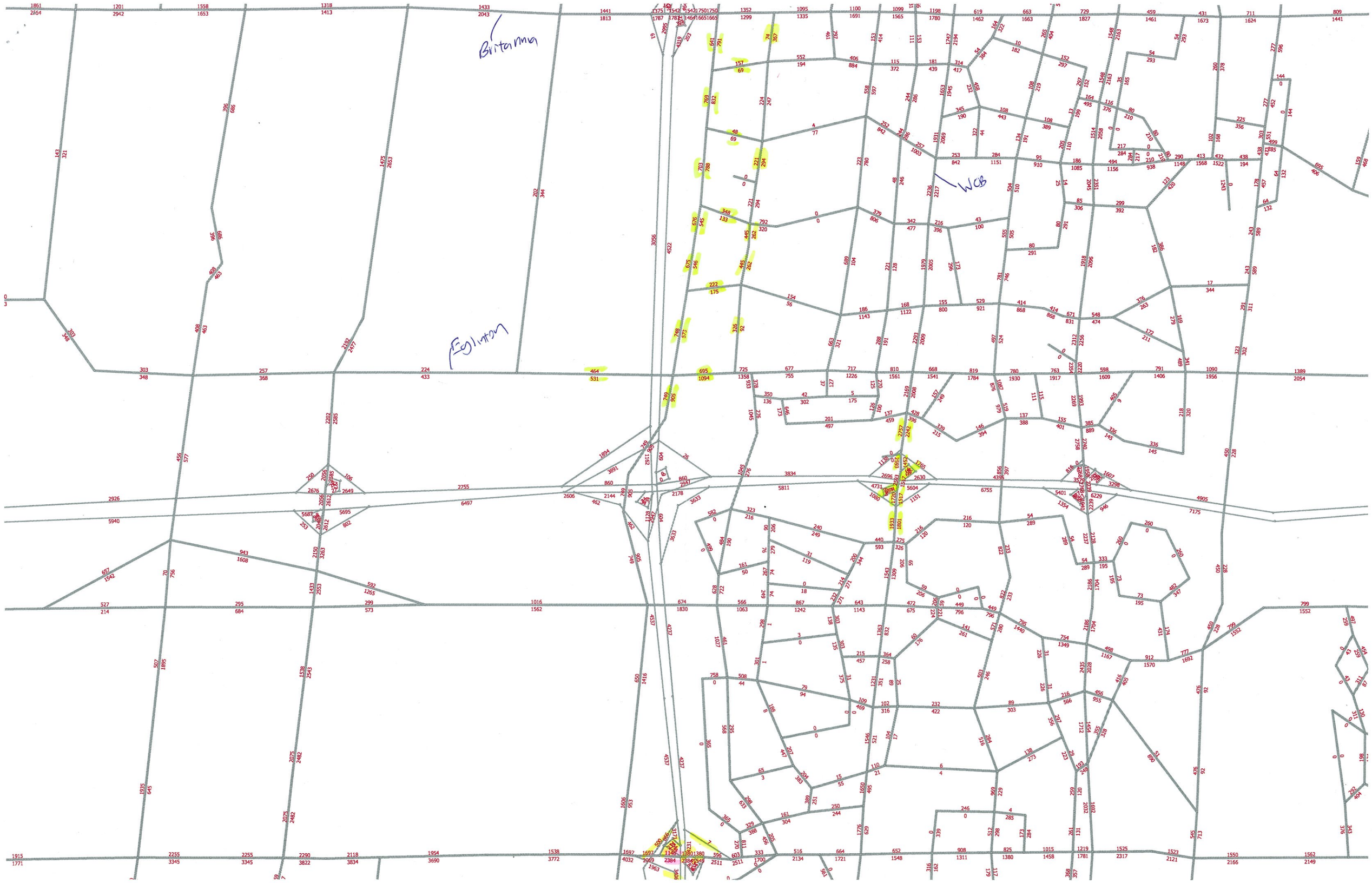
	2011 vs 2041 Without		2011 vs 2041 Without	
Winston Churchill Blvd	**NB**	**SB**	**NB**	**SB**
-btwn Britannia Rd and Eglinton Ave	1.7%	0.9%	1.2%	1.5%
-btwn Derry Rd and Britannia Rd	1.6%	1.6%	1.9%	1.9%
-btwn 401 and Derry Rd	1.2%	2.8%	3.4%	1.3%
Average	**1.5%**	**1.6%**	**2.0%**	**1.5%**

EAST/ WEST DEMAND

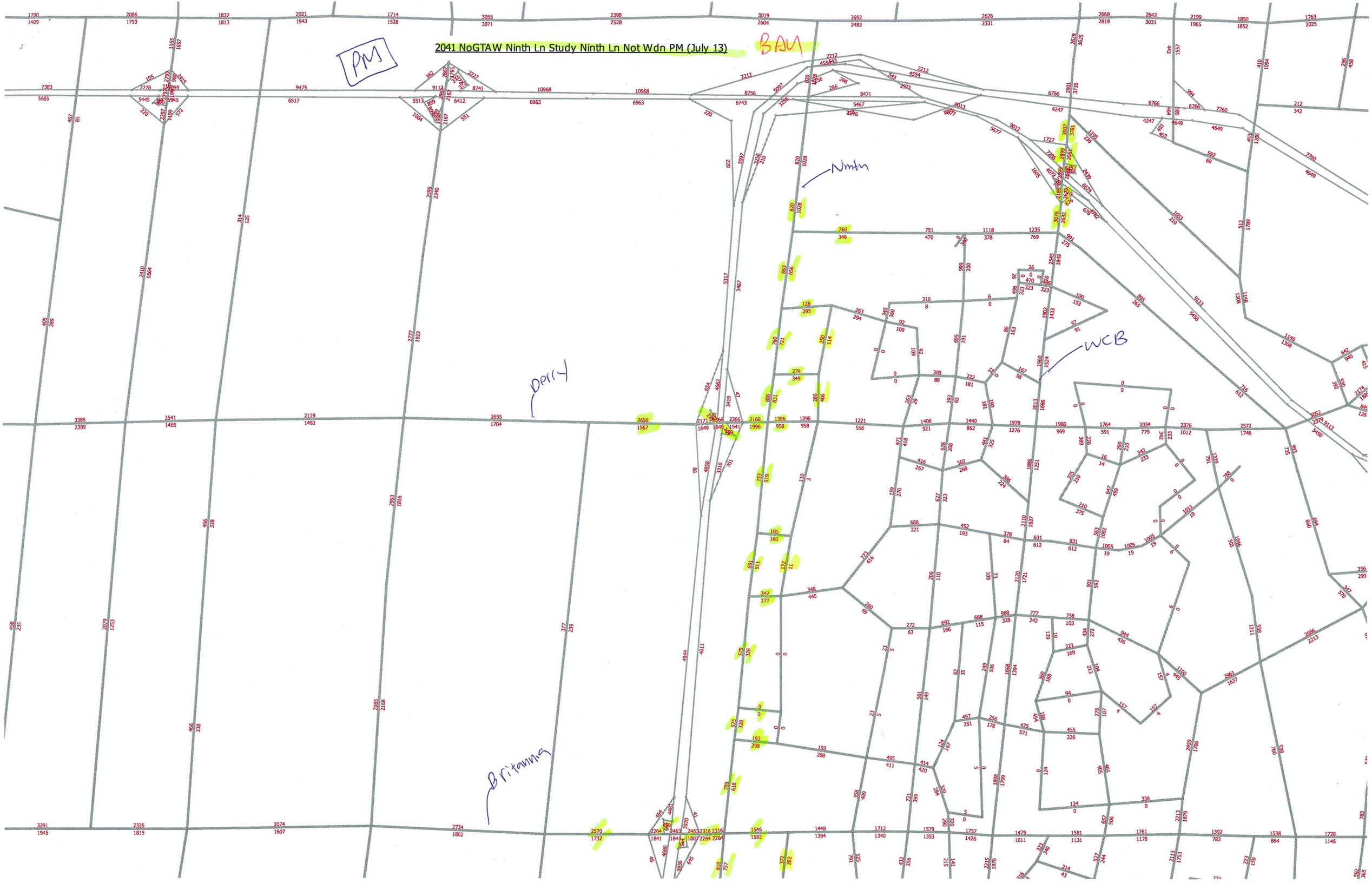
	AM PEAK HOUR		PM PEAK HOUR	
	2011 vs 2041 Without		2011 vs 2041 Without	
	EB	**WB**	**EB**	**WB**
Derry Rd btwn Eight Ln and Tenth Ln	1.9%	2.0%	1.7%	1.5%
Britannia Rd btwn Eight Ln and Tenth Ln	2.7%	2.0%	1.8%	2.4%
Eglinton Ave btwn Eight Ln and Tenth Ln	1.1%	2.1%	1.8%	1.1%
Dundas St btwn just west of 9th Ln to WCB	1.3%	1.7%	1.6%	1.6%
Average	**1.7%**	**2.0%**	**1.7%**	**1.7%**

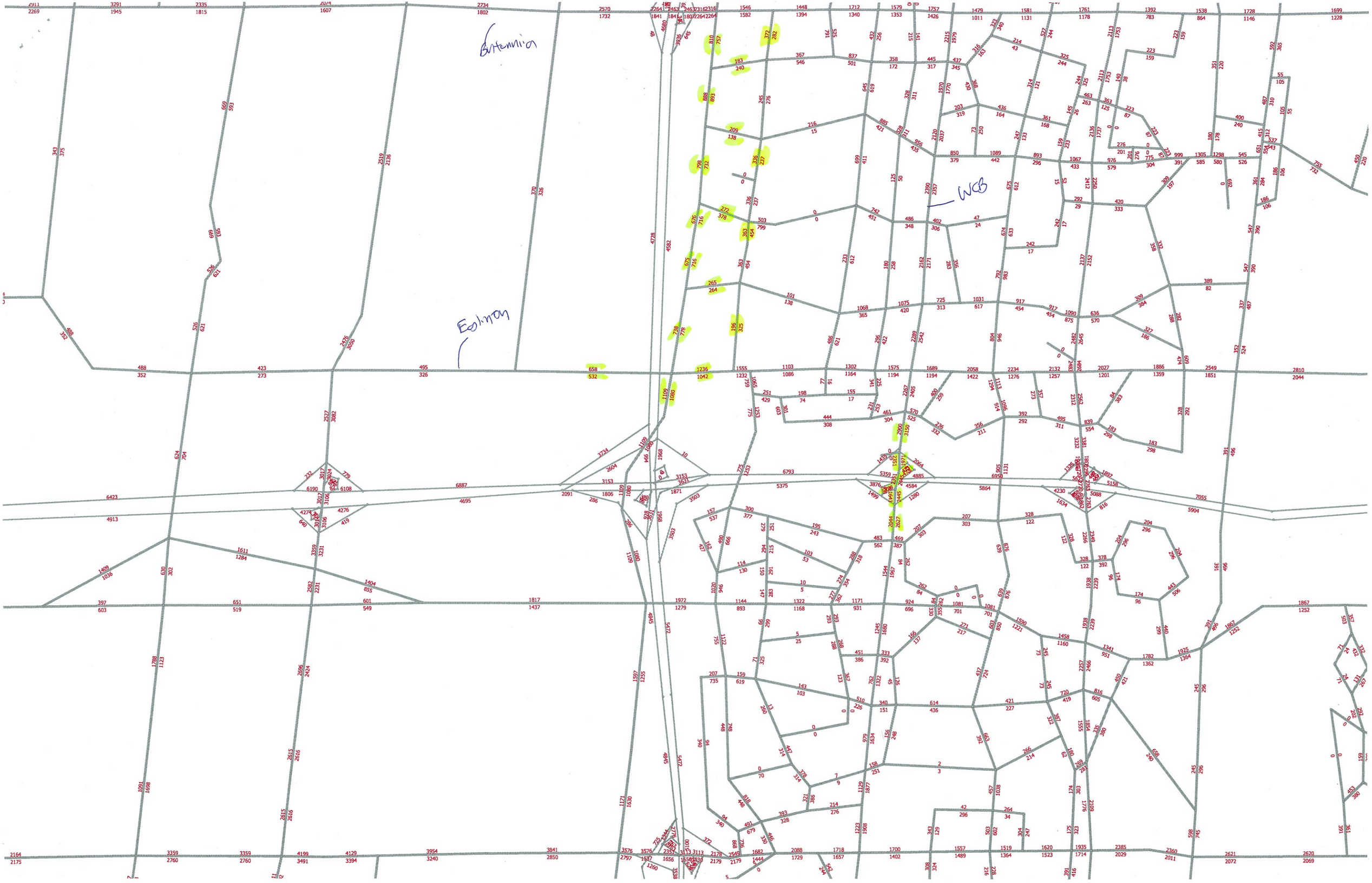
2041 NoGTAW Ninth Ln Study Ninth Ln Not Wdn AM (July 13)

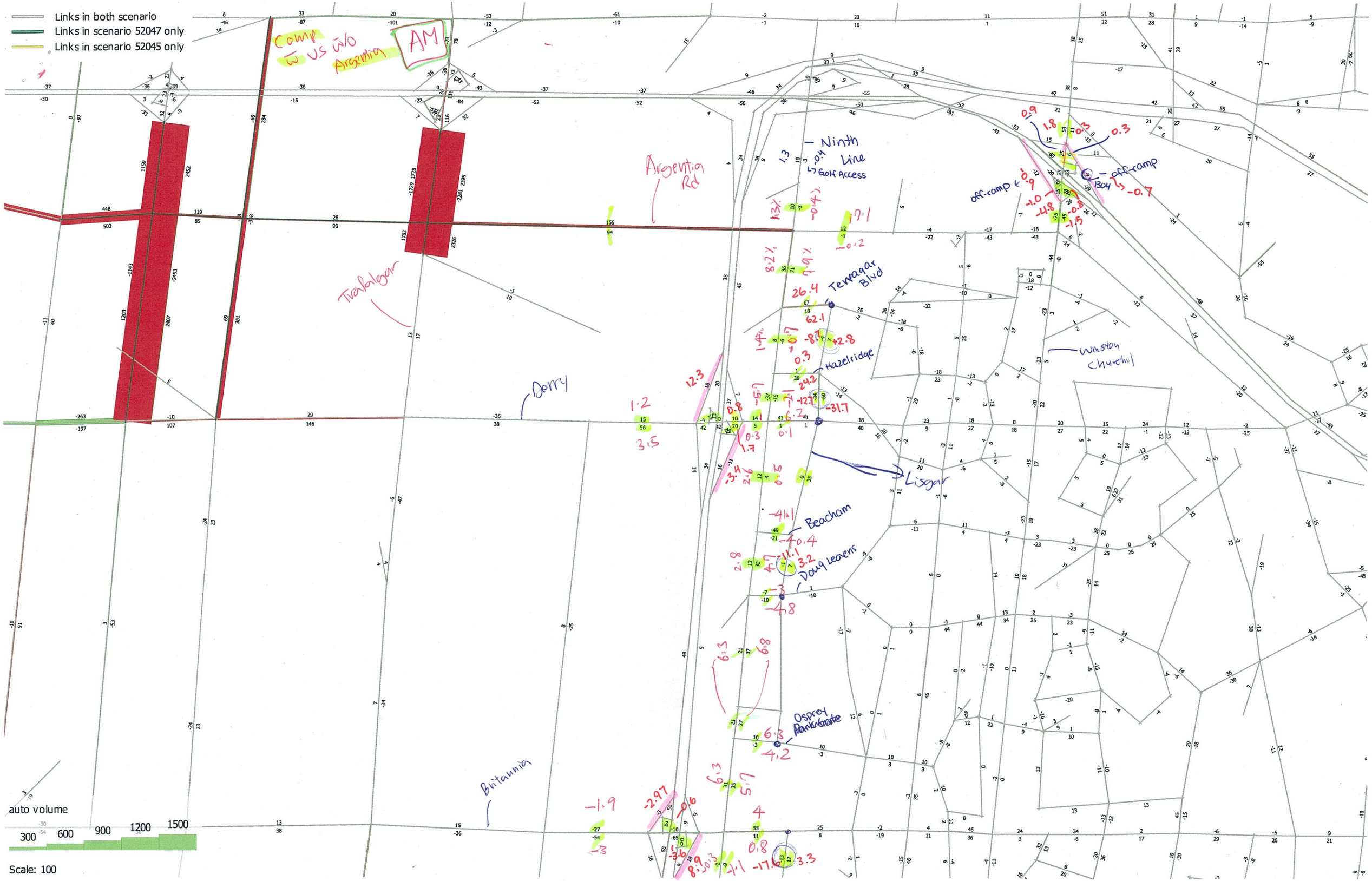


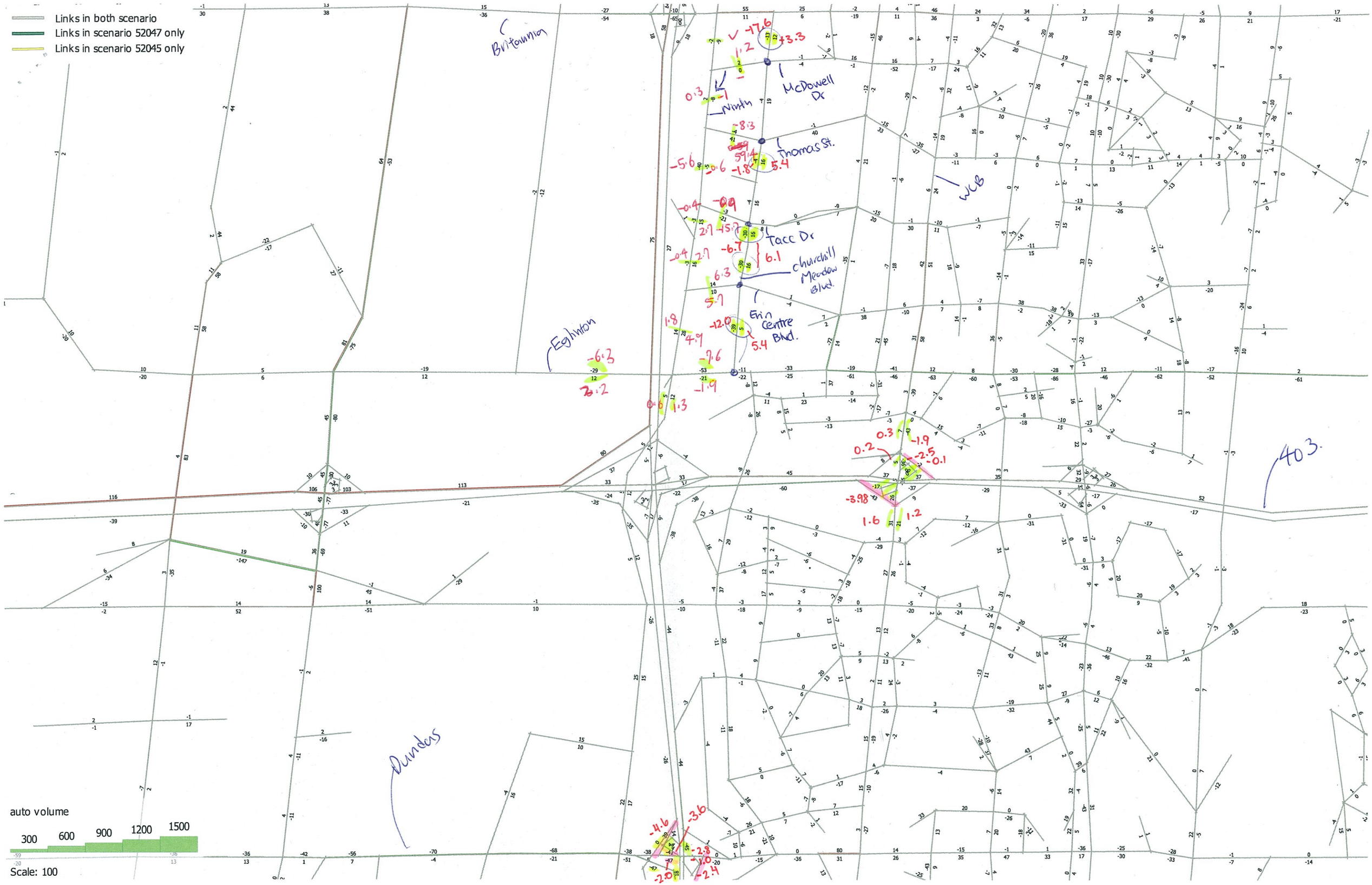

Britannia
Eglinton
WCB

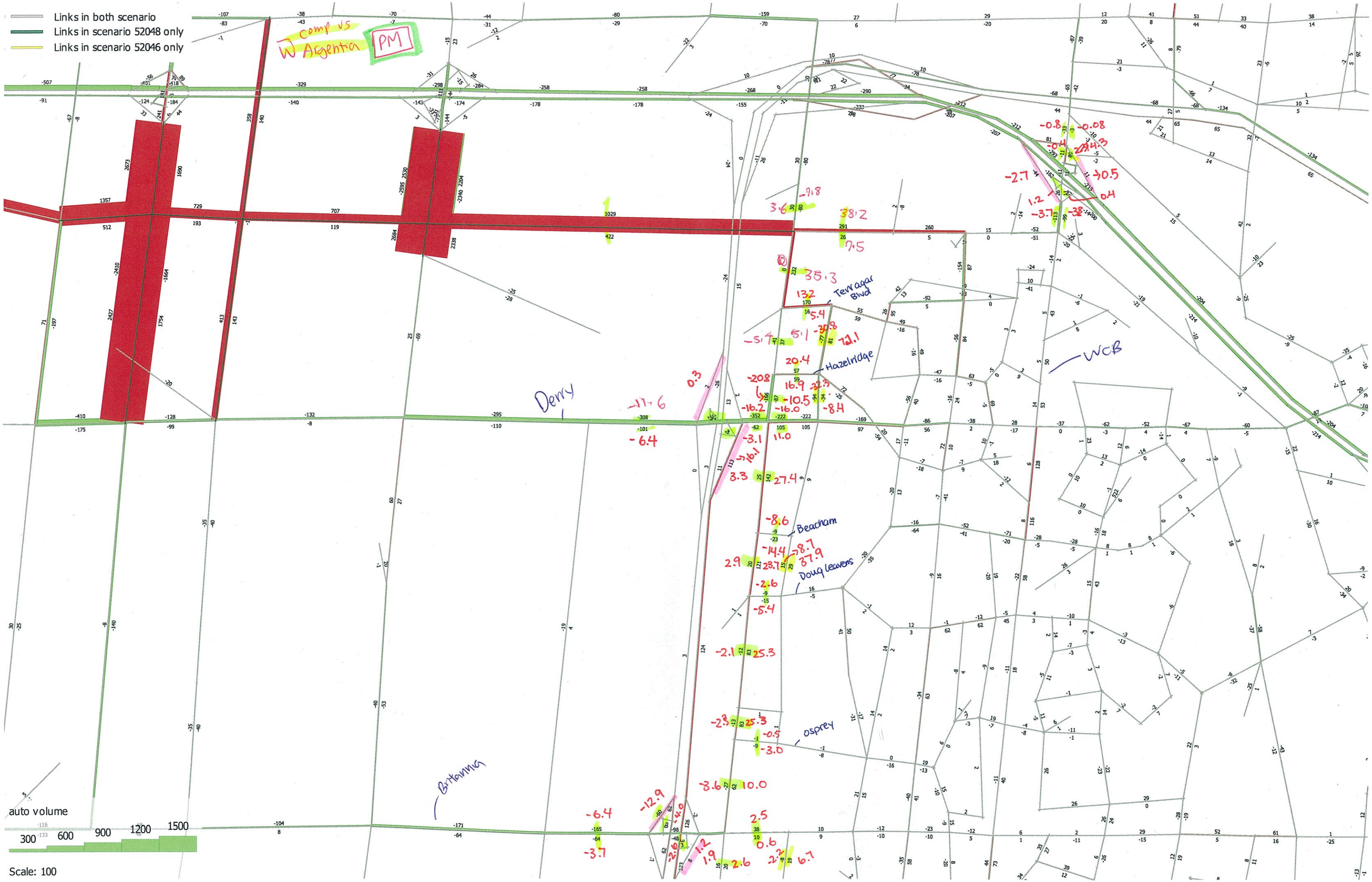
2041 NoGTAW Ninth Ln Study Ninth Ln Not Wdn PM (July 13)

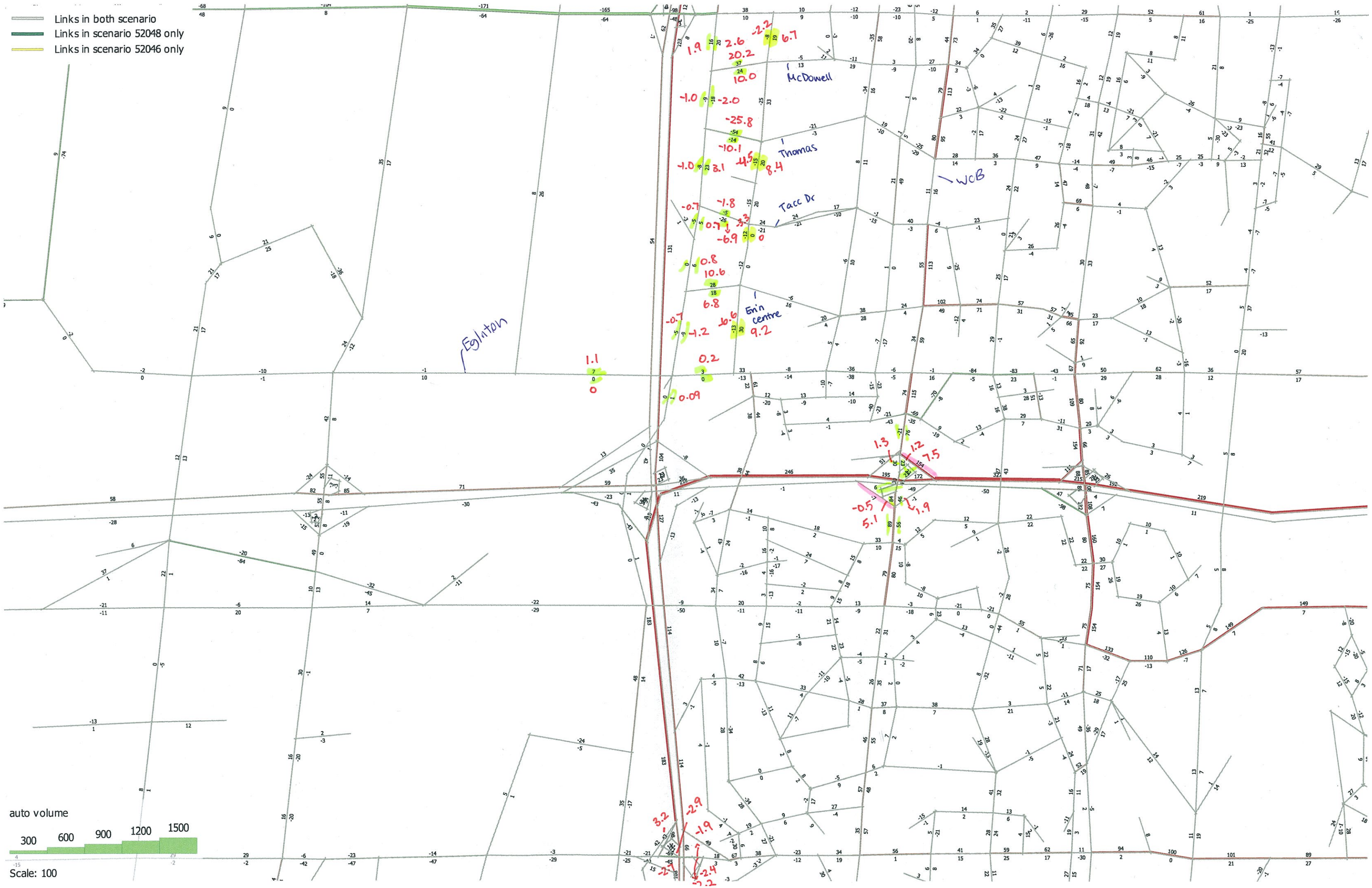


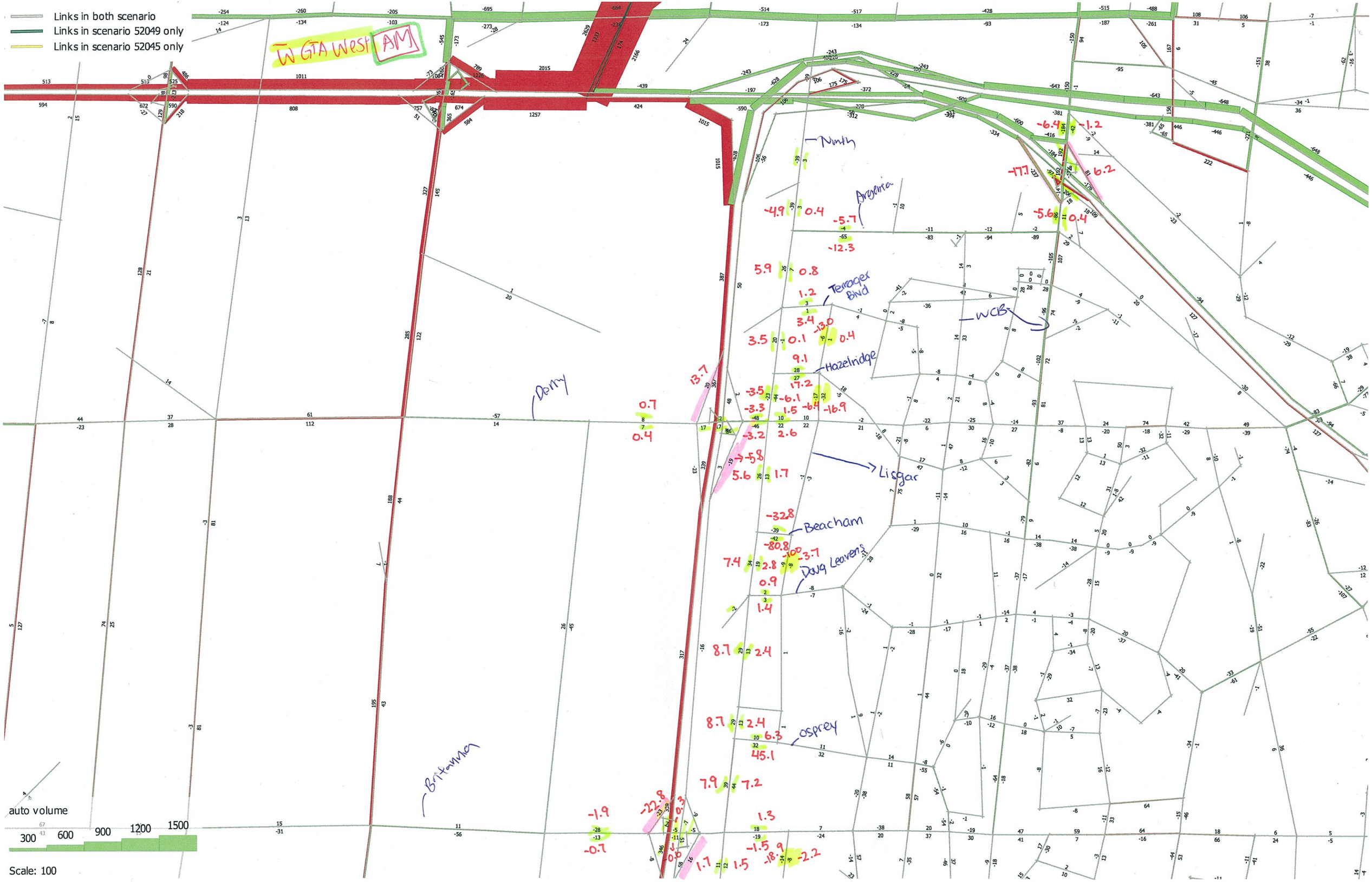

Britannia
Eglinton
WCB

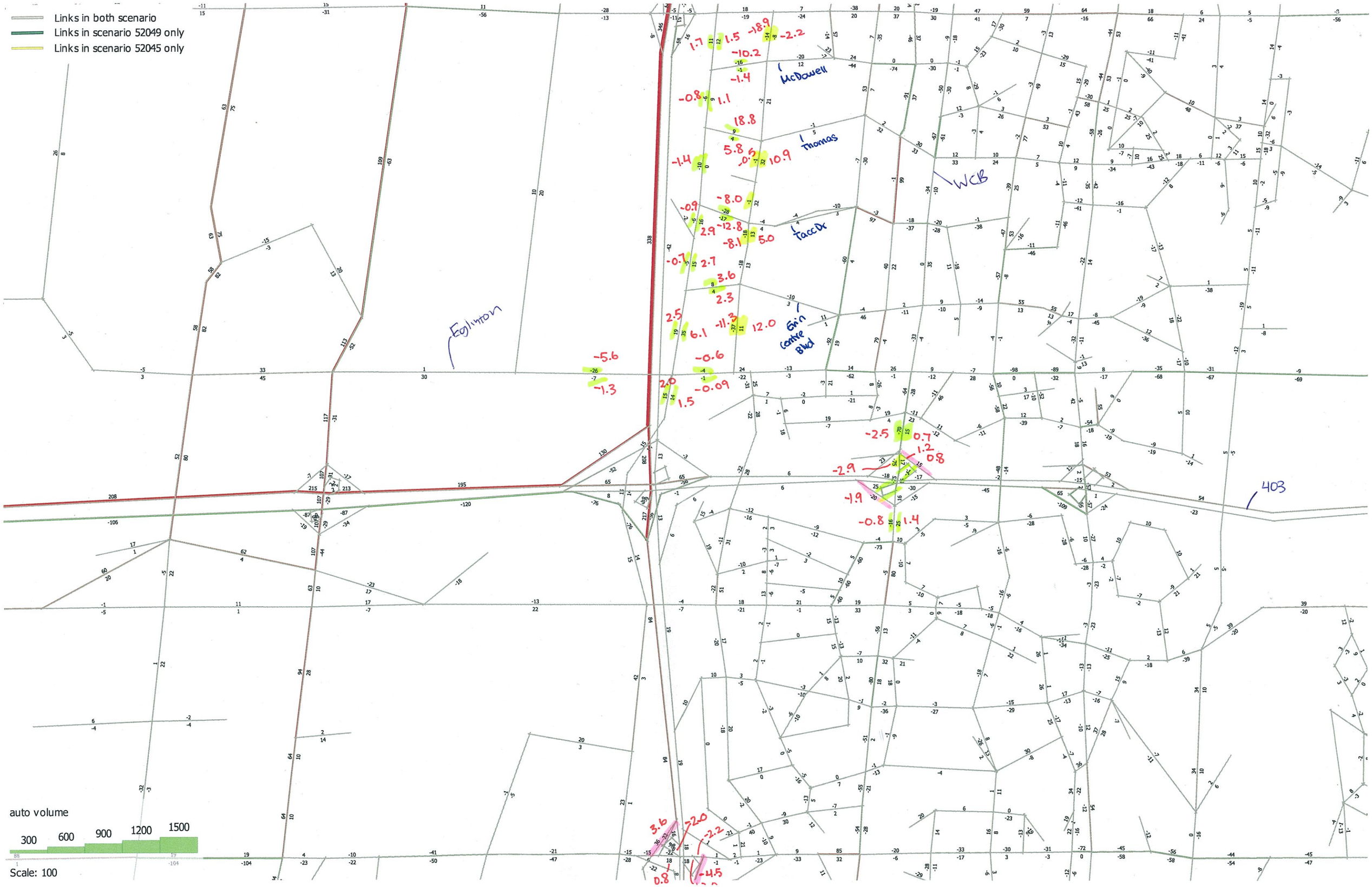

Links in both scenario
Links in scenario 52047 only
Links in scenario 52045 only
Comp
W US W/O
Argentia
AM
Argentia Rd
Trafalgar
Derry
Britannia
Ninth Line
Golf Access
off-ramp
1304
Terragar Blvd
Hazelridge
Winston Churchill
Lisgar
Beacham
Doug Leavens
Osprey Ridge
auto volume
300
600
900
1200
1500
Scale: 100

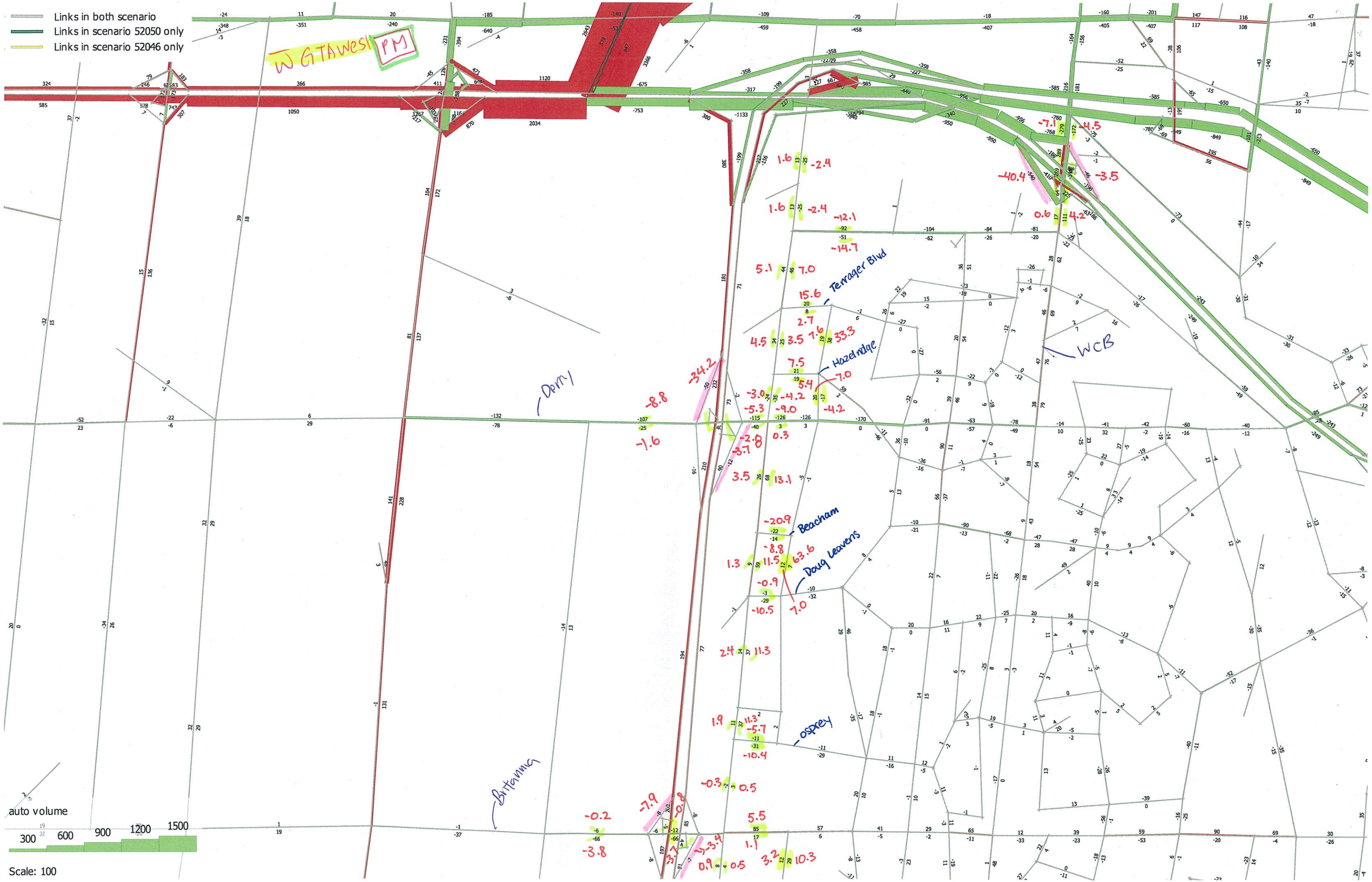

Links in both scenario
Links in scenario 52047 only
Links in scenario 52045 only
Britannia
Eglinton
Dundas
McDowell Dr
Ninth
Thomas St.
Tacc Dr
Churchill Meadow Blvd.
Erin Centre Blvd.
403
auto volume
300
600
900
1200
1500
Scale: 100


Links in both scenario
Links in scenario 52048 only
Links in scenario 52046 only
comp vs W Argentia
PM
Terragar Blvd
Hazelridge
WCB
Derry
Beacham
Doug Leavens
Osprey
Britannia
auto volume
300
600
900
1200
1500
Scale: 100

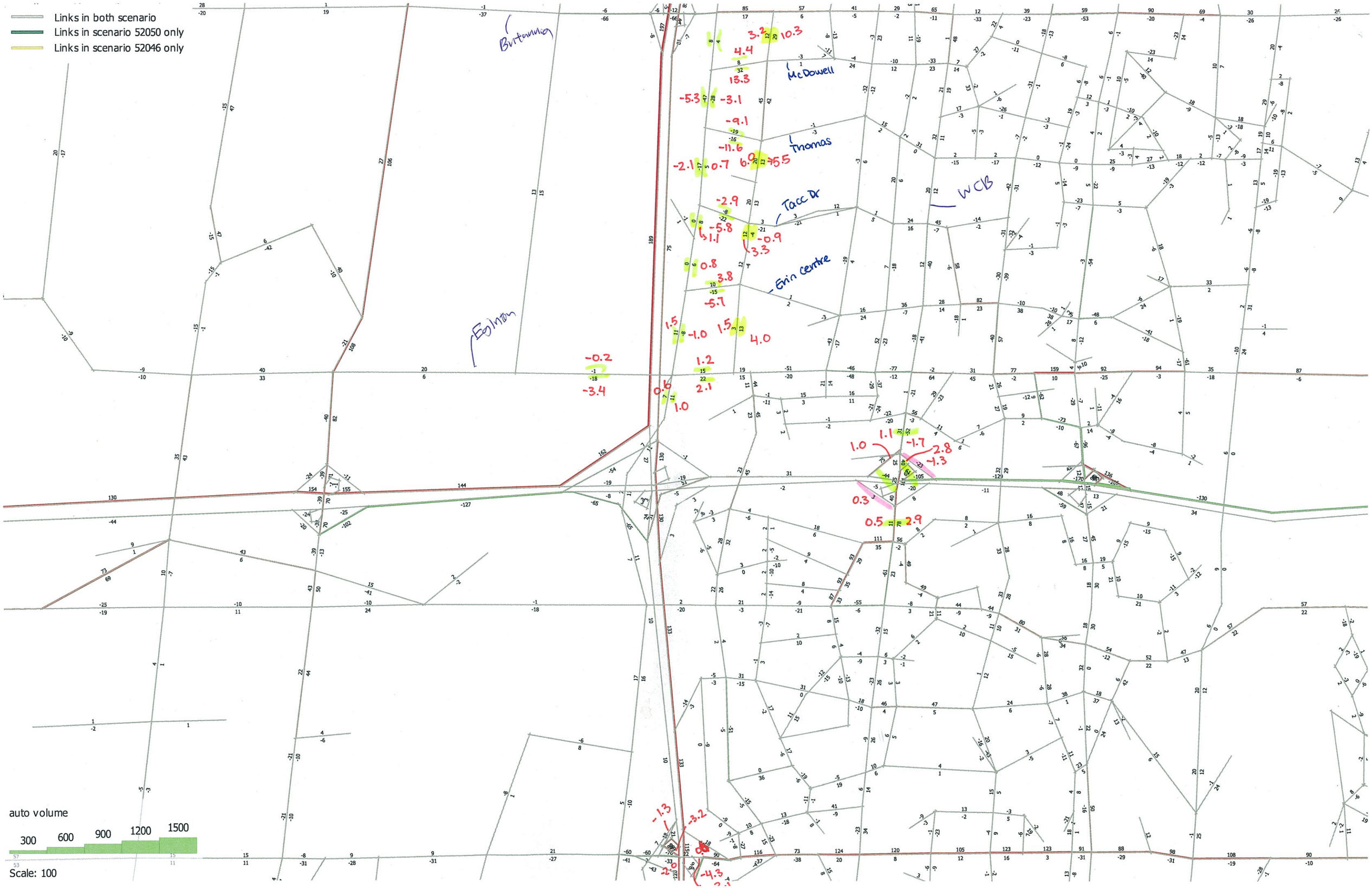

Links in both scenario
Links in scenario 52048 only
Links in scenario 52046 only
McDowell
Thomas
Tacc Dr
WCB
Eglinton
Erin centre
auto volume
300
600
900
1200
1500
Scale: 100


Links in both scenario
Links in scenario 52049 only
Links in scenario 52045 only
W GTA West AM
Ninth
Argentia
Terragar Blvd
WCB
Hazelridge
Derry
Lisgar
Beacham
Doug Leavens
Osprey
Britannia
auto volume
300
600
900
1200
1500
Scale: 100


Links in both scenario
Links in scenario 52049 only
Links in scenario 52045 only
McDowell
Thomas
WCB
TaccDr
Gin Centre Blvd
Eglinton
403
auto volume
300
600
900
1200
1500
Scale: 100



Links in both scenario
Links in scenario 52050 only
Links in scenario 52046 only
W GTAWESH
PM
Terrager Blvd
Hazelridge
WCB
Derry
Beacham
Doug Leavens
osprey
Britannia
auto volume
300
600
900
1200
1500
Scale: 100


Links in both scenario
Links in scenario 52050 only
Links in scenario 52046 only
Burtonwing
McDowell
Thomas
Tacc Dr
WCB
Erin centre
Eglinton
auto volume
300
600
900
1200
1500
Scale: 100

APPENDIX K

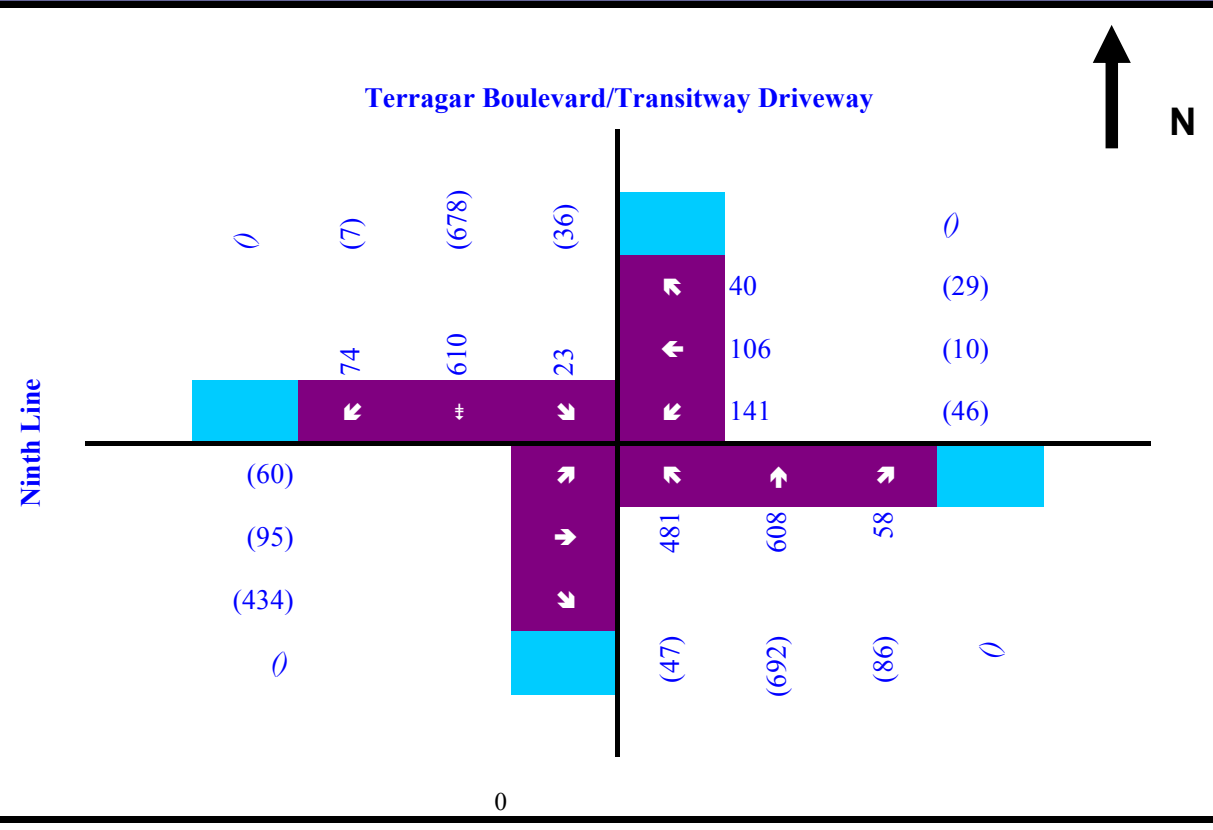
Signal Warrants

General Input

Analyst:		**AM Vehicle Data:**	FB_AM
Date:		**PM Vehicle Data:**	FB_PM
Project Name.:	Ninth Line Corridor Study	**AM Ped Data:**	Ped_AM
Project Number.:	1613112-001-T01	**PM Ped Data:**	Ped_PM
Comments:		**Intersection ID:**	2
		Intersection Name:	

Free Flow - Rural (FF) or Restricted Flow - Urban (RES):	RES
Major Street Approach Lanes (Per Direction):	2 or More
Future Condition (YES or NO):	Yes
New Intersection (YES or NO):	No

Traffic and Pedestrian Volume Input



Legend

	Pedestrian Volume	x	AM Peak Hour
	Vehicle Volume	(x)	PM Peak Hour

Do Not Edit

Legs 4

Major NS

Justifications	AM PHV	PM PHV
2B - 1 (See OTM 12 Page 78)	0	0
2B - 2	141	106
2B - 3	106	95
2B - 4A	Yes	No
2B - 4B	Yes	Yes
2B - 4	240.5	0

Justifications	AM PHV	PM PHV
1A (All Approaches)	2141	2220
1B (Minor Approaches)	287	674
2A (Major Approaches)	1854	1546
2B (Crossing Major Street)	488	201

Traffic Signal Warrant Analysis

Based on the Ontario Traffic Mannual Book 12

Project Name:	Ninth Line Corridor Study
Project Number.:	1613112-001-T01
Analyst:	0
Date:	January-00-00

Major Street:	Terragar Boulevard/Transitway Driveway
Minor Street:	Ninth Line
Comments:	Future Background Conditions

Free Flow - Rural (FF) or Restricted Flow - Urban (Res)	RES
Major Street Approach Lanes (Per Direction):	2 or More
Three or four legged intersection (3 or 4)	4
Future Condition (YES or NO):	Yes
New Intersection (YES or NO):	No

Justification 1 (Minimum Vehicle Volume)*

A (All Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	2141	2220	1071	1110	1080
Percent Compliance	-	-	99%	100%	-
				Sectional Percentage	100%

B (Minor Street Both Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	287	674	144	337	204
Percent Compliance	-	-	70%	100%	-
				Sectional Percentage	100%
				Entire Justification 1 Percentage	**100%**

Justification 2 (Delay Cross Traffic)*

A (Major Street Both Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	1854	1546	927	773	1080
Percent Compliance	-	-	86%	72%	-
				Sectional Percentage	**86%**

B (Traffic Crossing Major Street)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	488	201	244	101	90
Percent Compliance	-	-	100%	100%	-
				Sectional Percentage	100%
				Entire Justification 2 Percentage	**86%**

** Includes Justification 3 and 7*

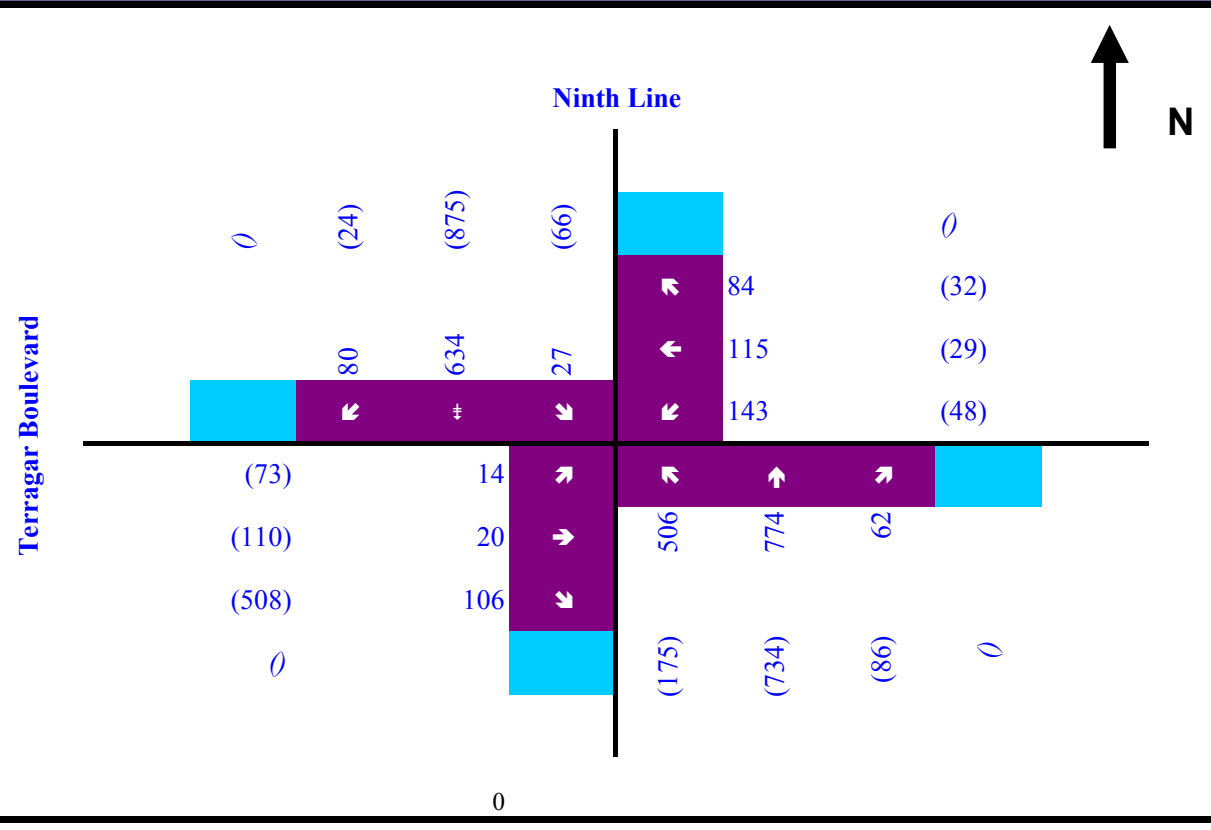
Are signals warranted at the intersection of Terragar Boulevard/ Transitway Driveway/Ninth Line?	**YES**

General Input

Analyst:		**AM Vehicle Data:**	FT_5_AM
Date:		**PM Vehicle Data:**	FT_5_PM
Project Name.:	Ninth Line Corridor Study	**AM Ped Data:**	Ped_AM
Project Number.:	1613112-001-T01	**PM Ped Data:**	Ped_PM
Comments:		**Intersection ID:**	2
		Intersection Name:	

Free Flow - Rural (FF) or Restricted Flow - Urban (RES):	RES
Major Street Approach Lanes (Per Direction):	2 or More
Future Condition (YES or NO):	Yes
New Intersection (YES or NO):	No

Traffic and Pedestrian Volume Input



Legend

	Pedestrian Volume	x	AM Peak Hour
	Vehicle Volume	(x)	PM Peak Hour

Do Not Edit

Legs 4

Major NS

Justifications	AM PHV	PM PHV
2B - 1 (See OTM 12 Page 78)	0	0
2B - 2	157	121
2B - 3	115	110
2B - 4A	Yes	Yes
2B - 4B	Yes	Yes
2B - 4	253	253

Justifications	AM PHV	PM PHV
1A (All Approaches)	2565	2760
1B (Minor Approaches)	482	800
2A (Major Approaches)	2083	1960
2B (Crossing Major Street)	525	484

Traffic Signal Warrant Analysis

Based on the Ontario Traffic Mannual Book 12

Project Name:	Ninth Line Corridor Study
Project Number.:	1613112-001-T01
Analyst:	0
Date:	January-00-00
Major Street:	Ninth Line
Minor Street:	Terragar Boulevard/Driveway
Comments:	0

Free Flow - Rural (FF) or Restricted Flow - Urban (Res)	RES
Major Street Approach Lanes (Per Direction):	2 or More
Three or four legged intersection (3 or 4)	4
Future Condition (YES or NO):	Yes
New Intersection (YES or NO):	No

Justification 1 (Minimum Vehicle Volume)*

A (All Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	2565	2760	1283	1380	1080
Percent Compliance	-	-	100%	100%	-
				Sectional Percentage	100%

B (Minor Street Both Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	482	800	241	400	204
Percent Compliance	-	-	100%	100%	-
				Sectional Percentage	100%
				Entire Justification 1 Percentage	**100%**

Justification 2 (Delay Cross Traffic)*

A (Major Street Both Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	2083	1960	1042	980	1080
Percent Compliance	-	-	96%	91%	-
				Sectional Percentage	**96%**

B (Traffic Crossing Major Street)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	525	484	263	242	90
Percent Compliance	-	-	100%	100%	-
				Sectional Percentage	100%
				Entire Justification 2 Percentage	**96%**

** Includes Justification 3 and 7*

Are signals warranted at the intersection of Ninth Line/Terragar Boulevard/Driveway? YES

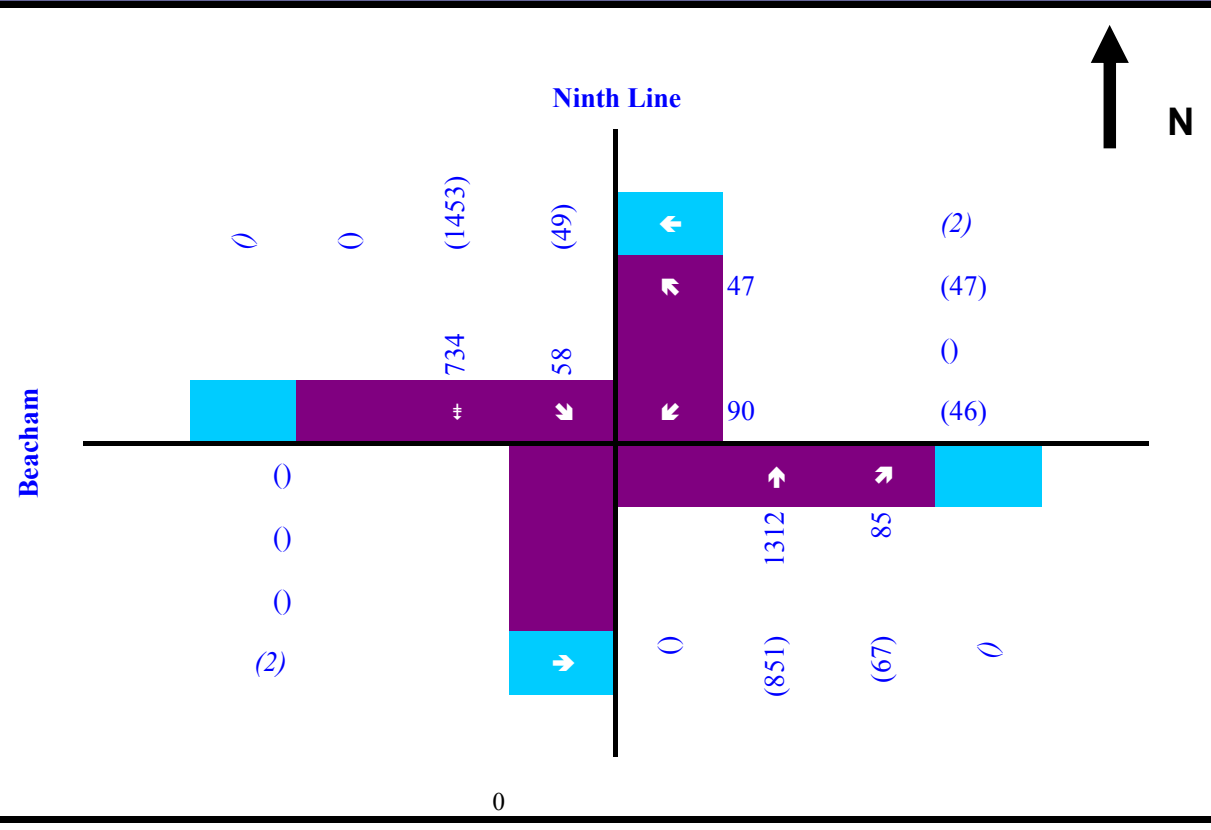
J:\01 PROJECTS\2013 jobs\16-13112 and 16-16039.PKH (Ninth Line Corridor Review)\04. Working Files\01. Analyses - Calculations\TIS Spreadsheet - Ninth Line Corridor Review - V12

General Input

Analyst:		**AM Vehicle Data:**	FT_5_AM
Date:		**PM Vehicle Data:**	FT_5_PM
Project Name.:	Ninth Line Corridor Study	**AM Ped Data:**	Ped_AM
Project Number.:	1613112-001-T01	**PM Ped Data:**	Ped_PM
Comments:		**Intersection ID:**	5
		Intersection Name:	

Free Flow - Rural (FF) or Restricted Flow - Urban (RES):	RES
Major Street Approach Lanes (Per Direction):	2 or More
Future Condition (YES or NO):	Yes
New Intersection (YES or NO):	No

Traffic and Pedestrian Volume Input



Legend

Pedestrian Volume	x	AM Peak Hour
Vehicle Volume	(x)	PM Peak Hour

Do Not Edit

Legs 3

Major NS

Justifications	AM PHV	PM PHV
2B - 1 (See OTM 12 Page 78)	0	4
2B - 2	90	46
2B - 3	0	0
2B - 4A	No	No
2B - 4B	Yes	Yes
2B - 4	0	0

Justifications	AM PHV	PM PHV
1A (All Approaches)	2326	2513
1B (Minor Approaches)	137	93
2A (Major Approaches)	2189	2420
2B (Crossing Major Street)	90	50

Traffic Signal Warrant Analysis

Based on the Ontario Traffic Mannual Book 12

Project Name:	Ninth Line Corridor Study
Project Number.:	1613112-001-T01
Analyst:	
Date:	

Major Street:	Ninth Line
Minor Street:	Beacham
Comments:	Future Total Conditions

Free Flow - Rural (FF) or Restricted Flow - Urban (Res)	RES
Major Street Approach Lanes (Per Direction):	2 or More
Three or four legged intersection (3 or 4)	3
Future Condition (YES or NO):	Yes
New Intersection (YES or NO):	No

Justification 1 (Minimum Vehicle Volume)*

A (All Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	2326	2513	1163	1257	1080
Percent Compliance	-	-	100%	100%	-
				Sectional Percentage	100%

B (Minor Street Both Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	137	93	69	47	306
Percent Compliance	-	-	22%	15%	-
				Sectional Percentage	22%
				Entire Justification 1 Percentage	**22%**

Justification 2 (Delay Cross Traffic)*

A (Major Street Both Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	2189	2420	1095	1210	1080
Percent Compliance	-	-	100%	100%	-
				Sectional Percentage	**100%**

B (Traffic Crossing Major Street)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	90	50	45	25	90
Percent Compliance	-	-	50%	28%	-
				Sectional Percentage	50%
				Entire Justification 2 Percentage	**50%**

** Includes Justification 3 and 7*

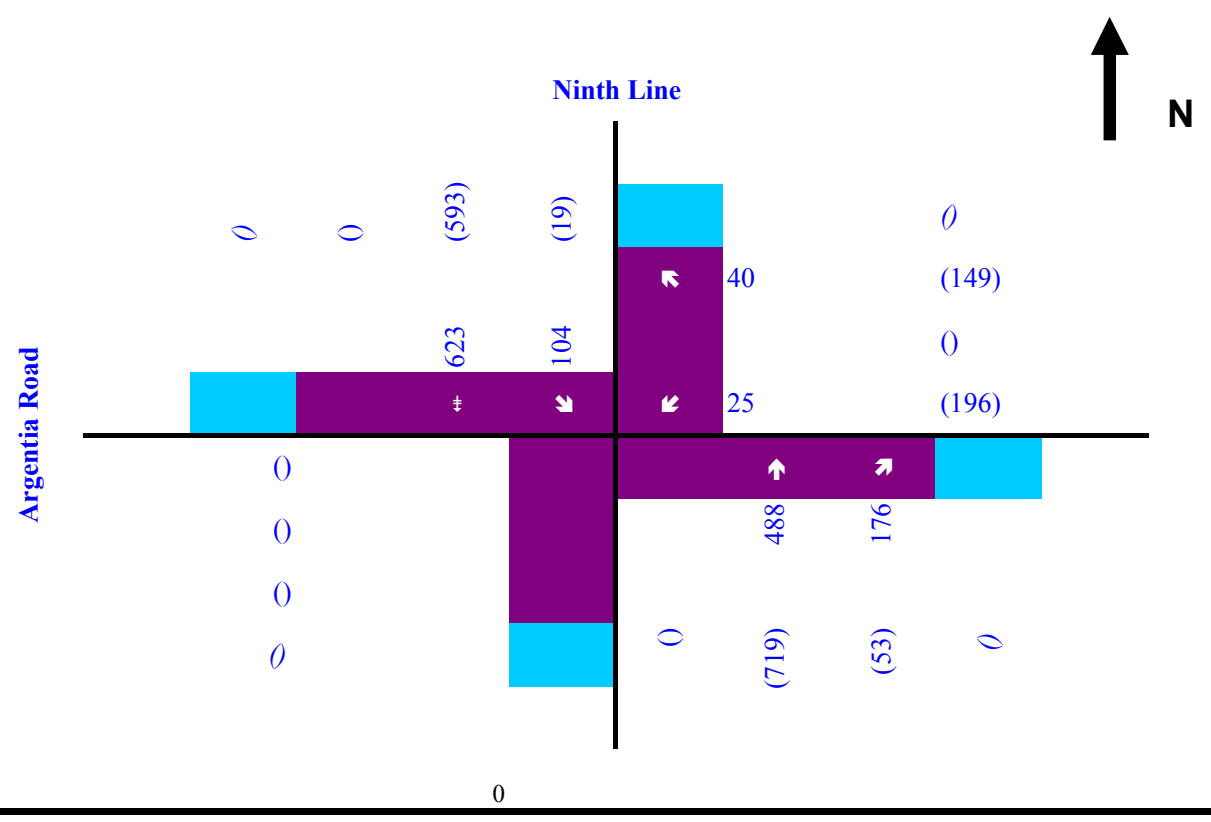
Are signals warranted at the intersection of Ninth Line/Beacham? NO

General Input

Analyst:		**AM Vehicle Data:**	FT_5_AM
Date:		**PM Vehicle Data:**	FT_5_PM
Project Name.:	Ninth Line Corridor Study	**AM Ped Data:**	Ped_AM
Project Number.:	1613112-001-T01	**PM Ped Data:**	Ped_PM
Comments:		**Intersection ID:**	52
		Intersection Name:	

Free Flow - Rural (FF) or Restricted Flow - Urban (RES):	RES
Major Street Approach Lanes (Per Direction):	2 or More
Future Condition (YES or NO):	Yes
New Intersection (YES or NO):	No

Traffic and Pedestrian Volume Input



Legend

	Pedestrian Volume	x	AM Peak Hour
	Vehicle Volume	(x)	PM Peak Hour

Do Not Edit

Legs 3

Major NS

Justifications	AM PHV	PM PHV
2B - 1 (See OTM 12 Page 78)	0	0
2B - 2	25	196
2B - 3	0	0
2B - 4A	No	No
2B - 4B	No	Yes
2B - 4	0	0

Justifications	AM PHV	PM PHV
1A (All Approaches)	1456	1729
1B (Minor Approaches)	65	345
2A (Major Approaches)	1391	1384
2B (Crossing Major Street)	25	196

Traffic Signal Warrant Analysis

Based on the Ontario Traffic Mannual Book 12

Project Name:	Ninth Line Corridor Study
Project Number.:	1613112-001-T01
Analyst:	0
Date:	
Major Street:	Ninth Line
Minor Street:	Argentia Road
Comments:	Future Conditions - Base - 3-Legged

Free Flow - Rural (FF) or Restricted Flow - Urban (Res)	RES
Major Street Approach Lanes (Per Direction):	2 or More
Three or four legged intersection (3 or 4)	3
Future Condition (YES or NO):	Yes
New Intersection (YES or NO):	No

Justification 1 (Minimum Vehicle Volume)*

A (All Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	1456	1729	728	865	1080
Percent Compliance	-	-	67%	80%	-
				Sectional Percentage	80%

B (Minor Street Both Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	65	345	33	173	306
Percent Compliance	-	-	11%	56%	-
				Sectional Percentage	56%
				Entire Justification 1 Percentage	**56%**

Justification 2 (Delay Cross Traffic)*

A (Major Street Both Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	1391	1384	696	692	1080
Percent Compliance	-	-	64%	64%	-
				Sectional Percentage	**64%**

B (Traffic Crossing Major Street)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	25	196	13	98	90
Percent Compliance	-	-	14%	100%	-
				Sectional Percentage	100%
				Entire Justification 2 Percentage	**64%**

** Includes Justification 3 and 7*

Are signals warranted at the intersection of Ninth Line/Argentia Road? NO

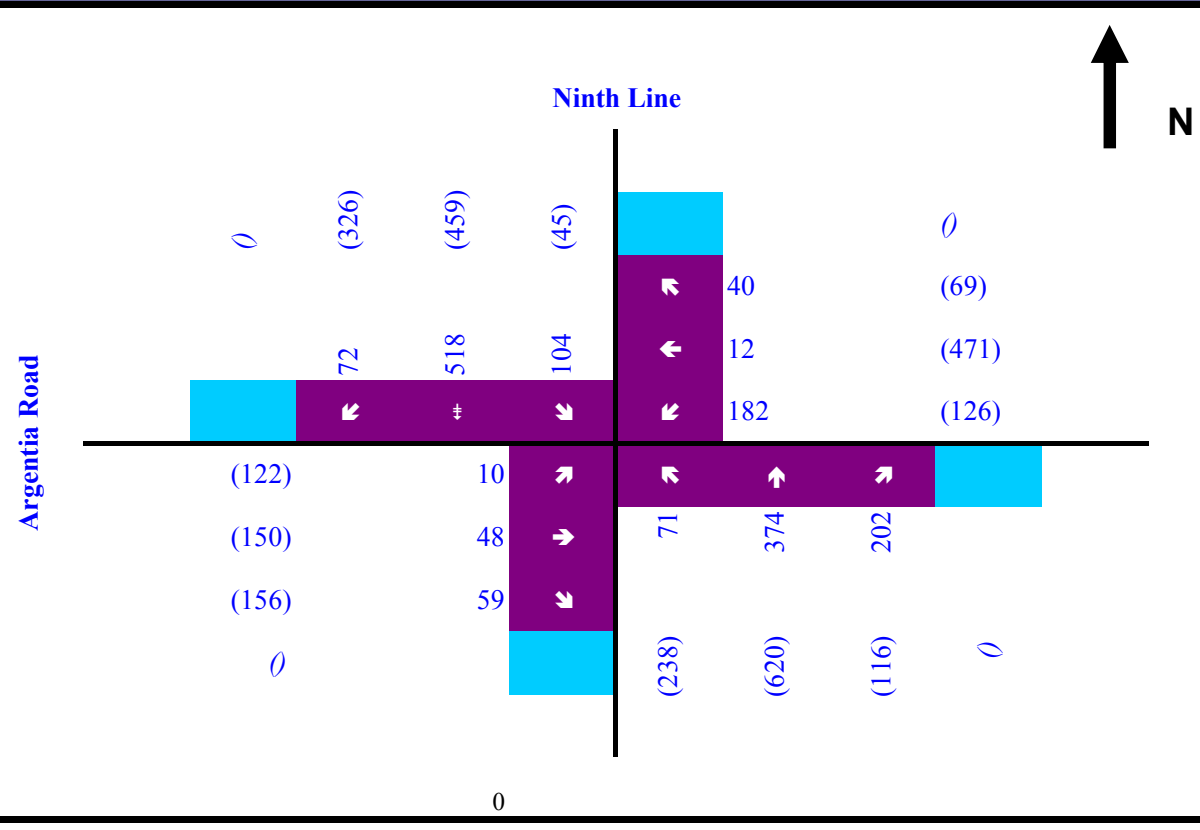
J:\01 PROJECTS\2013 jobs\16-13112 and 16-16039.PKH (Ninth Line Corridor Review)\04. Working Files\01. Analyses - Calculations\TIS Spreadsheet - Ninth Line Corridor Review - V12

General Input

Analyst:		**AM Vehicle Data:**	FT_Argentia_AM
Date:		**PM Vehicle Data:**	FT_Argentia_PM
Project Name.:	Ninth Line Corridor Study	**AM Ped Data:**	Ped_AM
Project Number.:	1613112-001-T01	**PM Ped Data:**	Ped_PM
Comments:		**Intersection ID:**	52
		Intersection Name:	

Free Flow - Rural (FF) or Restricted Flow - Urban (RES):	RES
Major Street Approach Lanes (Per Direction):	2 or More
Future Condition (YES or NO):	Yes
New Intersection (YES or NO):	No

Traffic and Pedestrian Volume Input



Legend

	Pedestrian Volume	x	AM Peak Hour
	Vehicle Volume	(x)	PM Peak Hour

Do Not Edit

Legs 4

Major NS

Justifications	AM PHV	PM PHV
2B - 1 (See OTM 12 Page 78)	0	0
2B - 2	192	248
2B - 3	48	471
2B - 4A	No	Yes
2B - 4B	No	No
2B - 4	0	0

Justifications	AM PHV	PM PHV
1A (All Approaches)	1692	2898
1B (Minor Approaches)	351	1094
2A (Major Approaches)	1341	1804
2B (Crossing Major Street)	240	719

Traffic Signal Warrant Analysis

Based on the Ontario Traffic Mannual Book 12

Project Name:	Ninth Line Corridor Study
Project Number.:	1613112-001-T01
Analyst:	
Date:	

Major Street:	Ninth Line
Minor Street:	Argentia Road
Comments:	Future Total - Argentia Extension - 4-legged

Free Flow - Rural (FF) or Restricted Flow - Urban (Res)	RES
Major Street Approach Lanes (Per Direction):	2 or More
Three or four legged intersection (3 or 4)	4
Future Condition (YES or NO):	Yes
New Intersection (YES or NO):	No

Justification 1 (Minimum Vehicle Volume)*

A (All Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	1692	2898	846	1449	1080
Percent Compliance	-	-	78%	100%	-
				Sectional Percentage	100%

B (Minor Street Both Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	351	1094	176	547	204
Percent Compliance	-	-	86%	100%	-
				Sectional Percentage	100%
				Entire Justification 1 Percentage	**100%**

Justification 2 (Delay Cross Traffic)*

A (Major Street Both Approaches)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	1341	1804	671	902	1080
Percent Compliance	-	-	62%	84%	-
				Sectional Percentage	**84%**

B (Traffic Crossing Major Street)

	AM PHV	PM PHV	AM AHV	PM AHV	Threshold
Volume	240	719	120	360	90
Percent Compliance	-	-	100%	100%	-
				Sectional Percentage	100%
				Entire Justification 2 Percentage	**84%**

** Includes Justification 3 and 7*

Are signals warranted at the intersection of Ninth Line/Argentia Road? YES

J:\01 PROJECTS\2013 jobs\16-13112 and 16-16039.PKH (Ninth Line Corridor Review)\04. Working Files\01. Analyses - Calculations\TIS Spreadsheet - Ninth Line Corridor Review - V12

APPENDIX L

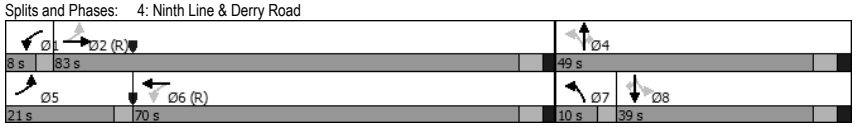
2041 Future Background Traffic Conditions (BAU)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Future Volume (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.968				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1733	3583	0	1716	3425	0	1785	1902	1566	1638	1902	1597
Flt Permitted	0.123			0.060			0.112			0.119		
Satd. Flow (perm)	224	3583	0	108	3425	0	210	1902	1566	205	1902	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			32				73			100
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	4%	4%	0%	0%	1%	2%	9%	1%	0%
Adj. Flow (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	271	2367	0	147	1156	0	207	584	241	33	514	171
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	30.1		8.0	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	21.0	83.0		8.0	70.0		10.0	49.0	49.0	39.0	39.0	39.0
Total Split (%)	15.0%	59.3%		5.7%	50.0%		7.1%	35.0%	35.0%	27.9%	27.9%	27.9%
Maximum Green (s)	18.0	76.9		5.0	63.9		7.0	42.6	42.6	32.6	32.6	32.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.1		0.0	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.1		2.0	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0	0	0	0
Act Effct Green (s)	89.0	77.9		75.9	66.8		47.0	43.6	43.6	33.6	33.6	33.6
Actuated g/C Ratio	0.64	0.56		0.54	0.48		0.34	0.31	0.31	0.24	0.24	0.24
v/c Ratio	0.83	1.19		1.16	0.70		1.29	0.99	0.45	0.67	1.13	0.37
Control Delay	48.3	115.3		158.2	23.4		202.9	81.5	29.4	107.1	129.4	21.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	115.3		158.2	23.4		202.9	81.5	29.4	107.1	129.4	21.2
LOS	D	F		F	C		F	F	C	F	F	C
Approach Delay		108.5			38.6			93.7			102.6	
Approach LOS		F			D			F			F	

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.29		
Intersection Signal Delay: 89.1		Intersection LOS: F
Intersection Capacity Utilization 128.1%		ICU Level of Service H
Analysis Period (min) 15		

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	271	2367	147	1156	207	584	241	33	514	171
v/c Ratio	0.83	1.19	1.16	0.70	1.29	0.99	0.45	0.67	1.13	0.37
Control Delay	48.3	115.3	158.2	23.4	202.9	81.5	29.4	107.1	129.4	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	115.3	158.2	23.4	202.9	81.5	29.4	107.1	129.4	21.2
Queue Length 50th (m)	49.5	~415.2	~33.8	97.7	~55.4	161.0	36.8	8.3	~164.2	15.8
Queue Length 95th (m)	#81.0	#450.7	#77.6	132.1	#106.6	#236.0	61.9	#27.8	#232.5	36.8
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	347	1996	127	1651	160	592	537	49	456	459
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	1.19	1.16	0.70	1.29	0.99	0.45	0.67	1.13	0.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Future Volume (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982				0.850		0.982			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	3545	0	1767	3579	1372	1785	1847	0	1653	1848	0
Flt Permitted	0.286			0.058			0.074			0.077		
Satd. Flow (perm)	532	3545	0	108	3579	1372	139	1847	0	134	1848	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				106		6			6	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	2%	1%	2%	19%	0%	2%	3%	8%	2%	2%
Adj. Flow (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	2646	0	72	753	106	203	964	0	60	877	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

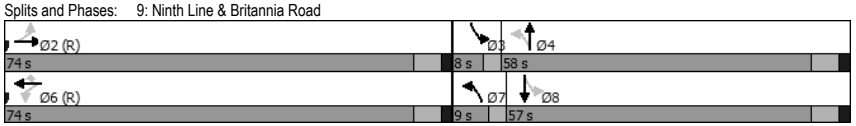
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2			6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0	12.0	5.0	12.0		5.0	12.0	
Minimum Split (s)	24.6	24.6		24.6	24.6	24.6	8.0	36.6		8.0	36.6	
Total Split (s)	74.0	74.0		74.0	74.0	74.0	9.0	58.0		8.0	57.0	
Total Split (%)	52.9%	52.9%		52.9%	52.9%	52.9%	6.4%	41.4%		5.7%	40.7%	
Maximum Green (s)	67.4	67.4		67.4	67.4	67.4	6.0	51.4		5.0	50.4	
Yellow Time (s)	4.6	4.6		4.6	4.6	4.6	3.0	4.6		3.0	4.6	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-2.0	-1.0	-1.0	-2.0	-1.0		-1.0	-3.0	
Total Lost Time (s)	5.6	5.6		4.6	5.6	5.6	1.0	5.6		2.0	3.6	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		12.0			12.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0		18.0			18.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)	68.4	68.4		69.4	68.4	68.4	65.0	54.0		61.0	53.4	
Actuated g/C Ratio	0.49	0.49		0.50	0.49	0.49	0.46	0.39		0.44	0.38	
v/c Ratio	0.40	1.52		1.36	0.43	0.15	1.28	1.35		0.49	1.24	
Control Delay	23.7	261.8		272.7	20.5	3.0	195.2	200.0		35.0	156.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	23.7	261.8		272.7	20.5	3.0	195.2	200.0		35.0	156.6	
LOS	C	F		F	C	A	F	F		C	F	
Approach Delay		252.8			38.0			199.1			148.8	
Approach LOS		F			D			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.52
Intersection Signal Delay: 190.5 Intersection LOS: F
Intersection Capacity Utilization 156.1% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	2646	72	753	106	203	964	60	877
v/c Ratio	0.40	1.52	1.36	0.43	0.15	1.28	1.35	0.49	1.24
Control Delay	23.7	261.8	272.7	20.5	3.0	195.2	200.0	35.0	156.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	261.8	272.7	20.5	3.0	195.2	200.0	35.0	156.6
Queue Length 50th (m)	12.5	~536.0	~26.5	49.2	0.0	~54.7	~355.3	9.2	~300.6
Queue Length 95th (m)	m16.8	#574.6	#59.7	58.1	6.6	#105.4	#435.1	17.9	#379.3
Internal Link Dist (m)		192.7		445.7			182.5		230.7
Turn Bay Length (m)	63.0		32.0		58.0	52.0		50.0	
Base Capacity (vph)	259	1739	53	1748	724	158	716	123	708
Starvation Cap Reductn	0	1	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	1.52	1.36	0.43	0.15	1.28	1.35	0.49	1.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	909	49	34	316	234	14	496	66	454	759	74
Future Volume (vph)	65	909	49	34	316	234	14	496	66	454	759	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992				0.850		0.982			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	1904	0	1825	1883	1526	1825	1854	0	1789	1894	0
Flt Permitted	0.452			0.062			0.105			0.100		
Satd. Flow (perm)	860	1904	0	119	1883	1526	202	1854	0	188	1894	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				254		5			5	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	2%	7%	0%	2%	0%	2%	0%	1%
Adj. Flow (vph)	71	988	53	37	343	254	15	539	72	493	825	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	1041	0	37	343	254	15	611	0	493	905	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			4		3	8	

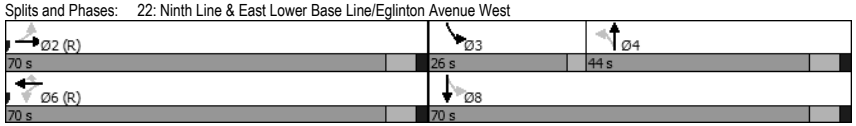
Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	70.0	70.0		70.0	70.0	70.0	44.0	44.0		26.0	70.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%	50.0%	31.4%	31.4%		18.6%	50.0%	
Maximum Green (s)	63.0	63.0		63.0	63.0	63.0	37.0	37.0		23.0	63.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-1.0	-1.0	-1.0	-1.0		-3.0	-1.0	
Total Lost Time (s)	6.0	4.0		6.0	6.0	6.0	6.0	6.0		0.0	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	Min	Min		None	Min	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0			0	
Act Effct Green (s)	64.0	66.0		64.0	64.0	64.0	38.0	38.0		70.0	64.0	
Actuated g/C Ratio	0.46	0.47		0.46	0.46	0.46	0.27	0.27		0.50	0.46	
v/c Ratio	0.18	1.16		0.69	0.40	0.30	0.28	1.21		1.26	1.04	
Control Delay	24.1	118.1		90.2	27.0	3.5	55.9	153.9		172.1	79.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	24.1	118.1		90.2	27.0	3.5	55.9	153.9		172.1	79.2	
LOS	C	F		F	C	A	E	F		F	E	
Approach Delay		112.1			21.3			151.5			112.0	
Approach LOS		F			C			F			F	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 77 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.26	
Intersection Signal Delay: 103.3	Intersection LOS: F
Intersection Capacity Utilization 120.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	1041	37	343	254	15	611	493	905
v/c Ratio	0.18	1.16	0.69	0.40	0.30	0.28	1.21	1.26	1.04
Control Delay	24.1	118.1	90.2	27.0	3.5	55.9	153.9	172.1	79.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	118.1	90.2	27.0	3.5	55.9	153.9	172.1	79.2
Queue Length 50th (m)	11.5	~340.4	7.9	62.0	0.0	3.3	~205.2	~154.2	~269.9
Queue Length 95th (m)	22.0	#420.9	#29.8	86.6	14.8	10.8	#277.5	#222.4	#348.6
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	393	899	54	860	835	54	506	391	868
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	1.16	0.69	0.40	0.30	0.28	1.21	1.26	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Future Volume (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			0.99		0.99		0.96	0.97		0.97
Frt		0.999			0.984				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3610	0	1684	3398	0	1750	1847	1617	1750	1795	1581
Flt Permitted	0.184			0.041			0.667			0.716		
Satd. Flow (perm)	344	3610	0	73	3398	0	1212	1847	1547	1281	1795	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			21				23			92
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	14		3	3		14	12		24	24		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	6%	5%	6%	2%	4%	1%	2%	7%	1%
Adj. Flow (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2532	0	104	1222	0	95	63	361	224	105	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

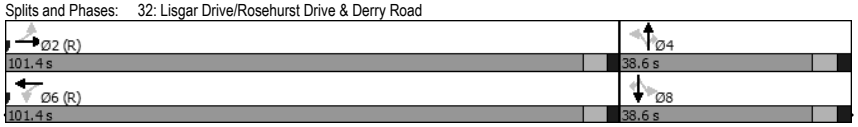
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	101.4	101.4		101.4	101.4		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (%)	72.4%	72.4%		72.4%	72.4%		27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Maximum Green (s)	95.4	95.4		95.4	95.4		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	96.8	96.8		96.8	96.8		32.6	32.6	32.6	32.6	32.6	32.6
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	0.09	1.01		2.08	0.52		0.34	0.15	0.96	0.75	0.25	0.21
Control Delay	2.5	20.8		563.9	11.2		48.5	43.6	86.0	66.8	45.5	9.2
Queue Delay	0.0	1.8		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	22.6		563.9	11.2		48.5	43.6	86.0	66.8	45.5	9.2
LOS	A	C		F	B		D	D	F	E	D	A
Approach Delay		22.5			54.5			74.0			48.9	
Approach LOS		C			D			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 132 (94%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.08
Intersection Signal Delay: 39.1 Intersection LOS: D
Intersection Capacity Utilization 121.7% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	2532	104	1222	95	63	361	224	105	92
v/c Ratio	0.09	1.01	2.08	0.52	0.34	0.15	0.96	0.75	0.25	0.21
Control Delay	2.5	20.8	563.9	11.2	48.5	43.6	86.0	66.8	45.5	9.2
Queue Delay	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	22.6	563.9	11.2	48.5	43.6	86.0	66.8	45.5	9.2
Queue Length 50th (m)	0.5	~87.0	~31.5	78.2	22.0	13.9	93.6	57.9	23.8	0.0
Queue Length 95th (m)	m0.6	m33.6	#70.0	93.4	38.7	26.4	#154.0	#93.7	40.3	14.0
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	237	2497	50	2356	285	435	382	301	423	432
Starvation Cap Reductn	0	14	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	1.02	2.08	0.52	0.33	0.14	0.95	0.74	0.25	0.21

Intersection Summary

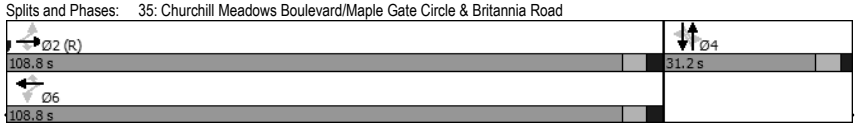
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Future Volume (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97			0.96	0.99	0.97		0.99	0.99	
Frt			0.850			0.850		0.852			0.929	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3614	1597	1552	3510	1298	1733	1575	0	1785	1721	0
Flt Permitted	0.285			0.038			0.734			0.346		
Satd. Flow (perm)	533	3614	1550	62	3510	1248	1326	1575	0	644	1721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			39			25		12			17	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			101.9			114.1			106.4	
Travel Time (s)		28.2			6.1			8.2			7.7	
Confl. Peds. (#/hr)	8		4	4		8	6		10	10		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	4%	23%	3%	0%	1%	0%	5%	0%
Adj. Flow (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2417	131	60	940	17	31	212	0	74	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2		2	6		6	4			4		
Detector Phase	2	2	2	6	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	31.2	31.2		31.2	31.2	
Total Split (s)	108.8	108.8	108.8	108.8	108.8	108.8	31.2	31.2		31.2	31.2	
Total Split (%)	77.7%	77.7%	77.7%	77.7%	77.7%	77.7%	22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	101.8	101.8	101.8	101.8	101.8	101.8	25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-2.0	-1.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	5.2	5.2		4.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	None	None	None	None		None	None	
Walk Time (s)	11.0	11.0	11.0	11.0	11.0	11.0	10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0	15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	106.3	106.3	106.3	106.3	106.3	106.3	22.5	22.5		23.5	22.5	
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.76	0.76	0.16	0.16		0.17	0.16	
v/c Ratio	0.00	0.88	0.11	1.28	0.35	0.02	0.15	0.81		0.69	0.12	
Control Delay	1.0	14.9	0.1	252.9	6.3	1.2	50.4	75.6		84.9	31.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	1.0	14.9	0.1	252.9	6.3	1.2	50.4	75.6		84.9	31.0	
LOS	A	B	A	F	A	A	D	E		F	C	
Approach Delay		14.1			20.7			72.3			67.3	
Approach LOS		B			C			E			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 20.9	Intersection LOS: C
Intersection Capacity Utilization 102.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	2417	131	60	940	17	31	212	74	36
v/c Ratio	0.00	0.88	0.11	1.28	0.35	0.02	0.15	0.81	0.69	0.12
Control Delay	1.0	14.9	0.1	252.9	6.3	1.2	50.4	75.6	84.9	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.0	14.9	0.1	252.9	6.3	1.2	50.4	75.6	84.9	31.0
Queue Length 50th (m)	0.0	76.7	0.2	~21.1	41.8	0.0	7.4	53.5	19.2	4.5
Queue Length 95th (m)	m0.0	m12.1	m0.0	#39.5	53.8	1.4	16.6	80.9	#39.6	14.2
Internal Link Dist (m)		445.7			77.9			90.1		82.4
Turn Bay Length (m)	33.0		22.0	35.0		22.0	21.0		19.0	
Base Capacity (vph)	404	2743	1186	47	2664	953	246	302	124	333
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.88	0.11	1.28	0.35	0.02	0.13	0.70	0.60	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2405	0	0	795	10	280
Future Volume (vph)	2405	0	0	795	10	280
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3952	0	0	3913	1847	1768
Flt Permitted					0.950	
Satd. Flow (perm)	3952	0	0	3913	1847	1768
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	80			80	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	13.4			9.8	11.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	1%	7%	0%
Adj. Flow (vph)	2505	0	0	828	10	292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2505	0	0	828	10	292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

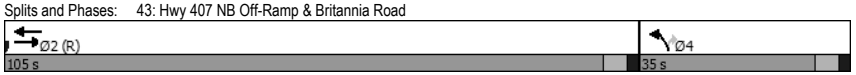
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	105.0			105.0	35.0	35.0
Total Split (%)	75.0%			75.0%	25.0%	25.0%
Maximum Green (s)	99.0			99.0	29.0	29.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	101.5			101.5	26.5	26.5
Actuated g/C Ratio	0.72			0.72	0.19	0.19
v/c Ratio	0.87			0.29	0.03	0.87
Control Delay	20.3			2.9	44.8	80.5
Queue Delay	46.3			0.0	0.0	6.8
Total Delay	66.6			2.9	44.8	87.3
LOS	E			A	D	F
Approach Delay	66.6			2.9	85.9	
Approach LOS	E			A	F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 53.7 Intersection LOS: D
Intersection Capacity Utilization 87.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2505	828	10	292
v/c Ratio	0.87	0.29	0.03	0.87
Control Delay	20.3	2.9	44.8	80.5
Queue Delay	46.3	0.0	0.0	6.8
Total Delay	66.6	2.9	44.8	87.3
Queue Length 50th (m)	342.5	15.6	2.3	77.7
Queue Length 95th (m)	388.0	m16.6	7.2	#120.0
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	2865	2837	382	366
Starvation Cap Reductn	257	0	0	0
Spillback Cap Reductn	714	0	0	43
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.16	0.29	0.03	0.90

Intersection Summary

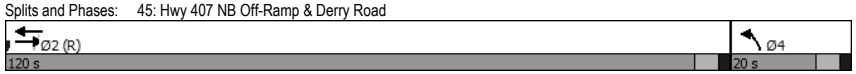
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2461	0	0	899	14	151
Future Volume (vph)	2461	0	0	899	14	151
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3913	0	0	3764	3582	1716
Flt Permitted					0.950	
Satd. Flow (perm)	3913	0	0	3764	3582	1716
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						154
Link Speed (k/h)	80			80	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	13.9			10.3	15.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	2%	2%	5%	7%	3%
Adj. Flow (vph)	2511	0	0	917	14	154
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2511	0	0	917	14	154
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	120.0			120.0	20.0	120.0
Total Split (%)	85.7%			85.7%	14.3%	85.7%
Maximum Green (s)	114.0			114.0	14.0	114.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	132.0			132.0	8.0	132.0
Actuated g/C Ratio	0.94			0.94	0.06	0.94
v/c Ratio	0.68			0.26	0.07	0.09
Control Delay	2.1			0.3	63.4	0.3
Queue Delay	0.5			0.0	0.0	0.0
Total Delay	2.6			0.3	63.4	0.4
LOS	A			A	E	A
Approach Delay	2.6			0.3	5.6	
Approach LOS	A			A	A	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 2.2	Intersection LOS: A
Intersection Capacity Utilization 81.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2511	917	14	154
v/c Ratio	0.68	0.26	0.07	0.09
Control Delay	2.1	0.3	63.4	0.3
Queue Delay	0.5	0.0	0.0	0.0
Total Delay	2.6	0.3	63.4	0.4
Queue Length 50th (m)	10.9	0.0	1.9	0.0
Queue Length 95th (m)	35.0	m5.1	5.6	2.4
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3689	3549	358	1626
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	630	0	0	276
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.82	0.26	0.04	0.11

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Future Volume (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt		0.968			0.997				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3445	0	1785	3600	0	1767	1921	1597	1733	1921	1597
Flt Permitted	0.056			0.262			0.088			0.367		
Satd. Flow (perm)	105	3445	0	492	3600	0	164	1921	1597	669	1921	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			2				179			82
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	4%	1%	0%	0%	3%	0%	0%
Adj. Flow (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Shared Lane Traffic (%)												
Lane Group Flow (vph)	144	931	0	164	2053	0	115	412	179	136	688	172
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

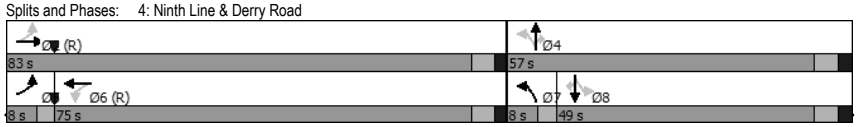
Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		6	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	30.1		30.1	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	8.0	83.0		75.0	75.0		8.0	57.0	57.0	49.0	49.0	49.0
Total Split (%)	5.7%	59.3%		53.6%	53.6%		5.7%	40.7%	40.7%	35.0%	35.0%	35.0%
Maximum Green (s)	5.0	76.9		68.9	68.9		5.0	50.6	50.6	42.6	42.6	42.6
Yellow Time (s)	3.0	4.0		4.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.1		2.1	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.1		5.1	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead			Lag	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0		9.0	9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0		15.0	15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0		0	0			0	0	0	0	0
Act Effct Green (s)	81.0	77.9		69.9	69.9		55.0	51.6	51.6	43.6	43.6	43.6
Actuated g/C Ratio	0.58	0.56		0.50	0.50		0.39	0.37	0.37	0.31	0.31	0.31
v/c Ratio	1.09	0.48		0.67	1.14		0.86	0.58	0.26	0.65	1.15	0.31
Control Delay	143.3	13.4		32.0	97.5		80.3	39.6	4.9	58.5	129.0	20.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	143.3	13.4		32.0	97.5		80.3	39.6	4.9	58.5	129.0	20.4
LOS	F	B		C	F		F	D	A	E	F	C
Approach Delay		30.8			92.7			37.4			100.6	
Approach LOS		C			F			D			F	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 114.8 (82%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 73.1	Intersection LOS: E
Intersection Capacity Utilization 122.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	144	931	164	2053	115	412	179	136	688	172
v/c Ratio	1.09	0.48	0.67	1.14	0.86	0.58	0.26	0.65	1.15	0.31
Control Delay	143.3	13.4	32.0	97.5	80.3	39.6	4.9	58.5	129.0	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	143.3	13.4	32.0	97.5	80.3	39.6	4.9	58.5	129.0	20.4
Queue Length 50th (m)	~29.3	47.2	25.6	~350.7	20.5	91.3	0.0	32.6	~223.4	18.2
Queue Length 95th (m)	#73.8	54.2	m38.2	#388.7	#50.9	125.0	15.2	#59.2	#296.9	37.6
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	132	1934	245	1798	133	708	701	208	598	553
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.48	0.67	1.14	0.86	0.58	0.26	0.65	1.15	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Future Volume (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.969				0.850		0.987			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	3482	0	1767	3650	1601	1767	1891	0	1684	1870	0
Flt Permitted	0.076			0.105			0.064			0.065		
Satd. Flow (perm)	141	3482	0	195	3650	1601	119	1891	0	115	1870	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29				75		4			6	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	1%	0%	2%	1%	0%	3%	6%	1%	1%
Adj. Flow (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	1166	0	96	1546	93	182	1110	0	140	1090	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

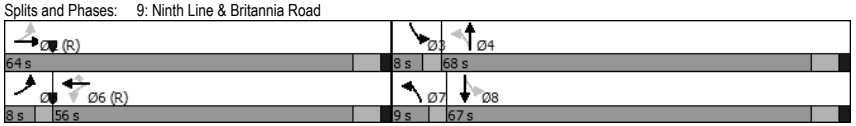
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0	12.0	5.0	12.0		5.0	12.0	
Minimum Split (s)	8.0	24.6		24.6	24.6	24.6	8.0	36.6		8.0	36.6	
Total Split (s)	8.0	64.0		56.0	56.0	56.0	9.0	68.0		8.0	67.0	
Total Split (%)	5.7%	45.7%		40.0%	40.0%	40.0%	6.4%	48.6%		5.7%	47.9%	
Maximum Green (s)	5.0	57.4		49.4	49.4	49.4	6.0	61.4		5.0	60.4	
Yellow Time (s)	3.0	4.6		4.6	4.6	4.6	3.0	4.6		3.0	4.6	
All-Red Time (s)	0.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	2.0	5.6		5.6	5.6	5.6	2.0	5.6		2.0	5.6	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0		12.0			12.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0		18.0			18.0	
Pedestrian Calls (#/hr)		0		0	0	0		0			0	
Act Effct Green (s)	62.0	58.4		50.4	50.4	50.4	73.0	62.4		71.0	61.4	
Actuated g/C Ratio	0.44	0.42		0.36	0.36	0.36	0.52	0.45		0.51	0.44	
v/c Ratio	0.90	0.79		1.37	1.18	0.15	1.26	1.31		1.12	1.32	
Control Delay	87.3	45.9		259.1	123.9	7.0	189.7	182.8		143.1	187.8	
Queue Delay	0.0	0.3		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	87.3	46.2		259.1	123.9	7.0	189.7	182.8		143.1	187.8	
LOS	F	D		F	F	A	F	F		F	F	
Approach Delay		50.0			125.1			183.8			182.7	
Approach LOS		D			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 32.2 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.37
Intersection Signal Delay: 134.1 — Intersection LOS: F
Intersection Capacity Utilization 133.8% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	1166	96	1546	93	182	1110	140	1090
v/c Ratio	0.90	0.79	1.37	1.18	0.15	1.26	1.31	1.12	1.32
Control Delay	87.3	45.9	259.1	123.9	7.0	189.7	182.8	143.1	187.8
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.3	46.2	259.1	123.9	7.0	189.7	182.8	143.1	187.8
Queue Length 50th (m)	26.4	161.9	~35.0	~270.3	4.7	~46.8	~396.5	~28.7	~390.8
Queue Length 95th (m)	#55.1	187.0	#67.2	#312.9	m10.9	#95.7	#477.5	#72.4	#471.9
Internal Link Dist (m)		192.7		445.7			182.5		230.7
Turn Bay Length (m)	63.0		32.0		58.0	52.0		50.0	
Base Capacity (vph)	132	1469	70	1314	624	144	845	125	823
Starvation Cap Reductn	0	41	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.82	1.37	1.18	0.15	1.26	1.31	1.12	1.32

Intersection Summary

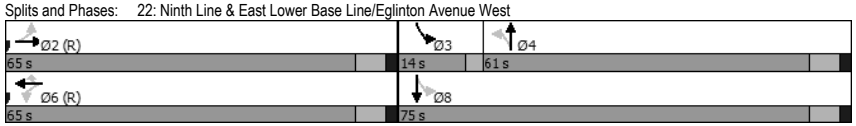
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	358	18	39	786	420	178	614	32	268	582	64
Future Volume (vph)	48	358	18	39	786	420	178	614	32	268	582	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.993			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1867	0	1789	1812	1458	1825	1871	0	1807	1861	0
Flt Permitted	0.068			0.368			0.216			0.070		
Satd. Flow (perm)	131	1867	0	693	1812	1458	415	1871	0	133	1861	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				258		2			6	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	6%	2%	6%	12%	0%	2%	1%	1%	1%	8%
Adj. Flow (vph)	52	389	20	42	854	457	193	667	35	291	633	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	409	0	42	854	457	193	702	0	291	703	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			4		3	8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	65.0	65.0		65.0	65.0	65.0	61.0	61.0		14.0	75.0	
Total Split (%)	46.4%	46.4%		46.4%	46.4%	46.4%	43.6%	43.6%		10.0%	53.6%	
Maximum Green (s)	58.0	58.0		58.0	58.0	58.0	54.0	54.0		11.0	68.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	0.0		0.0	-1.0	0.0	-1.0	-1.0		-1.0	0.0	
Total Lost Time (s)	6.0	7.0		7.0	6.0	7.0	6.0	6.0		2.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	Min	Min		None	Min	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0			0	
Act Effct Green (s)	59.0	58.0		58.0	59.0	58.0	55.0	55.0		73.0	68.0	
Actuated g/C Ratio	0.42	0.41		0.41	0.42	0.41	0.39	0.39		0.52	0.49	
v/c Ratio	0.95	0.53		0.15	1.12	0.61	1.18	0.95		1.37	0.78	
Control Delay	149.5	33.7		27.4	108.5	16.8	166.9	65.0		225.3	36.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	149.5	33.7		27.4	108.5	16.8	166.9	65.0		225.3	36.6	
LOS	F	C		C	F	B	F	E		F	D	
Approach Delay		46.7			75.0			87.0			91.9	
Approach LOS		D			E			F			F	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.37	
Intersection Signal Delay: 78.9	Intersection LOS: E
Intersection Capacity Utilization 103.8%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	409	42	854	457	193	702	291	703
v/c Ratio	0.95	0.53	0.15	1.12	0.61	1.18	0.95	1.37	0.78
Control Delay	149.5	33.7	27.4	108.5	16.8	166.9	65.0	225.3	36.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	149.5	33.7	27.4	108.5	16.8	166.9	65.0	225.3	36.6
Queue Length 50th (m)	13.7	83.6	7.2	~271.2	41.8	~64.0	186.9	~89.6	156.0
Queue Length 95th (m)	#42.2	115.2	15.8	#348.2	77.6	#112.9	#266.3	#147.2	208.0
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	55	774	287	763	755	163	736	212	907
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.53	0.15	1.12	0.61	1.18	0.95	1.37	0.78

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Future Volume (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00		0.99		0.99	1.00		0.98
Frt		0.992			0.988				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3513	0	1785	3563	0	1785	1921	1617	1785	1830	1566
Flt Permitted	0.035			0.275			0.733			0.734		
Satd. Flow (perm)	66	3513	0	515	3563	0	1362	1921	1593	1376	1830	1529
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			14				160			23
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	4		6	6		4	9		2	2		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	1%	0%	0%	1%	0%	5%	2%
Adj. Flow (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	987	0	335	2388	0	47	36	160	99	37	45
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

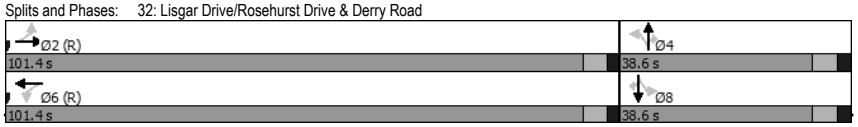
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	101.4	101.4		101.4	101.4		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (%)	72.4%	72.4%		72.4%	72.4%		27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Maximum Green (s)	95.4	95.4		95.4	95.4		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	113.0	113.0		113.0	113.0		16.4	16.4	16.4	16.4	16.4	16.4
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.12	0.12	0.12	0.12	0.12	0.12
v/c Ratio	1.08	0.35		0.81	0.83		0.30	0.16	0.49	0.61	0.17	0.23
Control Delay	163.9	2.2		27.0	12.2		59.3	54.8	12.7	74.1	55.2	33.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	163.9	2.2		27.0	12.2		59.3	54.8	12.7	74.1	55.2	33.6
LOS	F	A		C	B		E	D	B	E	E	C
Approach Delay		11.0			14.0			28.0			60.1	
Approach LOS		B			B			C			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 113.4 (81%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 16.1 — Intersection LOS: B
Intersection Capacity Utilization 105.7% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	987	335	2388	47	36	160	99	37	45
v/c Ratio	1.08	0.35	0.81	0.83	0.30	0.16	0.49	0.61	0.17	0.23
Control Delay	163.9	2.2	27.0	12.2	59.3	54.8	12.7	74.1	55.2	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	163.9	2.2	27.0	12.2	59.3	54.8	12.7	74.1	55.2	33.6
Queue Length 50th (m)	~17.9	15.1	42.5	167.9	12.1	9.1	0.0	26.5	9.4	5.6
Queue Length 95th (m)	m#47.0	26.3	#139.8	261.0	23.7	18.8	19.5	43.7	19.3	16.7
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	53	2836	415	2878	321	452	497	324	431	377
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.35	0.81	0.83	0.15	0.08	0.32	0.31	0.09	0.12

Intersection Summary

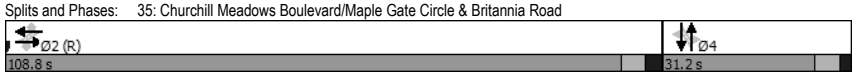
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Future Volume (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.97	1.00	0.99		1.00	0.99	
Frt			0.850			0.850		0.869			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3614	1597	1552	3650	1581	1733	1645	0	1785	1746	0
Flt Permitted	0.102			0.252			0.746			0.446		
Satd. Flow (perm)	192	3614	1597	412	3650	1535	1356	1645	0	835	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			62			30		102			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			97.9			114.1			106.4	
Travel Time (s)		28.2			5.9			8.2			7.7	
Confl. Peds. (#/hr)	4					4	2		3	3		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	0%	1%	3%	0%	0%	0%	5%	0%
Adj. Flow (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1092	94	219	1838	78	35	117	0	30	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Detector Phase	2	2	2	2	2	2	4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	31.2	31.2		31.2	31.2	
Total Split (s)	108.8	108.8	108.8	108.8	108.8	108.8	31.2	31.2		31.2	31.2	
Total Split (%)	77.7%	77.7%	77.7%	77.7%	77.7%	77.7%	22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	101.8	101.8	101.8	101.8	101.8	101.8	25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	5.2	5.2		5.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)	11.0	11.0	11.0	11.0	11.0	11.0	10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0	15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	117.9	117.9	117.9	117.9	117.9	117.9	10.9	10.9		10.9	10.9	
Actuated g/C Ratio	0.84	0.84	0.84	0.84	0.84	0.84	0.08	0.08		0.08	0.08	
v/c Ratio	0.10	0.36	0.07	0.63	0.60	0.06	0.33	0.53		0.47	0.13	
Control Delay	2.2	1.6	0.6	13.9	4.6	1.4	69.0	23.5		84.2	44.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	2.2	1.6	0.6	13.9	4.6	1.4	69.0	23.5		84.2	44.1	
LOS	A	A	A	B	A	A	E	C		F	D	
Approach Delay		1.5			5.5			34.0			69.1	
Approach LOS		A			A			C			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 1.4 (1%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 6.2	Intersection LOS: A
Intersection Capacity Utilization 84.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	1092	94	219	1838	78	35	117	30	18
v/c Ratio	0.10	0.36	0.07	0.63	0.60	0.06	0.33	0.53	0.47	0.13
Control Delay	2.2	1.6	0.6	13.9	4.6	1.4	69.0	23.5	84.2	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.2	1.6	0.6	13.9	4.6	1.4	69.0	23.5	84.2	44.1
Queue Length 50th (m)	0.3	16.1	0.0	15.2	63.2	1.6	9.4	4.0	8.2	2.9
Queue Length 95th (m)	m0.8	m24.1	m0.0	50.6	94.1	4.8	20.3	22.5	18.7	10.6
Internal Link Dist (m)		445.7			73.9			90.1		82.4
Turn Bay Length (m)	33.0		22.0	35.0		22.0	21.0		19.0	
Base Capacity (vph)	161	3044	1354	347	3074	1297	251	388	155	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.36	0.07	0.63	0.60	0.06	0.14	0.30	0.19	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1028	0	0	1885	73	110
Future Volume (vph)	1028	0	0	1885	73	110
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3935	0	0	3975	1987	1778
Flt Permitted					0.950	
Satd. Flow (perm)	3935	0	0	3975	1987	1778
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	17.9			13.0	11.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	0%	0%	0%
Adj. Flow (vph)	1142	0	0	2094	81	122
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1142	0	0	2094	81	122
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

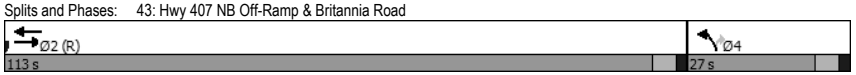
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	113.0			113.0	27.0	27.0
Total Split (%)	80.7%			80.7%	19.3%	19.3%
Maximum Green (s)	107.0			107.0	21.0	21.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	113.1			113.1	14.9	14.9
Actuated g/C Ratio	0.81			0.81	0.11	0.11
v/c Ratio	0.36			0.65	0.39	0.65
Control Delay	8.1			12.4	62.4	75.2
Queue Delay	0.0			0.7	0.0	0.0
Total Delay	8.1			13.1	62.4	75.2
LOS	A			B	E	E
Approach Delay	8.1			13.1	70.1	
Approach LOS	A			B	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 14.8 Intersection LOS: B
Intersection Capacity Utilization 76.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1142	2094	81	122
v/c Ratio	0.36	0.65	0.39	0.65
Control Delay	8.1	12.4	62.4	75.2
Queue Delay	0.0	0.7	0.0	0.0
Total Delay	8.1	13.1	62.4	75.2
Queue Length 50th (m)	56.5	111.8	21.2	33.0
Queue Length 95th (m)	66.3	m72.3	36.2	51.9
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3180	3212	298	266
Starvation Cap Reductn	0	667	0	0
Spillback Cap Reductn	77	452	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.82	0.27	0.46

Intersection Summary

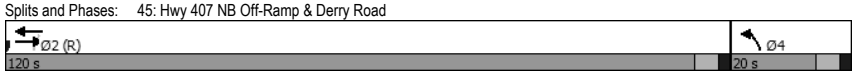
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1083	0	0	2516	104	123
Future Volume (vph)	1083	0	0	2516	104	123
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						0.99
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3935	0	0	3935	3856	1743
Flt Permitted					0.950	
Satd. Flow (perm)	3935	0	0	3935	3856	1722
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						129
Link Speed (k/h)	60			60	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	18.5			13.8	15.5	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	2%	1%	0%	2%
Adj. Flow (vph)	1140	0	0	2648	109	129
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1140	0	0	2648	109	129
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	120.0			120.0	20.0	120.0
Total Split (%)	85.7%			85.7%	14.3%	85.7%
Maximum Green (s)	114.0			114.0	14.0	114.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	118.5			118.5	9.5	118.5
Actuated g/C Ratio	0.85			0.85	0.07	0.85
v/c Ratio	0.34			0.80	0.42	0.09
Control Delay	3.9			5.9	67.2	0.4
Queue Delay	0.0			6.3	0.0	0.0
Total Delay	3.9			12.2	67.2	0.4
LOS	A			B	E	A
Approach Delay	3.9			12.2	31.0	
Approach LOS	A			B	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 11.0	Intersection LOS: B
Intersection Capacity Utilization 97.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1140	2648	109	129
v/c Ratio	0.34	0.80	0.42	0.09
Control Delay	3.9	5.9	67.2	0.4
Queue Delay	0.0	6.3	0.0	0.0
Total Delay	3.9	12.2	67.2	0.4
Queue Length 50th (m)	34.2	42.9	15.2	0.0
Queue Length 95th (m)	39.5	m14.1	24.5	2.9
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3330	3330	385	1477
Starvation Cap Reductn	0	646	0	0
Spillback Cap Reductn	0	143	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.99	0.28	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	574	2	2	607
Future Volume (vph)	1	0	574	2	2	607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1825	1921	1902	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1921	1902	0	0	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.2		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	3%
Adj. Flow (vph)	1	0	624	2	2	660
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	626	0	0	662
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	574	2	2	607
Future Volume (Veh/h)	1	0	574	2	2	607
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	624	2	2	660
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1289	625			626	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1289	625			626	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	182	488			965	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	626	662
Volume Left	1	0	2
Volume Right	0	2	0
cSH	137	1700	965
Volume to Capacity	0.01	0.37	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	31.6	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	31.6	0.0	0.1
Approach LOS	D		

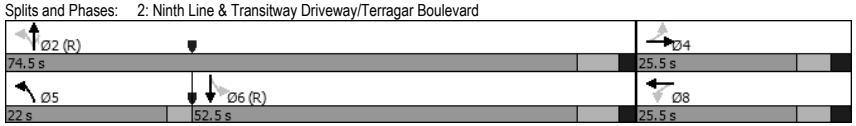
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	141	106	40	481	608	58	23	610	74
Future Volume (vph)	0	0	0	141	106	40	481	608	58	23	610	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.957				0.850		0.985	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1755	1797	0	1789	1865	1498	1825	1855	0
Flt Permitted				0.757			0.130			0.414		
Satd. Flow (perm)	1883	1883	0	1398	1797	0	245	1865	1498	795	1855	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					18				38		8	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		129.0			287.6			434.9			780.0	
Travel Time (s)		9.7			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	3%	2%	3%	9%	0%	2%	2%
Adj. Flow (vph)	0	0	0	153	106	43	481	661	63	25	663	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	153	149	0	481	661	63	25	737	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm			Perm	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		9.0	53.0	53.0	52.0	52.0	
Total Split (s)	25.5	25.5		25.5	25.5		22.0	74.5	74.5	52.5	52.5	
Total Split (%)	25.5%	25.5%		25.5%	25.5%		22.0%	74.5%	74.5%	52.5%	52.5%	
Maximum Green (s)	19.0	19.0		19.0	19.0		19.0	67.5	67.5	45.5	45.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		0.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		2.0	6.0	6.0	6.0	6.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0			35.0	35.0	35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0			10.0	10.0	10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0	0	0	0	
Act Effct Green (s)				16.4	16.4		76.1	72.1	72.1	47.2	47.2	
Actuated g/C Ratio				0.16	0.16		0.76	0.72	0.72	0.47	0.47	
v/c Ratio				0.67	0.48		0.89	0.49	0.06	0.07	0.84	
Control Delay				53.4	37.8		42.3	8.1	2.7	15.5	33.5	
Queue Delay				0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay				53.4	37.8		42.3	8.1	2.7	15.5	33.5	
LOS				D	D		D	A	A	B	C	
Approach Delay					45.7			21.5			32.9	
Approach LOS					D			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Ninth Line & Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	153	149	481	661	63	25	737
v/c Ratio	0.67	0.48	0.89	0.49	0.06	0.07	0.84
Control Delay	53.4	37.8	42.3	8.1	2.7	15.5	33.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	37.8	42.3	8.1	2.7	15.5	33.5
Queue Length 50th (m)	27.9	22.9	61.7	49.1	1.2	2.6	121.2
Queue Length 95th (m)	47.1	40.2	#129.7	79.6	5.1	7.4	#190.7
Internal Link Dist (m)		263.6		410.9			756.0
Turn Bay Length (m)			40.0		15.0	40.0	
Base Capacity (vph)	279	373	540	1345	1091	375	880
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.40	0.89	0.49	0.06	0.07	0.84

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Ninth Line & Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	46	0	18	53	1166	63	11	749	0
Future Volume (vph)	0	0	0	46	0	18	53	1166	63	11	749	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.850			0.992				
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1825	1633	0	1789	1851	0	1674	1865	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	1883	0	1825	1633	0	1789	1851	0	1674	1865	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		131.4			310.4			412.4			434.9	
Travel Time (s)		9.9			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	2%	9%	3%	2%
Adj. Flow (vph)	0	0	0	50	0	20	53	1267	68	12	814	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	50	20	0	53	1335	0	12	814	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 75.2% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Transitway Driveway/Hazelridge Road

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	46	0	18	53	1166	63	11	749	0
Future Volume (Veh/h)	0	0	0	46	0	18	53	1166	63	11	749	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	0	0	0	50	0	20	53	1267	68	12	814	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2231	2279	814	2245	2245	1301	814			1335		
vC1, stage 1 conf vol	838	838		1407	1407							
vC2, stage 2 conf vol	1393	1441		838	838							
vCu, unblocked vol	2231	2279	814	2245	2245	1301	814			1335		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	100	100	64	100	90	93			98		
cM capacity (veh/h)	124	155	378	140	163	199	813			495		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	0	0	50	20	53	1335	12	814
Volume Left	0	0	50	0	53	0	12	0
Volume Right	0	0	0	20	0	68	0	0
cSH	1700	1700	140	199	813	1700	495	1700
Volume to Capacity	0.00	0.00	0.36	0.10	0.07	0.79	0.02	0.48
Queue Length 95th (m)	0.0	0.0	11.2	2.5	1.6	0.0	0.6	0.0
Control Delay (s)	0.0	0.0	44.2	25.1	9.7	0.0	12.5	0.0
Lane LOS	A	A	E	D	A		B	
Approach Delay (s)	0.0		38.7		0.4		0.2	
Approach LOS	A		E					

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		75.2%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Future Volume (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.968				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1733	5148	0	1716	4921	0	1785	1902	1566	1638	1902	1597
Flt Permitted	0.135			0.074			0.097			0.177		
Satd. Flow (perm)	246	5148	0	134	4921	0	182	1902	1566	305	1902	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			52				127			106
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	4%	4%	0%	0%	1%	2%	9%	1%	0%
Adj. Flow (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	271	2367	0	147	1156	0	207	584	241	33	514	171
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	30.1		8.0	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	30.0	70.8		11.0	51.8		13.0	58.2	58.2	45.2	45.2	45.2
Total Split (%)	21.4%	50.6%		7.9%	37.0%		9.3%	41.6%	41.6%	32.3%	32.3%	32.3%
Maximum Green (s)	26.5	64.7		8.0	45.7		10.0	51.8	51.8	38.8	38.8	38.8
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	2.1		0.0	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.5	5.1		2.0	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0	0	0	0
Act Effct Green (s)	79.6	65.7		66.6	54.1		55.8	52.4	52.4	39.4	39.4	39.4
Actuated g/C Ratio	0.57	0.47		0.48	0.39		0.40	0.37	0.37	0.28	0.28	0.28
v/c Ratio	0.76	0.98		0.87	0.60		1.05	0.82	0.36	0.39	0.96	0.33
Control Delay	45.1	47.2		79.9	28.6		109.1	50.4	16.0	56.0	79.9	17.3
Queue Delay	0.0	1.1		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	48.3		79.9	28.6		109.1	50.4	16.0	56.0	79.9	17.3
LOS	D	D		E	C		F	D	B	E	E	B
Approach Delay		47.9			34.4			54.2			63.9	
Approach LOS		D			C			D			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 48.0 — Intersection LOS: D
Intersection Capacity Utilization 108.2% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road

Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	271	2367	147	1156	207	584	241	33	514	171
v/c Ratio	0.76	0.98	0.87	0.60	1.05	0.82	0.36	0.39	0.96	0.33
Control Delay	45.1	47.2	79.9	28.6	109.1	50.4	16.0	56.0	79.9	17.3
Queue Delay	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	48.3	79.9	28.6	109.1	50.4	16.0	56.0	79.9	17.3
Queue Length 50th (m)	51.8	167.6	27.2	92.7	~44.5	144.6	21.2	7.4	140.2	13.5
Queue Length 95th (m)	83.5	#266.4	#70.1	116.7	#95.2	192.9	42.8	19.1	#208.3	32.9
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	432	2420	169	1934	198	717	669	86	540	529
Starvation Cap Reductn	0	18	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.99	0.87	0.60	1.05	0.81	0.36	0.38	0.95	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1156	85	58	655
Future Volume (vph)	90	47	1156	85	58	655
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	1883	1601	1825	1865
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1807	1633	1883	1601	1825	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1257	92	63	712
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1257	92	63	712
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 73.0%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	90	47	1156	85	58	655
Future Volume (Veh/h)	90	47	1156	85	58	655
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	51	1257	92	63	712
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2095	1259			1349	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2095	1259			1349	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	76			88	
cM capacity (veh/h)	51	210			517	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	149	1257	92	63	712
Volume Left	98	0	0	63	0
Volume Right	51	0	92	0	0
cSH	69	1700	1700	517	1700
Volume to Capacity	2.15	0.74	0.05	0.12	0.42
Queue Length 95th (m)	106.0	0.0	0.0	3.1	0.0
Control Delay (s)	655.9	0.0	0.0	12.9	0.0
Lane LOS	F			B	
Approach Delay (s)	655.9	0.0		1.1	
Approach LOS	F				

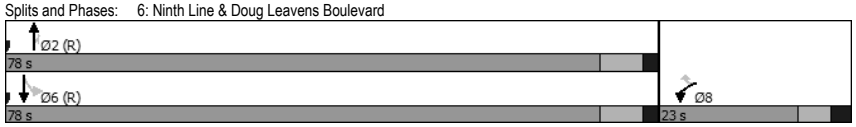
Intersection Summary			
Average Delay	43.4		
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	135	206	941	93	75	567
Future Volume (vph)	135	206	941	93	75	567
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	27.0		60.0	115.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1772	1601	1865	1555	1825	1883
Flt Permitted	0.950				0.186	
Satd. Flow (perm)	1772	1564	1865	1555	357	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		165		101		
Link Speed (k/h)	50		70			70
Link Distance (m)	255.0		850.0			603.1
Travel Time (s)	18.4		43.7			31.0
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	3%	5%	0%	2%
Adj. Flow (vph)	147	224	1023	101	82	616
Shared Lane Traffic (%)						
Lane Group Flow (vph)	147	224	1023	101	82	616
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	45.0	45.0
Minimum Split (s)	23.0	23.0	52.0	52.0	52.0	52.0
Total Split (s)	23.0	23.0	78.0	78.0	78.0	78.0
Total Split (%)	22.8%	22.8%	77.2%	77.2%	77.2%	77.2%
Maximum Green (s)	16.5	16.5	71.0	71.0	71.0	71.0
Yellow Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0	35.0	35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	14.1	14.1	75.4	75.4	75.4	75.4
Actuated g/C Ratio	0.14	0.14	0.75	0.75	0.75	0.75
v/c Ratio	0.59	0.62	0.74	0.09	0.31	0.44
Control Delay	50.3	20.0	16.9	2.4	8.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	20.0	16.9	2.4	8.5	6.4
LOS	D	B	B	A	A	A
Approach Delay	32.0		15.6			6.6
Approach LOS	C		B			A

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 85.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Doug Leavens Boulevard



Queues
6: Ninth Line & Doug Leavens Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	147	224	1023	101	82	616
v/c Ratio	0.59	0.62	0.74	0.09	0.31	0.44
Control Delay	50.3	20.0	16.9	2.4	8.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	20.0	16.9	2.4	8.5	6.4
Queue Length 50th (m)	27.2	10.4	156.3	1.7	4.5	38.8
Queue Length 95th (m)	45.2	32.5	m180.8	m4.2	13.2	64.0
Internal Link Dist (m)	231.0		826.0			579.1
Turn Bay Length (m)		27.0		60.0	115.0	
Base Capacity (vph)	307	407	1391	1186	266	1405
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.55	0.74	0.09	0.31	0.44

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
7: Ninth Line & Osprey Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	199	122	1062	148	55	796
Future Volume (vph)	199	122	1062	148	55	796
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	13.0	0.0		25.0	270.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	13.0				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1706	1601	1847	1526	1789	1865
Flt Permitted	0.950				0.061	
Satd. Flow (perm)	1706	1564	1847	1526	115	1865
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		133		55		
Link Speed (k/h)	50		70			70
Link Distance (m)	160.0		383.2			301.0
Travel Time (s)	11.5		19.7			15.5
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	4%	7%	2%	3%
Adj. Flow (vph)	216	133	1154	161	60	865
Shared Lane Traffic (%)						
Lane Group Flow (vph)	216	133	1154	161	60	865
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
7: Ninth Line & Osprey Boulevard

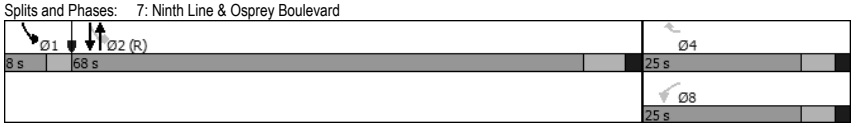
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4		2	2	
Detector Phase	8	4	2	2	1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	5.0	45.0
Minimum Split (s)	25.0	23.0	52.0	52.0	8.0	52.0
Total Split (s)	25.0	25.0	68.0	68.0	8.0	68.0
Total Split (%)	24.8%	24.8%	67.3%	67.3%	7.9%	67.3%
Maximum Green (s)	19.0	19.0	61.0	61.0	5.0	61.0
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	6.0	6.0	2.0	6.0
Lead/Lag			Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	8.0	8.0	37.0	37.0		37.0
Flash Dont Walk (s)	9.0	9.0	8.0	8.0		8.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	17.5	17.5	65.7	65.7	74.9	65.7
Actuated g/C Ratio	0.17	0.17	0.65	0.65	0.74	0.65
v/c Ratio	0.73	0.35	0.96	0.16	0.31	0.71
Control Delay	54.0	8.9	37.7	5.7	10.2	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	8.9	37.7	5.7	10.2	19.6
LOS	D	A	D	A	B	B
Approach Delay	36.8		33.8			19.0
Approach LOS	D		C			B

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 28.9 Intersection LOS: C
Intersection Capacity Utilization 76.2% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 7: Ninth Line & Osprey Boulevard



Queues
7: Ninth Line & Osprey Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	216	133	1154	161	60	865
v/c Ratio	0.73	0.35	0.96	0.16	0.31	0.71
Control Delay	54.0	8.9	37.7	5.7	10.2	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	8.9	37.7	5.7	10.2	19.6
Queue Length 50th (m)	39.8	0.0	~225.0	8.0	2.9	112.0
Queue Length 95th (m)	63.3	14.8	#316.4	16.2	9.4	169.0
Internal Link Dist (m)	136.0		359.2			277.0
Turn Bay Length (m)	13.0			25.0	270.0	
Base Capacity (vph)	337	416	1200	1010	192	1212
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.32	0.96	0.16	0.31	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
8: Ninth Line & Parkgate Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	91	959	6	27	790
Future Volume (vph)	18	91	959	6	27	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0	0.0		0.0	35.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				60.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1900	0	1825	1902
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1900	0	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	207.4		254.7			383.2
Travel Time (s)	14.9		13.1			19.7
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	20	99	1042	7	29	859
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	99	1049	0	29	859
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.5%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Parkgate Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	91	959	6	27	790
Future Volume (Veh/h)	18	91	959	6	27	790
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	99	1042	7	29	859
Pedestrians						1
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			255			383
pX, platoon unblocked	0.76	0.59			0.59	
vC, conflicting volume	1962	1046			1049	
vC1, stage 1 conf vol	1046					
vC2, stage 2 conf vol	917					
vCu, unblocked vol	1089	734			738	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	60			94	
cM capacity (veh/h)	254	250			519	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	20	99	1049	29	859
Volume Left	20	0	0	29	0
Volume Right	0	99	7	0	0
cSH	254	250	1700	519	1700
Volume to Capacity	0.08	0.40	0.62	0.06	0.51
Queue Length 95th (m)	1.9	13.6	0.0	1.3	0.0
Control Delay (s)	20.4	28.5	0.0	12.3	0.0
Lane LOS	C	D		B	
Approach Delay (s)	27.1		0.0	0.4	
Approach LOS	D				

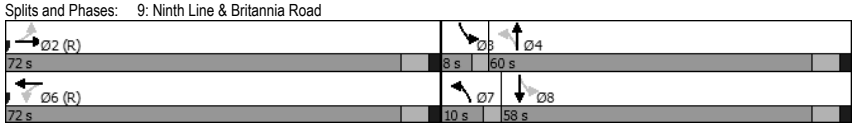
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Future Volume (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982			0.981			0.982			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	5093	0	1767	4942	0	1785	1847	0	1653	1848	0
Flt Permitted	0.269			0.060			0.073			0.075		
Satd. Flow (perm)	500	5093	0	112	4942	0	137	1847	0	130	1848	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			25			6			6	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	2%	1%	2%	19%	0%	2%	3%	8%	2%	2%
Adj. Flow (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	2646	0	72	859	0	203	964	0	60	877	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2			6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	24.6	24.6		24.6	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	72.0	72.0		72.0	72.0		10.0	60.0		8.0	58.0	
Total Split (%)	51.4%	51.4%		51.4%	51.4%		7.1%	42.9%		5.7%	41.4%	
Maximum Green (s)	65.4	65.4		65.4	65.4		7.0	53.4		5.0	51.4	
Yellow Time (s)	4.6	4.6		4.6	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-2.0	-1.0		-2.0	-1.0		-1.0	-3.0	
Total Lost Time (s)	5.6	5.6		4.6	5.6		1.0	5.6		2.0	3.6	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			12.0			12.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			18.0			18.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)	66.4	66.4		67.4	66.4		67.0	56.0		62.0	54.4	
Actuated g/C Ratio	0.47	0.47		0.48	0.47		0.48	0.40		0.44	0.39	
v/c Ratio	0.44	1.09		1.36	0.36		1.19	1.30		0.49	1.22	
Control Delay	19.0	73.3		275.5	19.2		158.0	179.6		34.2	147.2	
Queue Delay	0.0	0.2		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.0	73.5		275.5	19.2		158.0	179.6		34.2	147.2	
LOS	B	E		F	B		F	F		C	F	
Approach Delay		71.4			39.1			175.9			140.0	
Approach LOS		E			D			F			F	

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection		
Natural Cycle: 140		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.36		
Intersection Signal Delay: 98.4		Intersection LOS: F
Intersection Capacity Utilization 135.6%		ICU Level of Service H
Analysis Period (min) 15		

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	2646	72	859	203	964	60	877
v/c Ratio	0.44	1.09	1.36	0.36	1.19	1.30	0.49	1.22
Control Delay	19.0	73.3	275.5	19.2	158.0	179.6	34.2	147.2
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	73.5	275.5	19.2	158.0	179.6	34.2	147.2
Queue Length 50th (m)	11.5	~302.9	~26.4	33.5	~50.8	~347.5	9.0	~296.7
Queue Length 95th (m)	m14.3	#328.7	#59.7	39.1	#101.6	#427.4	17.4	#375.4
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	237	2428	53	2357	171	742	122	721
Starvation Cap Reductn	0	1	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.09	1.36	0.36	1.19	1.30	0.49	1.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
10: Ninth Line & Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	21	40	28	20	1176	8	2	1187	38
Future Volume (vph)	0	0	0	21	40	28	20	1176	8	2	1187	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.936			0.999			0.996	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1738	1778	0	1789	1880	0	1217	1858	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	1883	0	1738	1778	0	1789	1880	0	1217	1858	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		140.4			491.2			170.0			206.5	
Travel Time (s)		10.5			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	0%	2%	2%	13%	50%	3%	2%
Adj. Flow (vph)	0	0	0	23	40	30	20	1278	9	2	1290	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	23	70	0	20	1287	0	2	1328	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 75.3% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Transitway Driveway/Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	21	40	28	20	1176	8	2	1187	38
Future Volume (Veh/h)	0	0	0	21	40	28	20	1176	8	2	1187	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	0	0	0	23	40	30	20	1278	9	2	1290	38
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											206	
pX, platoon unblocked	0.61	0.61	0.61	0.61	0.61		0.61					
vC, conflicting volume	2681	2640	1309	2616	2654	1282	1328			1287		
vC1, stage 1 conf vol	1313	1313		1322	1322							
vC2, stage 2 conf vol	1368	1327		1294	1332							
vCu, unblocked vol	3439	3372	1186	3333	3396	1282	1218			1287		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.6		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.7		
p0 queue free %	100	100	100	76	62	85	94			100		
cM capacity (veh/h)	82	118	140	94	106	204	349			406		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	0	0	23	70	20	1287	2	1328
Volume Left	0	0	23	0	20	0	2	0
Volume Right	0	0	0	30	0	9	0	38
cSH	1700	1700	94	133	349	1700	406	1700
Volume to Capacity	0.00	0.00	0.24	0.53	0.06	0.76	0.00	0.78
Queue Length 95th (m)	0.0	0.0	6.7	19.2	1.4	0.0	0.1	0.0
Control Delay (s)	0.0	0.0	55.2	58.8	15.9	0.0	13.9	0.0
Lane LOS	A	A	F	F	C		B	
Approach Delay (s)	0.0		57.9		0.2		0.0	
Approach LOS	A		F					

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		75.3%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
11: Ninth Line & Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	24	0	32	13	1139	31	26	1173	25
Future Volume (vph)	0	0	0	24	0	32	13	1139	31	26	1173	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.850				0.850		0.997	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1825	1585	0	1789	1883	1445	1825	1878	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	1883	0	1825	1585	0	1789	1883	1445	1825	1878	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		110.9			511.9			217.0			170.0	
Travel Time (s)		8.3			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	3%	2%	2%	13%	0%	2%	2%
Adj. Flow (vph)	0	0	0	26	0	35	13	1238	34	28	1275	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	26	35	0	13	1238	34	28	1300	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 73.6%			ICU Level of Service D
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & Transitway Driveway/McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	24	0	32	13	1139	31	26	1173	25
Future Volume (Veh/h)	0	0	0	24	0	32	13	1139	31	26	1173	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	0	0	0	26	0	35	13	1238	34	28	1275	25
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											376	
pX, platoon unblocked	0.61	0.61	0.61	0.61	0.61		0.61					
vC, conflicting volume	2644	2642	1288	2595	2620	1239	1300			1272		
vC1, stage 1 conf vol	1344	1344		1264	1264							
vC2, stage 2 conf vol	1300	1298		1331	1356							
vCu, unblocked vol	3361	3358	1154	3283	3323	1239	1174			1272		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	72	100	84	96			95		
cM capacity (veh/h)	84	108	147	94	105	213	365			553		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	0	0	26	35	13	1238	34	28	1300
Volume Left	0	0	26	0	13	0	0	28	0
Volume Right	0	0	0	35	0	0	34	0	25
cSH	1700	1700	94	213	365	1700	1700	553	1700
Volume to Capacity	0.00	0.00	0.28	0.16	0.04	0.73	0.02	0.05	0.76
Queue Length 95th (m)	0.0	0.0	7.7	4.4	0.8	0.0	0.0	1.2	0.0
Control Delay (s)	0.0	0.0	57.1	25.2	15.2	0.0	0.0	11.9	0.0
Lane LOS	A	A	F	D	C			B	
Approach Delay (s)	0.0		38.8		0.2			0.3	
Approach LOS	A		E						

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		73.6%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	11	1276	8	4	1152
Future Volume (vph)	19	11	1276	8	4	1152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	30.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.951			0.850		
Flt Protected	0.969				0.950	
Satd. Flow (prot)	1714	0	1865	1633	1825	1883
Flt Permitted	0.969				0.950	
Satd. Flow (perm)	1714	0	1865	1633	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	0%	0%	2%
Adj. Flow (vph)	21	12	1387	9	4	1252
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	1387	9	4	1252
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 77.2%			ICU Level of Service D
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	11	1276	8	4	1152
Future Volume (Veh/h)	19	11	1276	8	4	1152
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	12	1387	9	4	1252
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2647	1387			1396	
vC1, stage 1 conf vol	1387					
vC2, stage 2 conf vol	1260					
vCu, unblocked vol	2647	1387			1396	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.4			2.2	
p0 queue free %	88	93			99	
cM capacity (veh/h)	170	169			496	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	33	1387	9	4	1252
Volume Left	21	0	0	4	0
Volume Right	12	0	9	0	0
cSH	170	1700	1700	496	1700
Volume to Capacity	0.19	0.82	0.01	0.01	0.74
Queue Length 95th (m)	5.3	0.0	0.0	0.2	0.0
Control Delay (s)	31.2	0.0	0.0	12.3	0.0
Lane LOS	D			B	
Approach Delay (s)	31.2	0.0		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	11	1155	6	3	1193
Future Volume (vph)	6	11	1155	6	3	1193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1498	1860	0	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1498	1860	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	33%	0%	2%
Adj. Flow (vph)	7	12	1255	7	3	1297
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	12	1262	0	3	1297
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 72.8%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	11	1155	6	3	1193
Future Volume (Veh/h)	6	11	1155	6	3	1193
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	12	1255	7	3	1297
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.38	0.38			0.38	
vC, conflicting volume	2562	1258			1262	
vC1, stage 1 conf vol	1258					
vC2, stage 2 conf vol	1303					
vCu, unblocked vol	4300	863			872	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.4			2.2	
p0 queue free %	94	91			99	
cM capacity (veh/h)	125	130			296	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	19	1262	3	1297
Volume Left	7	0	3	0
Volume Right	12	7	0	0
cSH	207	1700	296	1700
Volume to Capacity	0.09	0.74	0.01	0.76
Queue Length 95th (m)	2.3	0.0	0.2	0.0
Control Delay (s)	35.4	0.0	17.3	0.0
Lane LOS	E		C	
Approach Delay (s)	35.4	0.0	0.0	
Approach LOS	E			

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		72.8%	ICU Level of Service C
Analysis Period (min)		15	

Lanes, Volumes, Timings
14: Ninth Line & Thomas Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	204	95	1078	179	80	1099
Future Volume (vph)	204	95	1078	179	80	1099
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	28.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				45.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1526	1865	1585	1690	1883
Flt Permitted	0.950				0.062	
Satd. Flow (perm)	1789	1492	1865	1585	110	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		103		84		
Link Speed (k/h)	50		70			70
Link Distance (m)	534.8		346.0			306.2
Travel Time (s)	38.5		17.8			15.7
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Adj. Flow (vph)	222	103	1172	195	87	1195
Shared Lane Traffic (%)						
Lane Group Flow (vph)	222	103	1172	195	87	1195
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
14: Ninth Line & Thomas Street

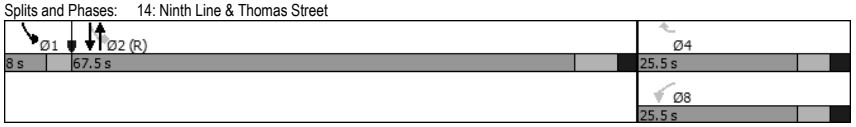
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4		2	2	
Detector Phase	8	4	2	2	1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	5.0	45.0
Minimum Split (s)	25.5	25.5	52.5	52.5	8.0	52.5
Total Split (s)	25.5	25.5	67.5	67.5	8.0	67.5
Total Split (%)	25.2%	25.2%	66.8%	66.8%	7.9%	66.8%
Maximum Green (s)	19.0	19.0	60.0	60.0	5.0	60.0
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.5	6.5	2.0	6.5
Lead/Lag			Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	8.0	8.0	33.0	33.0		33.0
Flash Dont Walk (s)	11.0	11.0	12.0	12.0		12.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	17.4	17.4	64.6	64.6	74.5	64.6
Actuated g/C Ratio	0.17	0.17	0.64	0.64	0.74	0.64
v/c Ratio	0.72	0.30	0.98	0.19	0.47	0.99
Control Delay	54.5	11.8	46.4	6.9	18.5	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	11.8	46.4	6.9	18.5	44.8
LOS	D	B	D	A	B	D
Approach Delay	41.0		40.8			43.1
Approach LOS	D		D			D

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 41.8 Intersection LOS: D
Intersection Capacity Utilization 86.0% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 14: Ninth Line & Thomas Street



Queues
14: Ninth Line & Thomas Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	222	103	1172	195	87	1195
v/c Ratio	0.72	0.30	0.98	0.19	0.47	0.99
Control Delay	54.5	11.8	46.4	6.9	18.5	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	11.8	46.4	6.9	18.5	44.8
Queue Length 50th (m)	43.2	1.0	~257.1	15.2	3.9	~256.7
Queue Length 95th (m)	67.4	16.1	#336.5	m18.0	16.6	#333.3
Internal Link Dist (m)	510.8		322.0			282.2
Turn Bay Length (m)				35.0	28.0	
Base Capacity (vph)	354	378	1193	1044	185	1205
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.27	0.98	0.19	0.47	0.99

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	46	1136	7	17	1297
Future Volume (vph)	18	46	1136	7	17	1297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1601	1865	1633	1722	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1601	1865	1633	1722	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	3%	0%	6%	2%
Adj. Flow (vph)	20	50	1235	8	18	1410
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	50	1235	8	18	1410
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 78.3%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	46	1136	7	17	1297
Future Volume (Veh/h)	18	46	1136	7	17	1297
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	50	1235	8	18	1410
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.27					
vC, conflicting volume	2681	1235			1243	
vC1, stage 1 conf vol	1235					
vC2, stage 2 conf vol	1446					
vCu, unblocked vol	5828	1235			1243	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.3	
p0 queue free %	68	77			97	
cM capacity (veh/h)	63	215			547	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	70	1235	8	18	1410
Volume Left	20	0	0	18	0
Volume Right	50	0	8	0	0
cSH	221	1700	1700	547	1700
Volume to Capacity	0.32	0.73	0.00	0.03	0.83
Queue Length 95th (m)	9.9	0.0	0.0	0.8	0.0
Control Delay (s)	43.8	0.0	0.0	11.8	0.0
Lane LOS	E			B	
Approach Delay (s)	43.8	0.0		0.1	
Approach LOS	E				

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	36	72	1093	45	36	1305
Future Volume (vph)	36	72	1093	45	36	1305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1617	1865	1498	1722	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1617	1865	1498	1722	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Adj. Flow (vph)	39	78	1188	49	39	1418
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	78	1188	49	39	1418
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 78.7%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	36	72	1093	45	36	1305
Future Volume (Veh/h)	36	72	1093	45	36	1305
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	78	1188	49	39	1418
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2684	1188			1237	
vC1, stage 1 conf vol	1188					
vC2, stage 2 conf vol	1496					
vCu, unblocked vol	2684	1188			1237	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.3	
p0 queue free %	75	66			93	
cM capacity (veh/h)	155	230			549	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	117	1188	49	39	1418
Volume Left	39	0	0	39	0
Volume Right	78	0	49	0	0
cSH	346	1700	1700	549	1700
Volume to Capacity	0.34	0.70	0.03	0.07	0.83
Queue Length 95th (m)	11.1	0.0	0.0	1.7	0.0
Control Delay (s)	30.9	0.0	0.0	12.1	0.0
Lane LOS	D			B	
Approach Delay (s)	30.9	0.0		0.3	
Approach LOS	D				

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Janice Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	18	1119	1	8	1340
Future Volume (vph)	9	18	1119	1	8	1340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	70.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.910					
Flt Protected	0.984				0.950	
Satd. Flow (prot)	1720	0	1865	0	1825	1883
Flt Permitted	0.984				0.950	
Satd. Flow (perm)	1720	0	1865	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	113.3		424.8			250.0
Travel Time (s)	8.2		21.8			12.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	0%	2%
Adj. Flow (vph)	10	20	1216	1	9	1457
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	0	1217	0	9	1457
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 80.5%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Janice Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	18	1119	1	8	1340
Future Volume (Veh/h)	9	18	1119	1	8	1340
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	20	1216	1	9	1457
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2692	1216			1217	
vC1, stage 1 conf vol	1216					
vC2, stage 2 conf vol	1475					
vCu, unblocked vol	2692	1216			1217	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	91			98	
cM capacity (veh/h)	162	223			580	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	30	1217	9	1457
Volume Left	10	0	9	0
Volume Right	20	1	0	0
cSH	198	1700	580	1700
Volume to Capacity	0.15	0.72	0.02	0.86
Queue Length 95th (m)	4.0	0.0	0.4	0.0
Control Delay (s)	26.4	0.0	11.3	0.0
Lane LOS	D		B	
Approach Delay (s)	26.4	0.0	0.1	
Approach LOS	D			

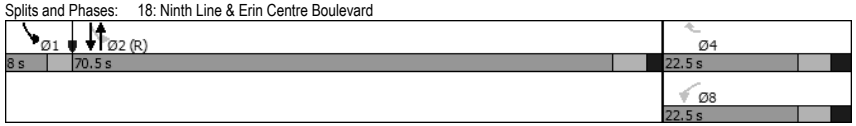
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	74	56	994	45	37	1316
Future Volume (vph)	74	56	994	45	37	1316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1706	1570	1844	0	1772	1883
Flt Permitted	0.950				0.121	
Satd. Flow (perm)	1706	1570	1844	0	226	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		61	5			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	4%	3%	16%	3%	2%
Adj. Flow (vph)	80	61	1080	49	40	1430
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	61	1129	0	40	1430
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	22.5	22.5	70.5		8.0	70.5
Total Split (%)	22.3%	22.3%	69.8%		7.9%	69.8%
Maximum Green (s)	16.0	16.0	64.5		5.0	64.5
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	5.0	8.0	50.0			50.0
Flash Dont Walk (s)	11.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	11.4	11.4	77.4		83.8	77.4
Actuated g/C Ratio	0.11	0.11	0.77		0.83	0.77
v/c Ratio	0.41	0.26	0.80		0.14	0.99
Control Delay	47.6	13.3	17.0		3.4	38.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.6	13.3	17.0		3.4	38.2
LOS	D	B	B		A	D
Approach Delay	32.8		17.0			37.2
Approach LOS	C		B			D

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 28.7	Intersection LOS: C
Intersection Capacity Utilization 84.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	80	61	1129	40	1430
v/c Ratio	0.41	0.26	0.80	0.14	0.99
Control Delay	47.6	13.3	17.0	3.4	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	13.3	17.0	3.4	38.2
Queue Length 50th (m)	14.9	0.0	150.0	1.4	~329.1
Queue Length 95th (m)	28.0	11.1	#291.7	m2.2	m#369.5
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	287	314	1414	294	1443
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	0.19	0.80	0.14	0.99

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Candlelight Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	17	41	954	8	14	1405
Future Volume (vph)	17	41	954	8	14	1405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1601	1864	0	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1601	1864	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	216.6		90.1			404.2
Travel Time (s)	15.6		4.6			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	3%	0%	0%	2%
Adj. Flow (vph)	18	45	1037	9	15	1527
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	45	1046	0	15	1527
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 83.9% ICU Level of Service E
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Candlelight Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	41	954	8	14	1405
Future Volume (Veh/h)	17	41	954	8	14	1405
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	45	1037	9	15	1527
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			373			
pX, platoon unblocked	0.70	0.70			0.70	
vC, conflicting volume	2598	1042			1046	
vC1, stage 1 conf vol	1042					
vC2, stage 2 conf vol	1557					
vCu, unblocked vol	3076	842			848	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	82			97	
cM capacity (veh/h)	150	254			556	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	63	1046	15	1527
Volume Left	18	0	15	0
Volume Right	45	9	0	0
cSH	355	1700	556	1700
Volume to Capacity	0.18	0.62	0.03	0.90
Queue Length 95th (m)	4.8	0.0	0.6	0.0
Control Delay (s)	25.1	0.0	11.7	0.0
Lane LOS	D		B	
Approach Delay (s)	25.1	0.0	0.1	
Approach LOS	D			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	17	1003	1	6	1380
Future Volume (vph)	5	17	1003	1	6	1380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.894					
Flt Protected	0.989				0.950	
Satd. Flow (prot)	1699	0	1865	0	1217	1902
Flt Permitted	0.989				0.950	
Satd. Flow (perm)	1699	0	1865	0	1217	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	50%	1%
Adj. Flow (vph)	5	18	1090	1	7	1500
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	1091	0	7	1500
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 82.6%		ICU Level of Service E	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	17	1003	1	6	1380
Future Volume (Veh/h)	5	17	1003	1	6	1380
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	18	1090	1	7	1500
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.68	0.68			0.68	
vC, conflicting volume	2604	1090			1091	
vC1, stage 1 conf vol	1090					
vC2, stage 2 conf vol	1514					
vCu, unblocked vol	3115	901			902	
tC, single (s)	6.4	6.2			4.6	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.7	
p0 queue free %	97	92			98	
cM capacity (veh/h)	151	232			402	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	23	1091	7	1500
Volume Left	5	0	7	0
Volume Right	18	1	0	0
cSH	208	1700	402	1700
Volume to Capacity	0.11	0.64	0.02	0.88
Queue Length 95th (m)	2.8	0.0	0.4	0.0
Control Delay (s)	24.4	0.0	14.1	0.0
Lane LOS	C		B	
Approach Delay (s)	24.4	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Stardust Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	25	906	6	0	1479
Future Volume (vph)	2	25	906	6	0	1479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865	0.999			
Flt Protected	0.950					
Satd. Flow (prot)	0	1662	1862	0	0	1902
Flt Permitted	0.950					
Satd. Flow (perm)	0	1662	1862	0	0	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	245.5		191.7			91.0
Travel Time (s)	17.7		9.9			4.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	17%	0%	1%
Adj. Flow (vph)	2	27	985	7	0	1608
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	27	992	0	0	1608
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Stardust Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	25	906	6	0	1479
Future Volume (Veh/h)	2	25	906	6	0	1479
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	27	985	7	0	1608
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			192			
pX, platoon unblocked	0.67	0.67			0.67	
vC, conflicting volume	2596	988			985	
vC1, stage 1 conf vol	988					
vC2, stage 2 conf vol	1608					
vCu, unblocked vol	3148	731			726	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	90			100	
cM capacity (veh/h)	150	283			590	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	29	992	1608
Volume Left	2	0	0
Volume Right	27	7	0
cSH	266	1700	1700
Volume to Capacity	0.11	0.58	0.95
Queue Length 95th (m)	2.8	0.0	0.0
Control Delay (s)	20.2	0.0	0.0
Lane LOS	C		
Approach Delay (s)	20.2	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		Err%	ICU Level of Service	H
Analysis Period (min)		15	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	909	49	34	316	234	14	496	66	454	759	74
Future Volume (vph)	65	909	49	34	316	234	14	496	66	454	759	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992				0.850		0.982			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3617	0	1825	1883	1526	1825	1854	0	1789	1894	0
Flt Permitted	0.346			0.091			0.230			0.081		
Satd. Flow (perm)	658	3617	0	175	1883	1526	442	1854	0	153	1894	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				254		5			6	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	2%	7%	0%	2%	0%	2%	0%	1%
Adj. Flow (vph)	71	988	53	37	343	254	15	539	72	493	825	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	1041	0	37	343	254	15	611	0	493	905	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

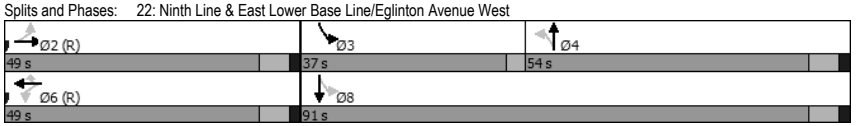
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	49.0	49.0		49.0	49.0	49.0	54.0	54.0		37.0	91.0	
Total Split (%)	35.0%	35.0%		35.0%	35.0%	35.0%	38.6%	38.6%		26.4%	65.0%	
Maximum Green (s)	42.0	42.0		42.0	42.0	42.0	47.0	47.0		34.0	84.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-1.0	-1.0	-1.0	-1.0		-3.0	-1.0	
Total Lost Time (s)	6.0	4.0		6.0	6.0	6.0	6.0	6.0		0.0	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	Min	Min		None	Min	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0			0	
Act Effct Green (s)	44.1	46.1		44.1	44.1	44.1	47.5	47.5		89.9	83.9	
Actuated g/C Ratio	0.32	0.33		0.32	0.32	0.32	0.34	0.34		0.64	0.60	
v/c Ratio	0.34	0.87		0.69	0.58	0.39	0.10	0.97		0.94	0.80	
Control Delay	43.4	53.4		99.2	45.2	5.9	33.7	73.9		66.9	27.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	43.4	53.4		99.2	45.2	5.9	33.7	73.9		66.9	27.7	
LOS	D	D		F	D	A	C	E		E	C	
Approach Delay		52.8			32.6			72.9			41.5	
Approach LOS		D			C			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 77 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 48.6 — Intersection LOS: D
Intersection Capacity Utilization 105.3% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	1041	37	343	254	15	611	493	905
v/c Ratio	0.34	0.87	0.69	0.58	0.39	0.10	0.97	0.94	0.80
Control Delay	43.4	53.4	99.2	45.2	5.9	33.7	73.9	66.9	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	53.4	99.2	45.2	5.9	33.7	73.9	66.9	27.7
Queue Length 50th (m)	15.3	144.0	9.0	80.6	0.0	2.8	164.1	115.3	178.0
Queue Length 95th (m)	30.2	#175.6	#29.9	112.5	19.3	8.4	#238.5	#180.9	237.2
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	207	1194	54	593	654	151	638	530	1152
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.87	0.69	0.58	0.39	0.10	0.96	0.93	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	78	22	159	182	14	33	24	249	21	40	13
Future Volume (vph)	7	78	22	159	182	14	33	24	249	21	40	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.972			0.995			0.890			0.976	
Flt Protected		0.997			0.978			0.995			0.986	
Satd. Flow (prot)	0	1761	0	0	1817	0	0	1664	0	0	1849	0
Flt Permitted		0.997			0.978			0.995			0.986	
Satd. Flow (perm)	0	1761	0	0	1817	0	0	1664	0	0	1849	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	9		16	16		9	10		27	27		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	4%	9%	3%	3%	0%	3%	4%	2%	0%	0%	0%
Adj. Flow (vph)	8	85	24	173	198	15	36	26	271	23	43	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	117	0	0	386	0	0	333	0	0	80	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	78	22	159	182	14	33	24	249	21	40	13
Future Volume (vph)	7	78	22	159	182	14	33	24	249	21	40	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	85	24	173	198	15	36	26	271	23	43	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	117	386	333	80
Volume Left (vph)	8	173	36	23
Volume Right (vph)	24	15	271	14
Hadj (s)	-0.01	0.12	-0.43	-0.05
Departure Headway (s)	5.6	5.3	5.0	5.8
Degree Utilization, x	0.18	0.57	0.46	0.13
Capacity (veh/h)	568	643	665	538
Control Delay (s)	9.9	15.2	12.3	9.7
Approach Delay (s)	9.9	15.2	12.3	9.7
Approach LOS	A	C	B	A

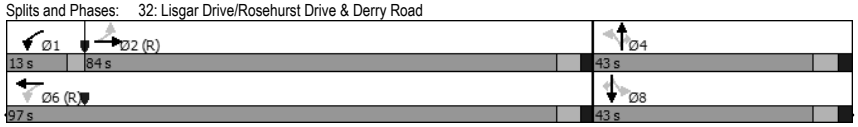
Intersection Summary			
Delay	13.0		
Level of Service	B		
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Future Volume (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99		0.99		0.96	0.97		0.97
Frt		0.999			0.984				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5187	0	1684	4882	0	1750	1847	1617	1750	1795	1581
Flt Permitted	0.218			0.045			0.662			0.716		
Satd. Flow (perm)	407	5187	0	80	4882	0	1203	1847	1547	1281	1795	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			31				126			92
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	14		3	3		14	12		24	24		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	6%	5%	6%	2%	4%	1%	2%	7%	1%
Adj. Flow (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2532	0	104	1222	0	95	63	361	224	105	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		8.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	84.0	84.0		13.0	97.0		43.0	43.0	43.0	43.0	43.0	43.0
Total Split (%)	60.0%	60.0%		9.3%	69.3%		30.7%	30.7%	30.7%	30.7%	30.7%	30.7%
Maximum Green (s)	78.0	78.0		10.0	91.0		36.4	36.4	36.4	36.4	36.4	36.4
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		0.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		2.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0			12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0			18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	87.5	87.5		102.3	99.3		30.1	30.1	30.1	30.1	30.1	30.1
Actuated g/C Ratio	0.62	0.62		0.73	0.71		0.22	0.22	0.22	0.22	0.22	0.22
v/c Ratio	0.09	0.78		0.61	0.35		0.37	0.16	0.84	0.81	0.27	0.23
Control Delay	3.4	4.4		39.6	8.5		49.3	43.3	50.6	74.2	45.9	8.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	4.4		39.6	8.5		49.3	43.3	50.6	74.2	45.9	8.8
LOS	A	A		D	A		D	D	D	E	D	A
Approach Delay		4.4			11.0			49.4			52.9	
Approach LOS		A			B			D			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 100.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	2532	104	1222	95	63	361	224	105	92
v/c Ratio	0.09	0.78	0.61	0.35	0.37	0.16	0.84	0.81	0.27	0.23
Control Delay	3.4	4.4	39.6	8.5	49.3	43.3	50.6	74.2	45.9	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	4.4	39.6	8.5	49.3	43.3	50.6	74.2	45.9	8.8
Queue Length 50th (m)	0.4	18.2	12.5	43.1	22.5	14.2	64.8	59.2	24.3	0.0
Queue Length 95th (m)	m0.7	m23.6	33.3	59.8	37.1	25.2	97.4	84.9	38.6	13.4
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	254	3243	188	3471	321	493	505	342	479	478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.78	0.55	0.35	0.30	0.13	0.71	0.65	0.22	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	131	36	53	191	130	65	82	170	223	70	69
Future Volume (vph)	9	131	36	53	191	130	65	82	170	223	70	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.968			0.939			0.928			0.974	
Flt Protected	0.950			0.950				0.990			0.970	
Satd. Flow (prot)	1496	1819	0	1674	1779	0	0	1705	0	0	1777	0
Flt Permitted	0.950			0.950				0.990			0.970	
Satd. Flow (perm)	1496	1819	0	1674	1779	0	0	1705	0	0	1777	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	15		33	33		15	38		42	42		38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	2%	3%	9%	1%	2%	3%	7%	2%	1%	4%	4%
Adj. Flow (vph)	10	142	39	58	208	141	71	89	185	242	76	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	181	0	58	349	0	0	345	0	0	393	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 76.3% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	131	36	53	191	130	65	82	170	223	70	69
Future Volume (vph)	9	131	36	53	191	130	65	82	170	223	70	69
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	142	39	58	208	141	71	89	185	242	76	75

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	10	181	58	349	345	393
Volume Left (vph)	10	0	58	0	71	242
Volume Right (vph)	0	39	0	141	185	75
Hadj (s)	0.87	-0.11	0.65	-0.26	-0.22	0.05
Departure Headway (s)	9.1	8.1	8.3	7.4	6.9	7.0
Degree Utilization, x	0.03	0.41	0.13	0.71	0.66	0.76
Capacity (veh/h)	336	385	407	464	491	492
Control Delay (s)	11.2	15.3	11.4	25.5	22.0	28.7
Approach Delay (s)	15.1		23.5		22.0	28.7
Approach LOS	C		C		C	D

Intersection Summary			
Delay		23.4	
Level of Service		C	
Intersection Capacity Utilization		76.3%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	57	3	9	78	122	5	16	12	210	11	104
Future Volume (vph)	89	57	3	9	78	122	5	16	12	210	11	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.921			0.950			0.957	
Flt Protected		0.971			0.998			0.993			0.969	
Satd. Flow (prot)	0	1838	0	0	1766	0	0	1812	0	0	1748	0
Flt Permitted		0.971			0.998			0.993			0.969	
Satd. Flow (perm)	0	1838	0	0	1766	0	0	1812	0	0	1748	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	8		6	6		8	2		12	12		2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%
Adj. Flow (vph)	97	62	3	10	85	133	5	17	13	228	12	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	162	0	0	228	0	0	35	0	0	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 57.1%	ICU Level of Service B
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	57	3	9	78	122	5	16	12	210	11	104
Future Volume (vph)	89	57	3	9	78	122	5	16	12	210	11	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	62	3	10	85	133	5	17	13	228	12	113

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	162	228	35	353
Volume Left (vph)	97	10	5	228
Volume Right (vph)	3	133	13	113
Hadj (s)	0.13	-0.34	-0.19	-0.03
Departure Headway (s)	5.4	4.8	5.3	4.9
Degree Utilization, x	0.24	0.31	0.05	0.48
Capacity (veh/h)	616	689	593	692
Control Delay (s)	10.1	10.0	8.5	12.5
Approach Delay (s)	10.1	10.0	8.5	12.5
Approach LOS	B	A	A	B

Intersection Summary				
Delay			11.1	
Level of Service			B	
Intersection Capacity Utilization			57.1%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Future Volume (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00		0.99	0.97		0.99	0.99	
Frt		0.992			0.997			0.852			0.929	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5146	0	1552	5008	0	1733	1575	0	1785	1721	0
Flt Permitted	0.287			0.039			0.734			0.293		
Satd. Flow (perm)	536	5146	0	64	5008	0	1326	1575	0	545	1721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			5			73			17	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			101.9			114.1			106.4	
Travel Time (s)		28.2			6.1			8.2			7.7	
Confl. Peds. (#/hr)	8		4	4		8	6		10	10		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	4%	23%	3%	0%	1%	0%	5%	0%
Adj. Flow (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2548	0	60	957	0	31	212	0	74	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

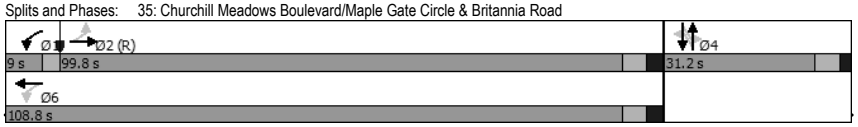
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			4	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		1	6		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		9.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	99.8	99.8		9.0	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	71.3%	71.3%		6.4%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	92.8	92.8		6.0	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		0.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-2.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0		5.2	5.2		4.2	5.2	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	11.0	11.0			11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0			18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	101.7	101.7		113.3	109.3		19.5	19.5		20.5	19.5	
Actuated g/C Ratio	0.73	0.73		0.81	0.78		0.14	0.14		0.15	0.14	
v/c Ratio	0.00	0.68		0.47	0.24		0.17	0.75		0.93	0.14	
Control Delay	2.0	3.0		27.9	4.7		52.2	53.5		140.4	31.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.0	3.0		27.9	4.7		52.2	53.5		140.4	31.9	
LOS	A	A		C	A		D	D		F	C	
Approach Delay		3.0			6.1			53.3			104.9	
Approach LOS		A			A			D			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 9.8 — Intersection LOS: A
Intersection Capacity Utilization 85.4% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	2548	60	957	31	212	74	36
v/c Ratio	0.00	0.68	0.47	0.24	0.17	0.75	0.93	0.14
Control Delay	2.0	3.0	27.9	4.7	52.2	53.5	140.4	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	3.0	27.9	4.7	52.2	53.5	140.4	31.9
Queue Length 50th (m)	0.0	15.5	2.9	23.2	7.6	37.4	20.4	4.6
Queue Length 95th (m)	m0.0	m15.4	18.2	33.5	16.6	62.8	#45.1	14.2
Internal Link Dist (m)		445.7		77.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	389	3740	130	3909	246	351	105	333
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.68	0.46	0.24	0.13	0.60	0.70	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	16	21	42	66	20	11	181	34	16	220	7
Future Volume (vph)	12	16	21	42	66	20	11	181	34	16	220	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.941			0.979			0.980			0.996	
Flt Protected		0.988			0.984			0.998			0.997	
Satd. Flow (prot)	0	1752	0	0	1771	0	0	1835	0	0	1794	0
Flt Permitted		0.988			0.984			0.998			0.997	
Satd. Flow (perm)	0	1752	0	0	1771	0	0	1835	0	0	1794	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)			13	13			16		13	13		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	0%	5%	4%	5%	0%	3%	0%	0%	7%	0%
Adj. Flow (vph)	13	17	23	46	72	22	12	197	37	17	239	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	0	0	140	0	0	246	0	0	264	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	16	21	42	66	20	11	181	34	16	220	7
Future Volume (Veh/h)	12	16	21	42	66	20	11	181	34	16	220	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	17	23	46	72	22	12	197	37	17	239	8
Pedestrians		16			13			13				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			1			1				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	590	564	272	574	550	228	263			247		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	590	564	272	574	550	228	263			247		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	96	97	88	83	97	99			99		
cM capacity (veh/h)	339	409	753	377	420	794	1295			1316		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	53	140	246	264
Volume Left	13	46	12	17
Volume Right	23	22	37	8
cSH	480	436	1295	1316
Volume to Capacity	0.11	0.32	0.01	0.01
Queue Length 95th (m)	2.8	10.4	0.2	0.3
Control Delay (s)	13.4	17.1	0.5	0.6
Lane LOS	B	C	A	A
Approach Delay (s)	13.4	17.1	0.5	0.6
Approach LOS	B	C		

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	174	31	90	61	29	13	205	161	61	269	11
Future Volume (vph)	23	174	31	90	61	29	13	205	161	61	269	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.978			0.943			0.996	
Flt Protected		0.995			0.976			0.998			0.991	
Satd. Flow (prot)	0	1748	0	0	1777	0	0	1767	0	0	1867	0
Flt Permitted		0.995			0.976			0.998			0.991	
Satd. Flow (perm)	0	1748	0	0	1777	0	0	1767	0	0	1867	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	19		71	71		19	20		20	20		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	9%	0%	2%	5%	3%	15%	1%	3%	0%	2%	0%
Adj. Flow (vph)	25	189	34	98	66	32	14	223	175	66	292	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	248	0	0	196	0	0	412	0	0	370	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 78.0%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	174	31	90	61	29	13	205	161	61	269	11
Future Volume (vph)	23	174	31	90	61	29	13	205	161	61	269	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	189	34	98	66	32	14	223	175	66	292	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	248	196	412	370
Volume Left (vph)	25	98	14	66
Volume Right (vph)	34	32	175	12
Hadj (s)	0.06	0.06	-0.21	0.04
Departure Headway (s)	7.0	7.2	6.1	6.5
Degree Utilization, x	0.48	0.39	0.70	0.66
Capacity (veh/h)	452	426	554	519
Control Delay (s)	16.4	14.7	22.4	21.3
Approach Delay (s)	16.4	14.7	22.4	21.3
Approach LOS	C	B	C	C

Intersection Summary			
Delay	19.6		
Level of Service	C		
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	316	14	104	258	181	20	244	68	181	306	63
Future Volume (vph)	131	316	14	104	258	181	20	244	68	181	306	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	1.00		0.99	0.97		1.00	0.99		0.98	1.00	
Frt		0.994			0.938			0.967			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3578	0	1772	3157	0	1825	1794	0	1807	1821	0
Flt Permitted	0.447			0.529			0.384			0.447		
Satd. Flow (perm)	827	3578	0	976	3157	0	735	1794	0	832	1821	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			197			19			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	7%	3%	3%	8%	0%	2%	4%	1%	2%	5%
Adj. Flow (vph)	142	343	15	113	280	197	22	265	74	197	333	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	142	358	0	113	477	0	22	339	0	197	401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	47.0	47.0		47.0	47.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.5%	46.5%		46.5%	46.5%		53.5%	53.5%		53.5%	53.5%	
Maximum Green (s)	40.5	40.5		40.5	40.5		48.0	48.0		48.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	47.5	47.5		47.5	47.5		43.0	43.0		43.0	43.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.43	0.43		0.43	0.43	
v/c Ratio	0.37	0.21		0.25	0.30		0.07	0.44		0.56	0.51	
Control Delay	19.4	15.3		18.4	10.1		17.4	21.1		28.8	23.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.4	15.3		18.4	10.1		17.4	21.1		28.8	23.1	
LOS	B	B		B	B		B	C		C	C	
Approach Delay		16.5			11.7			20.9			24.9	
Approach LOS		B			B			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 18.3	Intersection LOS: B
Intersection Capacity Utilization 113.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	358	113	477	22	339	197	401
v/c Ratio	0.37	0.21	0.25	0.30	0.07	0.44	0.56	0.51
Control Delay	19.4	15.3	18.4	10.1	17.4	21.1	28.8	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	15.3	18.4	10.1	17.4	21.1	28.8	23.1
Queue Length 50th (m)	14.0	17.1	12.5	15.8	2.5	43.8	28.9	55.3
Queue Length 95th (m)	26.7	26.5	26.4	28.5	6.8	61.5	48.2	75.5
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	389	1686	459	1590	356	880	403	890
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.21	0.25	0.30	0.06	0.39	0.49	0.45

Intersection Summary

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	100	20	26	62	39	17	115	26	78	269	19
Future Volume (vph)	21	100	20	26	62	39	17	115	26	78	269	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.959			0.978			0.993	
Flt Protected		0.993			0.990			0.995			0.989	
Satd. Flow (prot)	0	1770	0	0	1783	0	0	1781	0	0	1786	0
Flt Permitted		0.993			0.990			0.995			0.989	
Satd. Flow (perm)	0	1770	0	0	1783	0	0	1781	0	0	1786	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	21		17	17		21	16		16	16		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	4%	3%	0%	6%	5%	4%	1%	7%	5%
Adj. Flow (vph)	23	109	22	28	67	42	18	125	28	85	292	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	154	0	0	137	0	0	171	0	0	398	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 52.7%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	100	20	26	62	39	17	115	26	78	269	19
Future Volume (vph)	21	100	20	26	62	39	17	115	26	78	269	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	109	22	28	67	42	18	125	28	85	292	21

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	154	137	171	398
Volume Left (vph)	23	28	18	85
Volume Right (vph)	22	42	28	21
Hadj (s)	0.04	-0.10	0.01	0.11
Departure Headway (s)	5.7	5.6	5.4	5.1
Degree Utilization, x	0.24	0.21	0.25	0.57
Capacity (veh/h)	565	569	620	674
Control Delay (s)	10.6	10.1	10.2	14.6
Approach Delay (s)	10.6	10.1	10.2	14.6
Approach LOS	B	B	B	B

Intersection Summary				
Delay			12.3	
Level of Service			B	
Intersection Capacity Utilization			52.7%	ICU Level of Service A
Analysis Period (min)			15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	173	15	29	102	14	22	122	121	67	279	36
Future Volume (vph)	22	173	15	29	102	14	22	122	121	67	279	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.991			0.987			0.938			0.987	
Flt Protected		0.995			0.990			0.996			0.991	
Satd. Flow (prot)	0	1745	0	0	1766	0	0	1717	0	0	1792	0
Flt Permitted		0.995			0.990			0.996			0.991	
Satd. Flow (perm)	0	1745	0	0	1766	0	0	1717	0	0	1792	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	8%	7%	7%	6%	7%	5%	6%	3%	1%	6%	3%
Adj. Flow (vph)	24	188	16	32	111	15	24	133	132	73	303	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	228	0	0	158	0	0	289	0	0	415	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 55.8%	ICU Level of Service B
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	173	15	29	102	14	22	122	121	67	279	36
Future Volume (vph)	22	173	15	29	102	14	22	122	121	67	279	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	188	16	32	111	15	24	133	132	73	303	39

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	228	158	289	415
Volume Left (vph)	24	32	24	73
Volume Right (vph)	16	15	132	39
Hadj (s)	0.12	0.09	-0.18	0.06
Departure Headway (s)	6.5	6.7	5.8	5.8
Degree Utilization, x	0.41	0.29	0.47	0.67
Capacity (veh/h)	492	461	567	593
Control Delay (s)	13.9	12.4	13.9	19.9
Approach Delay (s)	13.9	12.4	13.9	19.9
Approach LOS	B	B	B	C

Intersection Summary				
Delay			15.9	
Level of Service			C	
Intersection Capacity Utilization			55.8%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	2166	1334	65	215	125
Future Volume (vph)	3	2166	1334	65	215	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt			0.993			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	3579	3443	0	1755	1183
Flt Permitted	0.154				0.950	
Satd. Flow (perm)	296	3579	3443	0	1755	1183
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			11			61
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	5%	8%	4%	38%
Adj. Flow (vph)	3	2166	1334	65	215	125
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	2166	1399	0	215	125
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

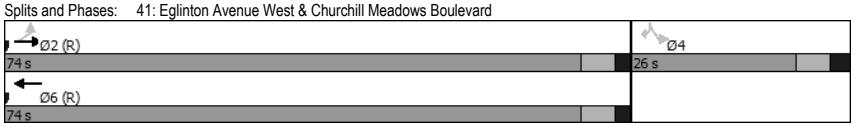
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				4	4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	24.0	24.0	24.0		25.5	25.5
Total Split (s)	74.0	74.0	74.0		26.0	26.0
Total Split (%)	74.0%	74.0%	74.0%		26.0%	26.0%
Maximum Green (s)	68.0	68.0	68.0		19.5	19.5
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	72.0	72.0	72.0		17.5	17.5
Actuated g/C Ratio	0.72	0.72	0.72		0.18	0.18
v/c Ratio	0.01	0.84	0.56		0.70	0.49
Control Delay	5.0	14.7	8.0		51.2	26.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	5.0	14.7	8.0		51.2	26.0
LOS	A	B	A		D	C
Approach Delay		14.7	8.0		42.0	
Approach LOS		B	A		D	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 14.7 — Intersection LOS: B
Intersection Capacity Utilization 80.5% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3	2166	1399	215	125
v/c Ratio	0.01	0.84	0.56	0.70	0.49
Control Delay	5.0	14.7	8.0	51.2	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	14.7	8.0	51.2	26.0
Queue Length 50th (m)	0.2	139.9	59.4	39.1	10.8
Queue Length 95th (m)	1.0	193.3	81.5	61.8	27.6
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	213	2578	2483	359	291
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.84	0.56	0.60	0.43

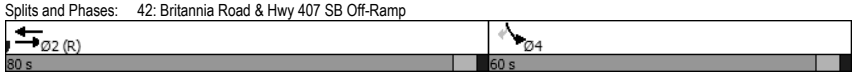
Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2074	653	0	428	6
Future Volume (vph)	0	2074	653	0	428	6
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5678	5622	0	1847	1524
Flt Permitted					0.950	
Satd. Flow (perm)	0	5678	5622	0	1847	1524
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						3
Link Speed (k/h)		80	80		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		9.3	13.4		15.0	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	0%	1%	2%	7%	16%
Adj. Flow (vph)	0	2095	660	0	432	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2095	660	0	432	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		80.0	80.0		60.0	60.0
Total Split (%)		57.1%	57.1%		42.9%	42.9%
Maximum Green (s)		74.0	74.0		54.0	54.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		89.1	89.1		38.9	38.9
Actuated g/C Ratio		0.64	0.64		0.28	0.28
v/c Ratio		0.58	0.18		0.84	0.01
Control Delay		16.3	6.1		62.5	24.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		16.3	6.1		62.5	24.8
LOS		B	A		E	C
Approach Delay		16.3	6.1		62.0	
Approach LOS		B	A		E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 20.5		Intersection LOS: C	
Intersection Capacity Utilization 68.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2095	660	432	6
v/c Ratio	0.58	0.18	0.84	0.01
Control Delay	16.3	6.1	62.5	24.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.3	6.1	62.5	24.8
Queue Length 50th (m)	115.6	11.5	113.1	0.6
Queue Length 95th (m)	155.5	13.6	139.1	3.7
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3615	3579	712	589
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.18	0.61	0.01

Intersection Summary

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2405	0	0	795	10	280
Future Volume (vph)	2405	0	0	795	10	280
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5678	0	0	5622	1847	1768
Flt Permitted					0.950	
Satd. Flow (perm)	5678	0	0	5622	1847	1768
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	80			80	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	13.4			9.8	11.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	1%	7%	0%
Adj. Flow (vph)	2505	0	0	828	10	292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2505	0	0	828	10	292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

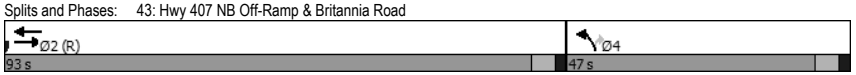
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	93.0			93.0	47.0	47.0
Total Split (%)	66.4%			66.4%	33.6%	33.6%
Maximum Green (s)	87.0			87.0	41.0	41.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	99.5			99.5	28.5	28.5
Actuated g/C Ratio	0.71			0.71	0.20	0.20
v/c Ratio	0.62			0.21	0.03	0.81
Control Delay	4.7			4.6	40.9	70.2
Queue Delay	0.2			0.0	0.0	0.0
Total Delay	4.9			4.6	40.9	70.2
LOS	A			A	D	E
Approach Delay	4.9			4.6	69.2	
Approach LOS	A			A	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 10.2 Intersection LOS: B
Intersection Capacity Utilization 68.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2505	828	10	292
v/c Ratio	0.62	0.21	0.03	0.81
Control Delay	4.7	4.6	40.9	70.2
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	4.9	4.6	40.9	70.2
Queue Length 50th (m)	47.0	14.3	2.3	77.8
Queue Length 95th (m)	49.0	m18.0	6.7	103.1
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4034	3995	540	517
Starvation Cap Reductn	13	0	0	0
Spillback Cap Reductn	616	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.21	0.02	0.56

Intersection Summary

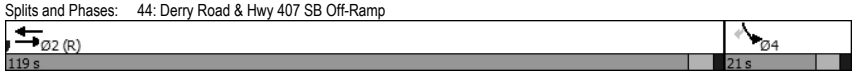
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3128	728	0	23	32
Future Volume (vph)	0	3128	728	0	23	32
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5622	5408	0	3686	1414
Flt Permitted					0.950	
Satd. Flow (perm)	0	5622	5408	0	3686	1414
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						33
Link Speed (k/h)		80	80		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		15.0	13.9		13.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	1%	5%	2%	4%	25%
Adj. Flow (vph)	0	3258	758	0	24	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	3258	758	0	24	33
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		119.0	119.0		21.0	21.0
Total Split (%)		85.0%	85.0%		15.0%	15.0%
Maximum Green (s)		113.0	113.0		15.0	15.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		123.8	123.8		8.2	8.2
Actuated g/C Ratio		0.88	0.88		0.06	0.06
v/c Ratio		0.66	0.16		0.11	0.29
Control Delay		3.7	0.5		63.5	25.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		3.7	0.5		63.5	25.8
LOS		A	A		E	C
Approach Delay		3.7	0.5		41.6	
Approach LOS		A	A		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 3.7	Intersection LOS: A
Intersection Capacity Utilization 72.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3258	758	24	33
v/c Ratio	0.66	0.16	0.11	0.29
Control Delay	3.7	0.5	63.5	25.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.7	0.5	63.5	25.8
Queue Length 50th (m)	84.2	2.6	3.2	0.0
Queue Length 95th (m)	97.8	2.7	8.1	10.9
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4970	4781	394	180
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.16	0.06	0.18

Intersection Summary

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2461	0	0	899	14	151
Future Volume (vph)	2461	0	0	899	14	151
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5622	0	0	5408	3582	1716
Flt Permitted					0.950	
Satd. Flow (perm)	5622	0	0	5408	3582	1716
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						154
Link Speed (k/h)	80			80	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	13.9			10.3	15.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	2%	2%	5%	7%	3%
Adj. Flow (vph)	2511	0	0	917	14	154
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2511	0	0	917	14	154
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

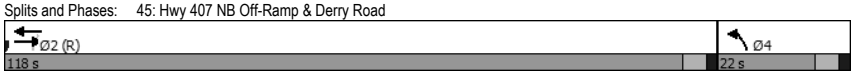
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	118.0			118.0	22.0	118.0
Total Split (%)	84.3%			84.3%	15.7%	84.3%
Maximum Green (s)	112.0			112.0	16.0	112.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	132.0			132.0	8.0	132.0
Actuated g/C Ratio	0.94			0.94	0.06	0.94
v/c Ratio	0.47			0.18	0.07	0.09
Control Delay	1.0			0.2	63.4	0.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	1.0			0.2	63.4	0.3
LOS	A			A	E	A
Approach Delay	1.0			0.2	5.6	
Approach LOS	A			A	A	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:WBEB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 1.0 Intersection LOS: A
Intersection Capacity Utilization 72.5% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2511	917	14	154
v/c Ratio	0.47	0.18	0.07	0.09
Control Delay	1.0	0.2	63.4	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.0	0.2	63.4	0.3
Queue Length 50th (m)	0.0	0.0	1.9	0.0
Queue Length 95th (m)	30.4	m1.8	5.6	2.4
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	5300	5099	409	1626
Starvation Cap Reductn	144	0	0	0
Spillback Cap Reductn	195	0	0	59
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.18	0.03	0.10

Intersection Summary

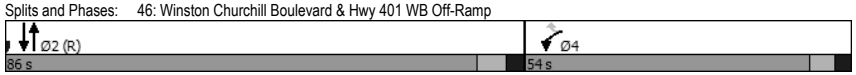
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	458	498	1644	0	0	2324
Future Volume (vph)	458	498	1644	0	0	2324
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.955	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3400	1424	5513	0	0	5408
Flt Permitted	0.966					
Satd. Flow (perm)	3400	1424	5513	0	0	5408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	11	11				
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	8%	13%	3%	2%	0%	5%
Adj. Flow (vph)	520	566	1868	0	0	2641
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	741	345	1868	0	0	2641
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	54.0	54.0	86.0			86.0
Total Split (%)	38.6%	38.6%	61.4%			61.4%
Maximum Green (s)	47.0	47.0	78.0			78.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	39.1	39.1	85.9			85.9
Actuated g/C Ratio	0.28	0.28	0.61			0.61
v/c Ratio	0.77	0.85	0.55			0.80
Control Delay	51.1	65.2	15.6			23.9
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	51.1	65.2	15.6			23.9
LOS	D	E	B			C
Approach Delay	55.6		15.6			23.9
Approach LOS	E		B			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 102.2 (73%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 27.3		Intersection LOS: C	
Intersection Capacity Utilization 70.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	741	345	1868	2641
v/c Ratio	0.77	0.85	0.55	0.80
Control Delay	51.1	65.2	15.6	23.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	51.1	65.2	15.6	23.9
Queue Length 50th (m)	95.3	95.8	98.0	195.9
Queue Length 95th (m)	106.1	125.0	116.0	233.9
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1148	485	3382	3318
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.71	0.55	0.80

Intersection Summary

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	704	370	0	1411	2319	0
Future Volume (vph)	704	370	0	1411	2319	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3685	1593	0	5567	5408	0
Flt Permitted	0.955					
Satd. Flow (perm)	3685	1593	0	5567	5408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1	1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	4%	1%	0%	2%	5%	8%
Adj. Flow (vph)	800	420	0	1603	2635	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	842	378	0	1603	2635	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

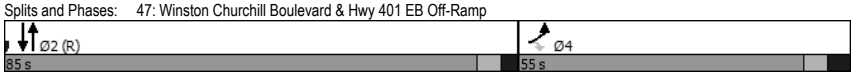
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	55.0	55.0		85.0	85.0	
Total Split (%)	39.3%	39.3%		60.7%	60.7%	
Maximum Green (s)	47.0	47.0		78.0	78.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	39.9	39.9		85.1	85.1	
Actuated g/C Ratio	0.28	0.28		0.61	0.61	
v/c Ratio	0.80	0.83		0.47	0.80	
Control Delay	52.2	62.4		16.4	21.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	52.2	62.4		16.4	21.2	
LOS	D	E		B	C	
Approach Delay	55.4			16.4	21.2	
Approach LOS	E			B	C	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 92.4 (66%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 27.4 Intersection LOS: C
Intersection Capacity Utilization 76.0% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	842	378	1603	2635
v/c Ratio	0.80	0.83	0.47	0.80
Control Delay	52.2	62.4	16.4	21.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.2	62.4	16.4	21.2
Queue Length 50th (m)	111.3	107.5	85.7	138.2
Queue Length 95th (m)	121.7	136.3	106.4	197.4
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	1237	535	3382	3285
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.71	0.47	0.80

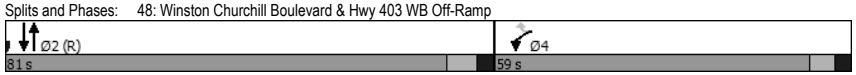
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	984	913	2616	0	0	2904
Future Volume (vph)	984	913	2616	0	0	2904
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.963	0.850				
Flt Protected	0.964					
Satd. Flow (prot)	3550	1547	5513	0	0	5513
Flt Permitted	0.964					
Satd. Flow (perm)	3548	1547	5513	0	0	5513
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	1	1				
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	4%	3%	0%	0%	3%
Adj. Flow (vph)	1047	971	2783	0	0	3089
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	1387	631	2783	0	0	3089
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	59.0	59.0	81.0			81.0
Total Split (%)	42.1%	42.1%	57.9%			57.9%
Maximum Green (s)	52.0	52.0	73.0			73.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	52.0	52.0	73.0			73.0
Actuated g/C Ratio	0.37	0.37	0.52			0.52
v/c Ratio	1.05	1.10	0.97			1.07
Control Delay	81.9	108.1	40.7			73.9
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	81.9	108.1	40.7			73.9
LOS	F	F	D			E
Approach Delay	90.1		40.7			73.9
Approach LOS	F		D			E

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 117.6 (84%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 66.3		Intersection LOS: E	
Intersection Capacity Utilization 132.6%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1387	631	2783	3089
v/c Ratio	1.05	1.10	0.97	1.07
Control Delay	81.9	108.1	40.7	73.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	81.9	108.1	40.7	73.9
Queue Length 50th (m)	~215.5	~217.0	233.9	~347.5
Queue Length 95th (m)	#257.9	#297.8	#289.5	#370.4
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1319	575	2874	2874
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.05	1.10	0.97	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1261	453	0	1535	2514	0
Future Volume (vph)	1261	453	0	1535	2514	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor	1.00					
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3795	1733	0	5460	5513	0
Flt Permitted	0.950					
Satd. Flow (perm)	3790	1733	0	5460	5513	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	0%	4%	3%	0%
Adj. Flow (vph)	1314	472	0	1599	2619	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1314	472	0	1599	2619	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

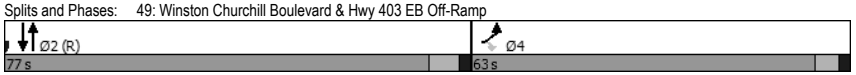
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	63.0	63.0		77.0	77.0	
Total Split (%)	45.0%	45.0%		55.0%	55.0%	
Maximum Green (s)	57.0	57.0		70.0	70.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	54.6	54.6		72.4	72.4	
Actuated g/C Ratio	0.39	0.39		0.52	0.52	
v/c Ratio	0.89	0.70		0.57	0.92	
Control Delay	48.2	41.8		24.4	36.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	48.2	41.8		24.4	36.2	
LOS	D	D		C	D	
Approach Delay	46.5			24.4	36.2	
Approach LOS	D			C	D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 50.4 (36%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 36.1 — Intersection LOS: D
Intersection Capacity Utilization 132.6% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1314	472	1599	2619
v/c Ratio	0.89	0.70	0.57	0.92
Control Delay	48.2	41.8	24.4	36.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	48.2	41.8	24.4	36.2
Queue Length 50th (m)	168.6	105.4	111.7	264.1
Queue Length 95th (m)	197.5	144.4	126.4	m239.8
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	1545	706	2824	2851
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.85	0.67	0.57	0.92

Intersection Summary

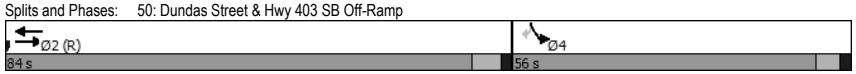
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3105	651	0	1312	582
Future Volume (vph)	0	3105	651	0	1312	582
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.994	0.850
Flt Protected					0.954	
Satd. Flow (prot)	0	5567	5307	0	3635	1449
Flt Permitted					0.954	
Satd. Flow (perm)	0	5567	5307	0	3635	1449
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					4	222
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	7%	0%	5%	11%
Adj. Flow (vph)	0	3201	671	0	1353	600
Shared Lane Traffic (%)						10%
Lane Group Flow (vph)	0	3201	671	0	1413	540
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		84.0	84.0		56.0	56.0
Total Split (%)		60.0%	60.0%		40.0%	40.0%
Maximum Green (s)		77.0	77.0		50.0	50.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		77.0	77.0		50.0	50.0
Actuated g/C Ratio		0.55	0.55		0.36	0.36
v/c Ratio		1.05	0.23		1.09	0.82
Control Delay		61.1	6.7		94.4	34.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		61.1	6.7		94.4	34.8
LOS		E	A		F	C
Approach Delay		61.1	6.7		77.9	
Approach LOS		E	A		E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 22.4 (16%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 60.5	Intersection LOS: E
Intersection Capacity Utilization 106.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3201	671	1413	540
v/c Ratio	1.05	0.23	1.09	0.82
Control Delay	61.1	6.7	94.4	34.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	61.1	6.7	94.4	34.8
Queue Length 50th (m)	~351.4	11.1	~225.8	93.8
Queue Length 95th (m)	#373.5	13.3	#268.2	#152.3
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	3061	2918	1300	660
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.05	0.23	1.09	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2909	0	0	1090	132	1128
Future Volume (vph)	2909	0	0	1090	132	1128
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Ped Bike Factor					1.00	
Frt					0.878	0.850
Flt Protected					0.991	
Satd. Flow (prot)	5513	0	0	5357	3448	1577
Flt Permitted					0.991	
Satd. Flow (perm)	5513	0	0	5357	3447	1577
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	0%	6%	1%	2%
Adj. Flow (vph)	3232	0	0	1211	147	1253
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	3232	0	0	1211	774	626
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	83.0			83.0	57.0	57.0
Total Split (%)	59.3%			59.3%	40.7%	40.7%
Maximum Green (s)	76.0			76.0	51.0	51.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	76.0			76.0	51.0	51.0
Actuated g/C Ratio	0.54			0.54	0.36	0.36
v/c Ratio	1.08			0.42	0.99dr	1.09
Control Delay	67.8			19.4	39.1	106.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	67.8			19.4	39.1	106.4
LOS	E			B	D	F
Approach Delay	67.8			19.4	69.2	
Approach LOS	E			B	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8.4 (6%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 58.1 Intersection LOS: E
Intersection Capacity Utilization 106.4% ICU Level of Service G
Analysis Period (min) 15
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street

Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	3232	1211	774	626
v/c Ratio	1.08	0.42	0.99dr	1.09
Control Delay	67.8	19.4	39.1	106.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	67.8	19.4	39.1	106.4
Queue Length 50th (m)	~363.4	70.1	90.1	~213.8
Queue Length 95th (m)	m#326.3	81.0	110.8	#293.4
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	2992	2908	1256	574
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.42	0.62	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	25	40	454	176	104	573
Future Volume (vph)	25	40	454	176	104	573
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	1883	1601	1789	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	1883	1601	1789	1883
Link Speed (k/h)	48		70			70
Link Distance (m)	294.8		780.0			514.0
Travel Time (s)	22.1		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	40	454	176	104	573
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	40	454	176	104	573
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
52: Ninth Line & Argentia Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	40	454	176	104	573
Future Volume (Veh/h)	25	40	454	176	104	573
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	40	454	176	104	573
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1235	454			630	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1235	454			630	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	93			89	
cM capacity (veh/h)	174	606			952	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	25	40	454	176	104	573
Volume Left	25	0	0	0	104	0
Volume Right	0	40	0	176	0	0
cSH	174	606	1700	1700	952	1700
Volume to Capacity	0.14	0.07	0.27	0.10	0.11	0.34
Queue Length 95th (m)	3.7	1.6	0.0	0.0	2.8	0.0
Control Delay (s)	29.2	11.4	0.0	0.0	9.2	0.0
Lane LOS	D	B			A	
Approach Delay (s)	18.2		0.0		1.4	
Approach LOS	C					

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
97: Ninth Line & Foxwood Ave

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	772	0	0	661
Future Volume (vph)	0	0	772	0	0	661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				15.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	1883	0	1883	1883
Flt Permitted						
Satd. Flow (perm)	1883	0	1883	0	1883	1883
Link Speed (k/h)	48		70			70
Link Distance (m)	226.1		301.0			850.0
Travel Time (s)	17.0		15.5			43.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	772	0	0	661
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	772	0	0	661
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
97: Ninth Line & Foxwood Ave

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	772	0	0	661
Future Volume (Veh/h)	0	0	772	0	0	661
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	772	0	0	661
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			301			
pX, platoon unblocked	0.51	0.51			0.51	
vC, conflicting volume	1433	772			772	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1368	63			63	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	82	507			780	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	0	772	0	661
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.45	0.00	0.39
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS	A			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
136: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1165	275	0	1169	0	0
Future Volume (vph)	1165	275	0	1169	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	125.7	
Travel Time (s)	15.5			6.8	9.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1165	275	0	1169	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1165	275	0	1169	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 70.9%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
136: Winston Churchill Boulevard

16/06/2017

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	3	581	7	3	636
Future Volume (vph)	11	3	581	7	3	636
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950					
Satd. Flow (prot)	1825	1633	1880	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1633	1880	0	0	1865
Link Speed (k/h)	48		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.3		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	3%
Adj. Flow (vph)	12	3	632	8	3	691
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	3	640	0	0	694
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	3	581	7	3	636
Future Volume (Veh/h)	11	3	581	7	3	636
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	3	632	8	3	691
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1333	636			640	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1333	636			640	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			100	
cM capacity (veh/h)	171	481			954	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	15	640	694
Volume Left	12	0	3
Volume Right	3	8	0
cSH	214	1700	954
Volume to Capacity	0.07	0.38	0.00
Queue Length 95th (m)	1.7	0.0	0.1
Control Delay (s)	24.6	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	24.6	0.0	0.1
Approach LOS	C		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
2: Ninth Line & Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	95	434	46	10	29	47	692	86	36	678	7
Future Volume (vph)	60	95	434	46	10	29	47	692	86	36	678	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	0.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.877			0.886				0.850		0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1652	0	1825	1609	0	1789	1902	1585	1722	1863	0
Flt Permitted	0.730			0.186			0.286			0.281		
Satd. Flow (perm)	1375	1652	0	357	1609	0	539	1902	1585	509	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		207			32				40		1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		175.6			287.6			434.9			780.0	
Travel Time (s)		13.2			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	7%	2%	1%	3%	6%	3%	2%
Adj. Flow (vph)	60	95	434	50	10	32	47	752	93	39	737	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	529	0	50	42	0	47	752	93	39	744	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	

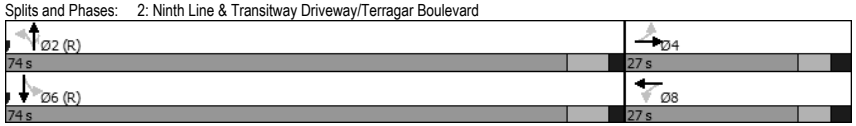
Lanes, Volumes, Timings
2: Ninth Line & Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		53.0	53.0	53.0	53.0	53.0	
Total Split (s)	27.0	27.0		27.0	27.0		74.0	74.0	74.0	74.0	74.0	
Total Split (%)	26.7%	26.7%		26.7%	26.7%		73.3%	73.3%	73.3%	73.3%	73.3%	
Maximum Green (s)	20.5	20.5		20.5	20.5		67.0	67.0	67.0	67.0	67.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0	35.0	35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0	10.0	10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)	21.5	21.5		21.5	21.5		68.0	68.0	68.0	68.0	68.0	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.67	0.67	0.67	0.67	0.67	
v/c Ratio	0.21	1.03		0.67	0.11		0.13	0.59	0.09	0.11	0.59	
Control Delay	35.0	72.6		78.8	15.4		7.0	11.2	3.7	6.9	11.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	35.0	72.6		78.8	15.4		7.0	11.2	3.7	6.9	11.4	
LOS	C	E		E	B		A	B	A	A	B	
Approach Delay		68.8			49.9			10.2			11.2	
Approach LOS		E			D			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 26.7	Intersection LOS: C
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Ninth Line & Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	529	50	42	47	752	93	39	744
v/c Ratio	0.21	1.03	0.67	0.11	0.13	0.59	0.09	0.11	0.59
Control Delay	35.0	72.6	78.8	15.4	7.0	11.2	3.7	6.9	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	72.6	78.8	15.4	7.0	11.2	3.7	6.9	11.4
Queue Length 50th (m)	9.7	~76.7	9.0	1.6	2.9	70.9	3.1	2.4	70.5
Queue Length 95th (m)	20.8	#139.9	#28.3	10.2	7.3	101.4	8.0	6.2	101.6
Internal Link Dist (m)		151.6		263.6		410.9			756.0
Turn Bay Length (m)							15.0	40.0	
Base Capacity (vph)	292	514	75	367	362	1280	1080	342	1254
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	1.03	0.67	0.11	0.13	0.59	0.09	0.11	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Ninth Line & Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	48	28	0	17	5	669	45	35	1229	3
Future Volume (vph)	6	0	48	28	0	17	5	669	45	35	1229	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850			0.991				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1541	0	1789	1850	0	1825	1883	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1541	0	1789	1850	0	1825	1883	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		131.4			310.4			412.4			434.9	
Travel Time (s)		9.9			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	6%	2%	3%	2%	0%	2%	2%
Adj. Flow (vph)	6	0	48	30	0	18	5	727	49	38	1336	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	48	0	30	18	0	5	776	0	38	1339	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 79.8% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Transitway Driveway/Hazelridge Road

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	48	28	0	17	5	669	45	35	1229	3
Future Volume (Veh/h)	6	0	48	28	0	17	5	669	45	35	1229	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	6	0	48	30	0	18	5	727	49	38	1336	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2168	2200	1338	2222	2176	752	1339			776		
vC1, stage 1 conf vol	1414	1414		762	762							
vC2, stage 2 conf vol	755	786		1460	1415							
vCu, unblocked vol	2168	2200	1338	2222	2176	752	1339			776		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	96	100	74	71	100	96	99			96		
cM capacity (veh/h)	145	170	187	104	170	404	515			849		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	6	48	30	18	5	776	38	1339
Volume Left	6	0	30	0	5	0	38	0
Volume Right	0	48	0	18	0	49	0	3
cSH	145	187	104	404	515	1700	849	1700
Volume to Capacity	0.04	0.26	0.29	0.04	0.01	0.46	0.04	0.79
Queue Length 95th (m)	1.0	7.4	8.3	1.1	0.2	0.0	1.1	0.0
Control Delay (s)	31.0	30.7	53.1	14.3	12.1	0.0	9.4	0.0
Lane LOS	D	D	F	B	B		A	
Approach Delay (s)	30.8		38.6		0.1		0.3	
Approach LOS	D		E					

Intersection Summary				
Average Delay		1.7		
Intersection Capacity Utilization	79.8%	ICU Level of Service	D	
Analysis Period (min)		15		

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Future Volume (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt		0.968			0.997				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	4950	0	1785	5172	0	1767	1921	1597	1733	1921	1597
Flt Permitted	0.064			0.281			0.074			0.417		
Satd. Flow (perm)	120	4950	0	528	5172	0	138	1921	1597	761	1921	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		70			2				155			90
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	4%	1%	0%	0%	3%	0%	0%
Adj. Flow (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Shared Lane Traffic (%)												
Lane Group Flow (vph)	144	931	0	164	2053	0	115	412	179	136	688	172
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

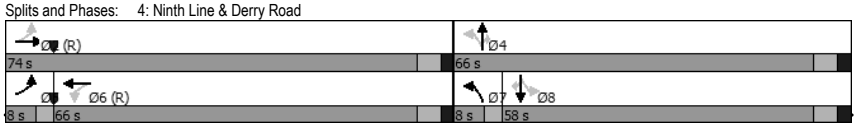
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		6	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		8.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	30.1		30.1	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	8.0	74.0		66.0	66.0		8.0	66.0	66.0	58.0	58.0	58.0
Total Split (%)	5.7%	52.9%		47.1%	47.1%		5.7%	47.1%	47.1%	41.4%	41.4%	41.4%
Maximum Green (s)	5.0	67.9		59.9	59.9		5.0	59.6	59.6	51.6	51.6	51.6
Yellow Time (s)	3.0	4.0		4.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.1		2.1	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.1		5.1	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead			Lag	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0		9.0	9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0		15.0	15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0		0	0			0	0	0	0	0
Act Effct Green (s)	72.6	69.5		60.9	60.9		63.4	60.0	60.0	52.0	52.0	52.0
Actuated g/C Ratio	0.52	0.50		0.44	0.44		0.45	0.43	0.43	0.37	0.37	0.37
v/c Ratio	1.03	0.37		0.72	0.91		0.87	0.50	0.23	0.48	0.96	0.26
Control Delay	123.2	15.7		44.6	38.6		76.8	31.6	5.9	40.5	69.2	15.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.2	15.7		44.6	38.6		76.8	31.6	5.9	40.5	69.2	15.3
LOS	F	B		D	D		E	C	A	D	E	B
Approach Delay		30.1			39.1			32.4			56.0	
Approach LOS		C			D			C			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 114.8 (82%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 39.6 Intersection LOS: D
Intersection Capacity Utilization 105.8% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	144	931	164	2053	115	412	179	136	688	172
v/c Ratio	1.03	0.37	0.72	0.91	0.87	0.50	0.23	0.48	0.96	0.26
Control Delay	123.2	15.7	44.6	38.6	76.8	31.6	5.9	40.5	69.2	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.2	15.7	44.6	38.6	76.8	31.6	5.9	40.5	69.2	15.3
Queue Length 50th (m)	~29.3	39.0	37.4	193.9	18.2	81.3	3.8	28.5	184.2	14.9
Queue Length 95th (m)	#73.8	41.5	#74.2	215.6	#51.1	111.5	17.8	49.9	#261.4	31.9
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	140	2491	229	2250	132	831	779	285	721	656
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.37	0.72	0.91	0.87	0.50	0.23	0.48	0.95	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	697	67	49	1220
Future Volume (vph)	46	47	697	67	49	1220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	1847	1617	1825	1865
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1585	1847	1617	1825	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	758	73	53	1326
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	758	73	53	1326
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 74.9%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	47	697	67	49	1220
Future Volume (Veh/h)	46	47	697	67	49	1220
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	51	758	73	53	1326
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2190	760			831	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2190	760			831	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	87			93	
cM capacity (veh/h)	47	404			810	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	101	758	73	53	1326
Volume Left	50	0	0	53	0
Volume Right	51	0	73	0	0
cSH	88	1700	1700	810	1700
Volume to Capacity	1.14	0.45	0.04	0.07	0.78
Queue Length 95th (m)	53.2	0.0	0.0	1.6	0.0
Control Delay (s)	226.3	0.0	0.0	9.8	0.0
Lane LOS	F			A	
Approach Delay (s)	226.3	0.0		0.4	
Approach LOS	F				

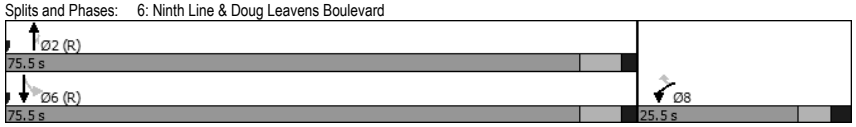
Intersection Summary			
Average Delay	10.1		
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	62	57	729	106	97	1046
Future Volume (vph)	62	57	729	106	97	1046
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	27.0		60.0	115.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	1883	1633	1825	1883
Flt Permitted	0.950				0.320	
Satd. Flow (perm)	1789	1564	1883	1633	615	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		62		115		
Link Speed (k/h)	50		70			70
Link Distance (m)	255.0		1151.0			603.1
Travel Time (s)	18.4		59.2			31.0
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	2%
Adj. Flow (vph)	67	62	792	115	105	1137
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	62	792	115	105	1137
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	45.0	45.0
Minimum Split (s)	25.5	25.5	53.0	53.0	53.0	53.0
Total Split (s)	25.5	25.5	75.5	75.5	75.5	75.5
Total Split (%)	25.2%	25.2%	74.8%	74.8%	74.8%	74.8%
Maximum Green (s)	19.0	19.0	68.5	68.5	68.5	68.5
Yellow Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0	35.0	35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	10.7	10.7	82.9	82.9	82.9	82.9
Actuated g/C Ratio	0.11	0.11	0.82	0.82	0.82	0.82
v/c Ratio	0.36	0.28	0.51	0.08	0.21	0.74
Control Delay	46.8	14.0	11.3	2.4	4.2	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	14.0	11.3	2.4	4.2	9.8
LOS	D	B	B	A	A	A
Approach Delay	31.1		10.2			9.3
Approach LOS	C		B			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 10.9		Intersection LOS: B	
Intersection Capacity Utilization 97.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 6: Ninth Line & Doug Leavens Boulevard



Queues
6: Ninth Line & Doug Leavens Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	67	62	792	115	105	1137
v/c Ratio	0.36	0.28	0.51	0.08	0.21	0.74
Control Delay	46.8	14.0	11.3	2.4	4.2	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	14.0	11.3	2.4	4.2	9.8
Queue Length 50th (m)	12.5	0.0	101.2	3.4	4.2	94.9
Queue Length 95th (m)	24.5	11.3	169.6	m5.1	10.7	178.9
Internal Link Dist (m)	231.0		1127.0			579.1
Turn Bay Length (m)		27.0		60.0	115.0	
Base Capacity (vph)	354	359	1546	1361	505	1546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.17	0.51	0.08	0.21	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
7: Ninth Line & Osprey Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	133	44	911	147	71	1299
Future Volume (vph)	133	44	911	147	71	1299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	13.0	0.0		25.0	270.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	13.0				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1738	1526	1865	1570	1825	1847
Flt Permitted	0.950				0.160	
Satd. Flow (perm)	1738	1491	1865	1570	307	1847
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		48		67		
Link Speed (k/h)	50		70			70
Link Distance (m)	160.0		383.2			1151.0
Travel Time (s)	11.5		19.7			59.2
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	7%	3%	4%	0%	4%
Adj. Flow (vph)	145	48	990	160	77	1412
Shared Lane Traffic (%)						
Lane Group Flow (vph)	145	48	990	160	77	1412
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
7: Ninth Line & Osprey Boulevard

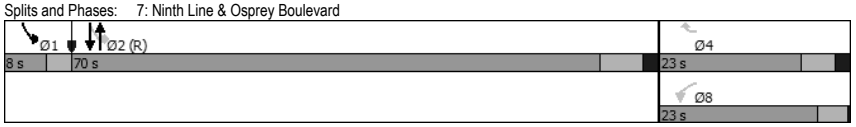
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4		2	2	
Detector Phase	8	4	2	2	1	2
Switch Phase						
Minimum Initial (s)	4.0	8.0	45.0	45.0	5.0	45.0
Minimum Split (s)	20.0	23.0	52.0	52.0	8.0	52.0
Total Split (s)	23.0	23.0	70.0	70.0	8.0	70.0
Total Split (%)	22.8%	22.8%	69.3%	69.3%	7.9%	69.3%
Maximum Green (s)	19.0	17.0	63.0	63.0	5.0	63.0
Yellow Time (s)	3.5	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	0.5	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.0	6.0	6.0	2.0	6.0
Lead/Lag			Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	5.0	8.0	37.0	37.0		37.0
Flash Dont Walk (s)	11.0	9.0	8.0	8.0		8.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	15.0	13.0	69.8	69.8	79.4	69.8
Actuated g/C Ratio	0.15	0.13	0.69	0.69	0.79	0.69
v/c Ratio	0.56	0.21	0.77	0.14	0.22	1.11
Control Delay	48.1	13.0	17.1	4.2	4.6	80.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	13.0	17.1	4.2	4.6	80.1
LOS	D	B	B	A	A	F
Approach Delay	39.4		15.4			76.2
Approach LOS	D		B			E

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 49.0 Intersection LOS: D
Intersection Capacity Utilization 84.3% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 7: Ninth Line & Osprey Boulevard



Queues
7: Ninth Line & Osprey Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	145	48	990	160	77	1412
v/c Ratio	0.56	0.21	0.77	0.14	0.22	1.11
Control Delay	48.1	13.0	17.1	4.2	4.6	80.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	13.0	17.1	4.2	4.6	80.1
Queue Length 50th (m)	26.8	0.0	120.3	5.6	3.4	~320.2
Queue Length 95th (m)	43.6	9.5	205.2	14.1	m6.1	#418.0
Internal Link Dist (m)	136.0		359.2			1127.0
Turn Bay Length (m)	13.0			25.0	270.0	
Base Capacity (vph)	344	305	1288	1105	345	1276
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.16	0.77	0.14	0.22	1.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
8: Ninth Line & Parkgate Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	14	19	851	20	32	965
Future Volume (vph)	14	19	851	20	32	965
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0	0.0		0.0	35.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				60.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.997			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1897	0	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1897	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	207.4		254.7			383.2
Travel Time (s)	14.9		13.1			19.7
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	2%
Adj. Flow (vph)	15	21	925	22	35	1049
Shared Lane Traffic (%)						
Lane Group Flow (vph)	15	21	947	0	35	1049
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 61.1%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Parkgate Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	19	851	20	32	965
Future Volume (Veh/h)	14	19	851	20	32	965
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	21	925	22	35	1049
Pedestrians						1
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			255			383
pX, platoon unblocked	0.62	0.51			0.51	
vC, conflicting volume	2055	937			947	
vC1, stage 1 conf vol	936					
vC2, stage 2 conf vol	1119					
vCu, unblocked vol	621	402			422	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	94			94	
cM capacity (veh/h)	263	334			589	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	15	21	947	35	1049
Volume Left	15	0	0	35	0
Volume Right	0	21	22	0	0
cSH	263	334	1700	589	1700
Volume to Capacity	0.06	0.06	0.56	0.06	0.62
Queue Length 95th (m)	1.4	1.5	0.0	1.4	0.0
Control Delay (s)	19.5	16.5	0.0	11.5	0.0
Lane LOS	C	C		B	
Approach Delay (s)	17.7		0.0	0.4	
Approach LOS	C				

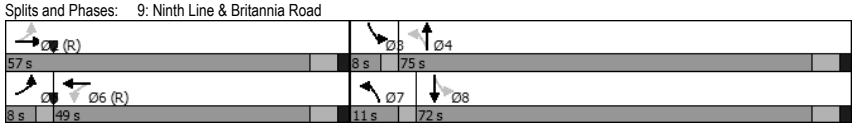
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Future Volume (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.969			0.991			0.987			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	5003	0	1767	5192	0	1767	1891	0	1684	1870	0
Flt Permitted	0.088			0.156			0.058			0.060		
Satd. Flow (perm)	164	5003	0	290	5192	0	108	1891	0	106	1870	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		53			7			5			6	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	1%	0%	2%	1%	0%	3%	6%	1%	1%
Adj. Flow (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	1166	0	96	1639	0	182	1110	0	140	1090	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	8.0	24.6		24.6	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	8.0	57.0		49.0	49.0		11.0	75.0		8.0	72.0	
Total Split (%)	5.7%	40.7%		35.0%	35.0%		7.9%	53.6%		5.7%	51.4%	
Maximum Green (s)	5.0	50.4		42.4	42.4		8.0	68.4		5.0	65.4	
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	0.0	2.0		2.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	2.0	5.6		5.6	5.6		2.0	5.6		2.0	5.6	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0			12.0			12.0	
Flash Dont Walk (s)		11.0		11.0	11.0			18.0			18.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	55.0	51.4		43.4	43.4		81.0	69.4		76.0	66.4	
Actuated g/C Ratio	0.39	0.37		0.31	0.31		0.58	0.50		0.54	0.47	
v/c Ratio	0.89	0.62		1.08	1.02		1.08	1.18		1.12	1.22	
Control Delay	91.7	42.7		158.5	70.3		123.4	125.8		144.2	144.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	91.7	42.7		158.5	70.3		123.4	125.8		144.2	144.5	
LOS	F	D		F	E		F	F		F	F	
Approach Delay		47.2			75.2			125.5			144.4	
Approach LOS		D			E			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 32.2 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 95.8		Intersection LOS: F	
Intersection Capacity Utilization 123.0%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	1166	96	1639	182	1110	140	1090
v/c Ratio	0.89	0.62	1.08	1.02	1.08	1.18	1.12	1.22
Control Delay	91.7	42.7	158.5	70.3	123.4	125.8	144.2	144.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.7	42.7	158.5	70.3	123.4	125.8	144.2	144.5
Queue Length 50th (m)	27.3	107.0	~29.3	~174.7	~39.7	~368.3	~28.9	~371.2
Queue Length 95th (m)	#54.4	122.6	#67.1	#204.8	#88.6	#449.3	#72.7	#452.2
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	133	1870	89	1614	169	939	125	890
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.62	1.08	1.02	1.08	1.18	1.12	1.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	12	13	0	13	3	1125	22	26	1280	10
Future Volume (vph)	55	0	12	13	0	13	3	1125	22	26	1280	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850			0.997			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	1879	0	1825	1882	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	1879	0	1825	1882	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		182.4			491.2			170.0			206.5	
Travel Time (s)		13.7			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	55	0	12	14	0	14	3	1223	24	28	1391	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	12	0	14	14	0	3	1247	0	28	1401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 84.4% ICU Level of Service E
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Transitway Driveway/Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	0	12	13	0	13	3	1125	22	26	1280	10
Future Volume (Veh/h)	55	0	12	13	0	13	3	1125	22	26	1280	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	55	0	12	14	0	14	3	1223	24	28	1391	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											206	
pX, platoon unblocked	0.50	0.50	0.50	0.50	0.50		0.50					
vC, conflicting volume	2695	2705	1396	2700	2698	1235	1401			1247		
vC1, stage 1 conf vol	1452	1452		1241	1241							
vC2, stage 2 conf vol	1243	1253		1459	1457							
vCu, unblocked vol	3879	3899	1293	3889	3885	1235	1303			1247		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	21	100	88	78	100	94	99			95		
cM capacity (veh/h)	70	84	100	63	83	217	267			565		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	55	12	14	14	3	1247	28	1401
Volume Left	55	0	14	0	3	0	28	0
Volume Right	0	12	0	14	0	24	0	10
cSH	70	100	63	217	267	1700	565	1700
Volume to Capacity	0.79	0.12	0.22	0.06	0.01	0.73	0.05	0.82
Queue Length 95th (m)	28.2	3.0	5.8	1.6	0.3	0.0	1.2	0.0
Control Delay (s)	152.8	45.9	78.4	22.7	18.6	0.0	11.7	0.0
Lane LOS	F	E	F	C	C		B	
Approach Delay (s)	133.6		50.6		0.0		0.2	
Approach LOS	F		F					

Intersection Summary				
Average Delay		3.9		
Intersection Capacity Utilization		84.4%	ICU Level of Service	E
Analysis Period (min)		15		

Lanes, Volumes, Timings
11: Ninth Line & Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	0	18	8	0	17	0	1178	35	18	1250	0
Future Volume (vph)	37	0	18	8	0	17	0	1178	35	18	1250	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.850			0.850				0.850			
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1883	1902	1498	1825	1902	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1883	1902	1498	1825	1902	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		161.9			511.9			217.0			170.0	
Travel Time (s)		12.1			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	9%	0%	1%	2%
Adj. Flow (vph)	37	0	18	9	0	18	0	1280	38	20	1359	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	18	0	9	18	0	0	1280	38	20	1359	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 81.2%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & Transitway Driveway/McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	0	18	8	0	17	0	1178	35	18	1250	0
Future Volume (Veh/h)	37	0	18	8	0	17	0	1178	35	18	1250	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	37	0	18	9	0	18	0	1280	38	20	1359	0
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											376	
pX, platoon unblocked	0.53	0.53	0.53	0.53	0.53		0.53					
vC, conflicting volume	2698	2717	1359	2697	2679	1281	1359			1318		
vC1, stage 1 conf vol	1399	1399		1280	1280							
vC2, stage 2 conf vol	1299	1318		1417	1399							
vCu, unblocked vol	3753	3789	1235	3751	3717	1281	1235			1318		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	53	100	84	87	100	91	100			96		
cM capacity (veh/h)	79	95	114	72	99	204	300			531		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	37	18	9	18	0	1280	38	20	1359
Volume Left	37	0	9	0	0	0	0	20	0
Volume Right	0	18	0	18	0	0	38	0	0
cSH	79	114	72	204	1700	1700	1700	531	1700
Volume to Capacity	0.47	0.16	0.13	0.09	0.00	0.75	0.02	0.04	0.80
Queue Length 95th (m)	14.6	4.1	3.1	2.2	0.0	0.0	0.0	0.9	0.0
Control Delay (s)	85.3	42.3	62.3	24.3	0.0	0.0	0.0	12.0	0.0
Lane LOS	F	E	F	C				B	
Approach Delay (s)	71.2		37.0		0.0			0.2	
Approach LOS	F		E						

Intersection Summary			
Average Delay		1.9	
Intersection Capacity Utilization		81.2%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	5	1184	20	12	1291
Future Volume (vph)	9	5	1184	20	12	1291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		35.0	30.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1883	1633	1825	1902
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1883	1633	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	1%
Adj. Flow (vph)	10	5	1287	22	13	1403
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	5	1287	22	13	1403
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 77.9%			ICU Level of Service D
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	5	1184	20	12	1291
Future Volume (Veh/h)	9	5	1184	20	12	1291
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	5	1287	22	13	1403
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2716	1287			1309	
vC1, stage 1 conf vol	1287					
vC2, stage 2 conf vol	1429					
vCu, unblocked vol	2716	1287			1309	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	98			98	
cM capacity (veh/h)	161	203			535	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	15	1287	22	13	1403
Volume Left	10	0	0	13	0
Volume Right	5	0	22	0	0
cSH	242	1700	1700	535	1700
Volume to Capacity	0.06	0.76	0.01	0.02	0.83
Queue Length 95th (m)	1.5	0.0	0.0	0.6	0.0
Control Delay (s)	26.9	0.0	0.0	11.9	0.0
Lane LOS	D			B	
Approach Delay (s)	26.9	0.0		0.1	
Approach LOS	D				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	9	1183	13	6	1225
Future Volume (vph)	3	9	1183	13	6	1225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1900	0	1825	1902
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1900	0	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	3	10	1286	14	7	1332
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	10	1300	0	7	1332
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 74.5%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	9	1183	13	6	1225
Future Volume (Veh/h)	3	9	1183	13	6	1225
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	10	1286	14	7	1332
Pedestrians	1					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.35	0.35			0.35	
vC, conflicting volume	2640	1294			1301	
vC1, stage 1 conf vol	1294					
vC2, stage 2 conf vol	1346					
vCu, unblocked vol	4752	912			932	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	91			97	
cM capacity (veh/h)	111	117			260	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	13	1300	7	1332
Volume Left	3	0	7	0
Volume Right	10	14	0	0
cSH	152	1700	260	1700
Volume to Capacity	0.09	0.76	0.03	0.78
Queue Length 95th (m)	2.1	0.0	0.6	0.0
Control Delay (s)	38.5	0.0	19.2	0.0
Lane LOS	E		C	
Approach Delay (s)	38.5	0.0	0.1	
Approach LOS	E			

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		74.5%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
14: Ninth Line & Thomas Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	110	92	1148	145	85	1146
Future Volume (vph)	110	92	1148	145	85	1146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	28.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				45.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1555	1902	1633	1807	1883
Flt Permitted	0.950				0.059	
Satd. Flow (perm)	1807	1555	1902	1607	112	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		100		64		
Link Speed (k/h)	50		70			70
Link Distance (m)	534.8		346.0			306.2
Travel Time (s)	38.5		17.8			15.7
Confl. Peds. (#/hr)				6	6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	5%	1%	0%	1%	2%
Adj. Flow (vph)	120	100	1248	158	92	1246
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	100	1248	158	92	1246
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
14: Ninth Line & Thomas Street

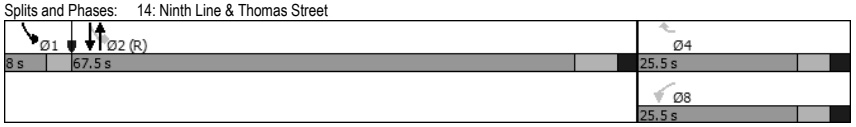
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4		2	2	
Detector Phase	8	4	2	2	1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	5.0	45.0
Minimum Split (s)	25.5	25.5	52.5	52.5	8.0	52.5
Total Split (s)	25.5	25.5	67.5	67.5	8.0	67.5
Total Split (%)	25.2%	25.2%	66.8%	66.8%	7.9%	66.8%
Maximum Green (s)	19.0	19.0	60.0	60.0	5.0	60.0
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.5	2.5	2.5	2.5	0.0	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.5	6.5	2.0	6.5
Lead/Lag			Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	8.0	8.0	33.0	33.0		33.0
Flash Dont Walk (s)	11.0	11.0	12.0	12.0		12.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	13.1	13.1	68.0	68.0	78.8	68.0
Actuated g/C Ratio	0.13	0.13	0.67	0.67	0.78	0.67
v/c Ratio	0.51	0.35	0.97	0.14	0.43	0.98
Control Delay	44.9	13.6	39.9	6.3	15.5	40.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	13.6	39.9	6.3	15.5	40.7
LOS	D	B	D	A	B	D
Approach Delay	30.7		36.1			39.0
Approach LOS	C		D			D

Intersection Summary

Area Type:	Other
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 37.0	Intersection LOS: D
Intersection Capacity Utilization 85.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 14: Ninth Line & Thomas Street



Queues
14: Ninth Line & Thomas Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	120	100	1248	158	92	1246
v/c Ratio	0.51	0.35	0.97	0.14	0.43	0.98
Control Delay	44.9	13.6	39.9	6.3	15.5	40.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	13.6	39.9	6.3	15.5	40.7
Queue Length 50th (m)	22.9	0.0	263.0	9.2	3.0	~225.6
Queue Length 95th (m)	39.9	16.5 m	#305.9	m12.1	16.6	#354.6
Internal Link Dist (m)	510.8		322.0			282.2
Turn Bay Length (m)				35.0	28.0	
Base Capacity (vph)	357	388	1280	1102	215	1267
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.26	0.97	0.14	0.43	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	6	1194	27	19	1189
Future Volume (vph)	9	6	1194	27	19	1189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1902	1633	1825	1902
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1902	1633	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	10	7	1298	29	21	1292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	7	1298	29	21	1292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 72.8%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	6	1194	27	19	1189
Future Volume (Veh/h)	9	6	1194	27	19	1189
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	7	1298	29	21	1292
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.33					
vC, conflicting volume	2632	1298			1327	
vC1, stage 1 conf vol	1298					
vC2, stage 2 conf vol	1334					
vCu, unblocked vol	4938	1298			1327	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	96			96	
cM capacity (veh/h)	98	200			527	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	17	1298	29	21	1292
Volume Left	10	0	0	21	0
Volume Right	7	0	29	0	0
cSH	167	1700	1700	527	1700
Volume to Capacity	0.10	0.76	0.02	0.04	0.76
Queue Length 95th (m)	2.5	0.0	0.0	0.9	0.0
Control Delay (s)	36.7	0.0	0.0	12.1	0.0
Lane LOS	E			B	
Approach Delay (s)	36.7	0.0		0.2	
Approach LOS	E				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	30	27	1286	71	47	1274
Future Volume (vph)	30	27	1286	71	47	1274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1883	1633	1825	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1883	1633	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	33	29	1398	77	51	1385
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	29	1398	77	51	1385
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 77.7%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	27	1286	71	47	1274
Future Volume (Veh/h)	30	27	1286	71	47	1274
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	29	1398	77	51	1385
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2885	1398			1475	
vC1, stage 1 conf vol	1398					
vC2, stage 2 conf vol	1487					
vCu, unblocked vol	2885	1398			1475	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	83			89	
cM capacity (veh/h)	139	174			463	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	62	1398	77	51	1385
Volume Left	33	0	0	51	0
Volume Right	29	0	77	0	0
cSH	261	1700	1700	463	1700
Volume to Capacity	0.24	0.82	0.05	0.11	0.81
Queue Length 95th (m)	6.9	0.0	0.0	2.8	0.0
Control Delay (s)	34.6	0.0	0.0	13.7	0.0
Lane LOS	D			B	
Approach Delay (s)	34.6	0.0		0.5	
Approach LOS	D				

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Janice Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	6	1315	5	10	1248
Future Volume (vph)	0	6	1315	5	10	1248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	70.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected					0.950	
Satd. Flow (prot)	1662	0	1902	0	1825	1883
Flt Permitted					0.950	
Satd. Flow (perm)	1662	0	1902	0	1825	1883
Link Speed (k/h)	50		70			70
Link Distance (m)	113.3		424.8			250.0
Travel Time (s)	8.2		21.8			12.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	2%
Adj. Flow (vph)	0	7	1429	5	11	1357
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	0	1434	0	11	1357
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 79.5%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Janice Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	6	1315	5	10	1248
Future Volume (Veh/h)	0	6	1315	5	10	1248
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	7	1429	5	11	1357
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2810	1432			1434	
vC1, stage 1 conf vol	1432					
vC2, stage 2 conf vol	1379					
vCu, unblocked vol	2810	1432			1434	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			98	
cM capacity (veh/h)	154	166			480	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	7	1434	11	1357
Volume Left	0	0	11	0
Volume Right	7	5	0	0
cSH	166	1700	480	1700
Volume to Capacity	0.04	0.84	0.02	0.80
Queue Length 95th (m)	1.0	0.0	0.5	0.0
Control Delay (s)	27.6	0.0	12.7	0.0
Lane LOS	D		B	
Approach Delay (s)	27.6	0.0	0.1	
Approach LOS	D			

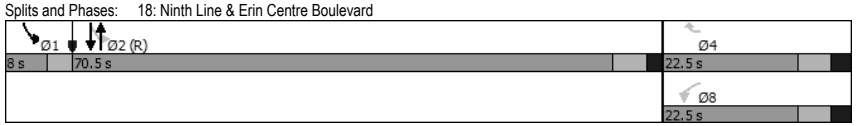
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	62	1253	51	44	1099
Future Volume (vph)	46	62	1253	51	44	1099
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.995			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	1880	0	1825	1883
Flt Permitted	0.950				0.054	
Satd. Flow (perm)	1789	1585	1880	0	104	1883
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		67	4			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	1%	18%	0%	2%
Adj. Flow (vph)	50	67	1362	55	48	1195
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	67	1417	0	48	1195
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	22.5	22.5	70.5		8.0	70.5
Total Split (%)	22.3%	22.3%	69.8%		7.9%	69.8%
Maximum Green (s)	16.0	16.0	64.5		5.0	64.5
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	8.0	8.0	50.0			50.0
Flash Dont Walk (s)	8.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	10.0	10.0	77.2		84.8	77.2
Actuated g/C Ratio	0.10	0.10	0.76		0.84	0.76
v/c Ratio	0.28	0.31	0.99		0.23	0.83
Control Delay	46.1	14.5	37.4		6.2	24.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.1	14.5	37.4		6.2	24.6
LOS	D	B	D		A	C
Approach Delay	28.0		37.4			23.9
Approach LOS	C		D			C

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 135	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 31.0	Intersection LOS: C
Intersection Capacity Utilization 84.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	50	67	1417	48	1195
v/c Ratio	0.28	0.31	0.99	0.23	0.83
Control Delay	46.1	14.5	37.4	6.2	24.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	14.5	37.4	6.2	24.6
Queue Length 50th (m)	9.3	0.0	~304.6	1.5	244.4
Queue Length 95th (m)	19.9	11.9	#399.1	m2.5	m263.5
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	301	322	1437	206	1438
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.21	0.99	0.23	0.83

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Candlelight Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	11	1189	15	23	1081
Future Volume (vph)	5	11	1189	15	23	1081
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	1899	0	1825	1902
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	1899	0	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	216.6		90.1			404.2
Travel Time (s)	15.6		4.6			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	5	12	1292	16	25	1175
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	12	1308	0	25	1175
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 73.5% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Candlelight Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	11	1189	15	23	1081
Future Volume (Veh/h)	5	11	1189	15	23	1081
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	12	1292	16	25	1175
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			373			
pX, platoon unblocked	0.66	0.66			0.66	
vC, conflicting volume	2525	1300			1308	
vC1, stage 1 conf vol	1300					
vC2, stage 2 conf vol	1225					
vCu, unblocked vol	3046	1198			1210	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	92			94	
cM capacity (veh/h)	145	151			387	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	17	1308	25	1175
Volume Left	5	0	25	0
Volume Right	12	16	0	0
cSH	214	1700	387	1700
Volume to Capacity	0.08	0.77	0.06	0.69
Queue Length 95th (m)	1.9	0.0	1.6	0.0
Control Delay (s)	30.8	0.0	15.0	0.0
Lane LOS	D		B	
Approach Delay (s)	30.8	0.0	0.3	
Approach LOS	D			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	1226	2	16	1111
Future Volume (vph)	1	1	1226	2	16	1111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932					
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1748	0	1902	0	1825	1902
Flt Permitted	0.976				0.950	
Satd. Flow (perm)	1748	0	1902	0	1825	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	1	1	1333	2	17	1208
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1335	0	17	1208
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 74.6%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	1	1226	2	16	1111
Future Volume (Veh/h)	1	1	1226	2	16	1111
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	1333	2	17	1208
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.66	0.66			0.66	
vC, conflicting volume	2576	1334			1335	
vC1, stage 1 conf vol	1334					
vC2, stage 2 conf vol	1242					
vCu, unblocked vol	3134	1248			1249	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			95	
cM capacity (veh/h)	140	141			371	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	2	1335	17	1208
Volume Left	1	0	17	0
Volume Right	1	2	0	0
cSH	140	1700	371	1700
Volume to Capacity	0.01	0.79	0.05	0.71
Queue Length 95th (m)	0.3	0.0	1.1	0.0
Control Delay (s)	31.1	0.0	15.2	0.0
Lane LOS	D		C	
Approach Delay (s)	31.1	0.0	0.2	
Approach LOS	D			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Stardust Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	2	1311	5	3	1125
Future Volume (vph)	0	2	1311	5	3	1125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1662	1902	0	0	1902
Flt Permitted						
Satd. Flow (perm)	0	1662	1902	0	0	1902
Link Speed (k/h)	50		70			70
Link Distance (m)	245.5		191.7			91.0
Travel Time (s)	17.7		9.9			4.7
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	0	2	1425	5	3	1223
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2	1430	0	0	1226
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 79.3%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Stardust Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	2	1311	5	3	1125
Future Volume (Veh/h)	0	2	1311	5	3	1125
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	1425	5	3	1223
Pedestrians	1					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			192			
pX, platoon unblocked	0.65	0.65			0.65	
vC, conflicting volume	2658	1428			1426	
vC1, stage 1 conf vol	1428					
vC2, stage 2 conf vol	1229					
vCu, unblocked vol	3272	1391			1387	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			99	
cM capacity (veh/h)	126	115			326	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	2	1430	1226
Volume Left	0	0	3
Volume Right	2	5	0
cSH	115	1700	326
Volume to Capacity	0.02	0.84	0.01
Queue Length 95th (m)	0.4	0.0	0.2
Control Delay (s)	36.9	0.0	0.6
Lane LOS	E		A
Approach Delay (s)	36.9	0.0	0.6
Approach LOS	E		

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		79.3%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	358	18	39	786	420	178	614	32	268	582	64
Future Volume (vph)	48	358	18	39	786	420	178	614	32	268	582	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.993			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3547	0	1789	1812	1458	1825	1871	0	1807	1861	0
Flt Permitted	0.067			0.477			0.082			0.078		
Satd. Flow (perm)	129	3547	0	898	1812	1458	158	1871	0	148	1861	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				262		2			5	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	6%	2%	6%	12%	0%	2%	1%	1%	1%	8%
Adj. Flow (vph)	52	389	20	42	854	457	193	667	35	291	633	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	409	0	42	854	457	193	702	0	291	703	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		7	4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

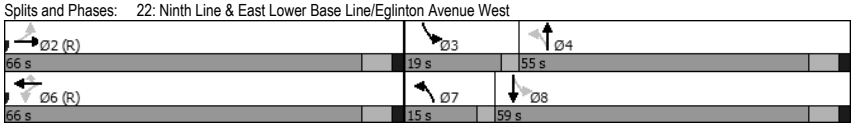
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	5.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	8.0	24.0		8.0	24.0	
Total Split (s)	66.0	66.0		66.0	66.0	66.0	15.0	55.0		19.0	59.0	
Total Split (%)	47.1%	47.1%		47.1%	47.1%	47.1%	10.7%	39.3%		13.6%	42.1%	
Maximum Green (s)	59.0	59.0		59.0	59.0	59.0	12.0	48.0		16.0	52.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	0.0		0.0	-1.0	0.0	-1.0	-1.0		-1.0	0.0	
Total Lost Time (s)	6.0	7.0		7.0	6.0	7.0	2.0	6.0		2.0	7.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	Min		None	Min	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0		8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0		9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)	60.0	59.0		59.0	60.0	59.0	65.8	49.0		72.0	52.2	
Actuated g/C Ratio	0.43	0.42		0.42	0.43	0.42	0.47	0.35		0.51	0.37	
v/c Ratio	0.95	0.27		0.11	1.10	0.60	0.85	1.07		1.05	1.01	
Control Delay	149.1	26.8		25.7	101.3	16.0	64.2	98.5		106.1	79.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	149.1	26.8		25.7	101.3	16.0	64.2	98.5		106.1	79.5	
LOS	F	C		C	F	B	E	F		F	E	
Approach Delay		40.6			70.1			91.1			87.3	
Approach LOS		D			E			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 76.1 — Intersection LOS: E
Intersection Capacity Utilization 103.8% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	409	42	854	457	193	702	291	703
v/c Ratio	0.95	0.27	0.11	1.10	0.60	0.85	1.07	1.05	1.01
Control Delay	149.1	26.8	25.7	101.3	16.0	64.2	98.5	106.1	79.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	149.1	26.8	25.7	101.3	16.0	64.2	98.5	106.1	79.5
Queue Length 50th (m)	13.6	38.0	7.0	~267.5	40.2	35.4	~214.8	~70.4	~198.4
Queue Length 95th (m)	#42.2	50.2	15.1	#344.5	75.4	#76.6	#290.0	#128.1	#278.7
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	55	1497	378	776	766	229	656	277	697
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.27	0.11	1.10	0.60	0.84	1.07	1.05	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	207	27	135	169	14	16	13	72	10	15	9
Future Volume (vph)	9	207	27	135	169	14	16	13	72	10	15	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.985			0.994			0.903			0.964	
Flt Protected		0.998			0.979			0.992			0.985	
Satd. Flow (prot)	0	1889	0	0	1862	0	0	1673	0	0	1824	0
Flt Permitted		0.998			0.979			0.992			0.985	
Satd. Flow (perm)	0	1889	0	0	1862	0	0	1673	0	0	1824	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	2		10	10		2	5		3	3		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	10	225	29	147	184	15	17	14	78	11	16	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	264	0	0	346	0	0	109	0	0	37	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	207	27	135	169	14	16	13	72	10	15	9
Future Volume (vph)	9	207	27	135	169	14	16	13	72	10	15	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	225	29	147	184	15	17	14	78	11	16	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	264	346	109	37
Volume Left (vph)	10	147	17	11
Volume Right (vph)	29	15	78	10
Hadj (s)	-0.06	0.07	-0.35	-0.10
Departure Headway (s)	4.6	4.7	5.0	5.4
Degree Utilization, x	0.34	0.45	0.15	0.06
Capacity (veh/h)	744	742	627	574
Control Delay (s)	10.0	11.4	8.9	8.7
Approach Delay (s)	10.0	11.4	8.9	8.7
Approach LOS	B	B	A	A

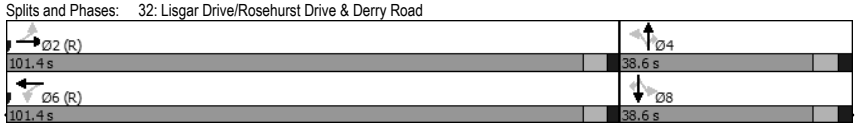
Intersection Summary				
Delay		10.4		
Level of Service		B		
Intersection Capacity Utilization		48.1%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Future Volume (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00		0.99		0.99	1.00		0.98
Frt		0.992			0.988				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5047	0	1785	5119	0	1785	1921	1617	1785	1830	1566
Flt Permitted	0.051			0.274			0.733			0.734		
Satd. Flow (perm)	96	5047	0	513	5119	0	1362	1921	1593	1376	1830	1529
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			22				160			23
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	4		6	6		4	9		2	2		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	1%	0%	0%	1%	0%	5%	2%
Adj. Flow (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	987	0	335	2388	0	47	36	160	99	37	45
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	101.4	101.4		101.4	101.4		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (%)	72.4%	72.4%		72.4%	72.4%		27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Maximum Green (s)	95.4	95.4		95.4	95.4		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	113.0	113.0		113.0	113.0		16.4	16.4	16.4	16.4	16.4	16.4
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.12	0.12	0.12	0.12	0.12	0.12
v/c Ratio	0.74	0.24		0.81	0.58		0.30	0.16	0.49	0.61	0.17	0.23
Control Delay	62.9	2.6		27.4	5.9		59.3	54.8	12.7	74.1	55.2	33.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.9	2.6		27.4	5.9		59.3	54.8	12.7	74.1	55.2	33.6
LOS	E	A		C	A		E	D	B	E	E	C
Approach Delay		5.9			8.5			28.0			60.1	
Approach LOS		A			A			C			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 113.4 (81%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 11.2	Intersection LOS: B
Intersection Capacity Utilization 85.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	987	335	2388	47	36	160	99	37	45
v/c Ratio	0.74	0.24	0.81	0.58	0.30	0.16	0.49	0.61	0.17	0.23
Control Delay	62.9	2.6	27.4	5.9	59.3	54.8	12.7	74.1	55.2	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.9	2.6	27.4	5.9	59.3	54.8	12.7	74.1	55.2	33.6
Queue Length 50th (m)	4.2	15.0	43.0	72.0	12.1	9.1	0.0	26.5	9.4	5.6
Queue Length 95th (m)	#41.7	18.5	#140.2	104.5	23.7	18.8	19.5	43.7	19.3	16.7
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	77	4075	413	4135	321	452	497	324	431	377
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.24	0.81	0.58	0.15	0.08	0.32	0.31	0.09	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	148	56	92	114	133	43	60	86	142	93	46
Future Volume (vph)	43	148	56	92	114	133	43	60	86	142	93	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.959			0.919			0.939			0.978	
Flt Protected	0.950			0.950				0.989			0.975	
Satd. Flow (prot)	1738	1636	0	1772	1644	0	0	1596	0	0	1668	0
Flt Permitted	0.950			0.950				0.989			0.975	
Satd. Flow (perm)	1738	1636	0	1772	1644	0	0	1596	0	0	1668	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	12		31	31		12	39		40	40		39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	14%	9%	3%	9%	6%	9%	22%	6%	6%	15%	11%
Adj. Flow (vph)	47	161	61	100	124	145	47	65	93	154	101	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	222	0	100	269	0	0	205	0	0	305	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 59.8% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	43	148	56	92	114	133	43	60	86	142	93	46
Future Volume (vph)	43	148	56	92	114	133	43	60	86	142	93	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	161	61	100	124	145	47	65	93	154	101	50

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	47	222	100	269	205	305
Volume Left (vph)	47	0	100	0	47	154
Volume Right (vph)	0	61	0	145	93	50
Hadj (s)	0.58	0.02	0.55	-0.25	-0.03	0.17
Departure Headway (s)	7.5	7.0	7.3	6.5	6.5	6.4
Degree Utilization, x	0.10	0.43	0.20	0.49	0.37	0.54
Capacity (veh/h)	441	473	461	514	498	525
Control Delay (s)	10.2	13.9	11.0	14.3	13.3	16.9
Approach Delay (s)	13.2		13.4		13.3	16.9
Approach LOS	B		B		B	C

Intersection Summary			
Delay		14.3	
Level of Service		B	
Intersection Capacity Utilization		59.8%	ICU Level of Service B
Analysis Period (min)		15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Future Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.907			0.940			0.953	
Flt Protected		0.979			0.996			0.986			0.971	
Satd. Flow (prot)	0	1814	0	0	1735	0	0	1781	0	0	1683	0
Flt Permitted		0.979			0.996			0.986			0.971	
Satd. Flow (perm)	0	1814	0	0	1735	0	0	1781	0	0	1683	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	10		4	4		10	1		46	46		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	6%
Adj. Flow (vph)	46	55	5	12	34	102	5	5	8	117	12	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	106	0	0	148	0	0	18	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 40.9%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Future Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	55	5	12	34	102	5	5	8	117	12	70

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	106	148	18	199
Volume Left (vph)	46	12	5	117
Volume Right (vph)	5	102	8	70
Hadj (s)	0.11	-0.40	-0.21	0.00
Departure Headway (s)	4.7	4.2	4.5	4.5
Degree Utilization, x	0.14	0.17	0.02	0.25
Capacity (veh/h)	718	813	736	754
Control Delay (s)	8.4	8.0	7.6	9.0
Approach Delay (s)	8.4	8.0	7.6	9.0
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.5	
Level of Service			A	
Intersection Capacity Utilization			40.9%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Future Volume (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00		1.00	0.99		1.00	0.99	
Frt		0.988			0.994			0.869			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5134	0	1552	5205	0	1733	1645	0	1785	1746	0
Flt Permitted	0.097			0.224			0.746			0.446		
Satd. Flow (perm)	182	5134	0	366	5205	0	1356	1645	0	835	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			12			102			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			97.9			114.1			106.4	
Travel Time (s)		28.2			5.9			8.2			7.7	
Confl. Peds. (#/hr)	4					4	2		3	3		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	0%	1%	3%	0%	0%	0%	5%	0%
Adj. Flow (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1186	0	219	1916	0	35	117	0	30	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

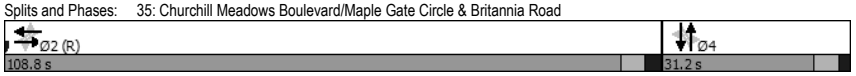
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Detector Phase	2	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		36.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	108.8	108.8		108.8	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	77.7%	77.7%		77.7%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	101.8	101.8		101.8	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.2	5.2		5.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	11.0	11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	117.9	117.9		117.9	117.9		10.9	10.9		10.9	10.9	
Actuated g/C Ratio	0.84	0.84		0.84	0.84		0.08	0.08		0.08	0.08	
v/c Ratio	0.10	0.27		0.71	0.44		0.33	0.53		0.47	0.13	
Control Delay	2.3	1.3		20.5	3.2		69.0	23.5		84.2	44.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.3	1.3		20.5	3.2		69.0	23.5		84.2	44.1	
LOS	A	A		C	A		E	C		F	D	
Approach Delay		1.3			5.0			34.0			69.1	
Approach LOS		A			A			C			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 5.8 — Intersection LOS: A
Intersection Capacity Utilization 71.4% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	1186	219	1916	35	117	30	18
v/c Ratio	0.10	0.27	0.71	0.44	0.33	0.53	0.47	0.13
Control Delay	2.3	1.3	20.5	3.2	69.0	23.5	84.2	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	1.3	20.5	3.2	69.0	23.5	84.2	44.1
Queue Length 50th (m)	0.4	10.1	17.6	35.6	9.4	4.0	8.2	2.9
Queue Length 95th (m)	m0.7	m12.2	#91.0	50.9	20.3	22.5	18.7	10.6
Internal Link Dist (m)		445.7		73.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	153	4328	308	4385	251	388	155	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.27	0.71	0.44	0.14	0.30	0.19	0.05

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	9	8	9	7	12	12	136	15	18	240	15
Future Volume (vph)	12	9	8	9	7	12	12	136	15	18	240	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.962			0.943			0.988			0.993	
Flt Protected		0.980			0.984			0.996			0.997	
Satd. Flow (prot)	0	1747	0	0	1720	0	0	1853	0	0	1878	0
Flt Permitted		0.980			0.984			0.996			0.997	
Satd. Flow (perm)	0	1747	0	0	1720	0	0	1853	0	0	1878	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)	6		3	3		6	11		10	10		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	13%	0%	14%	0%	0%	1%	13%	0%	1%	7%
Adj. Flow (vph)	13	10	9	10	8	13	13	148	16	20	261	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	31	0	0	177	0	0	297	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	9	8	9	7	12	12	136	15	18	240	15
Future Volume (Veh/h)	12	9	8	9	7	12	12	136	15	18	240	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	10	9	10	8	13	13	148	16	20	261	16
Pedestrians		11			10			3			6	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	525	520	283	518	520	172	288			174		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	525	520	283	518	520	172	288			174		
tC, single (s)	7.1	6.5	6.3	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	97	98	99	98	98	98	99			99		
cM capacity (veh/h)	432	444	722	438	425	865	1273			1403		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	32	31	177	297
Volume Left	13	10	13	20
Volume Right	9	13	16	16
cSH	492	547	1273	1403
Volume to Capacity	0.07	0.06	0.01	0.01
Queue Length 95th (m)	1.6	1.4	0.2	0.3
Control Delay (s)	12.8	12.0	0.7	0.6
Lane LOS	B	B	A	A
Approach Delay (s)	12.8	12.0	0.7	0.6
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	57	23	69	77	24	16	119	62	17	144	22
Future Volume (vph)	10	57	23	69	77	24	16	119	62	17	144	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.966			0.981			0.958			0.984	
Flt Protected		0.994			0.980			0.996			0.995	
Satd. Flow (prot)	0	1598	0	0	1727	0	0	1725	0	0	1782	0
Flt Permitted		0.994			0.980			0.996			0.995	
Satd. Flow (perm)	0	1598	0	0	1727	0	0	1725	0	0	1782	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	20		92	92		20	33		36	36		33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	19%	9%	6%	10%	0%	6%	7%	5%	0%	7%	0%
Adj. Flow (vph)	11	62	25	75	84	26	17	129	67	18	157	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	98	0	0	185	0	0	213	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	57	23	69	77	24	16	119	62	17	144	22
Future Volume (vph)	10	57	23	69	77	24	16	119	62	17	144	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	62	25	75	84	26	17	129	67	18	157	24

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	98	185	213	199
Volume Left (vph)	11	75	17	18
Volume Right (vph)	25	26	67	24
Hadj (s)	0.13	0.12	-0.07	0.04
Departure Headway (s)	5.4	5.2	4.9	5.0
Degree Utilization, x	0.15	0.27	0.29	0.28
Capacity (veh/h)	604	635	690	670
Control Delay (s)	9.3	10.1	9.9	9.9
Approach Delay (s)	9.3	10.1	9.9	9.9
Approach LOS	A	B	A	A

Intersection Summary			
Delay	9.9		
Level of Service	A		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	145	17	114	272	204	7	71	27	109	132	26
Future Volume (vph)	26	145	17	114	272	204	7	71	27	109	132	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		0.99	0.97		0.99	0.99		0.97	1.00	
Frt		0.985			0.936			0.959			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3456	0	1789	3241	0	1601	1638	0	1789	1737	0
Flt Permitted	0.424			0.641			0.631			0.689		
Satd. Flow (perm)	764	3456	0	1189	3241	0	1057	1638	0	1255	1737	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			222			27			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	2%	18%	2%	2%	2%	14%	11%	11%	2%	6%	15%
Adj. Flow (vph)	28	158	18	124	296	222	8	77	29	118	143	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	176	0	124	518	0	8	106	0	118	171	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	46.0	46.0		46.0	46.0		55.0	55.0		55.0	55.0	
Total Split (%)	45.5%	45.5%		45.5%	45.5%		54.5%	54.5%		54.5%	54.5%	
Maximum Green (s)	39.5	39.5		39.5	39.5		49.0	49.0		49.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.5	48.5		48.5	48.5		42.0	42.0		42.0	42.0	
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.42	0.42		0.42	0.42	
v/c Ratio	0.08	0.11		0.22	0.31		0.02	0.15		0.23	0.23	
Control Delay	14.4	12.9		16.5	9.3		17.7	14.3		20.5	18.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.4	12.9		16.5	9.3		17.7	14.3		20.5	18.5	
LOS	B	B		B	A		B	B		C	B	
Approach Delay		13.1			10.7			14.5			19.3	
Approach LOS		B			B			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 74.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	176	124	518	8	106	118	171
v/c Ratio	0.08	0.11	0.22	0.31	0.02	0.15	0.23	0.23
Control Delay	14.4	12.9	16.5	9.3	17.7	14.3	20.5	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	12.9	16.5	9.3	17.7	14.3	20.5	18.5
Queue Length 50th (m)	2.5	7.4	13.6	16.8	0.9	9.3	14.6	19.3
Queue Length 95th (m)	m5.7	10.8	25.0	27.2	3.7	19.7	27.1	33.6
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	366	1666	570	1671	523	824	621	866
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.11	0.22	0.31	0.02	0.13	0.19	0.20

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	33	7	29	57	35	17	96	26	22	176	13
Future Volume (vph)	8	33	7	29	57	35	17	96	26	22	176	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.980			0.961			0.975			0.992	
Flt Protected		0.992			0.988			0.994			0.995	
Satd. Flow (prot)	0	1757	0	0	1717	0	0	1707	0	0	1721	0
Flt Permitted		0.992			0.988			0.994			0.995	
Satd. Flow (perm)	0	1757	0	0	1717	0	0	1707	0	0	1721	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	14		19	19		14	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	6%	0%	3%	5%	11%	6%	11%	4%	5%	11%	8%
Adj. Flow (vph)	9	36	8	32	62	38	18	104	28	24	191	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	0	0	132	0	0	150	0	0	229	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	33	7	29	57	35	17	96	26	22	176	13
Future Volume (vph)	8	33	7	29	57	35	17	96	26	22	176	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	36	8	32	62	38	18	104	28	24	191	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	53	132	150	229
Volume Left (vph)	9	32	18	24
Volume Right (vph)	8	38	28	14
Hadj (s)	0.05	-0.02	0.07	0.16
Departure Headway (s)	5.1	4.9	4.7	4.7
Degree Utilization, x	0.07	0.18	0.20	0.30
Capacity (veh/h)	643	679	722	726
Control Delay (s)	8.5	8.9	8.9	9.7
Approach Delay (s)	8.5	8.9	8.9	9.7
Approach LOS	A	A	A	A

Intersection Summary				
Delay			9.2	
Level of Service			A	
Intersection Capacity Utilization			32.8%	ICU Level of Service A
Analysis Period (min)			15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	68	15	40	81	26	35	142	54	24	173	35
Future Volume (vph)	18	68	15	40	81	26	35	142	54	24	173	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.980			0.976			0.968			0.980	
Flt Protected		0.991			0.987			0.992			0.995	
Satd. Flow (prot)	0	1665	0	0	1776	0	0	1769	0	0	1781	0
Flt Permitted		0.991			0.987			0.992			0.995	
Satd. Flow (perm)	0	1665	0	0	1776	0	0	1769	0	0	1781	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	12%	0%	0%	5%	8%	9%	4%	2%	8%	4%	9%
Adj. Flow (vph)	20	74	16	43	88	28	38	154	59	26	188	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	110	0	0	159	0	0	251	0	0	252	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 40.0%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	68	15	40	81	26	35	142	54	24	173	35
Future Volume (vph)	18	68	15	40	81	26	35	142	54	24	173	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	74	16	43	88	28	38	154	59	26	188	38

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	110	159	251	252
Volume Left (vph)	20	43	38	26
Volume Right (vph)	16	28	59	38
Hadj (s)	0.15	0.02	-0.04	0.02
Departure Headway (s)	5.6	5.4	5.0	5.0
Degree Utilization, x	0.17	0.24	0.35	0.35
Capacity (veh/h)	573	603	680	670
Control Delay (s)	9.8	10.1	10.6	10.8
Approach Delay (s)	9.8	10.1	10.6	10.8
Approach LOS	A	B	B	B

Intersection Summary				
Delay			10.5	
Level of Service			B	
Intersection Capacity Utilization			40.0%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	1356	2439	191	123	70
Future Volume (vph)	13	1356	2439	191	123	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			1.00			
Frt			0.989			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1690	3579	3566	0	1789	1089
Flt Permitted	0.052				0.950	
Satd. Flow (perm)	92	3579	3566	0	1789	1089
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			19			8
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	4			4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	2%	1%	1%	2%	50%
Adj. Flow (vph)	13	1356	2439	191	123	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	1356	2630	0	123	70
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

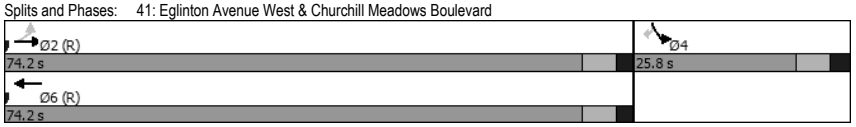
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.5	25.5
Total Split (s)	74.2	74.2	74.2		25.8	25.8
Total Split (%)	74.2%	74.2%	74.2%		25.8%	25.8%
Maximum Green (s)	68.2	68.2	68.2		19.3	19.3
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	76.2	76.2	76.2		13.3	13.3
Actuated g/C Ratio	0.76	0.76	0.76		0.13	0.13
v/c Ratio	0.19	0.50	0.97		0.52	0.46
Control Delay	11.5	5.6	23.3		47.6	44.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	11.5	5.6	23.3		47.6	44.8
LOS	B	A	C		D	D
Approach Delay		5.7	23.3		46.6	
Approach LOS		A	C		D	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 18.6 — Intersection LOS: B
Intersection Capacity Utilization 89.1% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	13	1356	2630	123	70
v/c Ratio	0.19	0.50	0.97	0.52	0.46
Control Delay	11.5	5.6	23.3	47.6	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	5.6	23.3	47.6	44.8
Queue Length 50th (m)	0.6	43.0	195.7	22.6	11.2
Queue Length 95th (m)	4.0	67.6	#329.4	38.1	23.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	70	2728	2723	363	227
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.50	0.97	0.34	0.31

Intersection Summary

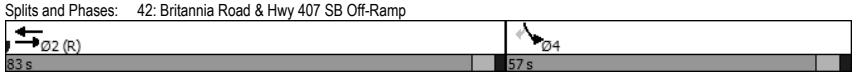
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	627	1855	0	373	31
Future Volume (vph)	0	627	1855	0	373	31
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	1987	1726
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	1987	1726
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (k/h)		60	60		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		12.4	17.9		15.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	0%	2%	0%	3%
Adj. Flow (vph)	0	697	2061	0	414	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	697	2061	0	414	34
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		83.0	83.0		57.0	57.0
Total Split (%)		59.3%	59.3%		40.7%	40.7%
Maximum Green (s)		77.0	77.0		51.0	51.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		92.9	92.9		35.1	35.1
Actuated g/C Ratio		0.66	0.66		0.25	0.25
v/c Ratio		0.19	0.54		0.83	0.08
Control Delay		9.8	27.7		64.0	37.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		9.8	27.7		64.0	37.5
LOS		A	C		E	D
Approach Delay		9.8	27.7		62.0	
Approach LOS		A	C		E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 28.6		Intersection LOS: C	
Intersection Capacity Utilization 61.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	697	2061	414	34
v/c Ratio	0.19	0.54	0.83	0.08
Control Delay	9.8	27.7	64.0	37.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.8	27.7	64.0	37.5
Queue Length 50th (m)	25.3	200.1	109.0	7.2
Queue Length 95th (m)	37.4	219.8	135.6	14.9
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3753	3791	723	628
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.54	0.57	0.05

Intersection Summary

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1028	0	0	1885	73	110
Future Volume (vph)	1028	0	0	1885	73	110
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5711	1987	1778
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5711	1987	1778
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	17.9			13.0	11.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	0%	0%	0%
Adj. Flow (vph)	1142	0	0	2094	81	122
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1142	0	0	2094	81	122
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

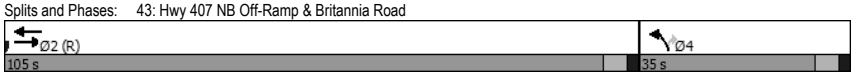
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	105.0			105.0	35.0	35.0
Total Split (%)	75.0%			75.0%	25.0%	25.0%
Maximum Green (s)	99.0			99.0	29.0	29.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	113.1			113.1	14.9	14.9
Actuated g/C Ratio	0.81			0.81	0.11	0.11
v/c Ratio	0.25			0.45	0.38	0.65
Control Delay	5.9			6.6	62.3	74.9
Queue Delay	0.0			0.2	0.0	0.0
Total Delay	5.9			6.8	62.3	74.9
LOS	A			A	E	E
Approach Delay	5.9			6.8	69.9	
Approach LOS	A			A	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 10.2 Intersection LOS: B
Intersection Capacity Utilization 61.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1142	2094	81	122
v/c Ratio	0.25	0.45	0.38	0.65
Control Delay	5.9	6.6	62.3	74.9
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	5.9	6.8	62.3	74.9
Queue Length 50th (m)	43.5	63.1	21.2	33.0
Queue Length 95th (m)	47.7	m64.7	36.1	51.9
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4567	4612	411	368
Starvation Cap Reductn	0	1308	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.25	0.63	0.20	0.33

Intersection Summary

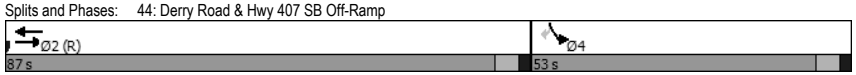
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	813	2539	0	226	434
Future Volume (vph)	0	813	2539	0	226	434
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	3817	1778
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	3817	1778
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						2
Link Speed (k/h)		60	60		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		20.0	18.5		13.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%
Adj. Flow (vph)	0	865	2701	0	240	462
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	865	2701	0	240	462
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		87.0	87.0		53.0	53.0
Total Split (%)		62.1%	62.1%		37.9%	37.9%
Maximum Green (s)		81.0	81.0		47.0	47.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	-2.9
Total Lost Time (s)		6.0	6.0		6.0	3.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		87.3	87.3		40.7	43.6
Actuated g/C Ratio		0.62	0.62		0.29	0.31
v/c Ratio		0.25	0.76		0.22	0.83
Control Delay		12.5	9.3		37.1	58.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		12.5	9.3		37.1	58.0
LOS		B	A		D	E
Approach Delay		12.5	9.3		50.8	
Approach LOS		B	A		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 78.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	865	2701	240	462
v/c Ratio	0.25	0.76	0.22	0.83
Control Delay	12.5	9.3	37.1	58.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.5	9.3	37.1	58.0
Queue Length 50th (m)	37.6	55.7	25.7	117.3
Queue Length 95th (m)	49.7	77.4	34.4	151.2
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3527	3562	1281	635
Starvation Cap Reductn	0	17	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.25	0.76	0.19	0.73

Intersection Summary

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1083	0	0	2516	104	123
Future Volume (vph)	1083	0	0	2516	104	123
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						0.99
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5655	3856	1743
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5655	3856	1722
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						129
Link Speed (k/h)	60			60	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	18.5			13.8	15.5	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	2%	1%	0%	2%
Adj. Flow (vph)	1140	0	0	2648	109	129
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1140	0	0	2648	109	129
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

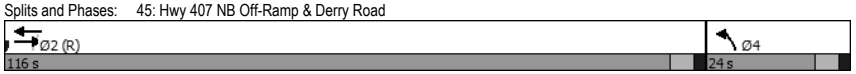
Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	116.0			116.0	24.0	116.0
Total Split (%)	82.9%			82.9%	17.1%	82.9%
Maximum Green (s)	110.0			110.0	18.0	110.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	118.5			118.5	9.5	118.5
Actuated g/C Ratio	0.85			0.85	0.07	0.85
v/c Ratio	0.24			0.55	0.42	0.09
Control Delay	1.6			0.8	67.1	0.4
Queue Delay	0.0			0.3	0.0	0.0
Total Delay	1.6			1.1	67.1	0.4
LOS	A			A	E	A
Approach Delay	1.6			1.1	31.0	
Approach LOS	A			A	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 3.0	Intersection LOS: A
Intersection Capacity Utilization 78.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1140	2648	109	129
v/c Ratio	0.24	0.55	0.42	0.09
Control Delay	1.6	0.8	67.1	0.4
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	1.6	1.1	67.1	0.4
Queue Length 50th (m)	9.3	8.4	15.2	0.0
Queue Length 95th (m)	14.8	10.4	24.5	2.9
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4785	4785	495	1477
Starvation Cap Reductn	0	1289	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	0.76	0.22	0.09

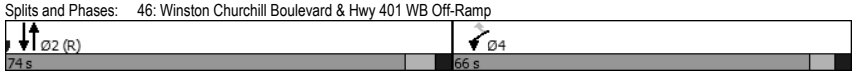
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1164	1104	3018	0	0	1778
Future Volume (vph)	1164	1104	3018	0	0	1778
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.963	0.850				
Flt Protected	0.964					
Satd. Flow (prot)	3740	1571	5491	0	0	5545
Flt Permitted	0.964					
Satd. Flow (perm)	3736	1571	5491	0	0	5545
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	4%	1%	0%	3%
Adj. Flow (vph)	1225	1162	3177	0	0	1872
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	1632	755	3177	0	0	1872
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	66.0	66.0	74.0			74.0
Total Split (%)	47.1%	47.1%	52.9%			52.9%
Maximum Green (s)	59.0	59.0	66.0			66.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	59.0	59.0	66.0			66.0
Actuated g/C Ratio	0.42	0.42	0.47			0.47
v/c Ratio	1.04	1.14	1.23			0.72
Control Delay	72.0	118.1	137.8			31.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	72.0	118.1	137.8			31.5
LOS	E	F	F			C
Approach Delay	86.6		137.8			31.5
Approach LOS	F		F			C

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 49 (35%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.23	
Intersection Signal Delay: 94.6	Intersection LOS: F
Intersection Capacity Utilization 120.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1632	755	3177	1872
v/c Ratio	1.04	1.14	1.23	0.72
Control Delay	72.0	118.1	137.8	31.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	72.0	118.1	137.8	31.5
Queue Length 50th (m)	~249.8	~267.6	~396.7	148.7
Queue Length 95th (m)	#291.3	#350.3	#419.0	165.7
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1576	662	2588	2614
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.04	1.14	1.23	0.72

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	434	474	0	3264	2520	0
Future Volume (vph)	434	474	0	3264	2520	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.955	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3457	1586	0	5545	5599	0
Flt Permitted	0.966					
Satd. Flow (perm)	3457	1586	0	5545	5599	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	3	3				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	2%	0%	3%	2%	7%
Adj. Flow (vph)	467	510	0	3510	2710	0
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	666	311	0	3510	2710	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

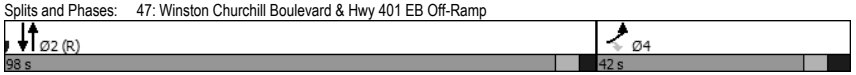
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	42.0	42.0		98.0	98.0	
Total Split (%)	30.0%	30.0%		70.0%	70.0%	
Maximum Green (s)	34.0	34.0		91.0	91.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	31.4	31.4		93.6	93.6	
Actuated g/C Ratio	0.22	0.22		0.67	0.67	
v/c Ratio	0.86	0.87		0.95	0.72	
Control Delay	63.4	75.3		28.5	11.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	63.4	75.3		28.5	11.3	
LOS	E	E		C	B	
Approach Delay	67.2			28.5	11.3	
Approach LOS	E			C	B	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 32.2 (23%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 27.3 — Intersection LOS: C
Intersection Capacity Utilization 86.3% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	666	311	3510	2710
v/c Ratio	0.86	0.87	0.95	0.72
Control Delay	63.4	75.3	28.5	11.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	63.4	75.3	28.5	11.3
Queue Length 50th (m)	89.5	89.0	316.8	128.6
Queue Length 95th (m)	111.5	#137.2	342.6	m135.1
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	841	387	3706	3742
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.79	0.80	0.95	0.72

Intersection Summary

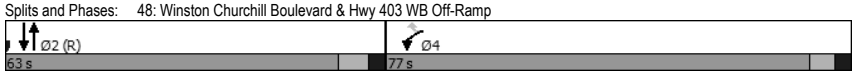
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1108	1816	2192	0	0	2353
Future Volume (vph)	1108	1816	2192	0	0	2353
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.938	0.850				
Flt Protected	0.972					
Satd. Flow (prot)	3685	1602	5655	0	0	5655
Flt Permitted	0.972					
Satd. Flow (perm)	3685	1602	5655	0	0	5655
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Peak Hour Factor	0.89	0.96	0.93	0.93	0.89	0.89
Heavy Vehicles (%)	0%	1%	1%	0%	0%	1%
Adj. Flow (vph)	1245	1892	2357	0	0	2644
Shared Lane Traffic (%)		47%				
Lane Group Flow (vph)	2134	1003	2357	0	0	2644
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	77.0	77.0	63.0			63.0
Total Split (%)	55.0%	55.0%	45.0%			45.0%
Maximum Green (s)	70.0	70.0	55.0			55.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	-2.9	-2.9			0.0
Total Lost Time (s)	7.0	4.1	5.1			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	70.0	72.9	57.9			55.0
Actuated g/C Ratio	0.50	0.52	0.41			0.39
v/c Ratio	1.16	1.20	1.01			1.19
Control Delay	111.0	134.1	63.2			128.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	111.0	134.1	63.2			128.5
LOS	F	F	E			F
Approach Delay	118.4		63.2			128.5
Approach LOS	F		E			F

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 2.8 (2%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 105.7	Intersection LOS: F
Intersection Capacity Utilization 164.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	2134	1003	2357	2644
v/c Ratio	1.16	1.20	1.01	1.19
Control Delay	111.0	134.1	63.2	128.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	111.0	134.1	63.2	128.5
Queue Length 50th (m)	~359.0	~369.8	~254.0	~322.6
Queue Length 95th (m)	#391.0	#456.3	#281.6	#341.7
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1842	834	2338	2221
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.16	1.20	1.01	1.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	517	205	0	2131	2737	0
Future Volume (vph)	517	205	0	2131	2737	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3817	1726	0	5655	5655	0
Flt Permitted	0.950					
Satd. Flow (perm)	3817	1726	0	5655	5655	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		2				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	3%	0%	1%	1%	0%
Adj. Flow (vph)	568	225	0	2342	3008	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	568	225	0	2342	3008	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

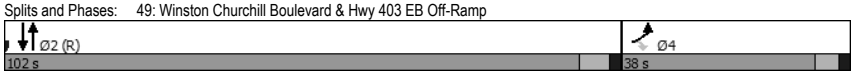
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	38.0	38.0		102.0	102.0	
Total Split (%)	27.1%	27.1%		72.9%	72.9%	
Maximum Green (s)	32.0	32.0		95.0	95.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	26.4	26.4		100.6	100.6	
Actuated g/C Ratio	0.19	0.19		0.72	0.72	
v/c Ratio	0.79	0.69		0.58	0.74	
Control Delay	62.3	63.2		10.6	24.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	62.3	63.2		10.6	24.2	
LOS	E	E		B	C	
Approach Delay	62.5			10.6	24.2	
Approach LOS	E			B	C	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 81.2 (58%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 24.0 Intersection LOS: C
Intersection Capacity Utilization 164.3% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	568	225	2342	3008
v/c Ratio	0.79	0.69	0.58	0.74
Control Delay	62.3	63.2	10.6	24.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	62.3	63.2	10.6	24.2
Queue Length 50th (m)	77.7	58.0	104.9	229.3
Queue Length 95th (m)	93.5	82.4	132.5	m189.3
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	872	396	4061	4061
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.57	0.58	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

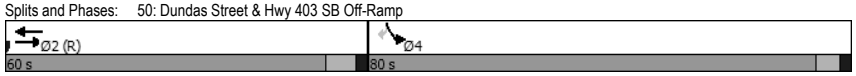
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1894	1840	0	520	1484
Future Volume (vph)	0	1894	1840	0	520	1484
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Ped Bike Factor						
Frt					0.912	0.850
Flt Protected					0.980	
Satd. Flow (prot)	0	5338	5599	0	3412	1571
Flt Permitted					0.980	
Satd. Flow (perm)	0	5338	5599	0	3412	1571
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					1	1
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	7%	2%	0%	11%	3%
Adj. Flow (vph)	0	1933	1878	0	531	1514
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	0	1933	1878	0	1288	757
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		60.0	60.0		80.0	80.0
Total Split (%)		42.9%	42.9%		57.1%	57.1%
Maximum Green (s)		53.0	53.0		74.0	74.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		54.8	54.8		72.2	72.2
Actuated g/C Ratio		0.39	0.39		0.52	0.52
v/c Ratio		0.93	0.86		0.85dr	0.93
Control Delay		49.7	68.1		29.1	51.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		49.7	68.1		29.1	51.0
LOS		D	E		C	D
Approach Delay		49.7	68.1		37.2	
Approach LOS		D	E		D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 4.2 (3%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 51.2 Intersection LOS: D
Intersection Capacity Utilization 99.7% ICU Level of Service F
Analysis Period (min) 15
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1933	1878	1288	757
v/c Ratio	0.93	0.86	0.85dr	0.93
Control Delay	49.7	68.1	29.1	51.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	49.7	68.1	29.1	51.0
Queue Length 50th (m)	189.7	200.4	134.9	203.1
Queue Length 95th (m)	#222.9	217.5	160.2	#298.6
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	2087	2189	1803	830
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.93	0.86	0.71	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1728	0	0	2386	105	853
Future Volume (vph)	1728	0	0	2386	105	853
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Frt					0.880	0.850
Flt Protected					0.990	
Satd. Flow (prot)	5491	0	0	5655	3466	1586
Flt Permitted					0.990	
Satd. Flow (perm)	5491	0	0	5655	3466	1586
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					9	9
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	4%	0%	0%	1%	2%	2%
Adj. Flow (vph)	1781	0	0	2460	108	879
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	1781	0	0	2460	548	439
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

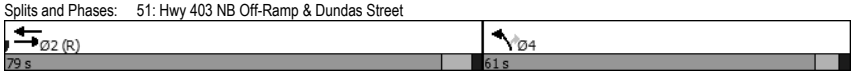
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	79.0			79.0	61.0	61.0
Total Split (%)	56.4%			56.4%	43.6%	43.6%
Maximum Green (s)	72.0			72.0	55.0	55.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	82.4			82.4	44.6	44.6
Actuated g/C Ratio	0.59			0.59	0.32	0.32
v/c Ratio	0.55			0.74	0.49	0.86
Control Delay	10.2			24.0	38.6	59.9
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.2			24.0	38.6	59.9
LOS	B			C	D	E
Approach Delay	10.2			24.0	48.1	
Approach LOS	B			C	D	

Intersection Summary

Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 43.4 (31%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 23.8	Intersection LOS: C
Intersection Capacity Utilization 99.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street



Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1781	2460	548	439
v/c Ratio	0.55	0.74	0.49	0.86
Control Delay	10.2	24.0	38.6	59.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.2	24.0	38.6	59.9
Queue Length 50th (m)	69.5	175.4	61.9	122.4
Queue Length 95th (m)	187.5	228.7	70.2	152.8
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	3231	3328	1367	628
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.74	0.40	0.70

Intersection Summary

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	196	149	657	53	19	547
Future Volume (vph)	196	149	657	53	19	547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	1883	1601	1789	1883
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	1883	1601	1789	1883
Link Speed (k/h)	48		70			70
Link Distance (m)	329.4		780.0			514.0
Travel Time (s)	24.7		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	196	149	657	53	19	547
Shared Lane Traffic (%)						
Lane Group Flow (vph)	196	149	657	53	19	547
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
52: Ninth Line & Argentia Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	196	149	657	53	19	547
Future Volume (Veh/h)	196	149	657	53	19	547
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	196	149	657	53	19	547
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1242	657			710	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1242	657			710	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	68			98	
cM capacity (veh/h)	189	465			889	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	196	149	657	53	19	547
Volume Left	196	0	0	0	19	0
Volume Right	0	149	0	53	0	0
cSH	189	465	1700	1700	889	1700
Volume to Capacity	1.04	0.32	0.39	0.03	0.02	0.32
Queue Length 95th (m)	68.7	10.4	0.0	0.0	0.5	0.0
Control Delay (s)	127.5	16.4	0.0	0.0	9.1	0.0
Lane LOS	F	C			A	
Approach Delay (s)	79.5		0.0		0.3	
Approach LOS	F					

Intersection Summary			
Average Delay	17.0		
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
97: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1118	362	0	1820	0	0
Future Volume (vph)	1118	362	0	1820	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	120.9	
Travel Time (s)	15.5			6.8	9.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1118	362	0	1820	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1118	362	0	1820	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 120.1%		ICU Level of Service H	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
97: Winston Churchill Boulevard

16/06/2017

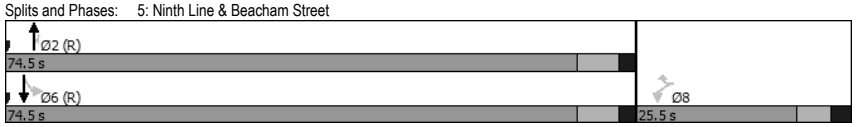
Intersection Sign configuration not allowed in HCM analysis.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1156	85	58	655
Future Volume (vph)	90	47	1156	85	58	655
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	1883	1601	1825	1865
Flt Permitted	0.950				0.101	
Satd. Flow (perm)	1807	1590	1883	1601	194	1865
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51		63		
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1257	92	63	712
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1257	92	63	712
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA	Perm	Perm	NA
Protected Phases			2			6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	45.0	45.0
Minimum Split (s)	25.5	25.5	52.0	52.0	52.0	52.0
Total Split (s)	25.5	25.5	74.5	74.5	74.5	74.5
Total Split (%)	25.5%	25.5%	74.5%	74.5%	74.5%	74.5%
Maximum Green (s)	19.0	19.0	67.5	67.5	67.5	67.5
Yellow Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0	35.0	35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	12.0	12.0	80.6	80.6	80.6	80.6
Actuated g/C Ratio	0.12	0.12	0.81	0.81	0.81	0.81
v/c Ratio	0.45	0.22	0.83	0.07	0.40	0.47
Control Delay	47.1	13.1	15.0	1.6	14.4	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	13.1	15.0	1.6	14.4	5.7
LOS	D	B	B	A	B	A
Approach Delay	35.5		14.1			6.4
Approach LOS	D		B			A

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 85.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	98	51	1257	92	63	712
v/c Ratio	0.45	0.22	0.83	0.07	0.40	0.47
Control Delay	47.1	13.1	15.0	1.6	14.4	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	13.1	15.0	1.6	14.4	5.7
Queue Length 50th (m)	18.0	0.0	137.6	1.1	3.4	42.0
Queue Length 95th (m)	32.2	9.9	#308.8	5.1	16.6	74.8
Internal Link Dist (m)	181.8		579.1			692.6
Turn Bay Length (m)		15.0		50.0	80.0	
Base Capacity (vph)	361	358	1517	1302	156	1503
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.14	0.83	0.07	0.40	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	697	67	49	1211
Future Volume (vph)	46	47	697	67	49	1211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97				
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	1847	1617	1825	1865
Flt Permitted	0.950				0.338	
Satd. Flow (perm)	1789	1544	1847	1617	649	1865
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51		73		
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	758	73	53	1316
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	758	73	53	1316
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	6.1	6.1	30.5	6.1	6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8	6.1	6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

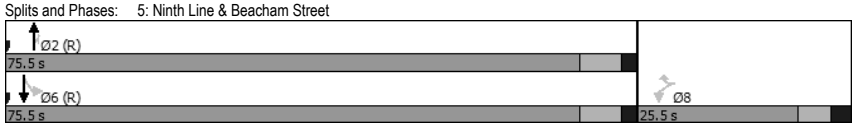
Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA	Perm	Perm	NA
Protected Phases			2			6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0	45.0	45.0	45.0
Minimum Split (s)	25.5	25.5	53.0	53.0	53.0	53.0
Total Split (s)	25.5	25.5	75.5	75.5	75.5	75.5
Total Split (%)	25.2%	25.2%	74.8%	74.8%	74.8%	74.8%
Maximum Green (s)	19.0	19.0	68.5	68.5	68.5	68.5
Yellow Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0	35.0	35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	10.0	10.0	83.6	83.6	83.6	83.6
Actuated g/C Ratio	0.10	0.10	0.83	0.83	0.83	0.83
v/c Ratio	0.28	0.26	0.50	0.05	0.10	0.85
Control Delay	46.1	15.2	1.8	0.1	3.2	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	15.2	1.8	0.1	3.2	15.0
LOS	D	B	A	A	A	B
Approach Delay	30.5		1.7			14.5
Approach LOS	C		A			B

Intersection Summary			
Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 10.6		Intersection LOS: B	
Intersection Capacity Utilization 85.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	50	51	758	73	53	1316
v/c Ratio	0.28	0.26	0.50	0.05	0.10	0.85
Control Delay	46.1	15.2	1.8	0.1	3.2	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	15.2	1.8	0.1	3.2	15.0
Queue Length 50th (m)	9.3	0.0	2.9	0.0	1.8	139.1
Queue Length 95th (m)	19.9	10.5	3.1	0.1	5.1	#324.3
Internal Link Dist (m)	181.8		579.1			692.6
Turn Bay Length (m)		15.0		50.0	80.0	
Base Capacity (vph)	354	346	1529	1351	537	1544
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.15	0.50	0.05	0.10	0.85

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX M

2041 Future Background Traffic Conditions (BAU) – Widened Ninth Line

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Future Volume (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.992			0.968				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1733	3583	0	1716	3425	0	1785	3614	1566	1638	3614	1597
Flt Permitted	0.146			0.054			0.167			0.215		
Satd. Flow (perm)	266	3583	0	98	3425	0	314	3614	1566	371	3614	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			33				114			171
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	4%	4%	0%	0%	1%	2%	9%	1%	0%
Adj. Flow (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	271	2367	0	147	1156	0	207	584	241	33	514	171
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

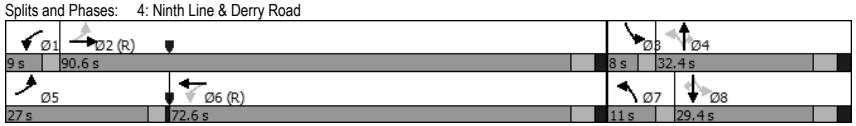
Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	5.0	8.0	8.0
Minimum Split (s)	9.0	30.1		8.0	30.1		8.0	29.4	29.4	8.0	29.4	29.4
Total Split (s)	27.0	90.6		9.0	72.6		11.0	32.4	32.4	8.0	29.4	29.4
Total Split (%)	19.3%	64.7%		6.4%	51.9%		7.9%	23.1%	23.1%	5.7%	21.0%	21.0%
Maximum Green (s)	23.5	84.5		6.0	66.5		8.0	26.0	26.0	5.0	23.0	23.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.5	2.1		0.0	2.1		0.0	2.4	2.4	0.0	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.5	5.1		2.0	5.1		2.0	5.4	5.4	2.0	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	97.4	85.5		86.2	75.5		37.8	29.6	29.6	32.8	23.4	23.4
Actuated g/C Ratio	0.70	0.61		0.62	0.54		0.27	0.21	0.21	0.23	0.17	0.17
v/c Ratio	0.74	1.08		0.99	0.62		1.16	0.77	0.57	0.24	0.85	0.42
Control Delay	32.5	67.5		107.5	18.1		156.4	59.9	32.2	42.0	71.0	10.2
Queue Delay	0.0	8.5		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	76.0		107.5	18.1		156.4	59.9	32.2	42.0	71.0	10.2
LOS	C	E		F	B		F	E	C	D	E	B
Approach Delay		71.5			28.1			72.8			55.2	
Approach LOS		E			C			E			E	

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green		
Natural Cycle: 140		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.16		
Intersection Signal Delay: 59.8		Intersection LOS: E
Intersection Capacity Utilization 115.2%		ICU Level of Service H
Analysis Period (min) 15		

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	271	2367	147	1156	207	584	241	33	514	171
v/c Ratio	0.74	1.08	0.99	0.62	1.16	0.77	0.57	0.24	0.85	0.42
Control Delay	32.5	67.5	107.5	18.1	156.4	59.9	32.2	42.0	71.0	10.2
Queue Delay	0.0	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	76.0	107.5	18.1	156.4	59.9	32.2	42.0	71.0	10.2
Queue Length 50th (m)	38.6	~385.0	~29.5	61.2	~47.7	82.8	32.2	6.8	73.2	0.0
Queue Length 95th (m)	70.9	#420.3	#75.7	118.0	#97.3	#106.4	61.0	15.4	#97.7	19.8
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	442	2191	148	1861	179	762	420	140	619	415
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	101	0	0	0	0	3	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	1.13	0.99	0.62	1.16	0.77	0.58	0.24	0.83	0.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Future Volume (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.982				0.850		0.982			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	3545	0	1767	3579	1372	1785	3510	0	1653	3511	0
Flt Permitted	0.355			0.049			0.118			0.125		
Satd. Flow (perm)	660	3545	0	91	3579	1372	222	3510	0	217	3511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18				106		10			11	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	2%	1%	2%	19%	0%	2%	3%	8%	2%	2%
Adj. Flow (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	2646	0	72	753	106	203	964	0	60	877	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

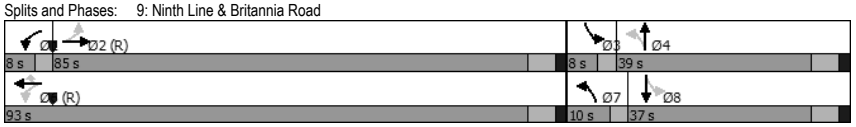
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		1	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0	12.0	5.0	12.0		5.0	12.0	
Minimum Split (s)	24.6	24.6		8.0	24.6	24.6	8.0	36.6		8.0	36.6	
Total Split (s)	85.0	85.0		8.0	93.0	93.0	10.0	39.0		8.0	37.0	
Total Split (%)	60.7%	60.7%		5.7%	66.4%	66.4%	7.1%	27.9%		5.7%	26.4%	
Maximum Green (s)	78.4	78.4		5.0	86.4	86.4	7.0	32.4		5.0	30.4	
Yellow Time (s)	4.6	4.6		3.0	4.6	4.6	3.0	4.6		3.0	4.6	
All-Red Time (s)	2.0	2.0		0.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-2.0	-1.0	-1.0	-2.0	-1.0		-1.0	-3.0	
Total Lost Time (s)	5.6	5.6		1.0	5.6	5.6	1.0	5.6		2.0	3.6	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)	7.0	7.0			7.0	7.0		12.0			12.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0		18.0			18.0	
Pedestrian Calls (#/hr)	0	0			0	0		0			0	
Act Effct Green (s)	81.0	81.0		92.0	87.4	87.4	46.0	35.0		41.0	33.4	
Actuated g/C Ratio	0.58	0.58		0.66	0.62	0.62	0.33	0.25		0.29	0.24	
v/c Ratio	0.27	1.29		0.50	0.34	0.12	1.17	1.09		0.48	1.04	
Control Delay	13.4	152.4		43.0	11.5	1.7	157.7	105.5		46.9	91.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	13.4	152.4		43.0	11.5	1.7	157.7	105.5		46.9	91.5	
LOS	B	F		D	B	A	F	F		D	F	
Approach Delay		147.1			12.8			114.6			88.6	
Approach LOS		F			B			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.29
Intersection Signal Delay: 109.5 Intersection LOS: F
Intersection Capacity Utilization 129.3% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	2646	72	753	106	203	964	60	877
v/c Ratio	0.27	1.29	0.50	0.34	0.12	1.17	1.09	0.48	1.04
Control Delay	13.4	152.4	43.0	11.5	1.7	157.7	105.5	46.9	91.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	152.4	43.0	11.5	1.7	157.7	105.5	46.9	91.5
Queue Length 50th (m)	8.7	~492.8	8.1	40.0	0.0	~49.4	~163.0	11.7	~136.1
Queue Length 95th (m)	m12.9	#531.5	25.3	47.2	5.1	#100.4	#205.1	22.8	#177.5
Internal Link Dist (m)		192.7		445.7			182.5		230.7
Turn Bay Length (m)	63.0		32.0		58.0	52.0		50.0	
Base Capacity (vph)	382	2058	143	2234	896	173	885	125	846
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	1.29	0.50	0.34	0.12	1.17	1.09	0.48	1.04

Intersection Summary

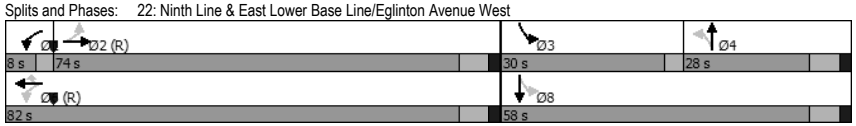
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	909	49	34	316	234	14	496	66	454	759	74
Future Volume (vph)	65	909	49	34	316	234	14	496	66	454	759	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.982			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	1904	0	1825	1883	1526	1825	3522	0	1789	3599	0
Flt Permitted	0.538			0.056			0.315			0.167		
Satd. Flow (perm)	1023	1904	0	108	1883	1526	605	3522	0	315	3599	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				254		9			8	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	2%	7%	0%	2%	0%	2%	0%	1%
Adj. Flow (vph)	71	988	53	37	343	254	15	539	72	493	825	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	1041	0	37	343	254	15	611	0	493	905	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		1	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		8.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	74.0	74.0		8.0	82.0	82.0	28.0	28.0		30.0	58.0	
Total Split (%)	52.9%	52.9%		5.7%	58.6%	58.6%	20.0%	20.0%		21.4%	41.4%	
Maximum Green (s)	67.0	67.0		5.0	75.0	75.0	21.0	21.0		27.0	51.0	
Yellow Time (s)	5.0	5.0		3.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		0.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-1.0	-1.0	-1.0	-1.0		-3.0	-1.0	
Total Lost Time (s)	6.0	4.0		2.0	6.0	6.0	6.0	6.0		0.0	6.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min	Min	Min		None	Min	
Walk Time (s)	8.0	8.0			8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0			8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0			0	
Act Effct Green (s)	69.6	71.6		80.0	76.0	76.0	22.0	22.0		58.0	52.0	
Actuated g/C Ratio	0.50	0.51		0.57	0.54	0.54	0.16	0.16		0.41	0.37	
v/c Ratio	0.14	1.07		0.27	0.34	0.27	0.16	1.09		1.11	0.67	
Control Delay	20.7	82.4		18.2	19.0	2.5	55.8	117.6		111.5	39.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	20.7	82.4		18.2	19.0	2.5	55.8	117.6		111.5	39.6	
LOS	C	F		B	B	A	E	F		F	D	
Approach Delay		78.4			12.4			116.1			65.0	
Approach LOS		E			B			F			E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 68.6	Intersection LOS: E
Intersection Capacity Utilization 106.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	1041	37	343	254	15	611	493	905
v/c Ratio	0.14	1.07	0.27	0.34	0.27	0.16	1.09	1.11	0.67
Control Delay	20.7	82.4	18.2	19.0	2.5	55.8	117.6	111.5	39.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	82.4	18.2	19.0	2.5	55.8	117.6	111.5	39.6
Queue Length 50th (m)	10.6	~324.4	4.3	51.4	0.0	3.6	~98.9	~136.8	109.1
Queue Length 95th (m)	20.2	#404.8	9.4	71.8	12.3	10.7	#137.0	#205.0	132.1
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	508	975	135	1022	944	95	561	446	1341
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	1.07	0.27	0.34	0.27	0.16	1.09	1.11	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Future Volume (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			0.99		0.99		0.96	0.97		0.97
Frt		0.999			0.984				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3610	0	1684	3398	0	1750	1847	1617	1750	1795	1581
Flt Permitted	0.184			0.041			0.667			0.716		
Satd. Flow (perm)	344	3610	0	73	3398	0	1212	1847	1547	1281	1795	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			21				23			92
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	14		3	3		14	12		24	24		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	6%	5%	6%	2%	4%	1%	2%	7%	1%
Adj. Flow (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2532	0	104	1222	0	95	63	361	224	105	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

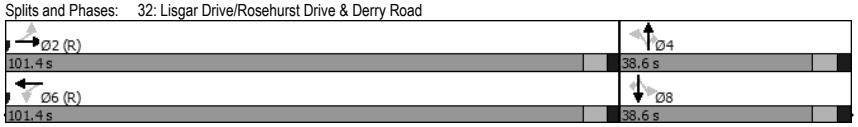
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	101.4	101.4		101.4	101.4		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (%)	72.4%	72.4%		72.4%	72.4%		27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Maximum Green (s)	95.4	95.4		95.4	95.4		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	96.8	96.8		96.8	96.8		32.6	32.6	32.6	32.6	32.6	32.6
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	0.09	1.01		2.08	0.52		0.34	0.15	0.96	0.75	0.25	0.21
Control Delay	3.0	16.4		563.9	11.2		48.5	43.6	86.0	66.8	45.5	9.2
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	16.5		563.9	11.2		48.5	43.6	86.0	66.8	45.5	9.2
LOS	A	B		F	B		D	D	F	E	D	A
Approach Delay		16.4			54.5			74.0			48.9	
Approach LOS		B			D			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 132 (94%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.08
Intersection Signal Delay: 35.9 Intersection LOS: D
Intersection Capacity Utilization 121.7% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	2532	104	1222	95	63	361	224	105	92
v/c Ratio	0.09	1.01	2.08	0.52	0.34	0.15	0.96	0.75	0.25	0.21
Control Delay	3.0	16.4	563.9	11.2	48.5	43.6	86.0	66.8	45.5	9.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	16.5	563.9	11.2	48.5	43.6	86.0	66.8	45.5	9.2
Queue Length 50th (m)	0.6	~66.5	~31.5	78.2	22.0	13.9	93.6	57.9	23.8	0.0
Queue Length 95th (m)	m0.7	m42.5	#70.0	93.4	38.7	26.4	#154.0	#93.7	40.3	14.0
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	237	2497	50	2356	285	435	382	301	423	432
Starvation Cap Reductn	0	1	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	1.01	2.08	0.52	0.33	0.14	0.95	0.74	0.25	0.21

Intersection Summary

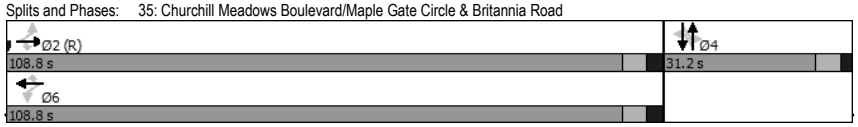
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Future Volume (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97			0.96	0.99	0.97		0.99	0.99	
Frt			0.850			0.850		0.852			0.929	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3614	1597	1552	3510	1298	1733	1575	0	1785	1721	0
Flt Permitted	0.285			0.038			0.734			0.346		
Satd. Flow (perm)	533	3614	1550	62	3510	1248	1326	1575	0	644	1721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			39			25		12			17	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			101.9			114.1			106.4	
Travel Time (s)		28.2			6.1			8.2			7.7	
Confl. Peds. (#/hr)	8		4	4		8	6		10	10		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	4%	23%	3%	0%	1%	0%	5%	0%
Adj. Flow (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2417	131	60	940	17	31	212	0	74	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2		2	6		6	4			4		
Detector Phase	2	2	2	6	6	6	4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	31.2	31.2		31.2	31.2	
Total Split (s)	108.8	108.8	108.8	108.8	108.8	108.8	31.2	31.2		31.2	31.2	
Total Split (%)	77.7%	77.7%	77.7%	77.7%	77.7%	77.7%	22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	101.8	101.8	101.8	101.8	101.8	101.8	25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-2.0	-1.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	5.2	5.2		4.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	None	None	None	None		None	None	
Walk Time (s)	11.0	11.0	11.0	11.0	11.0	11.0	10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0	15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	106.3	106.3	106.3	106.3	106.3	106.3	22.5	22.5		23.5	22.5	
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.76	0.76	0.16	0.16		0.17	0.16	
v/c Ratio	0.00	0.88	0.11	1.28	0.35	0.02	0.15	0.81		0.69	0.12	
Control Delay	3.0	10.4	1.3	252.9	6.3	1.2	50.4	75.6		84.9	31.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	3.0	10.4	1.3	252.9	6.3	1.2	50.4	75.6		84.9	31.0	
LOS	A	B	A	F	A	A	D	E		F	C	
Approach Delay		9.9			20.7			72.3			67.3	
Approach LOS		A			C			E			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 102.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	2417	131	60	940	17	31	212	74	36
v/c Ratio	0.00	0.88	0.11	1.28	0.35	0.02	0.15	0.81	0.69	0.12
Control Delay	3.0	10.4	1.3	252.9	6.3	1.2	50.4	75.6	84.9	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	10.4	1.3	252.9	6.3	1.2	50.4	75.6	84.9	31.0
Queue Length 50th (m)	0.0	72.2	0.0	~21.1	41.8	0.0	7.4	53.5	19.2	4.5
Queue Length 95th (m)	m0.0	m33.5	m0.0	#39.5	53.8	1.4	16.6	80.9	#39.6	14.2
Internal Link Dist (m)		445.7			77.9			90.1		82.4
Turn Bay Length (m)	33.0		22.0	35.0		22.0	21.0		19.0	
Base Capacity (vph)	404	2743	1186	47	2664	953	246	302	124	333
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.88	0.11	1.28	0.35	0.02	0.13	0.70	0.60	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2405	0	0	795	10	280
Future Volume (vph)	2405	0	0	795	10	280
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3952	0	0	3913	1847	1768
Flt Permitted					0.950	
Satd. Flow (perm)	3952	0	0	3913	1847	1768
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	80			80	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	13.4			9.8	11.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	1%	7%	0%
Adj. Flow (vph)	2505	0	0	828	10	292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2505	0	0	828	10	292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

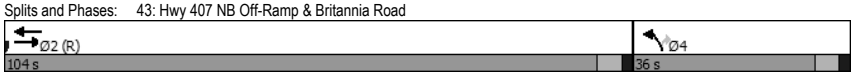
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	104.0			104.0	36.0	36.0
Total Split (%)	74.3%			74.3%	25.7%	25.7%
Maximum Green (s)	98.0			98.0	30.0	30.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	101.2			101.2	26.8	26.8
Actuated g/C Ratio	0.72			0.72	0.19	0.19
v/c Ratio	0.88			0.29	0.03	0.86
Control Delay	20.4			7.5	44.2	78.9
Queue Delay	17.9			0.0	0.0	0.0
Total Delay	38.4			7.5	44.2	78.9
LOS	D			A	D	E
Approach Delay	38.4			7.5	77.8	
Approach LOS	D			A	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 34.6 Intersection LOS: C
Intersection Capacity Utilization 87.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2505	828	10	292
v/c Ratio	0.88	0.29	0.03	0.86
Control Delay	20.4	7.5	44.2	78.9
Queue Delay	17.9	0.0	0.0	0.0
Total Delay	38.4	7.5	44.2	78.9
Queue Length 50th (m)	340.8	32.1	2.3	77.8
Queue Length 95th (m)	391.8	m36.8	7.2	#116.4
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	2857	2829	395	378
Starvation Cap Reductn	241	0	0	0
Spillback Cap Reductn	427	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	0.29	0.03	0.77

Intersection Summary

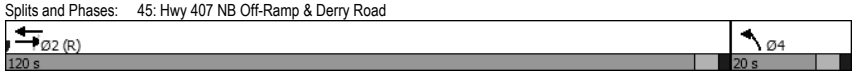
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2461	0	0	899	14	151
Future Volume (vph)	2461	0	0	899	14	151
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3913	0	0	3764	3582	1716
Flt Permitted					0.950	
Satd. Flow (perm)	3913	0	0	3764	3582	1716
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						154
Link Speed (k/h)	80			80	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	13.9			10.3	15.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	2%	2%	5%	7%	3%
Adj. Flow (vph)	2511	0	0	917	14	154
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2511	0	0	917	14	154
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	120.0			120.0	20.0	120.0
Total Split (%)	85.7%			85.7%	14.3%	85.7%
Maximum Green (s)	114.0			114.0	14.0	114.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	132.0			132.0	8.0	132.0
Actuated g/C Ratio	0.94			0.94	0.06	0.94
v/c Ratio	0.68			0.26	0.07	0.09
Control Delay	2.1			0.3	63.4	0.3
Queue Delay	0.2			0.0	0.0	0.0
Total Delay	2.4			0.3	63.4	0.4
LOS	A			A	E	A
Approach Delay	2.4			0.3	5.6	
Approach LOS	A			A	A	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 2.0	Intersection LOS: A
Intersection Capacity Utilization 81.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2511	917	14	154
v/c Ratio	0.68	0.26	0.07	0.09
Control Delay	2.1	0.3	63.4	0.3
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	2.4	0.3	63.4	0.4
Queue Length 50th (m)	10.9	0.0	1.9	0.0
Queue Length 95th (m)	38.0	m4.2	5.6	2.4
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3689	3549	358	1626
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	430	0	0	188
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.77	0.26	0.04	0.11

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Future Volume (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00							
Frt		0.968			0.997				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3445	0	1785	3600	0	1767	3650	1597	1733	3650	1597
Flt Permitted	0.049			0.238			0.131			0.497		
Satd. Flow (perm)	92	3445	0	447	3600	0	244	3650	1597	907	3650	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			2				179			100
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	4%	1%	0%	0%	3%	0%	0%
Adj. Flow (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Shared Lane Traffic (%)												
Lane Group Flow (vph)	144	931	0	164	2053	0	115	412	179	136	688	172
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

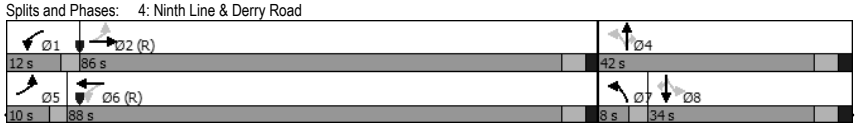
Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	30.1		8.0	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	10.0	86.0		12.0	88.0		8.0	42.0	42.0	34.0	34.0	34.0
Total Split (%)	7.1%	61.4%		8.6%	62.9%		5.7%	30.0%	30.0%	24.3%	24.3%	24.3%
Maximum Green (s)	7.0	79.9		9.0	81.9		5.0	35.6	35.6	27.6	27.6	27.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.1		0.0	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.1		2.0	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0	0	0	0
Act Effct Green (s)	92.4	81.3		95.7	82.9		40.0	36.6	36.6	28.6	28.6	28.6
Actuated g/C Ratio	0.66	0.58		0.68	0.59		0.29	0.26	0.26	0.20	0.20	0.20
v/c Ratio	0.91	0.46		0.41	0.96		0.86	0.43	0.33	0.74	0.92	0.42
Control Delay	88.7	12.4		5.0	29.1		88.9	44.8	7.1	76.1	73.6	24.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.7	12.4		5.0	29.1		88.9	44.8	7.1	76.1	73.6	24.1
LOS	F	B		A	C		F	D	A	E	E	C
Approach Delay		22.6			27.3			42.4			65.4	
Approach LOS		C			C			D			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 36.1	Intersection LOS: D
Intersection Capacity Utilization 105.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	144	931	164	2053	115	412	179	136	688	172
v/c Ratio	0.91	0.46	0.41	0.96	0.86	0.43	0.33	0.74	0.92	0.42
Control Delay	88.7	12.4	5.0	29.1	88.9	44.8	7.1	76.1	73.6	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.7	12.4	5.0	29.1	88.9	44.8	7.1	76.1	73.6	24.1
Queue Length 50th (m)	21.6	49.7	7.7	274.9	24.4	50.2	0.0	35.6	99.2	16.8
Queue Length 95th (m)	#62.0	80.9	m5.2	#336.7	#49.5	66.0	18.0	#67.4	#134.0	39.0
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	158	2017	402	2132	134	954	549	185	745	405
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.46	0.41	0.96	0.86	0.43	0.33	0.74	0.92	0.42

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Future Volume (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.969				0.850		0.987			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	3482	0	1767	3650	1601	1767	3593	0	1684	3553	0
Flt Permitted	0.060			0.162			0.088			0.092		
Satd. Flow (perm)	112	3482	0	301	3650	1601	164	3593	0	163	3553	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34				75		7			10	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	1%	0%	2%	1%	0%	3%	6%	1%	1%
Adj. Flow (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	1166	0	96	1546	93	182	1110	0	140	1090	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

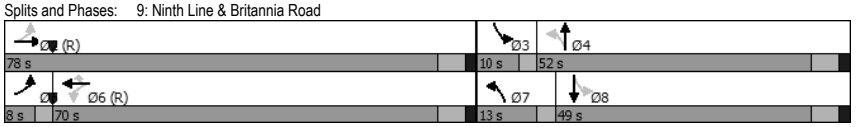
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2			6		6	4			8		
Detector Phase	5	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0	12.0	5.0	12.0		5.0	12.0	
Minimum Split (s)	8.0	24.6		24.6	24.6	24.6	8.0	36.6		8.0	36.6	
Total Split (s)	8.0	78.0		70.0	70.0	70.0	13.0	52.0		10.0	49.0	
Total Split (%)	5.7%	55.7%		50.0%	50.0%	50.0%	9.3%	37.1%		7.1%	35.0%	
Maximum Green (s)	5.0	71.4		63.4	63.4	63.4	10.0	45.4		7.0	42.4	
Yellow Time (s)	3.0	4.6		4.6	4.6	4.6	3.0	4.6		3.0	4.6	
All-Red Time (s)	0.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	2.0	5.6		5.6	5.6	5.6	2.0	5.6		2.0	5.6	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)		7.0		7.0	7.0	7.0		12.0			12.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0		18.0			18.0	
Pedestrian Calls (#/hr)		0		0	0	0		0			0	
Act Effct Green (s)	76.0	72.4		64.4	64.4	64.4	60.0	46.4		55.0	43.4	
Actuated g/C Ratio	0.54	0.52		0.46	0.46	0.46	0.43	0.33		0.39	0.31	
v/c Ratio	0.91	0.64		0.70	0.92	0.12	0.93	0.93		0.93	0.98	
Control Delay	86.5	37.2		51.6	40.9	4.6	80.5	58.8		87.7	70.7	
Queue Delay	0.0	0.2		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	86.5	37.4		51.6	40.9	4.6	80.5	58.8		87.7	70.7	
LOS	F	D		D	D	A	F	E		F	E	
Approach Delay		42.0			39.6			61.9			72.6	
Approach LOS		D			D			E			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 32.2 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 52.7 — Intersection LOS: D
Intersection Capacity Utilization 106.1% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	1166	96	1546	93	182	1110	140	1090
v/c Ratio	0.91	0.64	0.70	0.92	0.12	0.93	0.93	0.93	0.98
Control Delay	86.5	37.2	51.6	40.9	4.6	80.5	58.8	87.7	70.7
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.5	37.4	51.6	40.9	4.6	80.5	58.8	87.7	70.7
Queue Length 50th (m)	25.1	151.3	20.8	208.8	4.7	33.8	155.2	23.9	156.7
Queue Length 95th (m)	#55.2	176.5	#52.8	#245.3	m8.5	#80.1	#196.4	#64.5	#203.4
Internal Link Dist (m)		192.7		445.7			182.5		230.7
Turn Bay Length (m)	63.0		32.0		58.0	52.0		50.0	
Base Capacity (vph)	131	1817	138	1679	776	196	1195	150	1108
Starvation Cap Reductn	0	142	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.70	0.70	0.92	0.12	0.93	0.93	0.93	0.98

Intersection Summary

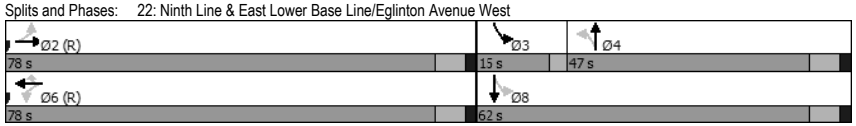
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	358	18	39	786	420	178	614	32	268	582	64
Future Volume (vph)	48	358	18	39	786	420	178	614	32	268	582	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.993				0.850		0.993			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	1867	0	1789	1812	1458	1825	3555	0	1807	3535	0
Flt Permitted	0.073			0.422			0.384			0.180		
Satd. Flow (perm)	140	1867	0	795	1812	1458	738	3555	0	342	3535	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				291		4			10	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	6%	2%	6%	12%	0%	2%	1%	1%	1%	8%
Adj. Flow (vph)	52	389	20	42	854	457	193	667	35	291	633	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	409	0	42	854	457	193	702	0	291	703	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2			6			4		3	8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	78.0	78.0		78.0	78.0	78.0	47.0	47.0		15.0	62.0	
Total Split (%)	55.7%	55.7%		55.7%	55.7%	55.7%	33.6%	33.6%		10.7%	44.3%	
Maximum Green (s)	71.0	71.0		71.0	71.0	71.0	40.0	40.0		12.0	55.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	0.0		0.0	-1.0	0.0	-1.0	-1.0		-1.0	0.0	
Total Lost Time (s)	6.0	7.0		7.0	6.0	7.0	6.0	6.0		2.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	Min	Min		None	Min	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0			0	
Act Effct Green (s)	71.2	70.2		70.2	71.2	70.2	39.2	39.2		60.8	55.8	
Actuated g/C Ratio	0.51	0.50		0.50	0.51	0.50	0.28	0.28		0.43	0.40	
v/c Ratio	0.73	0.44		0.11	0.93	0.52	0.93	0.70		0.94	0.50	
Control Delay	82.4	23.7		19.0	48.9	9.9	96.5	49.0		69.0	32.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	82.4	23.7		19.0	48.9	9.9	96.5	49.0		69.0	32.8	
LOS	F	C		B	D	A	F	D		E	C	
Approach Delay		30.4			34.8			59.2			43.4	
Approach LOS		C			C			E			D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 42.5	Intersection LOS: D
Intersection Capacity Utilization 87.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	409	42	854	457	193	702	291	703
v/c Ratio	0.73	0.44	0.11	0.93	0.52	0.93	0.70	0.94	0.50
Control Delay	82.4	23.7	19.0	48.9	9.9	96.5	49.0	69.0	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.4	23.7	19.0	48.9	9.9	96.5	49.0	69.0	32.8
Queue Length 50th (m)	10.8	69.1	5.9	211.6	26.8	51.3	89.8	~57.0	75.7
Queue Length 95th (m)	#37.3	95.2	12.8	#299.9	55.5	#97.6	111.5	#109.8	94.3
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	72	948	403	931	882	216	1043	310	1413
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.43	0.10	0.92	0.52	0.89	0.67	0.94	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Future Volume (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00		0.99		0.99	1.00		0.98
Frt		0.992			0.988				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3513	0	1785	3563	0	1785	1921	1617	1785	1830	1566
Flt Permitted	0.035			0.275			0.733			0.734		
Satd. Flow (perm)	66	3513	0	515	3563	0	1362	1921	1593	1376	1830	1529
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			14				160			23
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	4		6	6		4	9		2	2		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	1%	0%	0%	1%	0%	5%	2%
Adj. Flow (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	987	0	335	2388	0	47	36	160	99	37	45
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

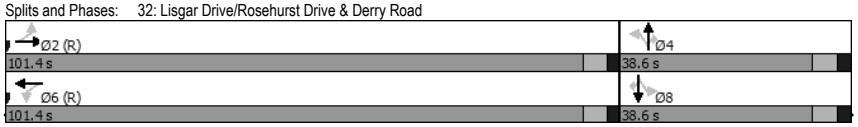
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	101.4	101.4		101.4	101.4		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (%)	72.4%	72.4%		72.4%	72.4%		27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Maximum Green (s)	95.4	95.4		95.4	95.4		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	113.0	113.0		113.0	113.0		16.4	16.4	16.4	16.4	16.4	16.4
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.12	0.12	0.12	0.12	0.12	0.12
v/c Ratio	1.08	0.35		0.81	0.83		0.30	0.16	0.49	0.61	0.17	0.23
Control Delay	170.5	2.8		27.0	12.2		59.3	54.8	12.7	74.1	55.2	33.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	170.5	2.8		27.0	12.2		59.3	54.8	12.7	74.1	55.2	33.6
LOS	F	A		C	B		E	D	B	E	E	C
Approach Delay		11.9			14.0			28.0			60.1	
Approach LOS		B			B			C			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 113.4 (81%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 16.3 — Intersection LOS: B
Intersection Capacity Utilization 105.7% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	987	335	2388	47	36	160	99	37	45
v/c Ratio	1.08	0.35	0.81	0.83	0.30	0.16	0.49	0.61	0.17	0.23
Control Delay	170.5	2.8	27.0	12.2	59.3	54.8	12.7	74.1	55.2	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	170.5	2.8	27.0	12.2	59.3	54.8	12.7	74.1	55.2	33.6
Queue Length 50th (m)	~14.2	21.2	42.5	167.9	12.1	9.1	0.0	26.5	9.4	5.6
Queue Length 95th (m)	m#46.1	29.0	#139.8	261.0	23.7	18.8	19.5	43.7	19.3	16.7
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	53	2836	415	2878	321	452	497	324	431	377
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.35	0.81	0.83	0.15	0.08	0.32	0.31	0.09	0.12

Intersection Summary

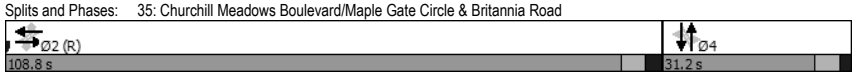
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Future Volume (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.97	1.00	0.99		1.00	0.99	
Frt			0.850			0.850		0.869			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	3614	1597	1552	3650	1581	1733	1645	0	1785	1746	0
Flt Permitted	0.102			0.252			0.746			0.446		
Satd. Flow (perm)	192	3614	1597	412	3650	1535	1356	1645	0	835	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			62			30		102			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			97.9			114.1			106.4	
Travel Time (s)		28.2			5.9			8.2			7.7	
Confl. Peds. (#/hr)	4					4	2		3	3		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	0%	1%	3%	0%	0%	0%	5%	0%
Adj. Flow (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1092	94	219	1838	78	35	117	0	30	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Detector Phase	2	2	2	2	2	2	4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	12.0	12.0	12.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	31.2	31.2		31.2	31.2	
Total Split (s)	108.8	108.8	108.8	108.8	108.8	108.8	31.2	31.2		31.2	31.2	
Total Split (%)	77.7%	77.7%	77.7%	77.7%	77.7%	77.7%	22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	101.8	101.8	101.8	101.8	101.8	101.8	25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	5.2	5.2		5.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)	11.0	11.0	11.0	11.0	11.0	11.0	10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0	15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	117.9	117.9	117.9	117.9	117.9	117.9	10.9	10.9		10.9	10.9	
Actuated g/C Ratio	0.84	0.84	0.84	0.84	0.84	0.84	0.08	0.08		0.08	0.08	
v/c Ratio	0.10	0.36	0.07	0.63	0.60	0.06	0.33	0.53		0.47	0.13	
Control Delay	1.8	1.1	0.1	13.9	4.6	1.4	69.0	23.5		84.2	44.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	1.8	1.1	0.1	13.9	4.6	1.4	69.0	23.5		84.2	44.1	
LOS	A	A	A	B	A	A	E	C		F	D	
Approach Delay		1.0			5.5			34.0			69.1	
Approach LOS		A			A			C			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 1.4 (1%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 6.0	Intersection LOS: A
Intersection Capacity Utilization 84.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	1092	94	219	1838	78	35	117	30	18
v/c Ratio	0.10	0.36	0.07	0.63	0.60	0.06	0.33	0.53	0.47	0.13
Control Delay	1.8	1.1	0.1	13.9	4.6	1.4	69.0	23.5	84.2	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.8	1.1	0.1	13.9	4.6	1.4	69.0	23.5	84.2	44.1
Queue Length 50th (m)	0.2	7.3	0.2	15.2	63.2	1.6	9.4	4.0	8.2	2.9
Queue Length 95th (m)	m0.4	m11.2	m0.3	50.6	94.1	4.8	20.3	22.5	18.7	10.6
Internal Link Dist (m)		445.7			73.9			90.1		82.4
Turn Bay Length (m)	33.0		22.0	35.0		22.0	21.0		19.0	
Base Capacity (vph)	161	3044	1354	347	3074	1297	251	388	155	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.36	0.07	0.63	0.60	0.06	0.14	0.30	0.19	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1028	0	0	1885	73	110
Future Volume (vph)	1028	0	0	1885	73	110
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3935	0	0	3975	1987	1778
Flt Permitted					0.950	
Satd. Flow (perm)	3935	0	0	3975	1987	1778
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	17.9			13.0	11.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	0%	0%	0%
Adj. Flow (vph)	1142	0	0	2094	81	122
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1142	0	0	2094	81	122
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

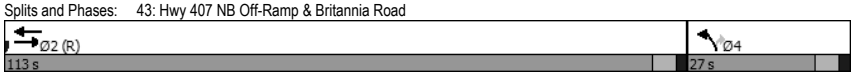
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	113.0			113.0	27.0	27.0
Total Split (%)	80.7%			80.7%	19.3%	19.3%
Maximum Green (s)	107.0			107.0	21.0	21.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	113.1			113.1	14.9	14.9
Actuated g/C Ratio	0.81			0.81	0.11	0.11
v/c Ratio	0.36			0.65	0.39	0.65
Control Delay	8.2			8.9	62.4	75.2
Queue Delay	0.0			0.6	0.0	0.0
Total Delay	8.2			9.5	62.4	75.2
LOS	A			A	E	E
Approach Delay	8.2			9.5	70.1	
Approach LOS	A			A	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 12.6 Intersection LOS: B
Intersection Capacity Utilization 76.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1142	2094	81	122
v/c Ratio	0.36	0.65	0.39	0.65
Control Delay	8.2	8.9	62.4	75.2
Queue Delay	0.0	0.6	0.0	0.0
Total Delay	8.2	9.5	62.4	75.2
Queue Length 50th (m)	61.0	109.5	21.2	33.0
Queue Length 95th (m)	70.0	m142.4	36.2	51.9
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3180	3212	298	266
Starvation Cap Reductn	0	647	0	0
Spillback Cap Reductn	0	484	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.82	0.27	0.46

Intersection Summary

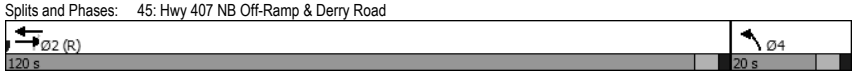
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1083	0	0	2516	104	123
Future Volume (vph)	1083	0	0	2516	104	123
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						0.99
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3935	0	0	3935	3856	1743
Flt Permitted					0.950	
Satd. Flow (perm)	3935	0	0	3935	3856	1722
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						129
Link Speed (k/h)	60			60	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	18.5			13.8	15.5	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	2%	1%	0%	2%
Adj. Flow (vph)	1140	0	0	2648	109	129
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1140	0	0	2648	109	129
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	120.0			120.0	20.0	120.0
Total Split (%)	85.7%			85.7%	14.3%	85.7%
Maximum Green (s)	114.0			114.0	14.0	114.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	118.5			118.5	9.5	118.5
Actuated g/C Ratio	0.85			0.85	0.07	0.85
v/c Ratio	0.34			0.80	0.42	0.09
Control Delay	3.8			4.6	67.2	0.4
Queue Delay	0.0			0.2	0.0	0.0
Total Delay	3.8			4.7	67.2	0.4
LOS	A			A	E	A
Approach Delay	3.8			4.7	31.0	
Approach LOS	A			A	C	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 6.0	Intersection LOS: A
Intersection Capacity Utilization 97.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1140	2648	109	129
v/c Ratio	0.34	0.80	0.42	0.09
Control Delay	3.8	4.6	67.2	0.4
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	3.8	4.7	67.2	0.4
Queue Length 50th (m)	34.7	40.6	15.2	0.0
Queue Length 95th (m)	40.1	m54.5	24.5	2.9
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3330	3330	385	1477
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	116	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.82	0.28	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	574	2	2	607
Future Volume (vph)	1	0	574	2	2	607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1825	1921	1902	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1921	1902	0	0	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.2		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	3%
Adj. Flow (vph)	1	0	624	2	2	660
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	626	0	0	662
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	574	2	2	607
Future Volume (Veh/h)	1	0	574	2	2	607
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	624	2	2	660
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1289	625			626	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1289	625			626	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	182	488			965	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	626	662
Volume Left	1	0	2
Volume Right	0	2	0
cSH	137	1700	965
Volume to Capacity	0.01	0.37	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	31.6	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	31.6	0.0	0.1
Approach LOS	D		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
2: Ninth Line & Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	141	106	40	481	608	58	23	610	74
Future Volume (vph)	0	0	0	141	106	40	481	608	58	23	610	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.957			0.987			0.985	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1755	1797	0	1789	3480	0	1825	3525	0
Flt Permitted				0.757			0.316			0.376		
Satd. Flow (perm)	1883	1883	0	1398	1797	0	595	3480	0	722	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					18			23			16	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		138.3			287.6			434.9			780.0	
Travel Time (s)		10.4			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	3%	2%	3%	9%	0%	2%	2%
Adj. Flow (vph)	0	0	0	153	106	43	481	661	63	25	663	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	153	149	0	481	724	0	25	737	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm			Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	

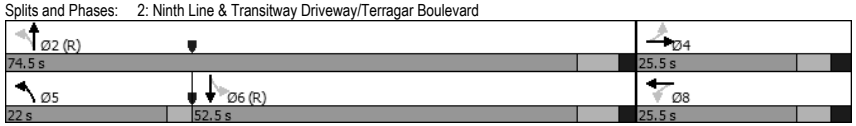
Lanes, Volumes, Timings
2: Ninth Line & Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	8.0		8.0	8.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		9.0	53.0		52.0	52.0	
Total Split (s)	25.5	25.5		25.5	25.5		22.0	74.5		52.5	52.5	
Total Split (%)	25.5%	25.5%		25.5%	25.5%		22.0%	74.5%		52.5%	52.5%	
Maximum Green (s)	19.0	19.0		19.0	19.0		19.0	67.5		45.5	45.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		2.0	6.0		6.0	6.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0			35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)				16.4	16.4		76.1	72.1		54.5	54.5	
Actuated g/C Ratio				0.16	0.16		0.76	0.72		0.54	0.54	
v/c Ratio				0.67	0.48		0.75	0.29		0.06	0.38	
Control Delay				53.4	37.8		13.3	5.4		14.3	14.7	
Queue Delay				0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay				53.4	37.8		13.3	5.4		14.3	14.7	
LOS				D	D		B	A		B	B	
Approach Delay					45.7			8.6			14.7	
Approach LOS					D			A			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 15.6	Intersection LOS: B
Intersection Capacity Utilization 66.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Ninth Line & Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	153	149	481	724	25	737
v/c Ratio	0.67	0.48	0.75	0.29	0.06	0.38
Control Delay	53.4	37.8	13.3	5.4	14.3	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	37.8	13.3	5.4	14.3	14.7
Queue Length 50th (m)	27.9	22.9	25.8	22.1	2.2	40.5
Queue Length 95th (m)	47.1	40.2	49.3	32.8	7.4	63.0
Internal Link Dist (m)		263.6		410.9		756.0
Turn Bay Length (m)			40.0		40.0	
Base Capacity (vph)	279	373	691	2516	393	1929
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.40	0.70	0.29	0.06	0.38

Intersection Summary

Lanes, Volumes, Timings
3: Ninth Line & Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	46	0	18	53	1166	63	11	749	0
Future Volume (vph)	0	0	0	46	0	18	53	1166	63	11	749	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.850			0.992				
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1825	1633	0	1789	3517	0	1674	3544	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	1883	0	1825	1633	0	1789	3517	0	1674	3544	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		150.1			310.4			412.4			434.9	
Travel Time (s)		11.3			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	2%	9%	3%	2%
Adj. Flow (vph)	0	0	0	50	0	20	53	1267	68	12	814	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	50	20	0	53	1335	0	12	814	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 50.9% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Transitway Driveway/Hazelridge Road

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	46	0	18	53	1166	63	11	749	0
Future Volume (Veh/h)	0	0	0	46	0	18	53	1166	63	11	749	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	0	0	0	50	0	20	53	1267	68	12	814	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1598	2279	407	1838	2245	668	814			1335		
vC1, stage 1 conf vol	838	838		1407	1407							
vC2, stage 2 conf vol	760	1441		431	838							
vCu, unblocked vol	1598	2279	407	1838	2245	668	814			1335		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	100	100	62	100	95	93			97		
cM capacity (veh/h)	226	153	593	133	162	406	809			477		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	0	50	20	53	845	490	12	543	271
Volume Left	0	0	50	0	53	0	0	12	0	0
Volume Right	0	0	0	20	0	0	68	0	0	0
cSH	1700	1700	133	406	809	1700	1700	477	1700	1700
Volume to Capacity	0.00	0.00	0.38	0.05	0.07	0.50	0.29	0.03	0.32	0.16
Queue Length 95th (m)	0.0	0.0	12.0	1.2	1.6	0.0	0.0	0.6	0.0	0.0
Control Delay (s)	0.0	0.0	47.7	14.3	9.8	0.0	0.0	12.7	0.0	0.0
Lane LOS	A	A	E	B	A			B		
Approach Delay (s)	0.0		38.1		0.4			0.2		
Approach LOS	A		E							

Intersection Summary				
Average Delay		1.5		
Intersection Capacity Utilization		50.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Future Volume (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.992			0.968				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1733	5148	0	1716	4921	0	1785	3614	1566	1638	3614	1597
Flt Permitted	0.168			0.059			0.175			0.347		
Satd. Flow (perm)	306	5148	0	107	4921	0	329	3614	1566	598	3614	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			60				188			171
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	4%	4%	0%	0%	1%	2%	9%	1%	0%
Adj. Flow (vph)	271	2238	129	147	912	244	207	584	241	33	514	171
Shared Lane Traffic (%)												
Lane Group Flow (vph)	271	2367	0	147	1156	0	207	584	241	33	514	171
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

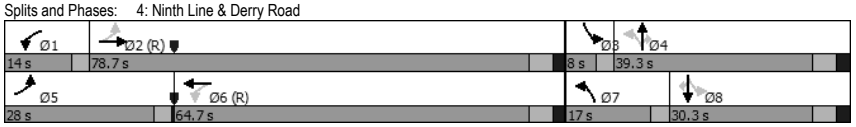
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	5.0	8.0	8.0
Minimum Split (s)	9.0	30.1		8.0	30.1		8.0	29.4	29.4	8.0	29.4	29.4
Total Split (s)	28.0	78.7		14.0	64.7		17.0	39.3	39.3	8.0	30.3	30.3
Total Split (%)	20.0%	56.2%		10.0%	46.2%		12.1%	28.1%	28.1%	5.7%	21.6%	21.6%
Maximum Green (s)	24.5	72.6		11.0	58.6		14.0	32.9	32.9	5.0	23.9	23.9
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.5	2.1		0.0	2.1		0.0	2.4	2.4	0.0	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.5	5.1		2.0	5.1		2.0	5.4	5.4	2.0	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	91.1	75.2		83.2	68.8		44.4	36.2	36.2	33.4	24.0	24.0
Actuated g/C Ratio	0.65	0.54		0.59	0.49		0.32	0.26	0.26	0.24	0.17	0.17
v/c Ratio	0.72	0.85		0.76	0.47		0.80	0.63	0.44	0.18	0.83	0.41
Control Delay	32.3	28.1		66.8	18.1		59.8	49.8	13.9	35.6	68.4	10.0
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	28.2		66.8	18.1		59.8	49.8	13.9	35.6	68.4	10.0
LOS	C	C		E	B		E	D	B	D	E	A
Approach Delay		28.7			23.6			43.4			52.9	
Approach LOS		C			C			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 33.2 — Intersection LOS: C
Intersection Capacity Utilization 95.3% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	271	2367	147	1156	207	584	241	33	514	171
v/c Ratio	0.72	0.85	0.76	0.47	0.80	0.63	0.44	0.18	0.83	0.41
Control Delay	32.3	28.1	66.8	18.1	59.8	49.8	13.9	35.6	68.4	10.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	28.2	66.8	18.1	59.8	49.8	13.9	35.6	68.4	10.0
Queue Length 50th (m)	37.4	143.8	27.4	40.1	43.9	77.5	11.6	6.3	72.6	0.0
Queue Length 95th (m)	69.2	151.8	#59.4	74.6	#72.5	97.8	35.9	14.3	93.0	19.7
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	459	2769	202	2447	260	934	544	187	642	424
Starvation Cap Reductn	0	33	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.87	0.73	0.47	0.80	0.63	0.44	0.18	0.80	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1156	85	58	655
Future Volume (vph)	90	47	1156	85	58	655
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.990			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3543	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1807	1633	3543	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1257	92	63	712
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1349	0	63	712
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	90	47	1156	85	58	655
Future Volume (Veh/h)	90	47	1156	85	58	655
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	51	1257	92	63	712
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1785	676			1349	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1785	676			1349	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	87			88	
cM capacity (veh/h)	65	400			517	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	149	838	511	63	356	356
Volume Left	98	0	0	63	0	0
Volume Right	51	0	92	0	0	0
cSH	92	1700	1700	517	1700	1700
Volume to Capacity	1.62	0.49	0.30	0.12	0.21	0.21
Queue Length 95th (m)	90.1	0.0	0.0	3.1	0.0	0.0
Control Delay (s)	403.4	0.0	0.0	12.9	0.0	0.0
Lane LOS	F			B		
Approach Delay (s)	403.4	0.0		1.1		
Approach LOS	F					

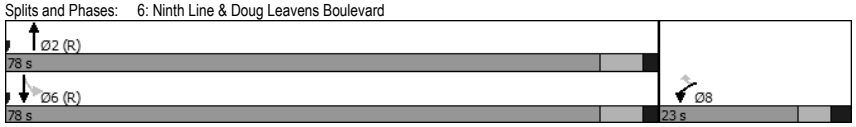
Intersection Summary			
Average Delay	26.8		
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	135	206	941	93	75	567
Future Volume (vph)	135	206	941	93	75	567
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	27.0		60.0	115.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.99				
Frt		0.850	0.987			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1772	1601	3492	0	1825	3579
Flt Permitted	0.950				0.231	
Satd. Flow (perm)	1772	1579	3492	0	444	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		166	26			
Link Speed (k/h)	50		70			70
Link Distance (m)	255.0		850.0			603.1
Travel Time (s)	18.4		43.7			31.0
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	3%	5%	0%	2%
Adj. Flow (vph)	147	224	1023	101	82	616
Shared Lane Traffic (%)						
Lane Group Flow (vph)	147	224	1124	0	82	616
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	23.0	23.0	52.0		52.0	52.0
Total Split (s)	23.0	23.0	78.0		78.0	78.0
Total Split (%)	22.8%	22.8%	77.2%		77.2%	77.2%
Maximum Green (s)	16.5	16.5	71.0		71.0	71.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	14.1	14.1	75.4		75.4	75.4
Actuated g/C Ratio	0.14	0.14	0.75		0.75	0.75
v/c Ratio	0.59	0.62	0.43		0.25	0.23
Control Delay	50.3	19.6	8.2		6.8	4.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	50.3	19.6	8.2		6.8	4.4
LOS	D	B	A		A	A
Approach Delay	31.8		8.2			4.7
Approach LOS	C		A			A

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 2 (2%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Doug Leavens Boulevard



Queues
6: Ninth Line & Doug Leavens Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	147	224	1124	82	616
v/c Ratio	0.59	0.62	0.43	0.25	0.23
Control Delay	50.3	19.6	8.2	6.8	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	19.6	8.2	6.8	4.4
Queue Length 50th (m)	27.2	10.2	44.2	4.3	16.6
Queue Length 95th (m)	45.2	32.2	83.4	11.5	25.3
Internal Link Dist (m)	231.0		826.0		579.1
Turn Bay Length (m)		27.0		115.0	
Base Capacity (vph)	307	410	2612	331	2670
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.55	0.43	0.25	0.23

Intersection Summary

Lanes, Volumes, Timings
7: Ninth Line & Osprey Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	199	122	1062	148	55	796
Future Volume (vph)	199	122	1062	148	55	796
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	13.0	0.0		25.0	270.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	13.0				0.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.99				
Frt		0.850	0.982			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1706	1601	3434	0	1789	3544
Flt Permitted	0.950				0.151	
Satd. Flow (perm)	1706	1579	3434	0	284	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		133	25			
Link Speed (k/h)	50		70			70
Link Distance (m)	160.0		383.2			301.0
Travel Time (s)	11.5		19.7			15.5
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	4%	7%	2%	3%
Adj. Flow (vph)	216	133	1154	161	60	865
Shared Lane Traffic (%)						
Lane Group Flow (vph)	216	133	1315	0	60	865
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
7: Ninth Line & Osprey Boulevard

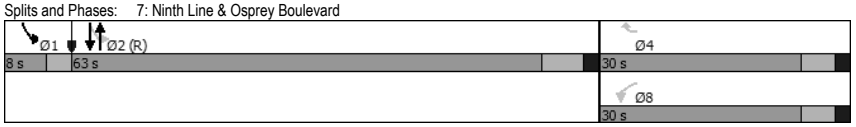
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		5.0	45.0
Minimum Split (s)	25.0	23.0	52.0		8.0	52.0
Total Split (s)	30.0	30.0	63.0		8.0	63.0
Total Split (%)	29.7%	29.7%	62.4%		7.9%	62.4%
Maximum Green (s)	24.0	24.0	56.0		5.0	56.0
Yellow Time (s)	4.0	4.0	5.0		3.0	5.0
All-Red Time (s)	2.0	2.0	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	6.0		2.0	6.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	8.0	8.0	37.0			37.0
Flash Dont Walk (s)	9.0	9.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	18.9	18.9	63.9		73.5	63.9
Actuated g/C Ratio	0.19	0.19	0.63		0.73	0.63
v/c Ratio	0.68	0.33	0.60		0.19	0.39
Control Delay	48.6	8.0	13.5		8.6	14.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	48.6	8.0	13.5		8.6	14.6
LOS	D	A	B		A	B
Approach Delay	33.1		13.5			14.2
Approach LOS	C		B			B

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 16.4 Intersection LOS: B
Intersection Capacity Utilization 65.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 7: Ninth Line & Osprey Boulevard



Queues
7: Ninth Line & Osprey Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	216	133	1315	60	865
v/c Ratio	0.68	0.33	0.60	0.19	0.39
Control Delay	48.6	8.0	13.5	8.6	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	8.0	13.5	8.6	14.6
Queue Length 50th (m)	39.7	0.0	77.3	3.3	52.5
Queue Length 95th (m)	59.1	13.8	110.8	10.7	72.8
Internal Link Dist (m)	136.0		359.2		277.0
Turn Bay Length (m)	13.0			270.0	
Base Capacity (vph)	422	490	2181	310	2241
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.27	0.60	0.19	0.39

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Parkgate Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	91	959	6	27	790
Future Volume (vph)	18	91	959	6	27	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0	0.0		0.0	35.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				60.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3611	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3611	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	207.4		254.7			383.2
Travel Time (s)	14.9		13.1			19.7
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	20	99	1042	7	29	859
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	99	1049	0	29	859
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Parkgate Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	91	959	6	27	790
Future Volume (Veh/h)	18	91	959	6	27	790
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	99	1042	7	29	859
Pedestrians						1
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			255			383
pX, platoon unblocked	0.78	0.74			0.74	
vC, conflicting volume	1533	526			1049	
vC1, stage 1 conf vol	1046					
vC2, stage 2 conf vol	488					
vCu, unblocked vol	708	0			370	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	88			97	
cM capacity (veh/h)	452	809			890	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	20	99	695	354	29	430	430
Volume Left	20	0	0	0	29	0	0
Volume Right	0	99	0	7	0	0	0
cSH	452	809	1700	1700	890	1700	1700
Volume to Capacity	0.04	0.12	0.41	0.21	0.03	0.25	0.25
Queue Length 95th (m)	1.1	3.2	0.0	0.0	0.8	0.0	0.0
Control Delay (s)	13.3	10.1	0.0	0.0	9.2	0.0	0.0
Lane LOS	B	B			A		
Approach Delay (s)	10.6		0.0		0.3		
Approach LOS	B						

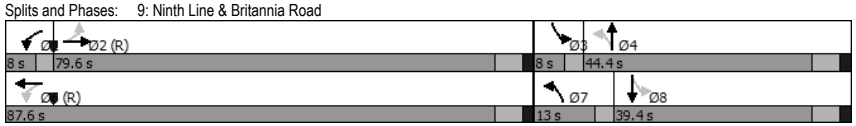
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	39.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Future Volume (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.982			0.981			0.982			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	5093	0	1767	4942	0	1785	3510	0	1653	3511	0
Flt Permitted	0.318			0.052			0.110			0.116		
Satd. Flow (perm)	592	5093	0	97	4942	0	207	3510	0	202	3511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			31			11			11	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	2%	1%	2%	19%	0%	2%	3%	8%	2%	2%
Adj. Flow (vph)	104	2322	324	72	753	106	203	848	116	60	764	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	2646	0	72	859	0	203	964	0	60	877	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	24.6	24.6		8.0	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	79.6	79.6		8.0	87.6		13.0	44.4		8.0	39.4	
Total Split (%)	56.9%	56.9%		5.7%	62.6%		9.3%	31.7%		5.7%	28.1%	
Maximum Green (s)	73.0	73.0		5.0	81.0		10.0	37.8		5.0	32.8	
Yellow Time (s)	4.6	4.6		3.0	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	2.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-2.0	-1.0		-2.0	-1.0		-1.0	-3.0	
Total Lost Time (s)	5.6	5.6		1.0	5.6		1.0	5.6		2.0	3.6	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			12.0			12.0	
Flash Dont Walk (s)	11.0	11.0			11.0			18.0			18.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)	75.6	75.6		86.6	82.0		51.4	40.4		43.4	35.8	
Actuated g/C Ratio	0.54	0.54		0.62	0.59		0.37	0.29		0.31	0.26	
v/c Ratio	0.33	0.96		0.50	0.30		0.96	0.95		0.48	0.97	
Control Delay	12.4	30.7		44.0	11.9		87.7	66.0		43.6	73.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.4	30.8		44.0	11.9		87.7	66.0		43.6	73.8	
LOS	B	C		D	B		F	E		D	E	
Approach Delay		30.1			14.4			69.8			71.9	
Approach LOS		C			B			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 42.3		Intersection LOS: D	
Intersection Capacity Utilization 106.9%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	2646	72	859	203	964	60	877
v/c Ratio	0.33	0.96	0.50	0.30	0.96	0.95	0.48	0.97
Control Delay	12.4	30.7	44.0	11.9	87.7	66.0	43.6	73.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	30.8	44.0	11.9	87.7	66.0	43.6	73.8
Queue Length 50th (m)	8.4	245.4	6.6	28.4	39.9	138.9	11.0	125.8
Queue Length 95th (m)	m11.2	#298.9	24.5	33.1	#89.4	#183.8	21.4	#168.2
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	319	2762	143	2907	211	1020	124	906
Starvation Cap Reductn	0	1	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.96	0.50	0.30	0.96	0.95	0.48	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
10: Ninth Line & Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	21	40	28	20	1176	8	2	1187	38
Future Volume (vph)	0	0	0	21	40	28	20	1176	8	2	1187	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.936			0.999			0.996	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		140.4			491.2			170.0			206.5	
Travel Time (s)		10.5			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	0%	2%	2%	13%	50%	3%	2%
Adj. Flow (vph)	0	0	0	23	40	30	20	1278	9	2	1290	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	23	70	0	20	1287	0	2	1328	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 44.5% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Transitway Driveway/Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	21	40	28	20	1176	8	2	1187	38
Future Volume (Veh/h)	0	0	0	21	40	28	20	1176	8	2	1187	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	0	0	0	23	40	30	20	1278	9	2	1290	38
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											206	
pX, platoon unblocked	0.76	0.76	0.76	0.76	0.76		0.76					
vC, conflicting volume	2042	2640	664	1972	2654	644	1328			1287		
vC1, stage 1 conf vol	1313	1313		1322	1322							
vC2, stage 2 conf vol	729	1327		649	1332							
vCu, unblocked vol	1746	2529	0	1654	2548	644	812			1287		
tC, single (s)	7.5	6.5	6.9	7.6	6.5	6.9	4.1			5.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.7		
p0 queue free %	100	100	100	85	75	93	97			99		
cM capacity (veh/h)	186	167	829	150	163	421	619			336		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	0	23	70	20	852	435	2	860	468
Volume Left	0	0	23	0	20	0	0	2	0	0
Volume Right	0	0	0	30	0	0	9	0	0	38
cSH	1700	1700	150	221	619	1700	1700	336	1700	1700
Volume to Capacity	0.00	0.00	0.15	0.32	0.03	0.50	0.26	0.01	0.51	0.28
Queue Length 95th (m)	0.0	0.0	4.0	9.9	0.8	0.0	0.0	0.1	0.0	0.0
Control Delay (s)	0.0	0.0	33.4	28.6	11.0	0.0	0.0	15.8	0.0	0.0
Lane LOS	A	A	D	D	B			C		
Approach Delay (s)	0.0		29.8		0.2			0.0		
Approach LOS	A		D							

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		44.5%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
11: Ninth Line & Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	24	0	32	13	1139	31	26	1173	25
Future Volume (vph)	0	0	0	24	0	32	13	1139	31	26	1173	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt					0.850			0.996			0.997	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1825	1585	0	1789	3554	0	1825	3568	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	1883	0	1825	1585	0	1789	3554	0	1825	3568	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		110.9			511.9			217.0			170.0	
Travel Time (s)		8.3			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	3%	2%	2%	13%	0%	2%	2%
Adj. Flow (vph)	0	0	0	26	0	35	13	1238	34	28	1275	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	26	35	0	13	1272	0	28	1300	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & Transitway Driveway/McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	24	0	32	13	1139	31	26	1173	25
Future Volume (Veh/h)	0	0	0	24	0	32	13	1139	31	26	1173	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	0	0	0	26	0	35	13	1238	34	28	1275	25
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											376	
pX, platoon unblocked	0.78	0.78	0.78	0.78	0.78		0.78					
vC, conflicting volume	2024	2642	650	1974	2637	637	1300			1272		
vC1, stage 1 conf vol	1344	1344		1281	1281							
vC2, stage 2 conf vol	681	1298		694	1356							
vCu, unblocked vol	1751	2541	0	1687	2535	637	823			1272		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	84	100	92	98			95		
cM capacity (veh/h)	186	153	847	166	163	417	627			553		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	0	26	35	13	825	447	28	850	450
Volume Left	0	0	26	0	13	0	0	28	0	0
Volume Right	0	0	0	35	0	0	34	0	0	25
cSH	1700	1700	166	417	627	1700	1700	553	1700	1700
Volume to Capacity	0.00	0.00	0.16	0.08	0.02	0.49	0.26	0.05	0.50	0.26
Queue Length 95th (m)	0.0	0.0	4.1	2.1	0.5	0.0	0.0	1.2	0.0	0.0
Control Delay (s)	0.0	0.0	30.6	14.4	10.9	0.0	0.0	11.9	0.0	0.0
Lane LOS	A	A	D	B	B			B		
Approach Delay (s)	0.0		21.3		0.1			0.3		
Approach LOS	A		C							

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		43.5%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	11	1276	8	4	1152
Future Volume (vph)	19	11	1276	8	4	1152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	30.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.951		0.999			
Flt Protected	0.969				0.950	
Satd. Flow (prot)	1714	0	3541	0	1825	3579
Flt Permitted	0.969				0.950	
Satd. Flow (perm)	1714	0	3541	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	0%	0%	2%
Adj. Flow (vph)	21	12	1387	9	4	1252
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	1396	0	4	1252
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	11	1276	8	4	1152
Future Volume (Veh/h)	19	11	1276	8	4	1152
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	12	1387	9	4	1252
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2026	698			1396	
vC1, stage 1 conf vol	1392					
vC2, stage 2 conf vol	634					
vCu, unblocked vol	2026	698			1396	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4			2.2	
p0 queue free %	89	97			99	
cM capacity (veh/h)	183	367			496	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	33	925	471	4	626	626
Volume Left	21	0	0	4	0	0
Volume Right	12	0	9	0	0	0
cSH	224	1700	1700	496	1700	1700
Volume to Capacity	0.15	0.54	0.28	0.01	0.37	0.37
Queue Length 95th (m)	3.9	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	23.8	0.0	0.0	12.3	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	23.8	0.0		0.0		
Approach LOS	C					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	11	1155	6	3	1193
Future Volume (vph)	6	11	1155	6	3	1193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1498	3535	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1498	3535	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	33%	0%	2%
Adj. Flow (vph)	7	12	1255	7	3	1297
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	12	1262	0	3	1297
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	11	1155	6	3	1193
Future Volume (Veh/h)	6	11	1155	6	3	1193
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	12	1255	7	3	1297
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.77	0.77			0.77	
vC, conflicting volume	1913	631			1262	
vC1, stage 1 conf vol	1258					
vC2, stage 2 conf vol	654					
vCu, unblocked vol	1584	0			736	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	279	815			674	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	19	837	425	3	648	648
Volume Left	7	0	0	3	0	0
Volume Right	12	0	7	0	0	0
cSH	759	1700	1700	674	1700	1700
Volume to Capacity	0.03	0.49	0.25	0.00	0.38	0.38
Queue Length 95th (m)	0.6	0.0	0.0	0.1	0.0	0.0
Control Delay (s)	12.7	0.0	0.0	10.4	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	12.7	0.0		0.0		
Approach LOS	B					

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		43.0%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
14: Ninth Line & Thomas Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	204	95	1078	179	80	1099
Future Volume (vph)	204	95	1078	179	80	1099
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	28.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				45.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.99				
Frt		0.850	0.979			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1526	3469	0	1690	3579
Flt Permitted	0.950				0.137	
Satd. Flow (perm)	1789	1505	3469	0	244	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		103	30			
Link Speed (k/h)	50		70			70
Link Distance (m)	534.8		346.0			306.2
Travel Time (s)	38.5		17.8			15.7
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	7%	3%	3%	8%	2%
Adj. Flow (vph)	222	103	1172	195	87	1195
Shared Lane Traffic (%)						
Lane Group Flow (vph)	222	103	1367	0	87	1195
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
14: Ninth Line & Thomas Street

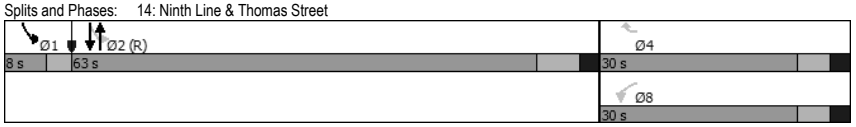
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		5.0	45.0
Minimum Split (s)	25.5	25.5	52.5		8.0	52.5
Total Split (s)	30.0	30.0	63.0		8.0	63.0
Total Split (%)	29.7%	29.7%	62.4%		7.9%	62.4%
Maximum Green (s)	23.5	23.5	55.5		5.0	55.5
Yellow Time (s)	4.0	4.0	5.0		3.0	5.0
All-Red Time (s)	2.5	2.5	2.5		0.0	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.5		2.0	6.5
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	8.0	8.0	33.0			33.0
Flash Dont Walk (s)	11.0	11.0	12.0			12.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	18.6	18.6	62.8		73.3	62.8
Actuated g/C Ratio	0.18	0.18	0.62		0.73	0.62
v/c Ratio	0.67	0.29	0.63		0.31	0.54
Control Delay	49.6	11.0	21.2		7.3	13.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	49.6	11.0	21.2		7.3	13.1
LOS	D	B	C		A	B
Approach Delay	37.4		21.2			12.7
Approach LOS	D		C			B

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 19.3 — Intersection LOS: B
Intersection Capacity Utilization 66.7% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 14: Ninth Line & Thomas Street



Queues
14: Ninth Line & Thomas Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	222	103	1367	87	1195
v/c Ratio	0.67	0.29	0.63	0.31	0.54
Control Delay	49.6	11.0	21.2	7.3	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	11.0	21.2	7.3	13.1
Queue Length 50th (m)	43.1	1.2	127.4	3.9	69.0
Queue Length 95th (m)	64.5	15.7	160.9	9.8	96.3
Internal Link Dist (m)	510.8		322.0		282.2
Turn Bay Length (m)				28.0	
Base Capacity (vph)	433	443	2169	281	2226
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.23	0.63	0.31	0.54

Intersection Summary

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	46	1136	7	17	1297
Future Volume (vph)	18	46	1136	7	17	1297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1601	3541	0	1722	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1601	3541	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	3%	0%	6%	2%
Adj. Flow (vph)	20	50	1235	8	18	1410
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	50	1243	0	18	1410
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	46	1136	7	17	1297
Future Volume (Veh/h)	18	46	1136	7	17	1297
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	50	1235	8	18	1410
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.80					
vC, conflicting volume	1980	622			1243	
vC1, stage 1 conf vol	1239					
vC2, stage 2 conf vol	741					
vCu, unblocked vol	1722	622			1243	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.3	
p0 queue free %	91	88			97	
cM capacity (veh/h)	224	430			534	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	70	823	420	18	705	705
Volume Left	20	0	0	18	0	0
Volume Right	50	0	8	0	0	0
cSH	602	1700	1700	534	1700	1700
Volume to Capacity	0.12	0.48	0.25	0.03	0.41	0.41
Queue Length 95th (m)	3.0	0.0	0.0	0.8	0.0	0.0
Control Delay (s)	16.8	0.0	0.0	12.0	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	16.8	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	36	72	1093	45	36	1305
Future Volume (vph)	36	72	1093	45	36	1305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1617	3514	0	1722	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1617	3514	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Adj. Flow (vph)	39	78	1188	49	39	1418
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	78	1237	0	39	1418
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	36	72	1093	45	36	1305
Future Volume (Veh/h)	36	72	1093	45	36	1305
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	78	1188	49	39	1418
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2000	618			1237	
vC1, stage 1 conf vol	1212					
vC2, stage 2 conf vol	787					
vCu, unblocked vol	2000	618			1237	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.3	
p0 queue free %	81	82			93	
cM capacity (veh/h)	207	434			537	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	117	792	445	39	709	709
Volume Left	39	0	0	39	0	0
Volume Right	78	0	49	0	0	0
cSH	622	1700	1700	537	1700	1700
Volume to Capacity	0.19	0.47	0.26	0.07	0.42	0.42
Queue Length 95th (m)	5.2	0.0	0.0	1.8	0.0	0.0
Control Delay (s)	18.8	0.0	0.0	12.2	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	18.8	0.0		0.3		
Approach LOS	C					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Janice Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	18	1119	1	8	1340
Future Volume (vph)	9	18	1119	1	8	1340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	70.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.910					
Flt Protected	0.984				0.950	
Satd. Flow (prot)	1720	0	3544	0	1825	3579
Flt Permitted	0.984				0.950	
Satd. Flow (perm)	1720	0	3544	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	113.3		424.8			250.0
Travel Time (s)	8.2		21.8			12.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	0%	2%
Adj. Flow (vph)	10	20	1216	1	9	1457
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	0	1217	0	9	1457
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Janice Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	18	1119	1	8	1340
Future Volume (Veh/h)	9	18	1119	1	8	1340
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	20	1216	1	9	1457
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1963	608			1217	
vC1, stage 1 conf vol	1216					
vC2, stage 2 conf vol	746					
vCu, unblocked vol	1963	608			1217	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	95			98	
cM capacity (veh/h)	213	443			580	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	30	811	406	9	728	728
Volume Left	10	0	0	9	0	0
Volume Right	20	0	1	0	0	0
cSH	326	1700	1700	580	1700	1700
Volume to Capacity	0.09	0.48	0.24	0.02	0.43	0.43
Queue Length 95th (m)	2.3	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	17.2	0.0	0.0	11.3	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	17.2	0.0		0.1		
Approach LOS	C					

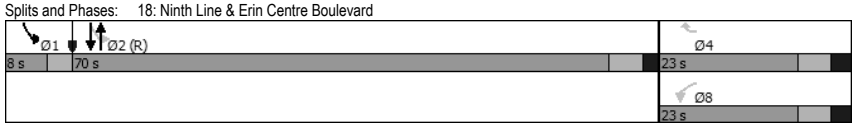
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	74	56	994	45	37	1316
Future Volume (vph)	74	56	994	45	37	1316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.993			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1706	1570	3500	0	1772	3579
Flt Permitted	0.950				0.224	
Satd. Flow (perm)	1706	1570	3500	0	418	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		61	9			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	4%	3%	16%	3%	2%
Adj. Flow (vph)	80	61	1080	49	40	1430
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	61	1129	0	40	1430
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	23.0	23.0	70.0		8.0	70.0
Total Split (%)	22.8%	22.8%	69.3%		7.9%	69.3%
Maximum Green (s)	16.5	16.5	64.0		5.0	64.0
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	5.0	8.0	50.0			50.0
Flash Dont Walk (s)	11.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	11.4	11.4	77.4		83.8	77.4
Actuated g/C Ratio	0.11	0.11	0.77		0.83	0.77
v/c Ratio	0.41	0.26	0.42		0.09	0.52
Control Delay	47.6	13.3	6.5		5.0	16.5
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.6	13.3	6.5		5.0	16.5
LOS	D	B	A		A	B
Approach Delay	32.8		6.5			16.2
Approach LOS	C		A			B

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	80	61	1129	40	1430
v/c Ratio	0.41	0.26	0.42	0.09	0.52
Control Delay	47.6	13.3	6.5	5.0	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	13.3	6.5	5.0	16.5
Queue Length 50th (m)	14.9	0.0	45.0	2.7	126.3
Queue Length 95th (m)	28.0	11.1	67.4	m5.4	151.0
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	295	322	2685	439	2743
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.27	0.19	0.42	0.09	0.52

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Candlelight Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	17	41	954	8	14	1405
Future Volume (vph)	17	41	954	8	14	1405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1601	3541	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1601	3541	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	216.6		90.1			404.2
Travel Time (s)	15.6		4.6			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	3%	0%	0%	2%
Adj. Flow (vph)	18	45	1037	9	15	1527
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	45	1046	0	15	1527
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 48.8% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Candlelight Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	41	954	8	14	1405
Future Volume (Veh/h)	17	41	954	8	14	1405
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	45	1037	9	15	1527
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			373			
pX, platoon unblocked	0.86	0.86			0.86	
vC, conflicting volume	1835	523			1046	
vC1, stage 1 conf vol	1042					
vC2, stage 2 conf vol	794					
vCu, unblocked vol	1648	125			732	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	94			98	
cM capacity (veh/h)	281	777			760	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	63	691	355	15	764	764
Volume Left	18	0	0	15	0	0
Volume Right	45	0	9	0	0	0
cSH	983	1700	1700	760	1700	1700
Volume to Capacity	0.06	0.41	0.21	0.02	0.45	0.45
Queue Length 95th (m)	1.6	0.0	0.0	0.5	0.0	0.0
Control Delay (s)	12.4	0.0	0.0	9.8	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	12.4	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	17	1003	1	6	1380
Future Volume (vph)	5	17	1003	1	6	1380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.894					
Flt Protected	0.989				0.950	
Satd. Flow (prot)	1699	0	3544	0	1217	3614
Flt Permitted	0.989				0.950	
Satd. Flow (perm)	1699	0	3544	0	1217	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	50%	1%
Adj. Flow (vph)	5	18	1090	1	7	1500
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	1091	0	7	1500
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	17	1003	1	6	1380
Future Volume (Veh/h)	5	17	1003	1	6	1380
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	18	1090	1	7	1500
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.85	0.85			0.85	
vC, conflicting volume	1854	546			1091	
vC1, stage 1 conf vol	1090					
vC2, stage 2 conf vol	764					
vCu, unblocked vol	1651	110			752	
tC, single (s)	6.8	6.9			5.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.7	
p0 queue free %	98	98			99	
cM capacity (veh/h)	279	789			510	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	23	727	364	7	750	750
Volume Left	5	0	0	7	0	0
Volume Right	18	0	1	0	0	0
cSH	565	1700	1700	510	1700	1700
Volume to Capacity	0.04	0.43	0.21	0.01	0.44	0.44
Queue Length 95th (m)	1.0	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	11.6	0.0	0.0	12.2	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	11.6	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Stardust Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	25	906	6	0	1479
Future Volume (vph)	2	25	906	6	0	1479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.865		0.850		
Flt Protected	0.950					
Satd. Flow (prot)	0	1662	3544	1396	0	3614
Flt Permitted	0.950					
Satd. Flow (perm)	0	1662	3544	1396	0	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	245.5		191.7			91.0
Travel Time (s)	17.7		9.9			4.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	17%	0%	1%
Adj. Flow (vph)	2	27	985	7	0	1608
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	27	985	7	0	1608
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization Err%		ICU Level of Service	H
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Stardust Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	25	906	6	0	1479
Future Volume (Veh/h)	2	25	906	6	0	1479
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	27	985	7	0	1608
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			192			
pX, platoon unblocked	0.84	0.84			0.84	
vC, conflicting volume	1789	492			985	
vC1, stage 1 conf vol	985					
vC2, stage 2 conf vol	804					
vCu, unblocked vol	1567	32			615	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	97			100	
cM capacity (veh/h)	300	880			823	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	29	492	492	7	804	804
Volume Left	2	0	0	0	0	0
Volume Right	27	0	0	7	0	0
cSH	776	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.29	0.29	0.00	0.47	0.47
Queue Length 95th (m)	0.9	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.8	0.0			0.0	
Approach LOS	A					

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		Err%	ICU Level of Service	H
Analysis Period (min)		15	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	909	49	34	316	234	14	496	66	454	759	74
Future Volume (vph)	65	909	49	34	316	234	14	496	66	454	759	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.982			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3617	0	1825	1883	1526	1825	3522	0	1789	3599	0
Flt Permitted	0.506			0.101			0.315			0.179		
Satd. Flow (perm)	962	3617	0	194	1883	1526	605	3522	0	337	3599	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				254		10			11	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	2%	7%	0%	2%	0%	2%	0%	1%
Adj. Flow (vph)	71	988	53	37	343	254	15	539	72	493	825	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	1041	0	37	343	254	15	611	0	493	905	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

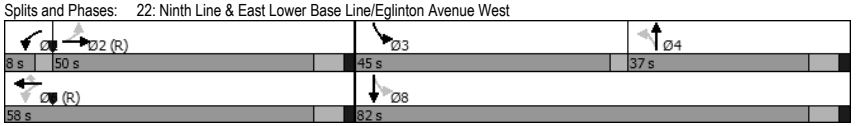
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		1	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		8.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	50.0	50.0		8.0	58.0	58.0	37.0	37.0		45.0	82.0	
Total Split (%)	35.7%	35.7%		5.7%	41.4%	41.4%	26.4%	26.4%		32.1%	58.6%	
Maximum Green (s)	43.0	43.0		5.0	51.0	51.0	30.0	30.0		42.0	75.0	
Yellow Time (s)	5.0	5.0		3.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		0.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-1.0	-1.0	-1.0	-1.0		-3.0	-1.0	
Total Lost Time (s)	6.0	4.0		2.0	6.0	6.0	6.0	6.0		0.0	6.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min	Min	Min		None	Min	
Walk Time (s)	8.0	8.0			8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0			8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0			0	
Act Effct Green (s)	53.9	55.9		65.2	61.2	61.2	29.4	29.4		72.8	66.8	
Actuated g/C Ratio	0.38	0.40		0.47	0.44	0.44	0.21	0.21		0.52	0.48	
v/c Ratio	0.19	0.72		0.22	0.42	0.31	0.12	0.82		0.88	0.53	
Control Delay	34.9	41.0		27.1	31.1	4.4	46.1	61.4		48.1	25.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	34.9	41.0		27.1	31.1	4.4	46.1	61.4		48.1	25.7	
LOS	C	D		C	C	A	D	E		D	C	
Approach Delay		40.6			20.2			61.1			33.6	
Approach LOS		D			C			E			C	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 38.0 Intersection LOS: D
Intersection Capacity Utilization 86.8% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	1041	37	343	254	15	611	493	905
v/c Ratio	0.19	0.72	0.22	0.42	0.31	0.12	0.82	0.88	0.53
Control Delay	34.9	41.0	27.1	31.1	4.4	46.1	61.4	48.1	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	41.0	27.1	31.1	4.4	46.1	61.4	48.1	25.7
Queue Length 50th (m)	13.8	135.1	5.7	66.8	0.0	3.4	83.4	100.8	85.6
Queue Length 95th (m)	27.8	170.4	13.6	101.4	17.4	9.8	104.7	133.9	93.2
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	370	1447	171	823	810	135	798	642	1958
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.72	0.22	0.42	0.31	0.11	0.77	0.77	0.46

Intersection Summary

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	78	22	159	182	14	33	24	249	21	40	13
Future Volume (vph)	7	78	22	159	182	14	33	24	249	21	40	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.972			0.995			0.890			0.976	
Flt Protected		0.997			0.978			0.995			0.986	
Satd. Flow (prot)	0	1761	0	0	1817	0	0	1664	0	0	1849	0
Flt Permitted		0.997			0.978			0.995			0.986	
Satd. Flow (perm)	0	1761	0	0	1817	0	0	1664	0	0	1849	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	9		16	16		9	10		27	27		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	4%	9%	3%	3%	0%	3%	4%	2%	0%	0%	0%
Adj. Flow (vph)	8	85	24	173	198	15	36	26	271	23	43	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	117	0	0	386	0	0	333	0	0	80	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	78	22	159	182	14	33	24	249	21	40	13
Future Volume (vph)	7	78	22	159	182	14	33	24	249	21	40	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	85	24	173	198	15	36	26	271	23	43	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	117	386	333	80
Volume Left (vph)	8	173	36	23
Volume Right (vph)	24	15	271	14
Hadj (s)	-0.01	0.12	-0.43	-0.05
Departure Headway (s)	5.6	5.3	5.0	5.8
Degree Utilization, x	0.18	0.57	0.46	0.13
Capacity (veh/h)	568	643	665	538
Control Delay (s)	9.9	15.2	12.3	9.7
Approach Delay (s)	9.9	15.2	12.3	9.7
Approach LOS	A	C	B	A

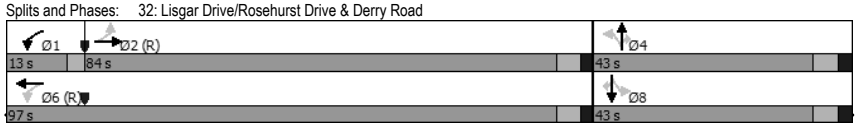
Intersection Summary			
Delay	13.0		
Level of Service	B		
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Future Volume (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99		0.99		0.96	0.97		0.97
Frt		0.999			0.984				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5187	0	1684	4882	0	1750	1847	1617	1750	1795	1581
Flt Permitted	0.218			0.045			0.662			0.716		
Satd. Flow (perm)	407	5187	0	80	4882	0	1203	1847	1547	1281	1795	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			31				126			92
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	14		3	3		14	12		24	24		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	6%	5%	6%	2%	4%	1%	2%	7%	1%
Adj. Flow (vph)	22	2512	20	104	1090	132	95	63	361	224	105	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2532	0	104	1222	0	95	63	361	224	105	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		8.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	84.0	84.0		13.0	97.0		43.0	43.0	43.0	43.0	43.0	43.0
Total Split (%)	60.0%	60.0%		9.3%	69.3%		30.7%	30.7%	30.7%	30.7%	30.7%	30.7%
Maximum Green (s)	78.0	78.0		10.0	91.0		36.4	36.4	36.4	36.4	36.4	36.4
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		0.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		2.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0			12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0			18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	87.5	87.5		102.3	99.3		30.1	30.1	30.1	30.1	30.1	30.1
Actuated g/C Ratio	0.62	0.62		0.73	0.71		0.22	0.22	0.22	0.22	0.22	0.22
v/c Ratio	0.09	0.78		0.61	0.35		0.37	0.16	0.84	0.81	0.27	0.23
Control Delay	4.8	4.9		39.6	8.5		49.3	43.3	50.6	74.2	45.9	8.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	4.9		39.6	8.5		49.3	43.3	50.6	74.2	45.9	8.8
LOS	A	A		D	A		D	D	D	E	D	A
Approach Delay		4.9			11.0			49.4			52.9	
Approach LOS		A			B			D			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 100.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	2532	104	1222	95	63	361	224	105	92
v/c Ratio	0.09	0.78	0.61	0.35	0.37	0.16	0.84	0.81	0.27	0.23
Control Delay	4.8	4.9	39.6	8.5	49.3	43.3	50.6	74.2	45.9	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	4.9	39.6	8.5	49.3	43.3	50.6	74.2	45.9	8.8
Queue Length 50th (m)	0.5	25.1	12.5	43.1	22.5	14.2	64.8	59.2	24.3	0.0
Queue Length 95th (m)	m1.0	35.0	33.3	59.8	37.1	25.2	97.4	84.9	38.6	13.4
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	254	3243	188	3471	321	493	505	342	479	478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.78	0.55	0.35	0.30	0.13	0.71	0.65	0.22	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	131	36	53	191	130	65	82	170	223	70	69
Future Volume (vph)	9	131	36	53	191	130	65	82	170	223	70	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.968			0.939			0.928			0.974	
Flt Protected	0.950			0.950				0.990			0.970	
Satd. Flow (prot)	1496	1819	0	1674	1779	0	0	1705	0	0	1777	0
Flt Permitted	0.950			0.950				0.990			0.970	
Satd. Flow (perm)	1496	1819	0	1674	1779	0	0	1705	0	0	1777	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	15		33	33		15	38		42	42		38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	2%	3%	9%	1%	2%	3%	7%	2%	1%	4%	4%
Adj. Flow (vph)	10	142	39	58	208	141	71	89	185	242	76	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	181	0	58	349	0	0	345	0	0	393	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 76.3% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	131	36	53	191	130	65	82	170	223	70	69
Future Volume (vph)	9	131	36	53	191	130	65	82	170	223	70	69
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	142	39	58	208	141	71	89	185	242	76	75

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	10	181	58	349	345	393
Volume Left (vph)	10	0	58	0	71	242
Volume Right (vph)	0	39	0	141	185	75
Hadj (s)	0.87	-0.11	0.65	-0.26	-0.22	0.05
Departure Headway (s)	9.1	8.1	8.3	7.4	6.9	7.0
Degree Utilization, x	0.03	0.41	0.13	0.71	0.66	0.76
Capacity (veh/h)	336	385	407	464	491	492
Control Delay (s)	11.2	15.3	11.4	25.5	22.0	28.7
Approach Delay (s)	15.1		23.5		22.0	28.7
Approach LOS	C		C		C	D

Intersection Summary			
Delay		23.4	
Level of Service		C	
Intersection Capacity Utilization		76.3%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	57	3	9	78	122	5	16	12	210	11	104
Future Volume (vph)	89	57	3	9	78	122	5	16	12	210	11	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.921			0.950			0.957	
Flt Protected		0.971			0.998			0.993			0.969	
Satd. Flow (prot)	0	1838	0	0	1766	0	0	1812	0	0	1748	0
Flt Permitted		0.971			0.998			0.993			0.969	
Satd. Flow (perm)	0	1838	0	0	1766	0	0	1812	0	0	1748	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	8		6	6		8	2		12	12		2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%
Adj. Flow (vph)	97	62	3	10	85	133	5	17	13	228	12	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	162	0	0	228	0	0	35	0	0	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 57.1%		ICU Level of Service B
Analysis Period (min) 15		

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	57	3	9	78	122	5	16	12	210	11	104
Future Volume (vph)	89	57	3	9	78	122	5	16	12	210	11	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	62	3	10	85	133	5	17	13	228	12	113

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	162	228	35	353
Volume Left (vph)	97	10	5	228
Volume Right (vph)	3	133	13	113
Hadj (s)	0.13	-0.34	-0.19	-0.03
Departure Headway (s)	5.4	4.8	5.3	4.9
Degree Utilization, x	0.24	0.31	0.05	0.48
Capacity (veh/h)	616	689	593	692
Control Delay (s)	10.1	10.0	8.5	12.5
Approach Delay (s)	10.1	10.0	8.5	12.5
Approach LOS	B	A	A	B

Intersection Summary				
Delay			11.1	
Level of Service			B	
Intersection Capacity Utilization			57.1%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Future Volume (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00		0.99	0.97		0.99	0.99	
Frt		0.992			0.997			0.852			0.929	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5146	0	1552	5008	0	1733	1575	0	1785	1721	0
Flt Permitted	0.287			0.039			0.734			0.293		
Satd. Flow (perm)	536	5146	0	64	5008	0	1326	1575	0	545	1721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			5			73			17	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			101.9			114.1			106.4	
Travel Time (s)		28.2			6.1			8.2			7.7	
Confl. Peds. (#/hr)	8		4	4		8	6		10	10		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	4%	23%	3%	0%	1%	0%	5%	0%
Adj. Flow (vph)	1	2417	131	60	940	17	31	3	209	74	19	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2548	0	60	957	0	31	212	0	74	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

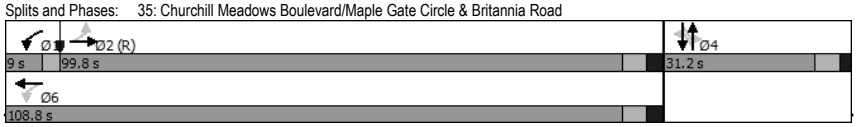
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			4	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		1	6		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		9.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	99.8	99.8		9.0	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	71.3%	71.3%		6.4%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	92.8	92.8		6.0	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		0.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-2.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0		5.2	5.2		4.2	5.2	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	11.0	11.0			11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0			18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	101.7	101.7		113.3	109.3		19.5	19.5		20.5	19.5	
Actuated g/C Ratio	0.73	0.73		0.81	0.78		0.14	0.14		0.15	0.14	
v/c Ratio	0.00	0.68		0.47	0.24		0.17	0.75		0.93	0.14	
Control Delay	6.0	4.7		27.9	4.7		52.2	53.5		140.4	31.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	6.0	4.7		27.9	4.7		52.2	53.5		140.4	31.9	
LOS	A	A		C	A		D	D		F	C	
Approach Delay		4.7			6.1			53.3			104.9	
Approach LOS		A			A			D			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 10.9 Intersection LOS: B
Intersection Capacity Utilization 85.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	2548	60	957	31	212	74	36
v/c Ratio	0.00	0.68	0.47	0.24	0.17	0.75	0.93	0.14
Control Delay	6.0	4.7	27.9	4.7	52.2	53.5	140.4	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	4.7	27.9	4.7	52.2	53.5	140.4	31.9
Queue Length 50th (m)	0.0	38.6	2.9	23.2	7.6	37.4	20.4	4.6
Queue Length 95th (m)	m0.0	m48.6	18.2	33.5	16.6	62.8	#45.1	14.2
Internal Link Dist (m)		445.7		77.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	389	3740	130	3909	246	351	105	333
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.68	0.46	0.24	0.13	0.60	0.70	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	16	21	42	66	20	11	181	34	16	220	7
Future Volume (vph)	12	16	21	42	66	20	11	181	34	16	220	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.941			0.979			0.980			0.996	
Flt Protected		0.988			0.984			0.998			0.997	
Satd. Flow (prot)	0	1752	0	0	1771	0	0	1835	0	0	1794	0
Flt Permitted		0.988			0.984			0.998			0.997	
Satd. Flow (perm)	0	1752	0	0	1771	0	0	1835	0	0	1794	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)			13	13			16		13	13		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	0%	5%	4%	5%	0%	3%	0%	0%	7%	0%
Adj. Flow (vph)	13	17	23	46	72	22	12	197	37	17	239	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	0	0	140	0	0	246	0	0	264	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	16	21	42	66	20	11	181	34	16	220	7
Future Volume (Veh/h)	12	16	21	42	66	20	11	181	34	16	220	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	17	23	46	72	22	12	197	37	17	239	8
Pedestrians		16			13			13				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			1			1				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	590	564	272	574	550	228	263			247		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	590	564	272	574	550	228	263			247		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	96	97	88	83	97	99			99		
cM capacity (veh/h)	339	409	753	377	420	794	1295			1316		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	53	140	246	264
Volume Left	13	46	12	17
Volume Right	23	22	37	8
cSH	480	436	1295	1316
Volume to Capacity	0.11	0.32	0.01	0.01
Queue Length 95th (m)	2.8	10.4	0.2	0.3
Control Delay (s)	13.4	17.1	0.5	0.6
Lane LOS	B	C	A	A
Approach Delay (s)	13.4	17.1	0.5	0.6
Approach LOS	B	C		

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	174	31	90	61	29	13	205	161	61	269	11
Future Volume (vph)	23	174	31	90	61	29	13	205	161	61	269	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.978			0.943			0.996	
Flt Protected		0.995			0.976			0.998			0.991	
Satd. Flow (prot)	0	1748	0	0	1777	0	0	1767	0	0	1867	0
Flt Permitted		0.995			0.976			0.998			0.991	
Satd. Flow (perm)	0	1748	0	0	1777	0	0	1767	0	0	1867	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	19		71	71		19	20		20	20		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	9%	0%	2%	5%	3%	15%	1%	3%	0%	2%	0%
Adj. Flow (vph)	25	189	34	98	66	32	14	223	175	66	292	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	248	0	0	196	0	0	412	0	0	370	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	78.0%	ICU Level of Service D	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	174	31	90	61	29	13	205	161	61	269	11
Future Volume (vph)	23	174	31	90	61	29	13	205	161	61	269	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	189	34	98	66	32	14	223	175	66	292	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	248	196	412	370
Volume Left (vph)	25	98	14	66
Volume Right (vph)	34	32	175	12
Hadj (s)	0.06	0.06	-0.21	0.04
Departure Headway (s)	7.0	7.2	6.1	6.5
Degree Utilization, x	0.48	0.39	0.70	0.66
Capacity (veh/h)	452	426	554	519
Control Delay (s)	16.4	14.7	22.4	21.3
Approach Delay (s)	16.4	14.7	22.4	21.3
Approach LOS	C	B	C	C

Intersection Summary			
Delay	19.6		
Level of Service	C		
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	316	14	104	258	181	20	244	68	181	306	63
Future Volume (vph)	131	316	14	104	258	181	20	244	68	181	306	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	1.00		0.99	0.97		1.00	0.99		0.98	1.00	
Frt		0.994			0.938			0.967			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3578	0	1772	3157	0	1825	1794	0	1807	1821	0
Flt Permitted	0.447			0.529			0.384			0.447		
Satd. Flow (perm)	827	3578	0	976	3157	0	735	1794	0	832	1821	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			197			19			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	7%	3%	3%	8%	0%	2%	4%	1%	2%	5%
Adj. Flow (vph)	142	343	15	113	280	197	22	265	74	197	333	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	142	358	0	113	477	0	22	339	0	197	401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	47.0	47.0		47.0	47.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.5%	46.5%		46.5%	46.5%		53.5%	53.5%		53.5%	53.5%	
Maximum Green (s)	40.5	40.5		40.5	40.5		48.0	48.0		48.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	47.5	47.5		47.5	47.5		43.0	43.0		43.0	43.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.43	0.43		0.43	0.43	
v/c Ratio	0.37	0.21		0.25	0.30		0.07	0.44		0.56	0.51	
Control Delay	25.8	20.5		18.4	10.1		17.4	21.1		28.8	23.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	25.8	20.5		18.4	10.1		17.4	21.1		28.8	23.1	
LOS	C	C		B	B		B	C		C	C	
Approach Delay		22.0			11.7			20.9			24.9	
Approach LOS		C			B			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 19.7		Intersection LOS: B	
Intersection Capacity Utilization 113.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	358	113	477	22	339	197	401
v/c Ratio	0.37	0.21	0.25	0.30	0.07	0.44	0.56	0.51
Control Delay	25.8	20.5	18.4	10.1	17.4	21.1	28.8	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	20.5	18.4	10.1	17.4	21.1	28.8	23.1
Queue Length 50th (m)	18.0	22.6	12.5	15.8	2.5	43.8	28.9	55.3
Queue Length 95th (m)	m35.0	36.1	26.4	28.5	6.8	61.5	48.2	75.5
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	389	1686	459	1590	356	880	403	890
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.21	0.25	0.30	0.06	0.39	0.49	0.45

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	100	20	26	62	39	17	115	26	78	269	19
Future Volume (vph)	21	100	20	26	62	39	17	115	26	78	269	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.959			0.978			0.993	
Flt Protected		0.993			0.990			0.995			0.989	
Satd. Flow (prot)	0	1770	0	0	1783	0	0	1781	0	0	1786	0
Flt Permitted		0.993			0.990			0.995			0.989	
Satd. Flow (perm)	0	1770	0	0	1783	0	0	1781	0	0	1786	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	21		17	17		21	16		16	16		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	4%	3%	0%	6%	5%	4%	1%	7%	5%
Adj. Flow (vph)	23	109	22	28	67	42	18	125	28	85	292	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	154	0	0	137	0	0	171	0	0	398	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 52.7% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	100	20	26	62	39	17	115	26	78	269	19
Future Volume (vph)	21	100	20	26	62	39	17	115	26	78	269	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	109	22	28	67	42	18	125	28	85	292	21

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	154	137	171	398
Volume Left (vph)	23	28	18	85
Volume Right (vph)	22	42	28	21
Hadj (s)	0.04	-0.10	0.01	0.11
Departure Headway (s)	5.7	5.6	5.4	5.1
Degree Utilization, x	0.24	0.21	0.25	0.57
Capacity (veh/h)	565	569	620	674
Control Delay (s)	10.6	10.1	10.2	14.6
Approach Delay (s)	10.6	10.1	10.2	14.6
Approach LOS	B	B	B	B

Intersection Summary				
Delay			12.3	
Level of Service			B	
Intersection Capacity Utilization			52.7%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	173	15	29	102	14	22	122	121	67	279	36
Future Volume (vph)	22	173	15	29	102	14	22	122	121	67	279	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.991			0.987			0.938			0.987	
Flt Protected		0.995			0.990			0.996			0.991	
Satd. Flow (prot)	0	1745	0	0	1766	0	0	1717	0	0	1792	0
Flt Permitted		0.995			0.990			0.996			0.991	
Satd. Flow (perm)	0	1745	0	0	1766	0	0	1717	0	0	1792	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	8%	7%	7%	6%	7%	5%	6%	3%	1%	6%	3%
Adj. Flow (vph)	24	188	16	32	111	15	24	133	132	73	303	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	228	0	0	158	0	0	289	0	0	415	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 55.8%			ICU Level of Service B
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	173	15	29	102	14	22	122	121	67	279	36
Future Volume (vph)	22	173	15	29	102	14	22	122	121	67	279	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	188	16	32	111	15	24	133	132	73	303	39

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	228	158	289	415
Volume Left (vph)	24	32	24	73
Volume Right (vph)	16	15	132	39
Hadj (s)	0.12	0.09	-0.18	0.06
Departure Headway (s)	6.5	6.7	5.8	5.8
Degree Utilization, x	0.41	0.29	0.47	0.67
Capacity (veh/h)	492	461	567	593
Control Delay (s)	13.9	12.4	13.9	19.9
Approach Delay (s)	13.9	12.4	13.9	19.9
Approach LOS	B	B	B	C

Intersection Summary				
Delay			15.9	
Level of Service			C	
Intersection Capacity Utilization			55.8%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	2166	1334	65	215	125
Future Volume (vph)	3	2166	1334	65	215	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt			0.993			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	3579	3443	0	1755	1183
Flt Permitted	0.154				0.950	
Satd. Flow (perm)	296	3579	3443	0	1755	1183
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			11			61
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	5%	8%	4%	38%
Adj. Flow (vph)	3	2166	1334	65	215	125
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	2166	1399	0	215	125
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

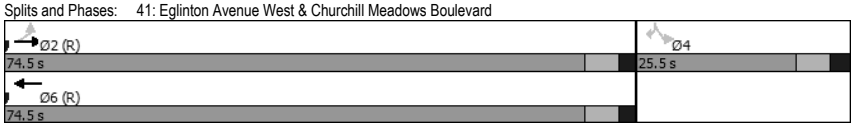
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				4	4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	24.0	24.0	24.0		25.5	25.5
Total Split (s)	74.5	74.5	74.5		25.5	25.5
Total Split (%)	74.5%	74.5%	74.5%		25.5%	25.5%
Maximum Green (s)	68.5	68.5	68.5		19.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	72.2	72.2	72.2		17.3	17.3
Actuated g/C Ratio	0.72	0.72	0.72		0.17	0.17
v/c Ratio	0.01	0.84	0.56		0.71	0.49
Control Delay	5.0	14.4	7.9		52.0	26.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	5.0	14.4	7.9		52.0	26.4
LOS	A	B	A		D	C
Approach Delay		14.4	7.9		42.6	
Approach LOS		B	A		D	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 14.5 — Intersection LOS: B
Intersection Capacity Utilization 80.5% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3	2166	1399	215	125
v/c Ratio	0.01	0.84	0.56	0.71	0.49
Control Delay	5.0	14.4	7.9	52.0	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	14.4	7.9	52.0	26.4
Queue Length 50th (m)	0.2	139.9	59.4	39.1	10.8
Queue Length 95th (m)	1.0	189.4	79.9	62.2	27.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	213	2585	2490	351	285
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.84	0.56	0.61	0.44

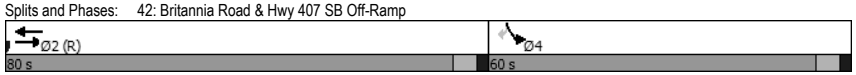
Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2074	653	0	428	6
Future Volume (vph)	0	2074	653	0	428	6
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5678	5622	0	1847	1524
Flt Permitted					0.950	
Satd. Flow (perm)	0	5678	5622	0	1847	1524
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						3
Link Speed (k/h)		80	80		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		9.3	13.4		15.0	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	0%	1%	2%	7%	16%
Adj. Flow (vph)	0	2095	660	0	432	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2095	660	0	432	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		80.0	80.0		60.0	60.0
Total Split (%)		57.1%	57.1%		42.9%	42.9%
Maximum Green (s)		74.0	74.0		54.0	54.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		89.1	89.1		38.9	38.9
Actuated g/C Ratio		0.64	0.64		0.28	0.28
v/c Ratio		0.58	0.18		0.84	0.01
Control Delay		16.3	5.0		62.5	24.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		16.3	5.0		62.5	24.8
LOS		B	A		E	C
Approach Delay		16.3	5.0		62.0	
Approach LOS		B	A		E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 20.2		Intersection LOS: C	
Intersection Capacity Utilization 68.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2095	660	432	6
v/c Ratio	0.58	0.18	0.84	0.01
Control Delay	16.3	5.0	62.5	24.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.3	5.0	62.5	24.8
Queue Length 50th (m)	115.6	8.8	113.1	0.6
Queue Length 95th (m)	155.5	10.4	139.1	3.7
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3615	3579	712	589
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.18	0.61	0.01

Intersection Summary

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2405	0	0	795	10	280
Future Volume (vph)	2405	0	0	795	10	280
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5678	0	0	5622	1847	1768
Flt Permitted					0.950	
Satd. Flow (perm)	5678	0	0	5622	1847	1768
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	80			80	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	13.4			9.8	11.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	1%	7%	0%
Adj. Flow (vph)	2505	0	0	828	10	292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2505	0	0	828	10	292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

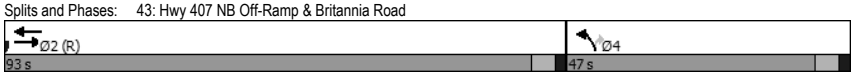
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	93.0			93.0	47.0	47.0
Total Split (%)	66.4%			66.4%	33.6%	33.6%
Maximum Green (s)	87.0			87.0	41.0	41.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	99.5			99.5	28.5	28.5
Actuated g/C Ratio	0.71			0.71	0.20	0.20
v/c Ratio	0.62			0.21	0.03	0.81
Control Delay	4.7			7.3	40.9	70.2
Queue Delay	0.2			0.0	0.0	0.0
Total Delay	4.8			7.3	40.9	70.2
LOS	A			A	D	E
Approach Delay	4.8			7.3	69.2	
Approach LOS	A			A	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 10.8 Intersection LOS: B
Intersection Capacity Utilization 68.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2505	828	10	292
v/c Ratio	0.62	0.21	0.03	0.81
Control Delay	4.7	7.3	40.9	70.2
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	4.8	7.3	40.9	70.2
Queue Length 50th (m)	47.0	22.6	2.3	77.8
Queue Length 95th (m)	49.0	m29.5	6.7	103.1
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4034	3995	540	517
Starvation Cap Reductn	13	0	0	0
Spillback Cap Reductn	497	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.21	0.02	0.56

Intersection Summary

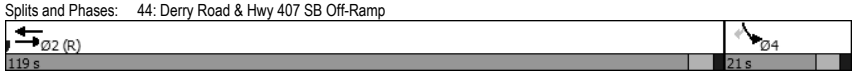
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3128	728	0	23	32
Future Volume (vph)	0	3128	728	0	23	32
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5622	5408	0	3686	1414
Flt Permitted					0.950	
Satd. Flow (perm)	0	5622	5408	0	3686	1414
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						33
Link Speed (k/h)		80	80		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		15.0	13.9		13.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	1%	5%	2%	4%	25%
Adj. Flow (vph)	0	3258	758	0	24	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	3258	758	0	24	33
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		119.0	119.0		21.0	21.0
Total Split (%)		85.0%	85.0%		15.0%	15.0%
Maximum Green (s)		113.0	113.0		15.0	15.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		123.8	123.8		8.2	8.2
Actuated g/C Ratio		0.88	0.88		0.06	0.06
v/c Ratio		0.66	0.16		0.11	0.29
Control Delay		3.7	0.5		63.5	25.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		3.7	0.5		63.5	25.8
LOS		A	A		E	C
Approach Delay		3.7	0.5		41.6	
Approach LOS		A	A		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 3.7	Intersection LOS: A
Intersection Capacity Utilization 72.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3258	758	24	33
v/c Ratio	0.66	0.16	0.11	0.29
Control Delay	3.7	0.5	63.5	25.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.7	0.5	63.5	25.8
Queue Length 50th (m)	84.2	2.7	3.2	0.0
Queue Length 95th (m)	97.8	3.2	8.1	10.9
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4970	4781	394	180
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.16	0.06	0.18

Intersection Summary

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2461	0	0	899	14	151
Future Volume (vph)	2461	0	0	899	14	151
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5622	0	0	5408	3582	1716
Flt Permitted					0.950	
Satd. Flow (perm)	5622	0	0	5408	3582	1716
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						154
Link Speed (k/h)	80			80	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	13.9			10.3	15.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	2%	2%	5%	7%	3%
Adj. Flow (vph)	2511	0	0	917	14	154
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2511	0	0	917	14	154
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

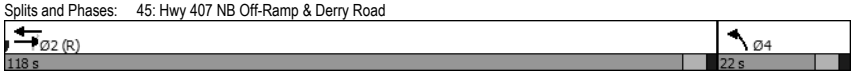
Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	118.0			118.0	22.0	118.0
Total Split (%)	84.3%			84.3%	15.7%	84.3%
Maximum Green (s)	112.0			112.0	16.0	112.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	132.0			132.0	8.0	132.0
Actuated g/C Ratio	0.94			0.94	0.06	0.94
v/c Ratio	0.47			0.18	0.07	0.09
Control Delay	1.0			0.2	63.4	0.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	1.0			0.2	63.4	0.3
LOS	A			A	E	A
Approach Delay	1.0			0.2	5.6	
Approach LOS	A			A	A	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 1.0	Intersection LOS: A
Intersection Capacity Utilization 72.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2511	917	14	154
v/c Ratio	0.47	0.18	0.07	0.09
Control Delay	1.0	0.2	63.4	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.0	0.2	63.4	0.3
Queue Length 50th (m)	0.0	0.0	1.9	0.0
Queue Length 95th (m)	30.4	2.9	5.6	2.4
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	5300	5099	409	1626
Starvation Cap Reductn	144	0	0	0
Spillback Cap Reductn	60	0	0	18
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.18	0.03	0.10

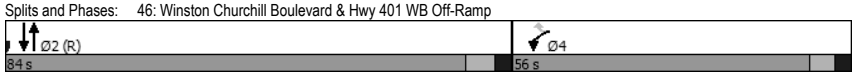
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	458	498	1644	0	0	2324
Future Volume (vph)	458	498	1644	0	0	2324
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.955	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3400	1424	5513	0	0	5408
Flt Permitted	0.966					
Satd. Flow (perm)	3400	1424	5513	0	0	5408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	10	10				
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	8%	13%	3%	2%	0%	5%
Adj. Flow (vph)	520	566	1868	0	0	2641
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	741	345	1868	0	0	2641
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	56.0	56.0	84.0			84.0
Total Split (%)	40.0%	40.0%	60.0%			60.0%
Maximum Green (s)	49.0	49.0	76.0			76.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	39.7	39.7	85.3			85.3
Actuated g/C Ratio	0.28	0.28	0.61			0.61
v/c Ratio	0.76	0.84	0.56			0.80
Control Delay	50.1	63.4	16.0			24.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	50.1	63.4	16.0			24.5
LOS	D	E	B			C
Approach Delay	54.3		16.0			24.5
Approach LOS	D		B			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 102.2 (73%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 27.5		Intersection LOS: C	
Intersection Capacity Utilization 70.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	741	345	1868	2641
v/c Ratio	0.76	0.84	0.56	0.80
Control Delay	50.1	63.4	16.0	24.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	50.1	63.4	16.0	24.5
Queue Length 50th (m)	95.1	95.8	99.3	197.1
Queue Length 95th (m)	103.8	122.5	118.8	242.2
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1196	504	3358	3294
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	0.68	0.56	0.80

Intersection Summary

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	704	370	0	1411	2319	0
Future Volume (vph)	704	370	0	1411	2319	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3685	1593	0	5567	5408	0
Flt Permitted	0.955					
Satd. Flow (perm)	3685	1593	0	5567	5408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1	1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	4%	1%	0%	2%	5%	8%
Adj. Flow (vph)	800	420	0	1603	2635	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	842	378	0	1603	2635	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

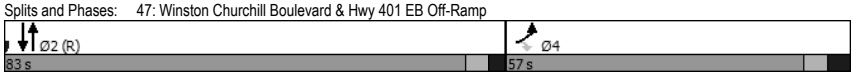
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	57.0	57.0		83.0	83.0	
Total Split (%)	40.7%	40.7%		59.3%	59.3%	
Maximum Green (s)	49.0	49.0		76.0	76.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	40.5	40.5		84.5	84.5	
Actuated g/C Ratio	0.29	0.29		0.60	0.60	
v/c Ratio	0.79	0.82		0.48	0.81	
Control Delay	51.2	60.7		16.7	21.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	51.2	60.7		16.7	21.9	
LOS	D	E		B	C	
Approach Delay	54.2			16.7	21.9	
Approach LOS	D			B	C	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 92.4 (66%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 27.6 Intersection LOS: C
Intersection Capacity Utilization 76.0% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	842	378	1603	2635
v/c Ratio	0.79	0.82	0.48	0.81
Control Delay	51.2	60.7	16.7	21.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	51.2	60.7	16.7	21.9
Queue Length 50th (m)	111.1	107.4	85.8	138.8
Queue Length 95th (m)	118.9	133.1	110.2	209.1
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	1290	558	3361	3265
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.68	0.48	0.81

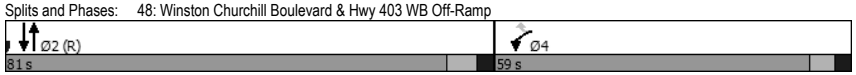
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	984	913	2616	0	0	2904
Future Volume (vph)	984	913	2616	0	0	2904
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.963	0.850				
Flt Protected	0.964					
Satd. Flow (prot)	3550	1547	5513	0	0	5513
Flt Permitted	0.964					
Satd. Flow (perm)	3548	1547	5513	0	0	5513
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	1	1				
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	4%	3%	0%	0%	3%
Adj. Flow (vph)	1047	971	2783	0	0	3089
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	1387	631	2783	0	0	3089
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	59.0	59.0	81.0			81.0
Total Split (%)	42.1%	42.1%	57.9%			57.9%
Maximum Green (s)	52.0	52.0	73.0			73.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	52.0	52.0	73.0			73.0
Actuated g/C Ratio	0.37	0.37	0.52			0.52
v/c Ratio	1.05	1.10	0.97			1.07
Control Delay	81.9	108.1	40.7			73.9
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	81.9	108.1	40.7			73.9
LOS	F	F	D			E
Approach Delay	90.1		40.7			73.9
Approach LOS	F		D			E

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 117.6 (84%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 66.3		Intersection LOS: E	
Intersection Capacity Utilization 132.6%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1387	631	2783	3089
v/c Ratio	1.05	1.10	0.97	1.07
Control Delay	81.9	108.1	40.7	73.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	81.9	108.1	40.7	73.9
Queue Length 50th (m)	~215.5	~217.0	233.9	~347.5
Queue Length 95th (m)	#257.9	#297.8	#289.5	#370.4
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1319	575	2874	2874
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.05	1.10	0.97	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1261	453	0	1535	2514	0
Future Volume (vph)	1261	453	0	1535	2514	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor	1.00					
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3795	1733	0	5460	5513	0
Flt Permitted	0.950					
Satd. Flow (perm)	3790	1733	0	5460	5513	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	0%	4%	3%	0%
Adj. Flow (vph)	1314	472	0	1599	2619	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1314	472	0	1599	2619	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

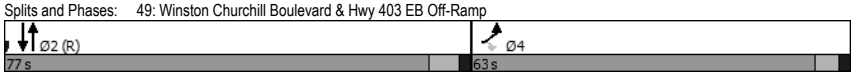
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	63.0	63.0		77.0	77.0	
Total Split (%)	45.0%	45.0%		55.0%	55.0%	
Maximum Green (s)	57.0	57.0		70.0	70.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	54.6	54.6		72.4	72.4	
Actuated g/C Ratio	0.39	0.39		0.52	0.52	
v/c Ratio	0.89	0.70		0.57	0.92	
Control Delay	48.2	41.8		24.4	36.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	48.2	41.8		24.4	36.2	
LOS	D	D		C	D	
Approach Delay	46.5			24.4	36.2	
Approach LOS	D			C	D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 50.4 (36%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 36.1 Intersection LOS: D
Intersection Capacity Utilization 132.6% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1314	472	1599	2619
v/c Ratio	0.89	0.70	0.57	0.92
Control Delay	48.2	41.8	24.4	36.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	48.2	41.8	24.4	36.2
Queue Length 50th (m)	168.6	105.4	111.7	264.1
Queue Length 95th (m)	197.5	144.4	126.4	m239.8
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	1545	706	2824	2851
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.85	0.67	0.57	0.92

Intersection Summary

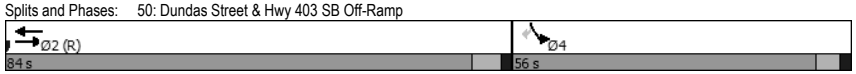
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3105	651	0	1312	582
Future Volume (vph)	0	3105	651	0	1312	582
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.994	0.850
Flt Protected					0.954	
Satd. Flow (prot)	0	5567	5307	0	3635	1449
Flt Permitted					0.954	
Satd. Flow (perm)	0	5567	5307	0	3635	1449
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					4	222
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	7%	0%	5%	11%
Adj. Flow (vph)	0	3201	671	0	1353	600
Shared Lane Traffic (%)						10%
Lane Group Flow (vph)	0	3201	671	0	1413	540
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		84.0	84.0		56.0	56.0
Total Split (%)		60.0%	60.0%		40.0%	40.0%
Maximum Green (s)		77.0	77.0		50.0	50.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		77.0	77.0		50.0	50.0
Actuated g/C Ratio		0.55	0.55		0.36	0.36
v/c Ratio		1.05	0.23		1.09	0.82
Control Delay		61.1	6.7		94.4	34.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		61.1	6.7		94.4	34.8
LOS		E	A		F	C
Approach Delay		61.1	6.7		77.9	
Approach LOS		E	A		E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 22.4 (16%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 60.5	Intersection LOS: E
Intersection Capacity Utilization 106.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3201	671	1413	540
v/c Ratio	1.05	0.23	1.09	0.82
Control Delay	61.1	6.7	94.4	34.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	61.1	6.7	94.4	34.8
Queue Length 50th (m)	~351.4	11.1	~225.8	93.8
Queue Length 95th (m)	#373.5	13.3	#268.2	#152.3
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	3061	2918	1300	660
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.05	0.23	1.09	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2909	0	0	1090	132	1128
Future Volume (vph)	2909	0	0	1090	132	1128
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Ped Bike Factor					1.00	
Frt					0.878	0.850
Flt Protected					0.991	
Satd. Flow (prot)	5513	0	0	5357	3448	1577
Flt Permitted					0.991	
Satd. Flow (perm)	5513	0	0	5357	3447	1577
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	0%	6%	1%	2%
Adj. Flow (vph)	3232	0	0	1211	147	1253
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	3232	0	0	1211	774	626
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	83.0			83.0	57.0	57.0
Total Split (%)	59.3%			59.3%	40.7%	40.7%
Maximum Green (s)	76.0			76.0	51.0	51.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	76.0			76.0	51.0	51.0
Actuated g/C Ratio	0.54			0.54	0.36	0.36
v/c Ratio	1.08			0.42	0.99dr	1.09
Control Delay	67.8			19.4	39.1	106.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	67.8			19.4	39.1	106.4
LOS	E			B	D	F
Approach Delay	67.8			19.4	69.2	
Approach LOS	E			B	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8.4 (6%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 58.1 Intersection LOS: E
Intersection Capacity Utilization 106.4% ICU Level of Service G
Analysis Period (min) 15
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street

Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	3232	1211	774	626
v/c Ratio	1.08	0.42	0.99dr	1.09
Control Delay	67.8	19.4	39.1	106.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	67.8	19.4	39.1	106.4
Queue Length 50th (m)	~363.4	70.1	90.1	~213.8
Queue Length 95th (m)	m#326.3	81.0	110.8	#293.4
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	2992	2908	1256	574
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.42	0.62	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	25	40	454	176	104	573
Future Volume (vph)	25	40	454	176	104	573
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.958			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3428	0	1789	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	3428	0	1789	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	379.3		780.0			514.0
Travel Time (s)	28.4		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	40	454	176	104	573
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	40	630	0	104	573
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
52: Ninth Line & Argentia Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	40	454	176	104	573
Future Volume (Veh/h)	25	40	454	176	104	573
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	40	454	176	104	573
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1036	315			630	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1036	315			630	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	94			89	
cM capacity (veh/h)	202	681			948	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	25	40	303	327	104	286	286
Volume Left	25	0	0	0	104	0	0
Volume Right	0	40	0	176	0	0	0
cSH	202	681	1700	1700	948	1700	1700
Volume to Capacity	0.12	0.06	0.18	0.19	0.11	0.17	0.17
Queue Length 95th (m)	3.2	1.4	0.0	0.0	2.8	0.0	0.0
Control Delay (s)	25.3	10.6	0.0	0.0	9.3	0.0	0.0
Lane LOS	D	B			A		
Approach Delay (s)	16.3		0.0		1.4		
Approach LOS	C						

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
97: Ninth Line & Foxwood Ave

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	772	0	0	661
Future Volume (vph)	0	0	772	0	0	661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				15.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	3579	0	1883	3579
Flt Permitted						
Satd. Flow (perm)	1883	0	3579	0	1883	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	226.1		301.0			850.0
Travel Time (s)	17.0		15.5			43.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	772	0	0	661
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	772	0	0	661
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
97: Ninth Line & Foxwood Ave

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	772	0	0	661
Future Volume (Veh/h)	0	0	772	0	0	661
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	772	0	0	661
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			301			
pX, platoon unblocked						
vC, conflicting volume	1102	386			772	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1102	386			772	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	206	612			839	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	386	386	0	330	330
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.23	0.23	0.00	0.19	0.19
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
136: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1165	275	0	1169	0	0
Future Volume (vph)	1165	275	0	1169	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	125.7	
Travel Time (s)	15.5			6.8	9.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1165	275	0	1169	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1165	275	0	1169	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 70.9%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
136: Winston Churchill Boulevard

16/06/2017

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	3	581	7	3	636
Future Volume (vph)	11	3	581	7	3	636
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950					
Satd. Flow (prot)	1825	1633	1880	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1633	1880	0	0	1865
Link Speed (k/h)	48		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.3		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	3%
Adj. Flow (vph)	12	3	632	8	3	691
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	3	640	0	0	694
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	3	581	7	3	636
Future Volume (Veh/h)	11	3	581	7	3	636
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	3	632	8	3	691
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1333	636			640	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1333	636			640	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			100	
cM capacity (veh/h)	171	481			954	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	15	640	694
Volume Left	12	0	3
Volume Right	3	8	0
cSH	214	1700	954
Volume to Capacity	0.07	0.38	0.00
Queue Length 95th (m)	1.7	0.0	0.1
Control Delay (s)	24.6	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	24.6	0.0	0.1
Approach LOS	C		

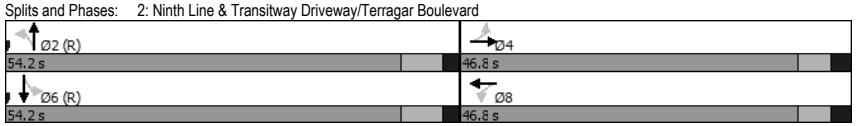
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	95	434	46	10	29	47	692	86	36	678	7
Future Volume (vph)	60	95	434	46	10	29	47	692	86	36	678	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.877			0.886			0.983			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1652	0	1825	1609	0	1789	3545	0	1722	3541	0
Flt Permitted	0.730			0.135			0.329			0.285		
Satd. Flow (perm)	1375	1652	0	259	1609	0	620	3545	0	517	3541	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		143			32			18			1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		171.0			287.6			434.9			780.0	
Travel Time (s)		12.8			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	7%	2%	1%	3%	6%	3%	2%
Adj. Flow (vph)	60	95	434	50	10	32	47	752	93	39	737	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	529	0	50	42	0	47	845	0	39	744	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		53.0	53.0		53.0	53.0	
Total Split (s)	46.8	46.8		46.8	46.8		54.2	54.2		54.2	54.2	
Total Split (%)	46.3%	46.3%		46.3%	46.3%		53.7%	53.7%		53.7%	53.7%	
Maximum Green (s)	40.3	40.3		40.3	40.3		47.2	47.2		47.2	47.2	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	32.4	32.4		32.4	32.4		57.1	57.1		57.1	57.1	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.57	0.57		0.57	0.57	
v/c Ratio	0.14	0.84		0.60	0.08		0.13	0.42		0.13	0.37	
Control Delay	22.1	35.2		57.2	9.1		14.5	14.3		14.9	14.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.1	35.2		57.2	9.1		14.5	14.3		14.9	14.0	
LOS	C	D		E	A		B	B		B	B	
Approach Delay		33.8			35.2			14.3			14.1	
Approach LOS		C			D			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 19.9	Intersection LOS: B
Intersection Capacity Utilization 81.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Ninth Line & Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	529	50	42	47	845	39	744
v/c Ratio	0.14	0.84	0.60	0.08	0.13	0.42	0.13	0.37
Control Delay	22.1	35.2	57.2	9.1	14.5	14.3	14.9	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	35.2	57.2	9.1	14.5	14.3	14.9	14.0
Queue Length 50th (m)	8.2	71.3	8.1	1.3	4.2	46.6	3.5	40.5
Queue Length 95th (m)	15.2	100.5	#21.1	7.4	12.2	72.6	10.8	63.7
Internal Link Dist (m)		147.0		263.6		410.9		756.0
Turn Bay Length (m)					40.0		40.0	
Base Capacity (vph)	562	760	105	676	350	2011	292	2001
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.70	0.48	0.06	0.13	0.42	0.13	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Ninth Line & Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	48	28	0	17	5	669	45	35	1229	3
Future Volume (vph)	6	0	48	28	0	17	5	669	45	35	1229	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.991				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1541	0	1789	3514	0	1825	3579	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1541	0	1789	3514	0	1825	3579	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		150.1			310.4			412.4			434.9	
Travel Time (s)		11.3			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	6%	2%	3%	2%	0%	2%	2%
Adj. Flow (vph)	6	0	48	30	0	18	5	727	49	38	1336	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	48	0	30	18	0	5	776	0	38	1339	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.0% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Transitway Driveway/Hazelridge Road

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	48	28	0	17	5	669	45	35	1229	3
Future Volume (Veh/h)	6	0	48	28	0	17	5	669	45	35	1229	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	6	0	48	30	0	18	5	727	49	38	1336	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1805	2200	670	1554	2176	388	1339			776		
vC1, stage 1 conf vol	1414	1414		762	762							
vC2, stage 2 conf vol	392	786		792	1415							
vCu, unblocked vol	1805	2200	670	1554	2176	388	1339			776		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	95	100	88	87	100	97	99			96		
cM capacity (veh/h)	132	169	400	231	169	599	511			849		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	6	48	30	18	5	485	291	38	891	448
Volume Left	6	0	30	0	5	0	0	38	0	0
Volume Right	0	48	0	18	0	0	49	0	0	3
cSH	132	400	231	599	511	1700	1700	849	1700	1700
Volume to Capacity	0.05	0.12	0.13	0.03	0.01	0.29	0.17	0.04	0.52	0.26
Queue Length 95th (m)	1.1	3.1	3.3	0.7	0.2	0.0	0.0	1.1	0.0	0.0
Control Delay (s)	33.5	15.2	22.9	11.2	12.1	0.0	0.0	9.4	0.0	0.0
Lane LOS	D	C	C	B	B			A		
Approach Delay (s)	17.3		18.5		0.1			0.3		
Approach LOS	C		C							

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		49.0%	ICU Level of Service
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Future Volume (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00							
Frt		0.968			0.997				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	4950	0	1785	5173	0	1767	3650	1597	1733	3650	1597
Flt Permitted	0.054			0.260			0.121			0.510		
Satd. Flow (perm)	101	4950	0	489	5173	0	225	3650	1597	930	3650	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73			3				179			144
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	4%	1%	0%	0%	3%	0%	0%
Adj. Flow (vph)	144	730	201	164	2016	37	115	412	179	136	688	172
Shared Lane Traffic (%)												
Lane Group Flow (vph)	144	931	0	164	2053	0	115	412	179	136	688	172
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

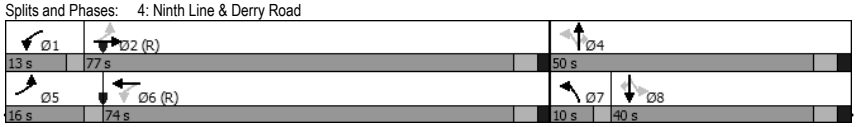
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	30.1		8.0	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	16.0	77.0		13.0	74.0		10.0	50.0	50.0	40.0	40.0	40.0
Total Split (%)	11.4%	55.0%		9.3%	52.9%		7.1%	35.7%	35.7%	28.6%	28.6%	28.6%
Maximum Green (s)	13.0	70.9		10.0	67.9		7.0	43.6	43.6	33.6	33.6	33.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.1		0.0	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.1		2.0	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0	0	0	0
Act Effct Green (s)	89.3	74.7		86.6	73.1		45.8	42.4	42.4	32.4	32.4	32.4
Actuated g/C Ratio	0.64	0.53		0.62	0.52		0.33	0.30	0.30	0.23	0.23	0.23
v/c Ratio	0.70	0.35		0.41	0.76		0.71	0.37	0.29	0.63	0.81	0.36
Control Delay	62.5	12.8		9.6	25.3		58.3	39.1	5.9	62.2	59.3	12.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	12.8		9.6	25.3		58.3	39.1	5.9	62.2	59.3	12.1
LOS	E	B		A	C		E	D	A	E	E	B
Approach Delay		19.5			24.2			33.8			51.5	
Approach LOS		B			C			C			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 30.0 Intersection LOS: C
Intersection Capacity Utilization 88.6% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	144	931	164	2053	115	412	179	136	688	172
v/c Ratio	0.70	0.35	0.41	0.76	0.71	0.37	0.29	0.63	0.81	0.36
Control Delay	62.5	12.8	9.6	25.3	58.3	39.1	5.9	62.2	59.3	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	12.8	9.6	25.3	58.3	39.1	5.9	62.2	59.3	12.1
Queue Length 50th (m)	26.6	31.5	11.8	171.6	22.3	46.1	0.0	33.4	93.6	6.0
Queue Length 95th (m)	49.4	36.4	10.4	193.4	#39.3	60.6	16.5	57.0	116.1	25.0
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	233	2674	405	2703	161	1162	630	229	902	503
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.35	0.40	0.76	0.71	0.35	0.28	0.59	0.76	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	697	67	49	1220
Future Volume (vph)	46	47	697	67	49	1220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.987			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3473	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1585	3473	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	758	73	53	1326
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	831	0	53	1326
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	47	697	67	49	1220
Future Volume (Veh/h)	46	47	697	67	49	1220
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	51	758	73	53	1326
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1564	418			831	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1564	418			831	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	48	91			93	
cM capacity (veh/h)	96	580			810	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	101	505	326	53	663	663
Volume Left	50	0	0	53	0	0
Volume Right	51	0	73	0	0	0
cSH	193	1700	1700	810	1700	1700
Volume to Capacity	0.52	0.30	0.19	0.07	0.39	0.39
Queue Length 95th (m)	20.3	0.0	0.0	1.6	0.0	0.0
Control Delay (s)	44.6	0.0	0.0	9.8	0.0	0.0
Lane LOS	E			A		
Approach Delay (s)	44.6	0.0		0.4		
Approach LOS	E					

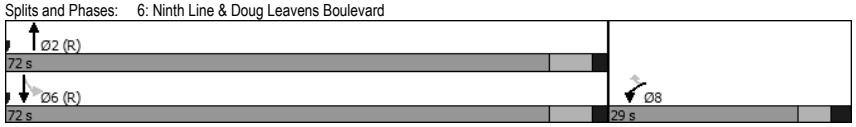
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	62	57	729	106	97	1046
Future Volume (vph)	62	57	729	106	97	1046
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	27.0		60.0	115.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.99				
Frt		0.850	0.981			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3519	0	1825	3579
Flt Permitted	0.950				0.309	
Satd. Flow (perm)	1789	1579	3519	0	594	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		62	33			
Link Speed (k/h)	50		70			70
Link Distance (m)	255.0		1151.0			603.1
Travel Time (s)	18.4		59.2			31.0
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	2%
Adj. Flow (vph)	67	62	792	115	105	1137
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	62	907	0	105	1137
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	29.0	29.0	72.0		72.0	72.0
Total Split (%)	28.7%	28.7%	71.3%		71.3%	71.3%
Maximum Green (s)	22.5	22.5	65.0		65.0	65.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	10.7	10.7	82.9		82.9	82.9
Actuated g/C Ratio	0.11	0.11	0.82		0.82	0.82
v/c Ratio	0.36	0.28	0.31		0.22	0.39
Control Delay	46.8	14.0	7.0		4.4	3.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.8	14.0	7.0		4.4	3.7
LOS	D	B	A		A	A
Approach Delay	31.0		7.0			3.8
Approach LOS	C		A			A

Intersection Summary		
Area Type:	Other	
Cycle Length: 101		
Actuated Cycle Length: 101		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green		
Natural Cycle: 80		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.39		
Intersection Signal Delay: 6.6		Intersection LOS: A
Intersection Capacity Utilization 96.5%		ICU Level of Service F
Analysis Period (min) 15		

Splits and Phases: 6: Ninth Line & Doug Leavens Boulevard



Queues
6: Ninth Line & Doug Leavens Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	67	62	907	105	1137
v/c Ratio	0.36	0.28	0.31	0.22	0.39
Control Delay	46.8	14.0	7.0	4.4	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	14.0	7.0	4.4	3.7
Queue Length 50th (m)	12.5	0.0	33.3	4.2	29.0
Queue Length 95th (m)	24.5	11.3	73.6	10.8	44.4
Internal Link Dist (m)	231.0		1127.0		579.1
Turn Bay Length (m)		27.0		115.0	
Base Capacity (vph)	416	414	2895	487	2939
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.15	0.31	0.22	0.39

Intersection Summary

Lanes, Volumes, Timings
7: Ninth Line & Osprey Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	133	44	911	147	71	1299
Future Volume (vph)	133	44	911	147	71	1299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	13.0	0.0		25.0	270.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	13.0				0.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.99				
Frt		0.850	0.979			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1738	1526	3465	0	1825	3510
Flt Permitted	0.950				0.211	
Satd. Flow (perm)	1738	1505	3465	0	405	3510
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		48	35			
Link Speed (k/h)	50		70			70
Link Distance (m)	160.0		383.2			1151.0
Travel Time (s)	11.5		19.7			59.2
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	7%	3%	4%	0%	4%
Adj. Flow (vph)	145	48	990	160	77	1412
Shared Lane Traffic (%)						
Lane Group Flow (vph)	145	48	1150	0	77	1412
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
7: Ninth Line & Osprey Boulevard

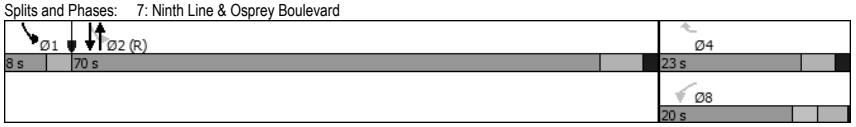
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	4.0	8.0	45.0		5.0	45.0
Minimum Split (s)	20.0	23.0	52.0		8.0	52.0
Total Split (s)	20.0	23.0	70.0		8.0	70.0
Total Split (%)	19.8%	22.8%	69.3%		7.9%	69.3%
Maximum Green (s)	16.0	17.0	63.0		5.0	63.0
Yellow Time (s)	3.5	4.0	5.0		3.0	5.0
All-Red Time (s)	0.5	2.0	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	3.0	5.0	6.0		2.0	6.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	5.0	8.0	37.0			37.0
Flash Dont Walk (s)	11.0	9.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	15.0	13.0	69.8		79.4	69.8
Actuated g/C Ratio	0.15	0.13	0.69		0.79	0.69
v/c Ratio	0.56	0.21	0.48		0.19	0.58
Control Delay	48.1	13.0	8.5		3.4	9.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	48.1	13.0	8.5		3.4	9.9
LOS	D	B	A		A	A
Approach Delay	39.4		8.5			9.6
Approach LOS	D		A			A

Intersection Summary

Area Type:	Other
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 11.2	Intersection LOS: B
Intersection Capacity Utilization 60.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Ninth Line & Osprey Boulevard



Queues
7: Ninth Line & Osprey Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	145	48	1150	77	1412
v/c Ratio	0.56	0.21	0.48	0.19	0.58
Control Delay	48.1	13.0	8.5	3.4	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	13.0	8.5	3.4	9.9
Queue Length 50th (m)	26.8	0.0	49.7	2.3	65.9
Queue Length 95th (m)	43.6	9.5	72.5	6.0	98.6
Internal Link Dist (m)	136.0		359.2		1127.0
Turn Bay Length (m)	13.0			270.0	
Base Capacity (vph)	344	307	2405	416	2425
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.42	0.16	0.48	0.19	0.58

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Parkgate Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	14	19	851	20	32	965
Future Volume (vph)	14	19	851	20	32	965
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0	0.0		0.0	35.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				60.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.997			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3604	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3604	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	207.4		254.7			383.2
Travel Time (s)	14.9		13.1			19.7
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	2%
Adj. Flow (vph)	15	21	925	22	35	1049
Shared Lane Traffic (%)						
Lane Group Flow (vph)	15	21	947	0	35	1049
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Parkgate Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	19	851	20	32	965
Future Volume (Veh/h)	14	19	851	20	32	965
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	21	925	22	35	1049
Pedestrians						1
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			255			383
pX, platoon unblocked	0.81	0.74			0.74	
vC, conflicting volume	1530	474			947	
vC1, stage 1 conf vol	936					
vC2, stage 2 conf vol	594					
vCu, unblocked vol	488	0			239	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	97			96	
cM capacity (veh/h)	531	811			996	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	15	21	617	330	35	524	524
Volume Left	15	0	0	0	35	0	0
Volume Right	0	21	0	22	0	0	0
cSH	531	811	1700	1700	996	1700	1700
Volume to Capacity	0.03	0.03	0.36	0.19	0.04	0.31	0.31
Queue Length 95th (m)	0.7	0.6	0.0	0.0	0.8	0.0	0.0
Control Delay (s)	12.0	9.6	0.0	0.0	8.7	0.0	0.0
Lane LOS	B	A			A		
Approach Delay (s)	10.6		0.0		0.3		
Approach LOS	B						

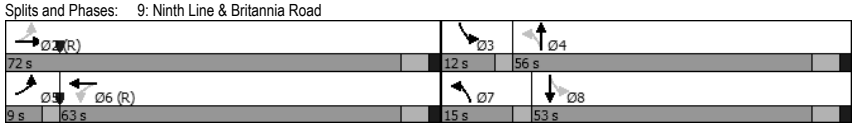
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Future Volume (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.969			0.991			0.987			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	5003	0	1767	5192	0	1767	3593	0	1684	3553	0
Flt Permitted	0.067			0.201			0.082			0.086		
Satd. Flow (perm)	125	5003	0	374	5192	0	153	3593	0	152	3553	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		63			8			8			11	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	1%	0%	2%	1%	0%	3%	6%	1%	1%
Adj. Flow (vph)	119	925	241	96	1546	93	182	1015	95	140	967	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	1166	0	96	1639	0	182	1110	0	140	1090	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	8.0	24.6		24.6	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	9.0	72.0		63.0	63.0		15.0	56.0		12.0	53.0	
Total Split (%)	6.4%	51.4%		45.0%	45.0%		10.7%	40.0%		8.6%	37.9%	
Maximum Green (s)	6.0	65.4		56.4	56.4		12.0	49.4		9.0	46.4	
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	0.0	2.0		2.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	2.0	5.6		5.6	5.6		2.0	5.6		2.0	5.6	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0			12.0			12.0	
Flash Dont Walk (s)		11.0		11.0	11.0			18.0			18.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	71.0	67.4		57.9	57.9		65.0	49.4		60.1	46.5	
Actuated g/C Ratio	0.51	0.48		0.41	0.41		0.46	0.35		0.43	0.33	
v/c Ratio	0.79	0.48		0.62	0.76		0.83	0.87		0.80	0.92	
Control Delay	68.3	39.2		49.5	35.3		60.7	50.7		60.5	57.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	68.3	39.2		49.5	35.3		60.7	50.7		60.5	57.2	
LOS	E	D		D	D		E	D		E	E	
Approach Delay		41.9			36.1			52.1			57.5	
Approach LOS		D			D			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 32.2 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 45.9		Intersection LOS: D	
Intersection Capacity Utilization 95.3%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	1166	96	1639	182	1110	140	1090
v/c Ratio	0.79	0.48	0.62	0.76	0.83	0.87	0.80	0.92
Control Delay	68.3	39.2	49.5	35.3	60.7	50.7	60.5	57.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	39.2	49.5	35.3	60.7	50.7	60.5	57.2
Queue Length 50th (m)	25.7	101.4	21.0	142.0	32.7	148.0	22.1	149.7
Queue Length 95th (m)	#51.6	117.9	#48.4	160.6	#72.3	176.6	#57.0	#187.5
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	151	2441	154	2152	221	1298	174	1210
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.48	0.62	0.76	0.82	0.86	0.80	0.90

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	12	13	0	13	3	1125	22	26	1280	10
Future Volume (vph)	55	0	12	13	0	13	3	1125	22	26	1280	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.997			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		135.2			491.2			170.0			206.5	
Travel Time (s)		10.1			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	55	0	12	14	0	14	3	1223	24	28	1391	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	12	0	14	14	0	3	1247	0	28	1401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 52.1% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Transitway Driveway/Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	0	12	13	0	13	3	1125	22	26	1280	10
Future Volume (Veh/h)	55	0	12	13	0	13	3	1125	22	26	1280	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	55	0	12	14	0	14	3	1223	24	28	1391	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											206	
pX, platoon unblocked	0.71	0.71	0.71	0.71	0.71		0.71					
vC, conflicting volume	2084	2705	700	2004	2698	624	1401			1247		
vC1, stage 1 conf vol	1452	1452		1241	1241							
vC2, stage 2 conf vol	632	1253		764	1457							
vCu, unblocked vol	1713	2586	0	1602	2576	624	754			1247		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	71	100	98	92	100	97	100			95		
cM capacity (veh/h)	191	157	772	178	168	434	606			565		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	55	12	14	14	3	815	432	28	927	474
Volume Left	55	0	14	0	3	0	0	28	0	0
Volume Right	0	12	0	14	0	0	24	0	0	10
cSH	191	772	178	434	606	1700	1700	565	1700	1700
Volume to Capacity	0.29	0.02	0.08	0.03	0.00	0.48	0.25	0.05	0.55	0.28
Queue Length 95th (m)	8.6	0.4	1.9	0.8	0.1	0.0	0.0	1.2	0.0	0.0
Control Delay (s)	31.2	9.7	27.0	13.6	11.0	0.0	0.0	11.7	0.0	0.0
Lane LOS	D	A	D	B	B			B		
Approach Delay (s)	27.4		20.3		0.0			0.2		
Approach LOS	D		C							

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization		52.1%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
11: Ninth Line & Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	0	18	8	0	17	0	1178	35	18	1250	0
Future Volume (vph)	37	0	18	8	0	17	0	1178	35	18	1250	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.850			0.850			0.996				
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1883	3591	0	1825	3614	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1883	3591	0	1825	3614	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		110.9			511.9			217.0			170.0	
Travel Time (s)		8.3			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	9%	0%	1%	2%
Adj. Flow (vph)	37	0	18	9	0	18	0	1280	38	20	1359	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	18	0	9	18	0	0	1318	0	20	1359	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & Transitway Driveway/McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	0	18	8	0	17	0	1178	35	18	1250	0
Future Volume (Veh/h)	37	0	18	8	0	17	0	1178	35	18	1250	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	37	0	18	9	0	18	0	1280	38	20	1359	0
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											376	
pX, platoon unblocked	0.72	0.72	0.72	0.72	0.72		0.72					
vC, conflicting volume	2058	2717	680	2036	2698	660	1359			1318		
vC1, stage 1 conf vol	1399	1399		1299	1299							
vC2, stage 2 conf vol	659	1318		738	1399							
vCu, unblocked vol	1700	2610	0	1671	2583	660	736			1318		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	82	100	98	95	100	96	100			96		
cM capacity (veh/h)	201	158	786	165	169	410	627			531		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	37	18	9	18	0	853	465	20	906	453
Volume Left	37	0	9	0	0	0	0	20	0	0
Volume Right	0	18	0	18	0	0	38	0	0	0
cSH	201	786	165	410	1700	1700	1700	531	1700	1700
Volume to Capacity	0.18	0.02	0.05	0.04	0.00	0.50	0.27	0.04	0.53	0.27
Queue Length 95th (m)	5.0	0.5	1.3	1.0	0.0	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	26.9	9.7	28.0	14.2	0.0	0.0	0.0	12.0	0.0	0.0
Lane LOS	D	A	D	B				B		
Approach Delay (s)	21.2		18.8		0.0			0.2		
Approach LOS	C		C							

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		49.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	5	1184	20	12	1291
Future Volume (vph)	9	5	1184	20	12	1291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		35.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.997			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3569	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3569	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	1%
Adj. Flow (vph)	10	5	1287	22	13	1403
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	5	1309	0	13	1403
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	5	1184	20	12	1291
Future Volume (Veh/h)	9	5	1184	20	12	1291
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	5	1287	22	13	1403
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2026	654			1309	
vC1, stage 1 conf vol	1298					
vC2, stage 2 conf vol	728					
vCu, unblocked vol	2026	654			1309	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			98	
cM capacity (veh/h)	197	414			535	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	15	858	451	13	702	702
Volume Left	10	0	0	13	0	0
Volume Right	5	0	22	0	0	0
cSH	296	1700	1700	535	1700	1700
Volume to Capacity	0.05	0.50	0.27	0.02	0.41	0.41
Queue Length 95th (m)	1.2	0.0	0.0	0.6	0.0	0.0
Control Delay (s)	20.7	0.0	0.0	11.9	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	20.7	0.0		0.1		
Approach LOS	C					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	9	1183	13	6	1225
Future Volume (vph)	3	9	1183	13	6	1225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3607	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3607	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	3	10	1286	14	7	1332
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	10	1300	0	7	1332
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	9	1183	13	6	1225
Future Volume (Veh/h)	3	9	1183	13	6	1225
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	10	1286	14	7	1332
Pedestrians	1					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.79	0.79			0.79	
vC, conflicting volume	1974	651			1301	
vC1, stage 1 conf vol	1294					
vC2, stage 2 conf vol	680					
vCu, unblocked vol	1706	39			858	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	255	817			627	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	13	857	443	7	666	666
Volume Left	3	0	0	7	0	0
Volume Right	10	0	14	0	0	0
cSH	1062	1700	1700	627	1700	1700
Volume to Capacity	0.01	0.50	0.26	0.01	0.39	0.39
Queue Length 95th (m)	0.3	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	11.7	0.0	0.0	10.8	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	11.7	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
14: Ninth Line & Thomas Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	110	92	1148	145	85	1146
Future Volume (vph)	110	92	1148	145	85	1146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	28.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				45.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor			1.00		1.00	
Frt		0.850	0.983			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1555	3550	0	1807	3579
Flt Permitted	0.950				0.143	
Satd. Flow (perm)	1807	1555	3550	0	272	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		100	23			
Link Speed (k/h)	50		70			70
Link Distance (m)	534.8		346.0			306.2
Travel Time (s)	38.5		17.8			15.7
Confl. Peds. (#/hr)				6	6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	5%	1%	0%	1%	2%
Adj. Flow (vph)	120	100	1248	158	92	1246
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	100	1406	0	92	1246
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
14: Ninth Line & Thomas Street

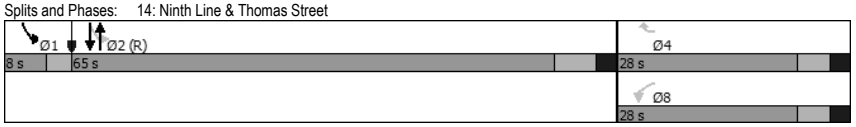
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		5.0	45.0
Minimum Split (s)	25.5	25.5	52.5		8.0	52.5
Total Split (s)	28.0	28.0	65.0		8.0	65.0
Total Split (%)	27.7%	27.7%	64.4%		7.9%	64.4%
Maximum Green (s)	21.5	21.5	57.5		5.0	57.5
Yellow Time (s)	4.0	4.0	5.0		3.0	5.0
All-Red Time (s)	2.5	2.5	2.5		0.0	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.5		2.0	6.5
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	8.0	8.0	33.0			33.0
Flash Dont Walk (s)	11.0	11.0	12.0			12.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	13.1	13.1	67.9		78.8	67.9
Actuated g/C Ratio	0.13	0.13	0.67		0.78	0.67
v/c Ratio	0.51	0.35	0.59		0.28	0.52
Control Delay	44.0	13.0	19.7		4.8	10.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	44.0	13.0	19.7		4.8	10.3
LOS	D	B	B		A	B
Approach Delay	29.9		19.7			9.9
Approach LOS	C		B			A

Intersection Summary

Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 16.0		Intersection LOS: B	
Intersection Capacity Utilization 62.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 14: Ninth Line & Thomas Street



Queues
14: Ninth Line & Thomas Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	120	100	1406	92	1246
v/c Ratio	0.51	0.35	0.59	0.28	0.52
Control Delay	44.0	13.0	19.7	4.8	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	13.0	19.7	4.8	10.3
Queue Length 50th (m)	22.7	0.0	126.6	3.0	60.5
Queue Length 95th (m)	39.6	16.2	168.4	7.4	92.0
Internal Link Dist (m)	510.8		322.0		282.2
Turn Bay Length (m)				28.0	
Base Capacity (vph)	402	424	2395	328	2407
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.30	0.24	0.59	0.28	0.52

Intersection Summary

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	6	1194	27	19	1189
Future Volume (vph)	9	6	1194	27	19	1189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.997			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3604	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3604	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	10	7	1298	29	21	1292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	7	1327	0	21	1292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	6	1194	27	19	1189
Future Volume (Veh/h)	9	6	1194	27	19	1189
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	7	1298	29	21	1292
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.82					
vC, conflicting volume	2000	664			1327	
vC1, stage 1 conf vol	1312					
vC2, stage 2 conf vol	688					
vCu, unblocked vol	1781	664			1327	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	98			96	
cM capacity (veh/h)	206	408			527	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	17	865	462	21	646	646
Volume Left	10	0	0	21	0	0
Volume Right	7	0	29	0	0	0
cSH	350	1700	1700	527	1700	1700
Volume to Capacity	0.05	0.51	0.27	0.04	0.38	0.38
Queue Length 95th (m)	1.2	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	19.5	0.0	0.0	12.1	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	19.5	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	30	27	1286	71	47	1274
Future Volume (vph)	30	27	1286	71	47	1274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.992			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3554	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3554	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	33	29	1398	77	51	1385
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	29	1475	0	51	1385
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	27	1286	71	47	1274
Future Volume (Veh/h)	30	27	1286	71	47	1274
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	29	1398	77	51	1385
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2231	738			1475	
vC1, stage 1 conf vol	1436					
vC2, stage 2 conf vol	794					
vCu, unblocked vol	2231	738			1475	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	92			89	
cM capacity (veh/h)	164	365			463	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	62	932	543	51	692	692
Volume Left	33	0	0	51	0	0
Volume Right	29	0	77	0	0	0
cSH	309	1700	1700	463	1700	1700
Volume to Capacity	0.20	0.55	0.32	0.11	0.41	0.41
Queue Length 95th (m)	5.6	0.0	0.0	2.8	0.0	0.0
Control Delay (s)	24.5	0.0	0.0	13.7	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	24.5	0.0		0.5		
Approach LOS	C					

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Janice Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	6	1315	5	10	1248
Future Volume (vph)	0	6	1315	5	10	1248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	70.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.865		0.999			
Flt Protected					0.950	
Satd. Flow (prot)	1662	0	3610	0	1825	3579
Flt Permitted					0.950	
Satd. Flow (perm)	1662	0	3610	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	113.3		424.8			250.0
Travel Time (s)	8.2		21.8			12.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	2%
Adj. Flow (vph)	0	7	1429	5	11	1357
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	0	1434	0	11	1357
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Janice Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	6	1315	5	10	1248
Future Volume (Veh/h)	0	6	1315	5	10	1248
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	7	1429	5	11	1357
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2132	717			1434	
vC1, stage 1 conf vol	1432					
vC2, stage 2 conf vol	700					
vCu, unblocked vol	2132	717			1434	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			98	
cM capacity (veh/h)	173	377			480	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	7	953	481	11	678	678
Volume Left	0	0	0	11	0	0
Volume Right	7	0	5	0	0	0
cSH	377	1700	1700	480	1700	1700
Volume to Capacity	0.02	0.56	0.28	0.02	0.40	0.40
Queue Length 95th (m)	0.4	0.0	0.0	0.5	0.0	0.0
Control Delay (s)	14.7	0.0	0.0	12.7	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	14.7	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

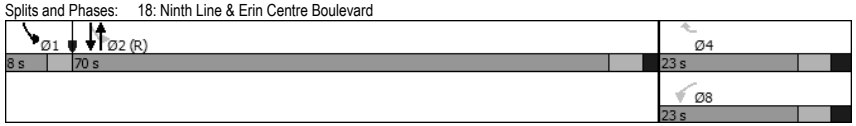
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	62	1253	51	44	1099
Future Volume (vph)	46	62	1253	51	44	1099
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3569	0	1825	3579
Flt Permitted	0.950				0.153	
Satd. Flow (perm)	1789	1585	3569	0	294	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		67	8			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	1%	18%	0%	2%
Adj. Flow (vph)	50	67	1362	55	48	1195
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	67	1417	0	48	1195
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	23.0	23.0	70.0		8.0	70.0
Total Split (%)	22.8%	22.8%	69.3%		7.9%	69.3%
Maximum Green (s)	16.5	16.5	64.0		5.0	64.0
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	8.0	8.0	50.0			50.0
Flash Dont Walk (s)	8.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	10.0	10.0	77.2		84.8	77.2
Actuated g/C Ratio	0.10	0.10	0.76		0.84	0.76
v/c Ratio	0.28	0.31	0.52		0.14	0.44
Control Delay	46.1	14.5	7.2		4.6	14.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.1	14.5	7.2		4.6	14.2
LOS	D	B	A		A	B
Approach Delay	28.0		7.2			13.8
Approach LOS	C		A			B

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 11.0 Intersection LOS: B
Intersection Capacity Utilization 63.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	50	67	1417	48	1195
v/c Ratio	0.28	0.31	0.52	0.14	0.44
Control Delay	46.1	14.5	7.2	4.6	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	14.5	7.2	4.6	14.2
Queue Length 50th (m)	9.3	0.0	58.7	2.8	82.3
Queue Length 95th (m)	19.9	11.9	85.0	m6.2	131.1
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	309	330	2728	352	2734
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.20	0.52	0.14	0.44

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Candlelight Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	11	1189	15	23	1081
Future Volume (vph)	5	11	1189	15	23	1081
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3607	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3607	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	216.6		90.1			404.2
Travel Time (s)	15.6		4.6			20.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	5	12	1292	16	25	1175
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	12	1308	0	25	1175
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 43.3% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Candlelight Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	11	1189	15	23	1081
Future Volume (Veh/h)	5	11	1189	15	23	1081
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	12	1292	16	25	1175
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			373			
pX, platoon unblocked	0.83	0.83			0.83	
vC, conflicting volume	1938	654			1308	
vC1, stage 1 conf vol	1300					
vC2, stage 2 conf vol	638					
vCu, unblocked vol	1713	159			951	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	98			96	
cM capacity (veh/h)	244	713			603	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	17	861	447	25	588	588
Volume Left	5	0	0	25	0	0
Volume Right	12	0	16	0	0	0
cSH	830	1700	1700	603	1700	1700
Volume to Capacity	0.02	0.51	0.26	0.04	0.35	0.35
Queue Length 95th (m)	0.5	0.0	0.0	1.0	0.0	0.0
Control Delay (s)	13.1	0.0	0.0	11.2	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	13.1	0.0		0.2		
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	1226	2	16	1111
Future Volume (vph)	1	1	1226	2	16	1111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.932					
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1748	0	3614	0	1825	3614
Flt Permitted	0.976				0.950	
Satd. Flow (perm)	1748	0	3614	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	1	1	1333	2	17	1208
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1335	0	17	1208
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	1	1226	2	16	1111
Future Volume (Veh/h)	1	1	1226	2	16	1111
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	1333	2	17	1208
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.82	0.82			0.82	
vC, conflicting volume	1972	668			1335	
vC1, stage 1 conf vol	1334					
vC2, stage 2 conf vol	638					
vCu, unblocked vol	1746	154			968	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			97	
cM capacity (veh/h)	237	714			590	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	2	889	446	17	604	604
Volume Left	1	0	0	17	0	0
Volume Right	1	0	2	0	0	0
cSH	356	1700	1700	590	1700	1700
Volume to Capacity	0.01	0.52	0.26	0.03	0.36	0.36
Queue Length 95th (m)	0.1	0.0	0.0	0.7	0.0	0.0
Control Delay (s)	15.2	0.0	0.0	11.3	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	15.2	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Stardust Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	2	1311	5	3	1125
Future Volume (vph)	0	2	1311	5	3	1125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	0.95
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected						
Satd. Flow (prot)	0	1662	3614	1633	0	3614
Flt Permitted						
Satd. Flow (perm)	0	1662	3614	1633	0	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	245.5		191.7			91.0
Travel Time (s)	17.7		9.9			4.7
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	0	2	1425	5	3	1223
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2	1425	5	0	1226
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Stardust Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	2	1311	5	3	1125
Future Volume (Veh/h)	0	2	1311	5	3	1125
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	1425	5	3	1223
Pedestrians	1					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			192			
pX, platoon unblocked	0.81	0.81			0.81	
vC, conflicting volume	2044	714			1426	
vC1, stage 1 conf vol	1426					
vC2, stage 2 conf vol	618					
vCu, unblocked vol	1821	182			1060	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	217	677			539	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	2	712	712	5	411	815
Volume Left	0	0	0	0	3	0
Volume Right	2	0	0	5	0	0
cSH	677	1700	1700	1700	539	1700
Volume to Capacity	0.00	0.42	0.42	0.00	0.01	0.48
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.1	0.0
Control Delay (s)	10.3	0.0	0.0	0.0	0.2	0.0
Lane LOS	B				A	
Approach Delay (s)	10.3	0.0			0.1	
Approach LOS	B					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	358	18	39	786	420	178	614	32	268	582	64
Future Volume (vph)	48	358	18	39	786	420	178	614	32	268	582	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.993				0.850		0.993			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3547	0	1789	1812	1458	1825	3555	0	1807	3535	0
Flt Permitted	0.102			0.498			0.244			0.124		
Satd. Flow (perm)	196	3547	0	938	1812	1458	469	3555	0	236	3535	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				316		3			8	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	6%	2%	6%	12%	0%	2%	1%	1%	1%	8%
Adj. Flow (vph)	52	389	20	42	854	457	193	667	35	291	633	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	409	0	42	854	457	193	702	0	291	703	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		7	4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

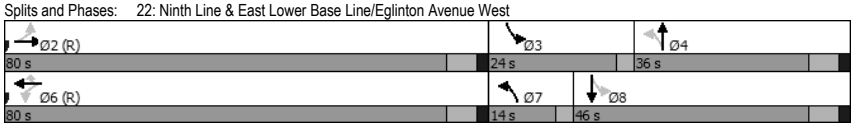
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	5.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	8.0	24.0		8.0	24.0	
Total Split (s)	80.0	80.0		80.0	80.0	80.0	14.0	36.0		24.0	46.0	
Total Split (%)	57.1%	57.1%		57.1%	57.1%	57.1%	10.0%	25.7%		17.1%	32.9%	
Maximum Green (s)	73.0	73.0		73.0	73.0	73.0	11.0	29.0		21.0	39.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	0.0		0.0	-1.0	0.0	-1.0	-1.0		-1.0	0.0	
Total Lost Time (s)	6.0	7.0		7.0	6.0	7.0	2.0	6.0		2.0	7.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	Min		None	Min	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0		8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0		9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)	74.9	73.9		73.9	74.9	73.9	46.6	30.3		57.1	37.7	
Actuated g/C Ratio	0.54	0.53		0.53	0.54	0.53	0.33	0.22		0.41	0.27	
v/c Ratio	0.50	0.22		0.08	0.88	0.50	0.70	0.91		0.88	0.73	
Control Delay	41.6	18.0		17.6	41.2	8.0	43.4	70.2		63.2	51.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	41.6	18.0		17.6	41.2	8.0	43.4	70.2		63.2	51.0	
LOS	D	B		B	D	A	D	E		E	D	
Approach Delay		20.6			29.3			64.4			54.6	
Approach LOS		C			C			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 43.5 Intersection LOS: D
Intersection Capacity Utilization 87.5% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	409	42	854	457	193	702	291	703
v/c Ratio	0.50	0.22	0.08	0.88	0.50	0.70	0.91	0.88	0.73
Control Delay	41.6	18.0	17.6	41.2	8.0	43.4	70.2	63.2	51.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	18.0	17.6	41.2	8.0	43.4	70.2	63.2	51.0
Queue Length 50th (m)	9.0	30.8	5.7	204.7	20.7	34.6	100.6	60.7	91.4
Queue Length 95th (m)	26.4	40.7	12.2	#292.5	47.8	#55.1	#135.6	#107.5	113.6
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	105	1884	497	973	921	276	779	343	990
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.22	0.08	0.88	0.50	0.70	0.90	0.85	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	207	27	135	169	14	16	13	72	10	15	9
Future Volume (vph)	9	207	27	135	169	14	16	13	72	10	15	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.985			0.994			0.903			0.964	
Flt Protected		0.998			0.979			0.992			0.985	
Satd. Flow (prot)	0	1889	0	0	1862	0	0	1673	0	0	1824	0
Flt Permitted		0.998			0.979			0.992			0.985	
Satd. Flow (perm)	0	1889	0	0	1862	0	0	1673	0	0	1824	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	2		10	10		2	5		3	3		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	10	225	29	147	184	15	17	14	78	11	16	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	264	0	0	346	0	0	109	0	0	37	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	207	27	135	169	14	16	13	72	10	15	9
Future Volume (vph)	9	207	27	135	169	14	16	13	72	10	15	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	225	29	147	184	15	17	14	78	11	16	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	264	346	109	37
Volume Left (vph)	10	147	17	11
Volume Right (vph)	29	15	78	10
Hadj (s)	-0.06	0.07	-0.35	-0.10
Departure Headway (s)	4.6	4.7	5.0	5.4
Degree Utilization, x	0.34	0.45	0.15	0.06
Capacity (veh/h)	744	742	627	574
Control Delay (s)	10.0	11.4	8.9	8.7
Approach Delay (s)	10.0	11.4	8.9	8.7
Approach LOS	B	B	A	A

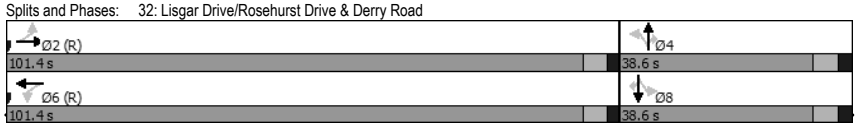
Intersection Summary			
Delay	10.4		
Level of Service	B		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Future Volume (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00		0.99		0.99	1.00		0.98
Frt		0.992			0.988				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5047	0	1785	5119	0	1785	1921	1617	1785	1830	1566
Flt Permitted	0.051			0.274			0.733			0.734		
Satd. Flow (perm)	96	5047	0	513	5119	0	1362	1921	1593	1376	1830	1529
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			22				160			23
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	4		6	6		4	9		2	2		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	1%	0%	0%	1%	0%	5%	2%
Adj. Flow (vph)	57	935	52	335	2203	185	47	36	160	99	37	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	987	0	335	2388	0	47	36	160	99	37	45
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	101.4	101.4		101.4	101.4		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (%)	72.4%	72.4%		72.4%	72.4%		27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Maximum Green (s)	95.4	95.4		95.4	95.4		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	113.0	113.0		113.0	113.0		16.4	16.4	16.4	16.4	16.4	16.4
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.12	0.12	0.12	0.12	0.12	0.12
v/c Ratio	0.74	0.24		0.81	0.58		0.30	0.16	0.49	0.61	0.17	0.23
Control Delay	70.8	2.3		27.4	5.9		59.3	54.8	12.7	74.1	55.2	33.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	2.3		27.4	5.9		59.3	54.8	12.7	74.1	55.2	33.6
LOS	E	A		C	A		E	D	B	E	E	C
Approach Delay		6.0			8.5			28.0			60.1	
Approach LOS		A			A			C			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 113.4 (81%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 85.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	987	335	2388	47	36	160	99	37	45
v/c Ratio	0.74	0.24	0.81	0.58	0.30	0.16	0.49	0.61	0.17	0.23
Control Delay	70.8	2.3	27.4	5.9	59.3	54.8	12.7	74.1	55.2	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	2.3	27.4	5.9	59.3	54.8	12.7	74.1	55.2	33.6
Queue Length 50th (m)	7.1	12.6	43.0	72.0	12.1	9.1	0.0	26.5	9.4	5.6
Queue Length 95th (m)	m#41.0	18.3	#140.2	104.5	23.7	18.8	19.5	43.7	19.3	16.7
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	77	4075	413	4135	321	452	497	324	431	377
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.24	0.81	0.58	0.15	0.08	0.32	0.31	0.09	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	148	56	92	114	133	43	60	86	142	93	46
Future Volume (vph)	43	148	56	92	114	133	43	60	86	142	93	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.959			0.919			0.939			0.978	
Flt Protected	0.950			0.950				0.989			0.975	
Satd. Flow (prot)	1738	1636	0	1772	1644	0	0	1596	0	0	1668	0
Flt Permitted	0.950			0.950				0.989			0.975	
Satd. Flow (perm)	1738	1636	0	1772	1644	0	0	1596	0	0	1668	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	12		31	31		12	39		40	40		39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	14%	9%	3%	9%	6%	9%	22%	6%	6%	15%	11%
Adj. Flow (vph)	47	161	61	100	124	145	47	65	93	154	101	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	222	0	100	269	0	0	205	0	0	305	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 59.8% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	43	148	56	92	114	133	43	60	86	142	93	46
Future Volume (vph)	43	148	56	92	114	133	43	60	86	142	93	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	161	61	100	124	145	47	65	93	154	101	50

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	47	222	100	269	205	305
Volume Left (vph)	47	0	100	0	47	154
Volume Right (vph)	0	61	0	145	93	50
Hadj (s)	0.58	0.02	0.55	-0.25	-0.03	0.17
Departure Headway (s)	7.5	7.0	7.3	6.5	6.5	6.4
Degree Utilization, x	0.10	0.43	0.20	0.49	0.37	0.54
Capacity (veh/h)	441	473	461	514	498	525
Control Delay (s)	10.2	13.9	11.0	14.3	13.3	16.9
Approach Delay (s)	13.2		13.4		13.3	16.9
Approach LOS	B		B		B	C

Intersection Summary			
Delay		14.3	
Level of Service		B	
Intersection Capacity Utilization		59.8%	ICU Level of Service B
Analysis Period (min)		15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Future Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.907			0.940			0.953	
Flt Protected		0.979			0.996			0.986			0.971	
Satd. Flow (prot)	0	1814	0	0	1735	0	0	1781	0	0	1683	0
Flt Permitted		0.979			0.996			0.986			0.971	
Satd. Flow (perm)	0	1814	0	0	1735	0	0	1781	0	0	1683	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	10		4	4		10	1		46	46		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	6%
Adj. Flow (vph)	46	55	5	12	34	102	5	5	8	117	12	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	106	0	0	148	0	0	18	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 40.9%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Future Volume (vph)	42	51	5	11	31	94	5	5	7	108	11	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	55	5	12	34	102	5	5	8	117	12	70

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	106	148	18	199
Volume Left (vph)	46	12	5	117
Volume Right (vph)	5	102	8	70
Hadj (s)	0.11	-0.40	-0.21	0.00
Departure Headway (s)	4.7	4.2	4.5	4.5
Degree Utilization, x	0.14	0.17	0.02	0.25
Capacity (veh/h)	718	813	736	754
Control Delay (s)	8.4	8.0	7.6	9.0
Approach Delay (s)	8.4	8.0	7.6	9.0
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.5	
Level of Service			A	
Intersection Capacity Utilization			40.9%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Future Volume (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00		1.00	0.99		1.00	0.99	
Frt		0.988			0.994			0.869			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5134	0	1552	5205	0	1733	1645	0	1785	1746	0
Flt Permitted	0.097			0.224			0.746			0.446		
Satd. Flow (perm)	182	5134	0	366	5205	0	1356	1645	0	835	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			12			102			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			97.9			114.1			106.4	
Travel Time (s)		28.2			5.9			8.2			7.7	
Confl. Peds. (#/hr)	4					4	2		3	3		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	0%	1%	3%	0%	0%	0%	5%	0%
Adj. Flow (vph)	16	1092	94	219	1838	78	35	15	102	30	11	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1186	0	219	1916	0	35	117	0	30	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

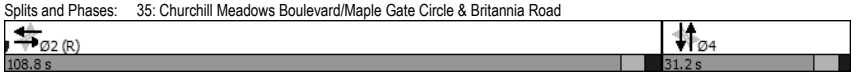
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Detector Phase	2	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		36.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	108.8	108.8		108.8	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	77.7%	77.7%		77.7%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	101.8	101.8		101.8	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.2	5.2		5.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	11.0	11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	117.9	117.9		117.9	117.9		10.9	10.9		10.9	10.9	
Actuated g/C Ratio	0.84	0.84		0.84	0.84		0.08	0.08		0.08	0.08	
v/c Ratio	0.10	0.27		0.71	0.44		0.33	0.53		0.47	0.13	
Control Delay	1.7	0.7		20.5	3.2		69.0	23.5		84.2	44.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	1.7	0.7		20.5	3.2		69.0	23.5		84.2	44.1	
LOS	A	A		C	A		E	C		F	D	
Approach Delay		0.7			5.0			34.0			69.1	
Approach LOS		A			A			C			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 5.6 — Intersection LOS: A
Intersection Capacity Utilization 71.4% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	1186	219	1916	35	117	30	18
v/c Ratio	0.10	0.27	0.71	0.44	0.33	0.53	0.47	0.13
Control Delay	1.7	0.7	20.5	3.2	69.0	23.5	84.2	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.7	0.7	20.5	3.2	69.0	23.5	84.2	44.1
Queue Length 50th (m)	0.2	3.5	17.6	35.6	9.4	4.0	8.2	2.9
Queue Length 95th (m)	m0.3	4.9	#91.0	50.9	20.3	22.5	18.7	10.6
Internal Link Dist (m)		445.7		73.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	153	4328	308	4385	251	388	155	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.27	0.71	0.44	0.14	0.30	0.19	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	9	8	9	7	12	12	136	15	18	240	15
Future Volume (vph)	12	9	8	9	7	12	12	136	15	18	240	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.962			0.943			0.988			0.993	
Flt Protected		0.980			0.984			0.996			0.997	
Satd. Flow (prot)	0	1747	0	0	1720	0	0	1853	0	0	1878	0
Flt Permitted		0.980			0.984			0.996			0.997	
Satd. Flow (perm)	0	1747	0	0	1720	0	0	1853	0	0	1878	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)	6		3	3		6	11		10	10		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	13%	0%	14%	0%	0%	1%	13%	0%	1%	7%
Adj. Flow (vph)	13	10	9	10	8	13	13	148	16	20	261	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	31	0	0	177	0	0	297	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	9	8	9	7	12	12	136	15	18	240	15
Future Volume (Veh/h)	12	9	8	9	7	12	12	136	15	18	240	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	10	9	10	8	13	13	148	16	20	261	16
Pedestrians		11			10			3			6	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	525	520	283	518	520	172	288			174		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	525	520	283	518	520	172	288			174		
tC, single (s)	7.1	6.5	6.3	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	97	98	99	98	98	98	99			99		
cM capacity (veh/h)	432	444	722	438	425	865	1273			1403		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	32	31	177	297
Volume Left	13	10	13	20
Volume Right	9	13	16	16
cSH	492	547	1273	1403
Volume to Capacity	0.07	0.06	0.01	0.01
Queue Length 95th (m)	1.6	1.4	0.2	0.3
Control Delay (s)	12.8	12.0	0.7	0.6
Lane LOS	B	B	A	A
Approach Delay (s)	12.8	12.0	0.7	0.6
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	57	23	69	77	24	16	119	62	17	144	22
Future Volume (vph)	10	57	23	69	77	24	16	119	62	17	144	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.966			0.981			0.958			0.984	
Flt Protected		0.994			0.980			0.996			0.995	
Satd. Flow (prot)	0	1598	0	0	1727	0	0	1725	0	0	1782	0
Flt Permitted		0.994			0.980			0.996			0.995	
Satd. Flow (perm)	0	1598	0	0	1727	0	0	1725	0	0	1782	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	20		92	92		20	33		36	36		33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	19%	9%	6%	10%	0%	6%	7%	5%	0%	7%	0%
Adj. Flow (vph)	11	62	25	75	84	26	17	129	67	18	157	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	98	0	0	185	0	0	213	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	57	23	69	77	24	16	119	62	17	144	22
Future Volume (vph)	10	57	23	69	77	24	16	119	62	17	144	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	62	25	75	84	26	17	129	67	18	157	24

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	98	185	213	199
Volume Left (vph)	11	75	17	18
Volume Right (vph)	25	26	67	24
Hadj (s)	0.13	0.12	-0.07	0.04
Departure Headway (s)	5.4	5.2	4.9	5.0
Degree Utilization, x	0.15	0.27	0.29	0.28
Capacity (veh/h)	604	635	690	670
Control Delay (s)	9.3	10.1	9.9	9.9
Approach Delay (s)	9.3	10.1	9.9	9.9
Approach LOS	A	B	A	A

Intersection Summary			
Delay	9.9		
Level of Service	A		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	145	17	114	272	204	7	71	27	109	132	26
Future Volume (vph)	26	145	17	114	272	204	7	71	27	109	132	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		0.99	0.97		0.99	0.99		0.97	1.00	
Frt		0.985			0.936			0.959			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3456	0	1789	3241	0	1601	1638	0	1789	1737	0
Flt Permitted	0.424			0.641			0.631			0.689		
Satd. Flow (perm)	764	3456	0	1189	3241	0	1057	1638	0	1255	1737	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			222			27			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	2%	18%	2%	2%	2%	14%	11%	11%	2%	6%	15%
Adj. Flow (vph)	28	158	18	124	296	222	8	77	29	118	143	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	176	0	124	518	0	8	106	0	118	171	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	46.0	46.0		46.0	46.0		55.0	55.0		55.0	55.0	
Total Split (%)	45.5%	45.5%		45.5%	45.5%		54.5%	54.5%		54.5%	54.5%	
Maximum Green (s)	39.5	39.5		39.5	39.5		49.0	49.0		49.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.5	48.5		48.5	48.5		42.0	42.0		42.0	42.0	
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.42	0.42		0.42	0.42	
v/c Ratio	0.08	0.11		0.22	0.31		0.02	0.15		0.23	0.23	
Control Delay	22.8	19.9		16.5	9.3		17.7	14.3		20.5	18.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.8	19.9		16.5	9.3		17.7	14.3		20.5	18.5	
LOS	C	B		B	A		B	B		C	B	
Approach Delay		20.3			10.7			14.5			19.3	
Approach LOS		C			B			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 74.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	176	124	518	8	106	118	171
v/c Ratio	0.08	0.11	0.22	0.31	0.02	0.15	0.23	0.23
Control Delay	22.8	19.9	16.5	9.3	17.7	14.3	20.5	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	19.9	16.5	9.3	17.7	14.3	20.5	18.5
Queue Length 50th (m)	3.3	10.1	13.6	16.8	0.9	9.3	14.6	19.3
Queue Length 95th (m)	m8.2	20.2	25.0	27.2	3.7	19.7	27.1	33.6
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	366	1666	570	1671	523	824	621	866
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.11	0.22	0.31	0.02	0.13	0.19	0.20

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	33	7	29	57	35	17	96	26	22	176	13
Future Volume (vph)	8	33	7	29	57	35	17	96	26	22	176	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.980			0.961			0.975			0.992	
Flt Protected		0.992			0.988			0.994			0.995	
Satd. Flow (prot)	0	1757	0	0	1717	0	0	1707	0	0	1721	0
Flt Permitted		0.992			0.988			0.994			0.995	
Satd. Flow (perm)	0	1757	0	0	1717	0	0	1707	0	0	1721	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	14		19	19		14	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	6%	0%	3%	5%	11%	6%	11%	4%	5%	11%	8%
Adj. Flow (vph)	9	36	8	32	62	38	18	104	28	24	191	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	0	0	132	0	0	150	0	0	229	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 32.8% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	33	7	29	57	35	17	96	26	22	176	13
Future Volume (vph)	8	33	7	29	57	35	17	96	26	22	176	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	36	8	32	62	38	18	104	28	24	191	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	53	132	150	229
Volume Left (vph)	9	32	18	24
Volume Right (vph)	8	38	28	14
Hadj (s)	0.05	-0.02	0.07	0.16
Departure Headway (s)	5.1	4.9	4.7	4.7
Degree Utilization, x	0.07	0.18	0.20	0.30
Capacity (veh/h)	643	679	722	726
Control Delay (s)	8.5	8.9	8.9	9.7
Approach Delay (s)	8.5	8.9	8.9	9.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay		9.2	
Level of Service		A	
Intersection Capacity Utilization		32.8%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	68	15	40	81	26	35	142	54	24	173	35
Future Volume (vph)	18	68	15	40	81	26	35	142	54	24	173	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.980			0.976			0.968			0.980	
Flt Protected		0.991			0.987			0.992			0.995	
Satd. Flow (prot)	0	1665	0	0	1776	0	0	1769	0	0	1781	0
Flt Permitted		0.991			0.987			0.992			0.995	
Satd. Flow (perm)	0	1665	0	0	1776	0	0	1769	0	0	1781	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	12%	0%	0%	5%	8%	9%	4%	2%	8%	4%	9%
Adj. Flow (vph)	20	74	16	43	88	28	38	154	59	26	188	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	110	0	0	159	0	0	251	0	0	252	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization	40.0%	ICU Level of Service A
Analysis Period (min)	15	

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	68	15	40	81	26	35	142	54	24	173	35
Future Volume (vph)	18	68	15	40	81	26	35	142	54	24	173	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	74	16	43	88	28	38	154	59	26	188	38

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	110	159	251	252
Volume Left (vph)	20	43	38	26
Volume Right (vph)	16	28	59	38
Hadj (s)	0.15	0.02	-0.04	0.02
Departure Headway (s)	5.6	5.4	5.0	5.0
Degree Utilization, x	0.17	0.24	0.35	0.35
Capacity (veh/h)	573	603	680	670
Control Delay (s)	9.8	10.1	10.6	10.8
Approach Delay (s)	9.8	10.1	10.6	10.8
Approach LOS	A	B	B	B

Intersection Summary				
Delay			10.5	
Level of Service			B	
Intersection Capacity Utilization			40.0%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	1356	2439	191	123	70
Future Volume (vph)	13	1356	2439	191	123	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			1.00			
Frt			0.989			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1690	3579	3566	0	1789	1089
Flt Permitted	0.052				0.950	
Satd. Flow (perm)	92	3579	3566	0	1789	1089
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			19			8
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	4			4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	2%	1%	1%	2%	50%
Adj. Flow (vph)	13	1356	2439	191	123	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	1356	2630	0	123	70
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

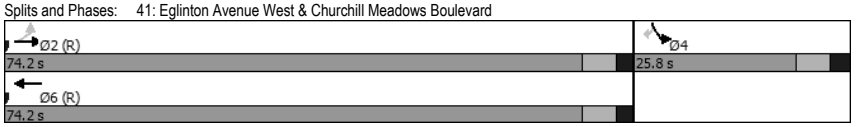
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.5	25.5
Total Split (s)	74.2	74.2	74.2		25.8	25.8
Total Split (%)	74.2%	74.2%	74.2%		25.8%	25.8%
Maximum Green (s)	68.2	68.2	68.2		19.3	19.3
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	76.2	76.2	76.2		13.3	13.3
Actuated g/C Ratio	0.76	0.76	0.76		0.13	0.13
v/c Ratio	0.19	0.50	0.97		0.52	0.46
Control Delay	11.5	5.6	23.3		47.6	44.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	11.5	5.6	23.3		47.6	44.8
LOS	B	A	C		D	D
Approach Delay		5.7	23.3		46.6	
Approach LOS		A	C		D	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 18.6 Intersection LOS: B
Intersection Capacity Utilization 89.1% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	13	1356	2630	123	70
v/c Ratio	0.19	0.50	0.97	0.52	0.46
Control Delay	11.5	5.6	23.3	47.6	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	5.6	23.3	47.6	44.8
Queue Length 50th (m)	0.6	43.0	195.7	22.6	11.2
Queue Length 95th (m)	4.0	67.6	#329.4	38.1	23.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	70	2728	2723	363	227
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.50	0.97	0.34	0.31

Intersection Summary

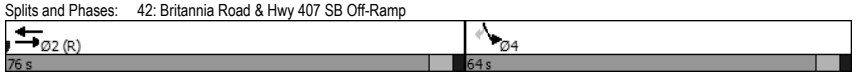
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	627	1855	0	373	31
Future Volume (vph)	0	627	1855	0	373	31
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	1987	1726
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	1987	1726
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (k/h)		60	60		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		12.4	17.9		15.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	0%	2%	0%	3%
Adj. Flow (vph)	0	697	2061	0	414	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	697	2061	0	414	34
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		76.0	76.0		64.0	64.0
Total Split (%)		54.3%	54.3%		45.7%	45.7%
Maximum Green (s)		70.0	70.0		58.0	58.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		92.4	92.4		35.6	35.6
Actuated g/C Ratio		0.66	0.66		0.25	0.25
v/c Ratio		0.19	0.55		0.82	0.08
Control Delay		10.0	18.7		62.3	37.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		10.0	18.7		62.3	37.0
LOS		B	B		E	D
Approach Delay		10.0	18.7		60.4	
Approach LOS		B	B		E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 61.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	697	2061	414	34
v/c Ratio	0.19	0.55	0.82	0.08
Control Delay	10.0	18.7	62.3	37.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.0	18.7	62.3	37.0
Queue Length 50th (m)	25.6	108.8	108.5	7.2
Queue Length 95th (m)	38.2	165.2	134.2	14.7
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3733	3770	823	715
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.55	0.50	0.05

Intersection Summary

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1028	0	0	1885	73	110
Future Volume (vph)	1028	0	0	1885	73	110
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5711	1987	1778
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5711	1987	1778
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	17.9			13.0	11.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	0%	0%	0%
Adj. Flow (vph)	1142	0	0	2094	81	122
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1142	0	0	2094	81	122
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

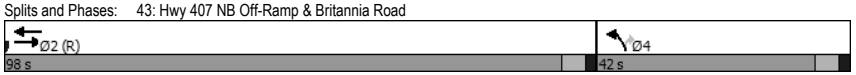
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	98.0			98.0	42.0	42.0
Total Split (%)	70.0%			70.0%	30.0%	30.0%
Maximum Green (s)	92.0			92.0	36.0	36.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	113.0			113.0	15.0	15.0
Actuated g/C Ratio	0.81			0.81	0.11	0.11
v/c Ratio	0.25			0.45	0.38	0.64
Control Delay	5.9			8.6	62.2	74.7
Queue Delay	0.0			0.3	0.0	0.0
Total Delay	5.9			8.9	62.2	74.7
LOS	A			A	E	E
Approach Delay	5.9			8.9	69.7	
Approach LOS	A			A	E	

Intersection Summary

Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 61.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1142	2094	81	122
v/c Ratio	0.25	0.45	0.38	0.64
Control Delay	5.9	8.6	62.2	74.7
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	5.9	8.9	62.2	74.7
Queue Length 50th (m)	43.4	78.7	21.2	32.9
Queue Length 95th (m)	47.7	114.5	36.0	51.9
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4565	4610	510	457
Starvation Cap Reductn	0	1494	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.25	0.67	0.16	0.27

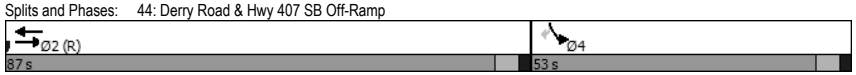
Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	813	2539	0	226	434
Future Volume (vph)	0	813	2539	0	226	434
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	3817	1778
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	3817	1778
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						2
Link Speed (k/h)		60	60		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		20.0	18.5		13.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%
Adj. Flow (vph)	0	865	2701	0	240	462
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	865	2701	0	240	462
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		87.0	87.0		53.0	53.0
Total Split (%)		62.1%	62.1%		37.9%	37.9%
Maximum Green (s)		81.0	81.0		47.0	47.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	-2.9
Total Lost Time (s)		6.0	6.0		6.0	3.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		87.3	87.3		40.7	43.6
Actuated g/C Ratio		0.62	0.62		0.29	0.31
v/c Ratio		0.25	0.76		0.22	0.83
Control Delay		12.5	23.3		37.1	58.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		12.5	23.3		37.1	58.0
LOS		B	C		D	E
Approach Delay		12.5	23.3		50.8	
Approach LOS		B	C		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 25.6	Intersection LOS: C
Intersection Capacity Utilization 78.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	865	2701	240	462
v/c Ratio	0.25	0.76	0.22	0.83
Control Delay	12.5	23.3	37.1	58.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.5	23.3	37.1	58.0
Queue Length 50th (m)	37.6	160.5	25.7	117.3
Queue Length 95th (m)	49.7	192.9	34.4	151.2
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3527	3562	1281	635
Starvation Cap Reductn	0	17	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.25	0.76	0.19	0.73

Intersection Summary

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1083	0	0	2516	104	123
Future Volume (vph)	1083	0	0	2516	104	123
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						0.99
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5655	3856	1743
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5655	3856	1722
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						129
Link Speed (k/h)	60			60	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	18.5			13.8	15.5	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	2%	1%	0%	2%
Adj. Flow (vph)	1140	0	0	2648	109	129
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1140	0	0	2648	109	129
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

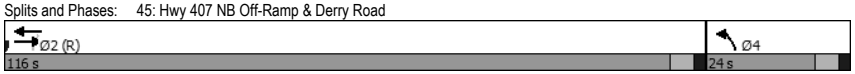
Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	116.0			116.0	24.0	116.0
Total Split (%)	82.9%			82.9%	17.1%	82.9%
Maximum Green (s)	110.0			110.0	18.0	110.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	118.5			118.5	9.5	118.5
Actuated g/C Ratio	0.85			0.85	0.07	0.85
v/c Ratio	0.24			0.55	0.42	0.09
Control Delay	1.6			1.4	67.1	0.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	1.6			1.5	67.1	0.4
LOS	A			A	E	A
Approach Delay	1.6			1.5	31.0	
Approach LOS	A			A	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 3.2	Intersection LOS: A
Intersection Capacity Utilization 78.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1140	2648	109	129
v/c Ratio	0.24	0.55	0.42	0.09
Control Delay	1.6	1.4	67.1	0.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.6	1.5	67.1	0.4
Queue Length 50th (m)	9.3	18.3	15.2	0.0
Queue Length 95th (m)	14.8	24.6	24.5	2.9
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4785	4785	495	1477
Starvation Cap Reductn	0	285	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	0.59	0.22	0.09

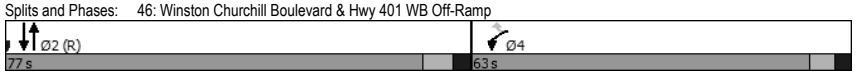
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1164	1104	3018	0	0	1778
Future Volume (vph)	1164	1104	3018	0	0	1778
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.963	0.850				
Flt Protected	0.964					
Satd. Flow (prot)	3740	1571	5491	0	0	5545
Flt Permitted	0.964					
Satd. Flow (perm)	3735	1571	5491	0	0	5545
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	4%	1%	0%	3%
Adj. Flow (vph)	1225	1162	3177	0	0	1872
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	1632	755	3177	0	0	1872
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	63.0	63.0	77.0			77.0
Total Split (%)	45.0%	45.0%	55.0%			55.0%
Maximum Green (s)	56.0	56.0	69.0			69.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	56.0	56.0	69.0			69.0
Actuated g/C Ratio	0.40	0.40	0.49			0.49
v/c Ratio	1.09	1.20	1.17			0.69
Control Delay	92.0	143.0	113.8			28.8
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	92.0	143.0	113.8			28.8
LOS	F	F	F			C
Approach Delay	108.1		113.8			28.8
Approach LOS	F		F			C

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 49 (35%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 90.6	Intersection LOS: F
Intersection Capacity Utilization 120.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1632	755	3177	1872
v/c Ratio	1.09	1.20	1.17	0.69
Control Delay	92.0	143.0	113.8	28.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	92.0	143.0	113.8	28.8
Queue Length 50th (m)	~261.7	~278.2	~383.9	142.0
Queue Length 95th (m)	#303.1	#360.9	#406.5	158.4
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1496	628	2706	2732
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.09	1.20	1.17	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	434	474	0	3264	2520	0
Future Volume (vph)	434	474	0	3264	2520	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.955	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3457	1586	0	5545	5599	0
Flt Permitted	0.966					
Satd. Flow (perm)	3457	1586	0	5545	5599	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	4	4				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	2%	0%	3%	2%	7%
Adj. Flow (vph)	467	510	0	3510	2710	0
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	666	311	0	3510	2710	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

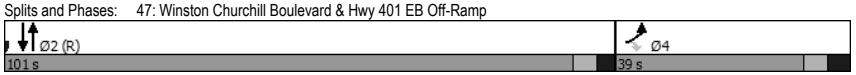
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	39.0	39.0		101.0	101.0	
Total Split (%)	27.9%	27.9%		72.1%	72.1%	
Maximum Green (s)	31.0	31.0		94.0	94.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	30.0	30.0		95.0	95.0	
Actuated g/C Ratio	0.21	0.21		0.68	0.68	
v/c Ratio	0.90	0.91		0.93	0.71	
Control Delay	68.8	83.0		25.9	10.6	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	68.8	83.0		25.9	10.6	
LOS	E	F		C	B	
Approach Delay	73.3			25.9	10.6	
Approach LOS	E			C	B	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 32.2 (23%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 26.6 Intersection LOS: C
Intersection Capacity Utilization 86.3% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	666	311	3510	2710
v/c Ratio	0.90	0.91	0.93	0.71
Control Delay	68.8	83.0	25.9	10.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	68.8	83.0	25.9	10.6
Queue Length 50th (m)	91.9	91.2	296.2	124.0
Queue Length 95th (m)	#120.6	#147.8	318.9	m126.3
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	768	354	3763	3800
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.87	0.88	0.93	0.71

Intersection Summary

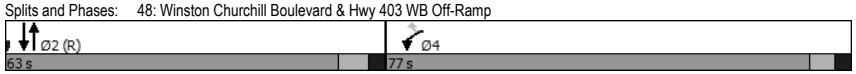
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1108	1816	2192	0	0	2353
Future Volume (vph)	1108	1816	2192	0	0	2353
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.938	0.850				
Flt Protected	0.972					
Satd. Flow (prot)	3685	1602	5655	0	0	5655
Flt Permitted	0.972					
Satd. Flow (perm)	3685	1602	5655	0	0	5655
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Peak Hour Factor	0.89	0.96	0.93	0.93	0.89	0.89
Heavy Vehicles (%)	0%	1%	1%	0%	0%	1%
Adj. Flow (vph)	1245	1892	2357	0	0	2644
Shared Lane Traffic (%)		47%				
Lane Group Flow (vph)	2134	1003	2357	0	0	2644
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	77.0	77.0	63.0			63.0
Total Split (%)	55.0%	55.0%	45.0%			45.0%
Maximum Green (s)	70.0	70.0	55.0			55.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	-2.9	-2.9			0.0
Total Lost Time (s)	7.0	4.1	5.1			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	70.0	72.9	57.9			55.0
Actuated g/C Ratio	0.50	0.52	0.41			0.39
v/c Ratio	1.16	1.20	1.01			1.19
Control Delay	111.0	134.1	63.2			128.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	111.0	134.1	63.2			128.5
LOS	F	F	E			F
Approach Delay	118.4		63.2			128.5
Approach LOS	F		E			F

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 2.8 (2%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 105.7	Intersection LOS: F
Intersection Capacity Utilization 164.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	2134	1003	2357	2644
v/c Ratio	1.16	1.20	1.01	1.19
Control Delay	111.0	134.1	63.2	128.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	111.0	134.1	63.2	128.5
Queue Length 50th (m)	~359.0	~369.8	~254.0	~322.6
Queue Length 95th (m)	#391.0	#456.3	#281.6	#341.7
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1842	834	2338	2221
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.16	1.20	1.01	1.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	517	205	0	2131	2737	0
Future Volume (vph)	517	205	0	2131	2737	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3817	1726	0	5655	5655	0
Flt Permitted	0.950					
Satd. Flow (perm)	3817	1726	0	5655	5655	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		2				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	3%	0%	1%	1%	0%
Adj. Flow (vph)	568	225	0	2342	3008	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	568	225	0	2342	3008	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

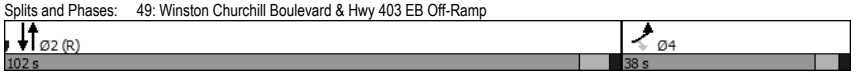
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	38.0	38.0		102.0	102.0	
Total Split (%)	27.1%	27.1%		72.9%	72.9%	
Maximum Green (s)	32.0	32.0		95.0	95.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	26.4	26.4		100.6	100.6	
Actuated g/C Ratio	0.19	0.19		0.72	0.72	
v/c Ratio	0.79	0.69		0.58	0.74	
Control Delay	62.3	63.2		10.6	24.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	62.3	63.2		10.6	24.2	
LOS	E	E		B	C	
Approach Delay	62.5			10.6	24.2	
Approach LOS	E			B	C	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 81.2 (58%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 24.0 Intersection LOS: C
Intersection Capacity Utilization 164.3% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	568	225	2342	3008
v/c Ratio	0.79	0.69	0.58	0.74
Control Delay	62.3	63.2	10.6	24.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	62.3	63.2	10.6	24.2
Queue Length 50th (m)	77.7	58.0	104.9	229.3
Queue Length 95th (m)	93.5	82.4	132.5	m189.3
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	872	396	4061	4061
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.57	0.58	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

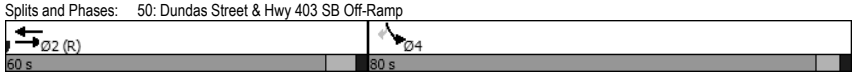
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1894	1840	0	520	1484
Future Volume (vph)	0	1894	1840	0	520	1484
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Ped Bike Factor						
Frt					0.912	0.850
Flt Protected					0.980	
Satd. Flow (prot)	0	5338	5599	0	3412	1571
Flt Permitted					0.980	
Satd. Flow (perm)	0	5338	5599	0	3412	1571
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					1	1
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	7%	2%	0%	11%	3%
Adj. Flow (vph)	0	1933	1878	0	531	1514
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	0	1933	1878	0	1288	757
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		60.0	60.0		80.0	80.0
Total Split (%)		42.9%	42.9%		57.1%	57.1%
Maximum Green (s)		53.0	53.0		74.0	74.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		54.8	54.8		72.2	72.2
Actuated g/C Ratio		0.39	0.39		0.52	0.52
v/c Ratio		0.93	0.86		0.85dr	0.93
Control Delay		49.7	68.1		29.1	51.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		49.7	68.1		29.1	51.0
LOS		D	E		C	D
Approach Delay		49.7	68.1		37.2	
Approach LOS		D	E		D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 4.2 (3%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 51.2 Intersection LOS: D
Intersection Capacity Utilization 99.7% ICU Level of Service F
Analysis Period (min) 15
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1933	1878	1288	757
v/c Ratio	0.93	0.86	0.85dr	0.93
Control Delay	49.7	68.1	29.1	51.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	49.7	68.1	29.1	51.0
Queue Length 50th (m)	189.7	200.4	134.9	203.1
Queue Length 95th (m)	#222.9	217.5	160.2	#298.6
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	2087	2189	1803	830
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.93	0.86	0.71	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1728	0	0	2386	105	853
Future Volume (vph)	1728	0	0	2386	105	853
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Frt					0.880	0.850
Flt Protected					0.990	
Satd. Flow (prot)	5491	0	0	5655	3466	1586
Flt Permitted					0.990	
Satd. Flow (perm)	5491	0	0	5655	3466	1586
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					9	9
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	4%	0%	0%	1%	2%	2%
Adj. Flow (vph)	1781	0	0	2460	108	879
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	1781	0	0	2460	548	439
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

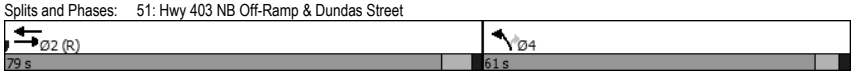
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	79.0			79.0	61.0	61.0
Total Split (%)	56.4%			56.4%	43.6%	43.6%
Maximum Green (s)	72.0			72.0	55.0	55.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	82.4			82.4	44.6	44.6
Actuated g/C Ratio	0.59			0.59	0.32	0.32
v/c Ratio	0.55			0.74	0.49	0.86
Control Delay	10.2			24.0	38.6	59.9
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.2			24.0	38.6	59.9
LOS	B			C	D	E
Approach Delay	10.2			24.0	48.1	
Approach LOS	B			C	D	

Intersection Summary

Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 43.4 (31%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 23.8	Intersection LOS: C
Intersection Capacity Utilization 99.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street



Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1781	2460	548	439
v/c Ratio	0.55	0.74	0.49	0.86
Control Delay	10.2	24.0	38.6	59.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.2	24.0	38.6	59.9
Queue Length 50th (m)	69.5	175.4	61.9	122.4
Queue Length 95th (m)	187.5	228.7	70.2	152.8
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	3231	3328	1367	628
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.74	0.40	0.70

Intersection Summary

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	196	149	657	53	19	547
Future Volume (vph)	196	149	657	53	19	547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.989			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3539	0	1789	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	3539	0	1789	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	289.7		780.0			514.0
Travel Time (s)	21.7		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	196	149	657	53	19	547
Shared Lane Traffic (%)						
Lane Group Flow (vph)	196	149	710	0	19	547
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
52: Ninth Line & Argentia Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	196	149	657	53	19	547
Future Volume (Veh/h)	196	149	657	53	19	547
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	196	149	657	53	19	547
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	995	355			710	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	995	355			710	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	17	77			98	
cM capacity (veh/h)	236	641			885	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	196	149	438	272	19	274	274
Volume Left	196	0	0	0	19	0	0
Volume Right	0	149	0	53	0	0	0
cSH	236	641	1700	1700	885	1700	1700
Volume to Capacity	0.83	0.23	0.26	0.16	0.02	0.16	0.16
Queue Length 95th (m)	48.7	6.8	0.0	0.0	0.5	0.0	0.0
Control Delay (s)	66.4	12.3	0.0	0.0	9.2	0.0	0.0
Lane LOS	F	B			A		
Approach Delay (s)	43.1		0.0		0.3		
Approach LOS	E						

Intersection Summary			
Average Delay	9.3		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
97: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1118	362	0	1820	0	0
Future Volume (vph)	1118	362	0	1820	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	120.9	
Travel Time (s)	15.5			6.8	9.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1118	362	0	1820	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1118	362	0	1820	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 120.1%		ICU Level of Service H	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
97: Winston Churchill Boulevard

16/06/2017

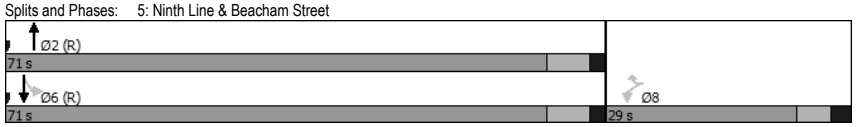
Intersection Sign configuration not allowed in HCM analysis.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1147	85	58	655
Future Volume (vph)	90	47	1147	85	58	655
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.97				
Frt		0.850	0.990			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3543	0	1825	3544
Flt Permitted	0.950				0.183	
Satd. Flow (perm)	1807	1590	3543	0	352	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	15			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1247	92	63	712
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1339	0	63	712
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	52.0		52.0	52.0
Total Split (s)	29.0	29.0	71.0		71.0	71.0
Total Split (%)	29.0%	29.0%	71.0%		71.0%	71.0%
Maximum Green (s)	22.5	22.5	64.0		64.0	64.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	12.0	12.0	80.6		80.6	80.6
Actuated g/C Ratio	0.12	0.12	0.81		0.81	0.81
v/c Ratio	0.45	0.22	0.47		0.22	0.25
Control Delay	47.0	13.1	4.8		6.2	3.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.0	13.1	4.8		6.2	3.6
LOS	D	B	A		A	A
Approach Delay	35.4		4.8			3.8
Approach LOS	D		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 6.5		Intersection LOS: A	
Intersection Capacity Utilization 64.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	98	51	1339	63	712
v/c Ratio	0.45	0.22	0.47	0.22	0.25
Control Delay	47.0	13.1	4.8	6.2	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	13.1	4.8	6.2	3.6
Queue Length 50th (m)	18.0	0.0	40.7	2.8	17.1
Queue Length 95th (m)	32.2	9.9	63.3	9.0	27.8
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	424	412	2857	283	2855
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.12	0.47	0.22	0.25

Intersection Summary

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	697	67	49	1211
Future Volume (vph)	46	47	697	67	49	1211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.97				
Frt		0.850	0.987			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3473	0	1825	3544
Flt Permitted	0.950				0.337	
Satd. Flow (perm)	1789	1544	3473	0	647	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	21			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	758	73	53	1316
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	831	0	53	1316
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

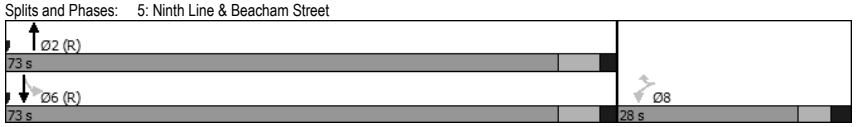
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	28.0	28.0	73.0		73.0	73.0
Total Split (%)	27.7%	27.7%	72.3%		72.3%	72.3%
Maximum Green (s)	21.5	21.5	66.0		66.0	66.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	10.0	10.0	83.6		83.6	83.6
Actuated g/C Ratio	0.10	0.10	0.83		0.83	0.83
v/c Ratio	0.28	0.26	0.29		0.10	0.45
Control Delay	46.1	15.2	0.7		3.2	3.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.1	15.2	0.7		3.2	3.8
LOS	D	B	A		A	A
Approach Delay	30.5		0.7			3.8
Approach LOS	C		A			A

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.45
Intersection Signal Delay: 3.9 — Intersection LOS: A
Intersection Capacity Utilization 57.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	50	51	831	53	1316
v/c Ratio	0.28	0.26	0.29	0.10	0.45
Control Delay	46.1	15.2	0.7	3.2	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	15.2	0.7	3.2	3.8
Queue Length 50th (m)	9.3	0.0	1.2	1.8	34.3
Queue Length 95th (m)	19.9	10.5	6.1	5.1	51.5
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	398	383	2879	535	2934
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.13	0.29	0.10	0.45

Intersection Summary

APPENDIX N

Emerging Land Use Concept and Distribution Information

Ninth Line Population and Employment Calculations - September 18, 2016
Ultimate Scenario

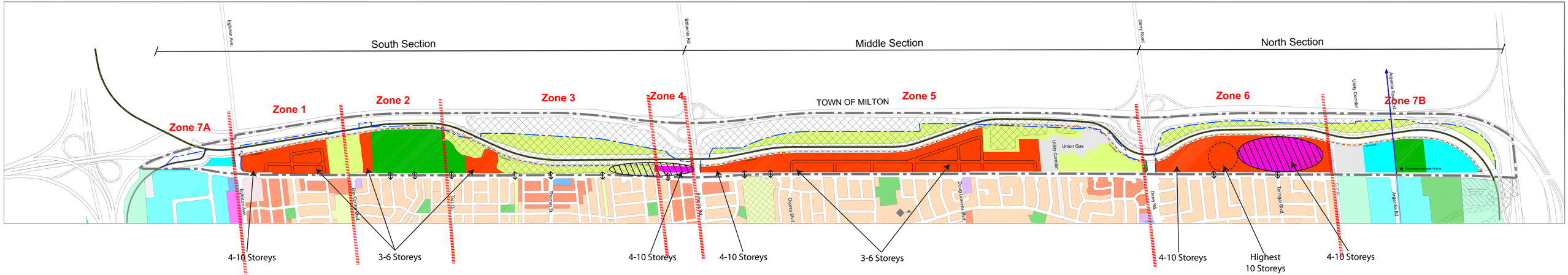
Land Use	FSI/UPH	Units (Res) / m^2 (non-res)
	Max	Min
Study Area		
Non-Developable Areas		
Hwy 407		
Ninth Line		
NHS		
Existing Utility Uses		
Transitway and Setback		
Total Non-Developable		

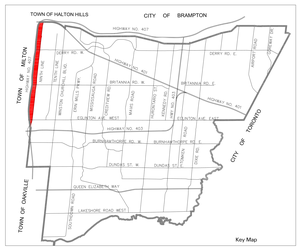
Developable Areas

Residential Area 1 (North of Eglinton Ave.)		
Residential 4-10 storeys	160	120
Residential 3-4 Storeys	75	193
Residential 3-6 Storeys	120	157
Residential Area 2 (North of Erin Centre Blvd.)		
Residential 3-4 Storeys	75	92
Residential Area 3 (North of Tacc Dr.)		
Residential 3-4 Storeys	75	103
Residential Area 4 (South of Britania Rd.)		
Mixed 4-10 Storeys		
Residential	160	43
Commercial	0.3	151
Residential Area 5 (North of Britania Rd.)		
Residential 4-10 Storeys	160	46
Residential 3-6 Storeys	120	235
Residential 3-4 Storeys		
Residential	100	526
Commercial	0.3	2,478
Residential 4-6 Storeys	120	932
Residential Area 6 (North of Derry Rd.)		
Residential 4 Storeys	90	310
Residential 4-6 Storeys	120	82
Residential 6-8 Storeys	150	135
Residential 6-10 Storeys	160	447
Mixed Use 4 Storeys		
Residential	160	41
Commercial	0.3	301
Mixed Use 6-10 Storeys		
Residential	200	81
Commercial	0.3	365
Business Employment		
Office	0.5	3,717
Industrial	0.4	27,517
Other Developable Lands		
Station Areas		
Public Open Space		
Total Developable Lands		

Study Area

Area Check	**Units**	3,461
	Non-Res m^2	34,528





Shaping Ninth Line Draft Emerging Land Use Concept

- STUDY AREA
- PROPOSED TRANSITWAY
- TRANSITWAY RIGHT OF WAY
- 14 METRE SETBACK
- PROPOSED TRANSITWAY STATION
- 407 RIGHT-OF-WAY
- PROPOSED TRAIL
- CONNECTIONS
- PROPOSED ROADS
- RESIDENTIAL
- MIXED USE
- BUSINESS EMPLOYMENT
- PUBLIC OPEN SPACE
- GREENLANDS
- UTILITY
- NATURAL HAZARDS

Official Plan Designations East of Ninth Line

- RESIDENTIAL LOW DENSITY I
- RESIDENTIAL LOW DENSITY II
- RESIDENTIAL MEDIUM DENSITY
- RESIDENTIAL HIGH DENSITY
- MIXED USE
- CONVENIENCE COMMERCIAL
- MOTOR VEHICLE COMMERCIAL
- BUSINESS EMPLOYMENT
- PUBLIC OPEN SPACE
- GREENLANDS
- EXISTING CATHOLIC SCHOOL
- UTILITY
- NATURAL HAZARDS

1:5,000

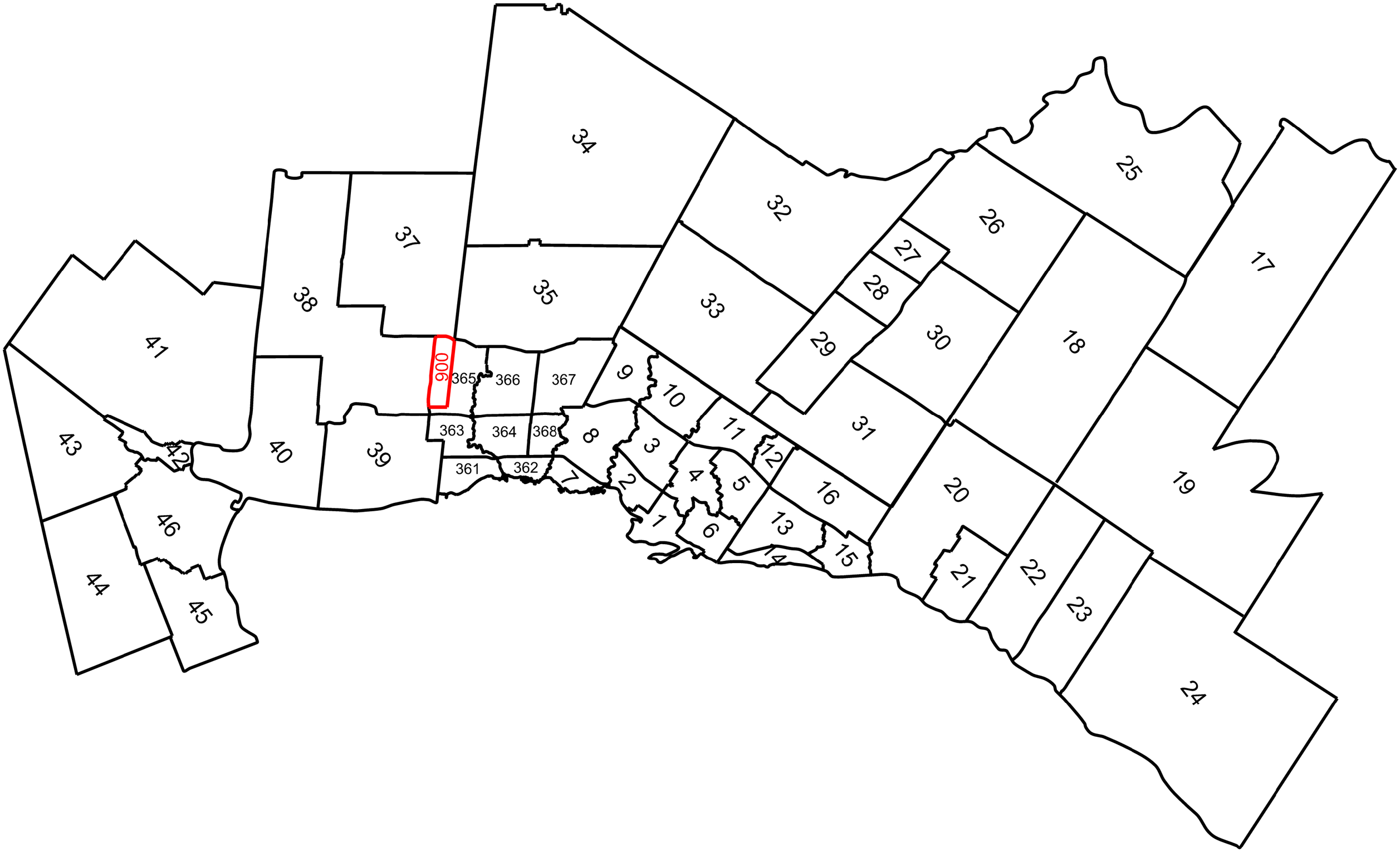
0 1km

September 12, 2016

Land uses shown in the Draft Emerging Land Use Concept are preliminary, for information purposes only and subject to change based on pending studies, agency, public and stakeholder input and other considerations.

SHAPING NINTH LINE

Mississauga's Northwestern Gateway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2
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5
16
20
19
46
1
6
13
14
15
21
22
23
44
45
24

AM PEAK PERIOD

From gx900 (origin)

	gx01	gx02	gx03	gx04	gx05	gx06	gx07	gx08	gx09	gx10	gx11	gx12	gx13	gx14	gx15	gx16	gx17	gx18	gx19
gx900	0.66%	0.22%	0.56%	0.26%	0.17%	0.08%	0.41%	1.23%	1.15%	0.63%	0.28%	0.08%	0.13%	0.01%	0.06%	0.10%	0.00%	0.00%	0.00%

To gx900 (destination)

	gx01	gx02	gx03	gx04	gx05	gx06	gx07	gx08	gx09	gx10	gx11	gx12	gx13	gx14	gx15	gx16	gx17	gx18	gx19
gx900	0.05%	0.20%	0.30%	0.15%	0.07%	0.10%	0.12%	0.53%	0.16%	0.22%	0.14%	0.04%	0.07%	0.02%	0.03%	0.09%	0.00%	0.00%	0.00%

Outbound

NE	E	SE	NW	SW	Internal
10.25%	36.14%	13.24%	10.04%	7.34%	23.00%

Inbound

NE	E	SE	NW	SW	Internal
7.40%	22.99%	6.92%	12.22%	8.41%	42.06%

PM PEAK PERIOD

From gx900 (origin)

	gx01	gx02	gx03	gx04	gx05	gx06	gx07	gx08	gx09	gx10	gx11	gx12	gx13	gx14	gx15	gx16	gx17	gx18	gx19
gx900	0.09%	0.16%	0.33%	0.14%	0.05%	0.06%	0.24%	1.09%	0.46%	0.24%	0.11%	0.03%	0.05%	0.01%	0.02%	0.08%	0.00%	0.00%	0.00%

To gx900 (destination)

	gx01	gx02	gx03	gx04	gx05	gx06	gx07	gx08	gx09	gx10	gx11	gx12	gx13	gx14	gx15	gx16	gx17	gx18	gx19
gx900	0.46%	0.17%	0.37%	0.15%	0.11%	0.05%	0.31%	1.29%	0.76%	0.41%	0.19%	0.06%	0.08%	0.01%	0.01%	0.08%	0.00%	0.00%	0.00%

Outbound

NE	E	SE	NW	SW	Internal
10.64%	26.20%	12.97%	17.29%	10.83%	22.08%

Inbound

NE	E	SE	NW	SW	Internal
11.02%	32.12%	14.18%	16.39%	12.08%	14.21%

gx20	gx21	gx22	gx23	gx24	gx25	gx26	gx27	gx28	gx29	gx30	gx31	gx32	gx33	gx34	gx35	gx361	gx362	gx363	gx364	gx365
0.02%	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%	0.03%	0.02%	0.25%	0.01%	0.40%	0.03%	1.27%	0.34%	7.89%	0.80%	0.56%	3.18%	4.27%	23.81%

gx20	gx21	gx22	gx23	gx24	gx25	gx26	gx27	gx28	gx29	gx30	gx31	gx32	gx33	gx34	gx35	gx361	gx362	gx363	gx364	gx365
0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.05%	0.04%	0.23%	0.02%	0.22%	0.05%	0.39%	0.20%	6.17%	0.65%	0.17%	1.98%	2.06%	18.16%

gx20	gx21	gx22	gx23	gx24	gx25	gx26	gx27	gx28	gx29	gx30	gx31	gx32	gx33	gx34	gx35	gx361	gx362	gx363	gx364	gx365
0.02%	0.03%	0.01%	0.01%	0.00%	0.00%	0.00%	0.02%	0.02%	0.12%	0.01%	0.11%	0.03%	0.55%	0.38%	9.39%	1.14%	0.39%	4.79%	3.58%	16.81%

gx20	gx21	gx22	gx23	gx24	gx25	gx26	gx27	gx28	gx29	gx30	gx31	gx32	gx33	gx34	gx35	gx361	gx362	gx363	gx364	gx365
0.02%	0.01%	0.01%	0.01%	0.01%	0.00%	0.00%	0.02%	0.01%	0.12%	0.00%	0.24%	0.02%	1.03%	0.35%	9.22%	1.01%	0.35%	4.73%	4.29%	19.29%

gx366	gx367	gx368	gx37	gx38	gx39	gx40	gx41	gx42	gx43	gx44	gx45	gx46	gx900	Grand Total
5.79%	4.28%	0.57%	2.42%	7.39%	4.07%	1.94%	0.23%	0.04%	0.08%	0.02%	0.16%	1.03%	23.00%	100.00%

gx366	gx367	gx368	gx37	gx38	gx39	gx40	gx41	gx42	gx43	gx44	gx45	gx46	gx900
4.05%	0.12%	0.36%	1.77%	10.25%	6.47%	1.18%	0.19%	0.05%	0.06%	0.04%	0.16%	0.47%	42.06%

gx366	gx367	gx368	gx37	gx38	gx39	gx40	gx41	gx42	gx43	gx44	gx45	gx46	gx900
7.27%	1.20%	0.73%	3.88%	13.20%	8.79%	1.45%	0.21%	0.03%	0.04%	0.02%	0.09%	0.41%	22.08%

gx366	gx367	gx368	gx37	gx38	gx39	gx40	gx41	gx42	gx43	gx44	gx45	gx46	gx900
7.58%	3.75%	0.75%	3.15%	13.06%	8.70%	2.28%	0.18%	0.03%	0.06%	0.01%	0.14%	0.86%	14.21%

Morning Peak

Tue Jul 26 2016 18:01:46 GMT-0400 (Eastern Daylight Time) - Run Time: 2931ms

Cross Tabulation Query Form - Trip - 2011
Row: 2006 GTA zone of origin - gta06_orig
Column: Primary travel mode of trip - mode_prime
Table: Trip purpose of origin - purp_orig

RowG:(3615-3617 3809 3637-3638 3810-3811 3634-3636 3812 4024)
ColG:(B)(C)(D)(G)(J)(M)(O)(P)(S)(T)(W)
TblG:(H W)

Filters:
Start time of trip - start_time In 700-900

Trip 2011
Table: 1

	Transit - no Go	Cycle	Auto Drive	GO Rail	Joing GO Local	Motorcycle	Other	Auto Passenger	School Bus	Taxi Passenger	Walk	
	1	2	3	4	5			8	9	10	11	
1	2328	294	27777	1572	998			8197	2214	17	3906	**47303**
	5%	1%	59%	3%	2%	0%	0%	17%	5%	0%	8%	

Auto	76%
Non-auto	**24%**

Afternoon Peak

Tue Jul 26 2016 18:06:05 GMT-0400 (Eastern Daylight Time) - Run Time: 3118ms

Cross Tabulation Query Form - Trip - 2011
Row: 2006 GTA zone of origin - gta06_orig
Column: Primary travel mode of trip - mode_prime
Table: Trip purpose of origin - purp_orig

RowG:(3615-3617 3809 3637-3638 3810-3811 3634-3636 3812 4024)
ColG:(B)(C)(D)(G)(J)(M)(O)(P)(S)(T)(W)
TblG:(H W)

Filters:
Start time of trip - start_time In 1600-1800

Trip 2011
Table: 1

	Transit - no Go	Cycle	Auto Drive	GO Rail	Joing GO Local	Motorcycle	Other	Auto Passenger	School Bus	Taxi Passenger	Walk	
	1	2	3	4	5	6	7	8	9	10	11	
##############	732	214	16836	0	0	0	0	2861	0	0	338	**20981**
	3%	1%	80%	0%	0%	0%	0%	14%	0%	0%	2%	

Auto	94%
Non-auto	**6%**

Morning Peak

Tue Jul 26 2016 18:20:38 GMT-0400 (Eastern Daylight Time) - Run Time: 3071ms

Cross Tabulation Query Form - Trip - 2011
Row: 2006 GTA zone of destination - gta06_dest
Column: Primary travel mode of trip - mode_prime
Table: Trip purpose of destination - purp_dest

RowG:(3615-3617 3809 3637-3638 3810-3811 3634-3636 3812 4024)
ColG:(B)(C)(D)(G)(J)(M)(O)(P)(S)(T)(W)
TblG:(H W)

Filters:
Start time of trip - start_time In 700-900

Trip 2011
Table: 1

Transit - no Go	Cycle	Auto Drive	GO Rail	Joing GO Local	Motorcycle	Other	Auto Passenger	School Bus	Taxi Passenger	Walk	
1	2	3	4	5	6	7	8	9	10	11	
############## 370	103	15119	0	0	0	0	816	0	0	232	**16640**
2%	1%	91%	0%	0%	0%	0%	5%	0%	0%	1%	

Auto	96%
Non-auto	**4%**

Afternoon Peak

Tue Jul 26 2016 18:23:41 GMT-0400 (Eastern Daylight Time) - Run Time: 3248ms

Cross Tabulation Query Form - Trip - 2011
Row: 2006 GTA zone of destination - gta06_dest
Column: Primary travel mode of trip - mode_prime
Table: Trip purpose of destination - purp_dest

RowG:(3615-3617 3809 3637-3638 3810-3811 3634-3636 3812 4024)
ColG:(B)(C)(D)(G)(J)(M)(O)(P)(S)(T)(W)
TblG:(H W)

Filters:
Start time of trip - start_time In 1600-1800

Trip 2011
Table: 1

Transit - no Go	Cycle	Auto Drive	GO Rail	Joing GO Local	Motorcycle	Other	Auto Passenger	School Bus	Taxi Passenger	Walk	
1	2	3	4	5	6	7	8	9	10	11	
1 2324	108	22357	1750	1068	18	19	3830	82	0	729	**32285**
7%	0%	69%	5%	3%	0%	0%	12%	0%	0%	2%	

Auto	81%
Non-auto	**19%**

Yu, Peter

From: Mel Kayama <Mel.Kayama@mississauga.ca>
Sent: October-07-16 10:46 AM
To: Yu, Peter
Cc: Norbert Orzel; Frank Marzo; Susan Tanabe
Subject: RE: Ninth Line - Status Update and Information Request

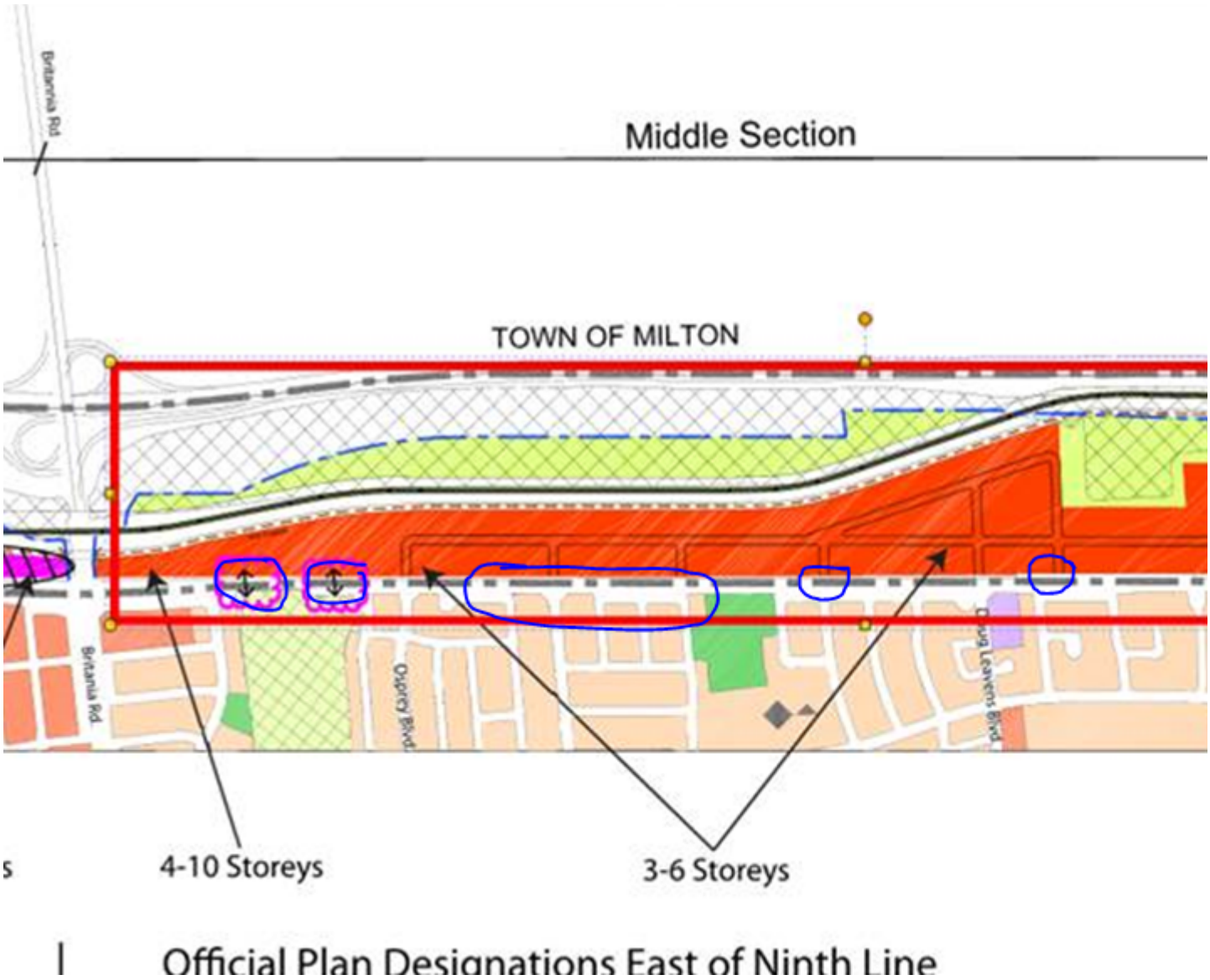
Hi Peter,

Agreed, go with the assumption that all site traffic will enter/exit from Osprey and Doug Leavens.

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2016/10/06 1:35 PM
To: Mel Kayama
Cc: Norbert Orzel; Frank Marzo; Susan Tanabe
Subject: RE: Ninth Line - Status Update and Information Request

Thanks Mel,

Just as a follow up, how should we deal with the remaining (probably unsignalized) driveways that are shown on the land use concept? I've circled some of these here. One conservative assumption to make is that all of the site-traffic would enter/exit from the key ones @ Osprey and Doug Leaven. If these intersections work, then we know that once the other minor accesses are provided, driveway operations will only improve.



Thanks

Peter

From: Mel Kayama [mailto:Mel.Kayama@mississauga.ca]
Sent: October-06-16 11:14 AM
To: Yu, Peter
Cc: Norbert Orzel; Frank Marzo; Susan Tanabe; Mel Kayama
Subject: RE: Ninth Line - Status Update and Information Request

Hi Peter,

I've forwarded your information request for Ninth Line / Doug Leavens and Eglinton / Churchill Meadows intersections to our Traffic Management Division. I will advise once received.

Regarding your comment in the last paragraph, please match the lane configuration with those to the east side of Ninth Line. If it is determined that improvements are required, please advise for further discussion.

Thanks,
Mel

From: Yu, Peter [mailto:YuP@mmm.ca]
Sent: 2016/10/06 8:59 AM
To: Norbert Orzel; Frank Marzo; Mel Kayama; Susan Tanabe
Cc: Liz Howson (howson@mshplan.ca); Bumstead, Greig
Subject: Ninth Line - Status Update and Information Request
Importance: High

Morning everyone,

I'm currently going through the assessment of the future conditions. The intersections of **Eglinton at Churchill Meadows Blvd** and **Ninth Line at Doug Leavens** are now signalized. Can you please send the signal timing plan for these intersections? Also, does the City have any updated traffic counts at this intersection since the signalizations?

I have ran the base case for the future total scenario with the background developments, growth, and site-generated traffic. I have not applied the transitway station or modal split influence yet.
The key east-west intersections of Ninth Line at Derry, Britannia and Dundas are over capacity (by approx.20%) in the east-west direction (primarily due to the assumed growth rates). As discussed previously, I will identify and carry forward the minimum E-W improvement required to facilitate the future background volumes. Generally speaking, the widening of these E-W roads by an additional lane is required.

Most of the remaining of the intersections are able to accommodate the future total volumes, with the implementation of signal timing improvements.

In order to refine the site-traffic assignment, I would like to clarify the #, type and arrangement of site accesses on Ninth Line. For the time being, I am assuming that the majority of site-generated traffic from each Area will use the accesses that are aligned with the major side street intersections on Ninth Line. For example, in Area 5, most of the site traffic are assumed to use the signalized Osprey Blvd and Doug Leaven Blvd. This means that I am not evaluating the connections (as shown below in the purple boxes). Please clarify whether this approach is appropriate. Also, in the new west leg of these major side-street intersections (i.e., at Osprey or Doug Leaven), is there a particular set of lane configuration should be assumed, or should I just assume the typical configuration of either matching the east leg or providing left and through-right outbound lanes?

Ninth Line Population and Employment Calculations - September
Ultimate Scenario

Land Use	FSI/UPH	Units (Res) / m² (non-res)	
	Max	Min	Max
Residential 3-4 Storeys	75	92	138
Residential Area 3 (North of Tacc Dr.)			
Residential 3-4 Storeys	75	103	154
Residential Area 4 (South of Britania Rd.)			
Mixed 4-10 Storeys			
Residential	160	43	69
Commercial	0.3	151	227
Residential Area 5 (North of Britania Rd.)			
Residential 4-10 Storeys	160	46	92
Residential 3-6 Storeys	120	235	376
Residential 3-4 Storeys			
Residential	100	526	702
Commercial	0.3	2,478	3,716
Residential 4-6 Storeys	120	932	1,398
Residential Area 6 (North of Derry Rd.)			
Residential 4 Storeys	90	310	349
Residential 4-6 Storeys	120	82	124
Residential 6-8 Storeys	150	135	156
Residential 6-10 Storeys	160	447	551
Mixed Use 4 Storeys			
Residential	160	41	82
Commercial	0.3	301	451

Once I receive the input and data as noted above, I will move continue on with the other scenarios (i.e., with the 407 Transitway modal split ranges, GTA West, Argentia).

Thanks

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Please consider the environment before printing

APPENDIX O

Detailed Trip Generation for Each Zone

The trip generation of each zone is based on the order of the row. The overall auto trip generation is determined first based on the ITE methodology (**Table 8.4** of the report). Then the multi-use adjustment would be applied, followed by the modal split adjustment (splits are provided in **Table 8.3**).

Table O-1
Zone 1 - Net New Site Auto Trip Generation (10% Non-Auto Increase)

Uses	Net Proposed Magnitude	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Residential	470	30	148	143	71
Multi-Use Trips (NCHRP)		0	0	0	0
Modal Split (Existing + 10%)		-4	-50	-42	-11
Net New Site Trips		26	98	101	60
Total Inbound/Outbound Trips		**124**		**161**	

Table O-2
Zone 2 - Net New Site Auto Trip Generation (10% Non-Auto Increase)

Uses	Net Proposed Magnitude	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Residential	92	8	40	38	19
Multi-Use Trips (NCHRP)		0	0	0	0
Modal Split (Existing + 10%)		-1	-14	-11	-3
Net New Site Trips		7	26	27	16
Total Inbound/Outbound Trips		**33**		**43**	

Table O-3
Zone 3 - Net New Site Auto Trip Generation (10% Non-Auto Increase)

Uses	Net Proposed Magnitude	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Residential	103	9	44	41	20
Multi-Use Trips (NCHRP)		0	0	0	0
Modal Split (Existing + 10%)		-1	-15	-12	-3
Net New Site Trips		8	29	29	17
Total Inbound/Outbound Trips		**37**		**46**	

Table O-4
Zone 4 - Net New Site Auto Trip Generation (10% Non-Auto Increase)

Uses	Net Proposed Magnitude	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Residential	43	4	22	20	10
Commercial Retail	1,625 ft^2	1	1	3	3
Sub Total		5	23	23	13
Multi-Use Trips (NCHRP)		0	0	0	0
Modal Split (Existing + 10%)		-1	-8	-7	-2
Net New Site Trips		4	15	16	11
Total Inbound/Outbound Trips		**19**		**27**	

Table O-5
Zone 5 - Net New Site Auto Trip Generation (10% Non-Auto Increase)

Uses	Net Proposed Magnitude	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Residential	1,739	86	421	419	206
Commercial Retail	26,673 ft^2	16	10	47	51
Sub Total		102	431	466	257
Multi-Use Trips (NCHRP)		-10	-43	-47	-26
Modal Split (Existing + 10%)		-13	-132	-122	-37
Net New Site Trips		79	256	297	194
Total Inbound/Outbound Trips		**335**		**491**	

Table O-6
Zone 6 - Net New Site Auto Trip Generation (10% Non-Auto Increase)

Uses	Net Proposed Magnitude	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Residential	1,096	60	291	287	141
Commercial Retail	7,169 ft^2	4	3	13	14
Sub Total		64	294	300	155
Multi-Use Trips (NCHRP)		-6	-29	-30	-16
Modal Split (Existing + 10%)		-8	-90	-78	-22
Net New Site Trips		50	175	192	117
Total Inbound/Outbound Trips		**225**		**309**	

Table O-7
Zone 7A - Net New Site Auto Trip Generation (10% Non-Auto Increase)

Uses	Net Proposed Magnitude	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		Inbound	Outbound	Inbound	Outbound
General Office	3,638 ft^2	5	1	1	4
General Light Industrial	26,921 ft^2	22	3	3	23
Sub Total		27	4	4	27
Multi-Use Trips (NCHRP)		0	0	0	0
Modal Split (Existing + 10%)		-4	-1	-1	-4
Net New Site Trips		23	3	3	23
Total Inbound/Outbound Trips		**26**		**26**	

Table O-8
Zone 7B - Net New Site Auto Trip Generation (10% Non-Auto Increase)

Uses	Net Proposed Magnitude	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		Inbound	Outbound	Inbound	Outbound
General Office	36,371 ft^2	50	7	9	45
General Light Industrial	269,270 ft^2	218	30	31	230
Sub Total		268	37	40	275
Multi-Use Trips (NCHRP)		0	0	0	0
Modal Split (Existing + 10%)		-38	-12	-12	-44
Net New Site Trips		230	25	28	231
Total Inbound/Outbound Trips		**255**		**259**	

APPENDIX P

2041 Scenario 1 Future Total Traffic Conditions – 5%

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	610	2	2	659
Future Volume (vph)	1	0	610	2	2	659
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1825	1921	1902	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1921	1902	0	0	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.2		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	3%
Adj. Flow (vph)	1	0	663	2	2	716
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	665	0	0	718
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	610	2	2	659
Future Volume (Veh/h)	1	0	610	2	2	659
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	663	2	2	716
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1384	664			665	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1384	664			665	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	159	464			934	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	665	718
Volume Left	1	0	2
Volume Right	0	2	0
cSH	120	1700	934
Volume to Capacity	0.01	0.39	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	35.4	0.0	0.1
Lane LOS	E		A
Approach Delay (s)	35.4	0.0	0.1
Approach LOS	E		

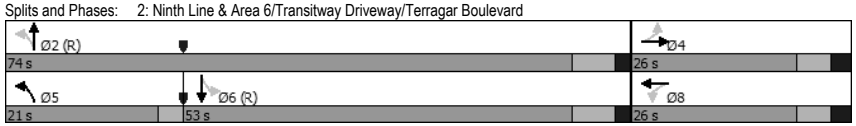
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	22	115	143	115	86	507	784	63	27	635	80
Future Volume (vph)	15	22	115	143	115	86	507	784	63	27	635	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.874			0.933			0.989			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1646	0	1755	1750	0	1789	3490	0	1825	3521	0
Flt Permitted	0.441			0.621			0.294			0.310		
Satd. Flow (perm)	831	1646	0	1147	1750	0	554	3490	0	596	3521	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		115			37			18			17	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		138.3			287.6			434.9			780.0	
Travel Time (s)		10.4			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	3%	2%	3%	9%	0%	2%	2%
Adj. Flow (vph)	15	22	115	155	115	93	507	852	68	29	690	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	137	0	155	208	0	507	920	0	29	770	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	8.0		8.0	8.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		9.0	53.0		52.0	52.0	
Total Split (s)	26.0	26.0		26.0	26.0		21.0	74.0		53.0	53.0	
Total Split (%)	26.0%	26.0%		26.0%	26.0%		21.0%	74.0%		53.0%	53.0%	
Maximum Green (s)	19.5	19.5		19.5	19.5		18.0	67.0		46.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		2.0	6.0		6.0	6.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0			35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)	17.7	17.7		17.7	17.7		74.8	70.8		52.1	52.1	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.75	0.71		0.52	0.52	
v/c Ratio	0.10	0.36		0.77	0.61		0.82	0.37		0.09	0.42	
Control Delay	34.5	12.0		63.0	38.6		18.8	6.5		15.5	16.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.5	12.0		63.0	38.6		18.8	6.5		15.5	16.2	
LOS	C	B		E	D		B	A		B	B	
Approach Delay		14.2			49.0			10.9			16.2	
Approach LOS		B			D			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 83.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	15	137	155	208	507	920	29	770
v/c Ratio	0.10	0.36	0.77	0.61	0.82	0.37	0.09	0.42
Control Delay	34.5	12.0	63.0	38.6	18.8	6.5	15.5	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	12.0	63.0	38.6	18.8	6.5	15.5	16.2
Queue Length 50th (m)	2.4	3.5	28.2	30.0	31.4	33.8	2.9	48.4
Queue Length 95th (m)	7.9	18.9	#53.7	52.1	#75.8	45.3	8.4	65.5
Internal Link Dist (m)		114.3		263.6		410.9		756.0
Turn Bay Length (m)					40.0		40.0	
Base Capacity (vph)	170	428	235	388	649	2476	310	1841
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.32	0.66	0.54	0.78	0.37	0.09	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	29	46	0	18	60	1365	63	11	887	4
Future Volume (vph)	8	0	29	46	0	18	60	1365	63	11	887	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.993			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3520	0	1674	3540	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3520	0	1674	3540	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		134.3			310.4			412.4			434.9	
Travel Time (s)		10.1			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	2%	9%	3%	2%
Adj. Flow (vph)	8	0	29	50	0	20	60	1484	68	12	964	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	29	0	50	20	0	60	1552	0	12	968	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 62.3% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	29	46	0	18	60	1365	63	11	887	4
Future Volume (Veh/h)	8	0	29	46	0	18	60	1365	63	11	887	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	8	0	29	50	0	20	60	1484	68	12	964	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1872	2662	484	2173	2630	776	968			1552		
vC1, stage 1 conf vol	990	990		1638	1638							
vC2, stage 2 conf vol	882	1672		535	992							
vCu, unblocked vol	1872	2662	484	2173	2630	776	968			1552		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	96	100	95	46	100	94	92			97		
cM capacity (veh/h)	178	114	529	93	122	345	707			391		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	8	29	50	20	60	989	563	12	643	325
Volume Left	8	0	50	0	60	0	0	12	0	0
Volume Right	0	29	0	20	0	0	68	0	0	4
cSH	178	529	93	345	707	1700	1700	391	1700	1700
Volume to Capacity	0.04	0.05	0.54	0.06	0.08	0.58	0.33	0.03	0.38	0.19
Queue Length 95th (m)	1.1	1.3	18.3	1.4	2.1	0.0	0.0	0.7	0.0	0.0
Control Delay (s)	26.2	12.2	81.6	16.1	10.6	0.0	0.0	14.5	0.0	0.0
Lane LOS	D	B	F	C	B			B		
Approach Delay (s)	15.2		62.9		0.4			0.2		
Approach LOS	C		F							

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		62.3%	ICU Level of Service
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	293	2238	137	159	912	350	233	662	307	121	577	187
Future Volume (vph)	293	2238	137	159	912	350	233	662	307	121	577	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.991			0.958				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1733	5143	0	1716	4883	0	1785	3614	1566	1638	3614	1597
Flt Permitted	0.131			0.064			0.150			0.213		
Satd. Flow (perm)	239	5143	0	116	4883	0	282	3614	1566	367	3614	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			82				156			178
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	4%	4%	0%	0%	1%	2%	9%	1%	0%
Adj. Flow (vph)	293	2238	137	159	912	350	233	662	307	121	577	187
Shared Lane Traffic (%)												
Lane Group Flow (vph)	293	2375	0	159	1262	0	233	662	307	121	577	187
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

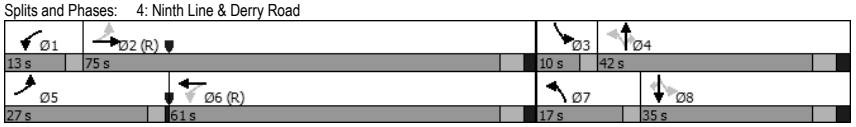
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	5.0	8.0	8.0
Minimum Split (s)	9.0	30.1		8.0	30.1		8.0	29.4	29.4	8.0	29.4	29.4
Total Split (s)	27.0	75.0		13.0	61.0		17.0	42.0	42.0	10.0	35.0	35.0
Total Split (%)	19.3%	53.6%		9.3%	43.6%		12.1%	30.0%	30.0%	7.1%	25.0%	25.0%
Maximum Green (s)	23.5	68.9		10.0	54.9		14.0	35.6	35.6	7.0	28.6	28.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.5	2.1		0.0	2.1		0.0	2.4	2.4	0.0	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.5	5.1		2.0	5.1		2.0	5.4	5.4	2.0	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	87.5	71.5		76.7	62.3		48.0	34.6	34.6	39.0	27.6	27.6
Actuated g/C Ratio	0.62	0.51		0.55	0.44		0.34	0.25	0.25	0.28	0.20	0.20
v/c Ratio	0.80	0.90		0.83	0.57		0.91	0.74	0.61	0.69	0.81	0.41
Control Delay	47.7	33.4		73.9	22.7		72.4	54.0	27.5	55.5	63.3	10.2
Queue Delay	0.0	0.2		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	33.6		73.9	22.7		72.4	54.0	27.5	55.5	63.3	10.2
LOS	D	C		E	C		E	D	C	E	E	B
Approach Delay		35.2			28.4			50.8			51.0	
Approach LOS		D			C			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 38.9 Intersection LOS: D
Intersection Capacity Utilization 99.4% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	293	2375	159	1262	233	662	307	121	577	187
v/c Ratio	0.80	0.90	0.83	0.57	0.91	0.74	0.61	0.69	0.81	0.41
Control Delay	47.7	33.4	73.9	22.7	72.4	54.0	27.5	55.5	63.3	10.2
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	33.6	73.9	22.7	72.4	54.0	27.5	55.5	63.3	10.2
Queue Length 50th (m)	55.7	163.0	31.3	95.7	47.6	87.7	36.2	23.2	79.6	2.0
Queue Length 95th (m)	88.2	186.0	#70.9	95.6	#90.6	109.2	67.5	#42.3	100.5	22.0
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	410	2632	194	2216	257	944	524	175	764	478
Starvation Cap Reductn	0	24	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.91	0.82	0.57	0.91	0.70	0.59	0.69	0.76	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1328	85	58	738
Future Volume (vph)	90	47	1328	85	58	738
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3546	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1807	1633	3546	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1443	92	63	802
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1535	0	63	802
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	90	47	1328	85	58	738
Future Volume (Veh/h)	90	47	1328	85	58	738
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	51	1443	92	63	802
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2016	770			1535	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2016	770			1535	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	85			86	
cM capacity (veh/h)	44	347			439	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	149	962	573	63	401	401
Volume Left	98	0	0	63	0	0
Volume Right	51	0	92	0	0	0
cSH	63	1700	1700	439	1700	1700
Volume to Capacity	2.36	0.57	0.34	0.14	0.24	0.24
Queue Length 95th (m)	110.7	0.0	0.0	3.8	0.0	0.0
Control Delay (s)	759.0	0.0	0.0	14.6	0.0	0.0
Lane LOS	F			B		
Approach Delay (s)	759.0	0.0		1.1		
Approach LOS	F					

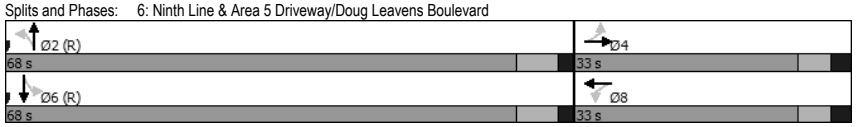
Intersection Summary			
Average Delay	44.7		
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	81	38	138	30	207	9	1076	97	80	637	8
Future Volume (vph)	36	81	38	138	30	207	9	1076	97	80	637	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		27.0	50.0		60.0	115.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.952			0.868			0.988			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1793	0	1772	1615	0	1789	3496	0	1825	3571	0
Flt Permitted	0.337			0.668			0.376			0.181		
Satd. Flow (perm)	635	1793	0	1246	1615	0	708	3496	0	348	3571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			87			17			2	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		99.7			255.0			850.0			603.1	
Travel Time (s)		7.5			18.4			43.7			31.0	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	3%	5%	0%	2%	2%
Adj. Flow (vph)	36	81	38	150	30	225	9	1170	105	87	692	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	119	0	150	255	0	9	1275	0	87	700	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		45.0	45.0	
Minimum Split (s)	25.5	25.5		23.0	23.0		52.0	52.0		52.0	52.0	
Total Split (s)	33.0	33.0		33.0	33.0		68.0	68.0		68.0	68.0	
Total Split (%)	32.7%	32.7%		32.7%	32.7%		67.3%	67.3%		67.3%	67.3%	
Maximum Green (s)	26.5	26.5		26.5	26.5		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	18.5	18.5		18.5	18.5		71.0	71.0		71.0	71.0	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.70	0.70		0.70	0.70	
v/c Ratio	0.31	0.34		0.66	0.70		0.02	0.52		0.36	0.28	
Control Delay	40.5	29.8		51.2	34.6		10.3	14.8		12.7	6.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.5	29.8		51.2	34.6		10.3	14.8		12.7	6.5	
LOS	D	C		D	C		B	B		B	A	
Approach Delay		32.3			40.7			14.8			7.2	
Approach LOS		C			D			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 17.5		Intersection LOS: B	
Intersection Capacity Utilization 101.8%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard



Queues
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	36	119	150	255	9	1275	87	700
v/c Ratio	0.31	0.34	0.66	0.70	0.02	0.52	0.36	0.28
Control Delay	40.5	29.8	51.2	34.6	10.3	14.8	12.7	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	29.8	51.2	34.6	10.3	14.8	12.7	6.5
Queue Length 50th (m)	6.2	16.5	27.7	31.1	0.8	88.2	5.8	22.8
Queue Length 95th (m)	14.5	29.2	43.9	52.1	m2.6	132.5	20.1	40.1
Internal Link Dist (m)		75.7		231.0		826.0		579.1
Turn Bay Length (m)					50.0		115.0	
Base Capacity (vph)	172	504	339	503	497	2463	244	2511
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.24	0.44	0.51	0.02	0.52	0.36	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	29	38	200	14	122	9	1174	150	55	899	8
Future Volume (vph)	36	29	38	200	14	122	9	1174	150	55	899	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	13.0		0.0	35.0		25.0	270.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			13.0			60.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.915			0.864			0.983			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1723	0	1706	1607	0	1789	3439	0	1789	3541	0
Flt Permitted	0.607			0.713			0.237			0.109		
Satd. Flow (perm)	1143	1723	0	1280	1607	0	446	3439	0	205	3541	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			133			20			1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		142.8			160.0			383.2			301.0	
Travel Time (s)		10.7			11.5			19.7			15.5	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	7%	2%	3%	2%
Adj. Flow (vph)	36	29	38	217	14	133	9	1276	163	60	977	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	67	0	217	147	0	9	1439	0	60	985	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

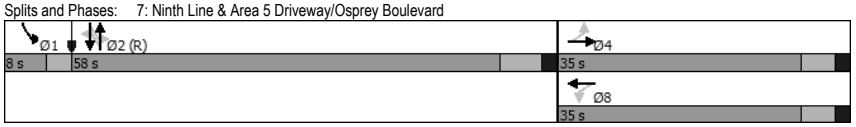
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.0	25.0		52.0	52.0		8.0	52.0	
Total Split (s)	35.0	35.0		35.0	35.0		58.0	58.0		8.0	58.0	
Total Split (%)	34.7%	34.7%		34.7%	34.7%		57.4%	57.4%		7.9%	57.4%	
Maximum Green (s)	29.0	29.0		29.0	29.0		51.0	51.0		5.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		37.0	37.0			37.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	22.9	22.9		22.9	22.9		59.8	59.8		69.5	59.8	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.59	0.59		0.69	0.59	
v/c Ratio	0.14	0.16		0.75	0.31		0.03	0.70		0.24	0.47	
Control Delay	29.8	15.6		51.7	8.2		12.2	18.4		11.0	17.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	29.8	15.6		51.7	8.2		12.2	18.4		11.0	17.3	
LOS	C	B		D	A		B	B		B	B	
Approach Delay		20.6			34.2			18.3			17.0	
Approach LOS		C			C			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 19.9 Intersection LOS: B
Intersection Capacity Utilization 76.8% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 7: Ninth Line & Area 5 Driveway/Osprey Boulevard



Queues
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	36	67	217	147	9	1439	60	985
v/c Ratio	0.14	0.16	0.75	0.31	0.03	0.70	0.24	0.47
Control Delay	29.8	15.6	51.7	8.2	12.2	18.4	11.0	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	15.6	51.7	8.2	12.2	18.4	11.0	17.3
Queue Length 50th (m)	5.6	4.5	39.5	2.1	0.7	102.5	3.1	62.6
Queue Length 95th (m)	12.8	13.6	60.1	15.6	3.4	146.3	12.2	96.3
Internal Link Dist (m)		118.8		136.0		359.2		277.0
Turn Bay Length (m)			13.0		35.0		270.0	
Base Capacity (vph)	339	538	380	570	264	2043	251	2096
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.12	0.57	0.26	0.03	0.70	0.24	0.47

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	9	18	0	91	2	1074	6	27	929	2
Future Volume (vph)	8	0	9	18	0	91	2	1074	6	27	929	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			60.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.850			0.850			0.999				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3611	0	1825	3614	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3611	0	1825	3614	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		144.4			207.4			254.7			383.2	
Travel Time (s)		10.8			14.9			13.1			19.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	8	0	9	20	0	99	2	1167	7	29	1010	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	9	0	20	99	0	2	1174	0	29	1012	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	9	18	0	91	2	1074	6	27	929	2
Future Volume (Veh/h)	8	0	9	18	0	91	2	1074	6	27	929	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	8	0	9	20	0	99	2	1167	7	29	1010	2
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								255			383	
pX, platoon unblocked	0.77	0.77	0.88	0.77	0.77	0.71	0.88			0.71		
vC, conflicting volume	1756	2247	506	1746	2244	588	1012			1174		
vC1, stage 1 conf vol	1069	1069		1174	1174							
vC2, stage 2 conf vol	688	1178		572	1070							
vCu, unblocked vol	697	1330	165	684	1327	0	740			446		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	99	95	100	87	100			96		
cM capacity (veh/h)	281	267	748	378	273	779	758			804		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	8	9	20	99	2	778	396	29	673	339
Volume Left	8	0	20	0	2	0	0	29	0	0
Volume Right	0	9	0	99	0	0	7	0	0	2
cSH	281	748	378	779	758	1700	1700	804	1700	1700
Volume to Capacity	0.03	0.01	0.05	0.13	0.00	0.46	0.23	0.04	0.40	0.20
Queue Length 95th (m)	0.7	0.3	1.3	3.3	0.1	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	18.2	9.9	15.0	10.3	9.8	0.0	0.0	9.6	0.0	0.0
Lane LOS	C	A	C	B	A			A		
Approach Delay (s)	13.8		11.1		0.0			0.3		
Approach LOS	B		B							

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	2322	328	80	753	127	211	927	145	107	838	139
Future Volume (vph)	121	2322	328	80	753	127	211	927	145	107	838	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.981			0.978			0.980			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	5088	0	1767	4911	0	1785	3502	0	1653	3503	0
Flt Permitted	0.311			0.055			0.102			0.107		
Satd. Flow (perm)	579	5088	0	102	4911	0	192	3502	0	186	3503	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			38			13			13	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	2%	1%	2%	19%	0%	2%	3%	8%	2%	2%
Adj. Flow (vph)	121	2322	328	80	753	127	211	927	145	107	838	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	2650	0	80	880	0	211	1072	0	107	977	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	24.6	24.6		8.0	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	76.0	76.0		8.0	84.0		13.0	48.0		8.0	43.0	
Total Split (%)	54.3%	54.3%		5.7%	60.0%		9.3%	34.3%		5.7%	30.7%	
Maximum Green (s)	69.4	69.4		5.0	77.4		10.0	41.4		5.0	36.4	
Yellow Time (s)	4.6	4.6		3.0	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	2.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-2.0	-1.0		-2.0	-1.0		-1.0	-3.0	
Total Lost Time (s)	5.6	5.6		1.0	5.6		1.0	5.6		2.0	3.6	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			12.0			12.0	
Flash Dont Walk (s)	11.0	11.0			11.0			18.0			18.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)	70.4	70.4		83.0	78.4		55.0	42.4		47.0	39.4	
Actuated g/C Ratio	0.50	0.50		0.59	0.56		0.39	0.30		0.34	0.28	
v/c Ratio	0.42	1.03		0.56	0.32		1.00	1.00		0.86	0.98	
Control Delay	16.2	48.0		48.7	14.4		96.7	76.0		82.4	73.5	
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.2	48.2		48.7	14.4		96.7	76.0		82.4	73.5	
LOS	B	D		D	B		F	E		F	E	
Approach Delay		46.8			17.3			79.4			74.4	
Approach LOS		D			B			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 53.9		Intersection LOS: D	
Intersection Capacity Utilization 110.6%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 9: Ninth Line & Britannia Road

Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	121	2650	80	880	211	1072	107	977
v/c Ratio	0.42	1.03	0.56	0.32	1.00	1.00	0.86	0.98
Control Delay	16.2	48.0	48.7	14.4	96.7	76.0	82.4	73.5
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	48.2	48.7	14.4	96.7	76.0	82.4	73.5
Queue Length 50th (m)	10.1	~288.1	9.7	32.8	41.9	~155.8	19.3	140.3
Queue Length 95th (m)	16.2	#305.6	28.9	37.9	#94.2	#203.6	#47.6	#185.4
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	291	2571	143	2766	211	1069	125	995
Starvation Cap Reductn	0	1	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	1.03	0.56	0.32	1.00	1.00	0.86	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	22	40	28	20	1292	9	2	1272	38
Future Volume (vph)	0	0	0	22	40	28	20	1292	9	2	1272	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.936			0.999			0.996	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		111.0			491.2			170.0			206.5	
Travel Time (s)		8.3			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	0%	2%	2%	13%	50%	3%	2%
Adj. Flow (vph)	0	0	0	24	40	30	20	1404	10	2	1383	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	24	70	0	20	1414	0	2	1421	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.9% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	22	40	28	20	1292	9	2	1272	38
Future Volume (Veh/h)	0	0	0	22	40	28	20	1292	9	2	1272	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	0	0	0	24	40	30	20	1404	10	2	1383	38
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											206	
pX, platoon unblocked	0.74	0.74	0.74	0.74	0.74		0.74					
vC, conflicting volume	2198	2860	710	2144	2874	707	1421			1414		
vC1, stage 1 conf vol	1406	1406		1449	1449							
vC2, stage 2 conf vol	792	1454		696	1425							
vCu, unblocked vol	1912	2810	0	1839	2829	707	857			1414		
tC, single (s)	7.5	6.5	6.9	7.6	6.5	6.9	4.1			5.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.7		
p0 queue free %	100	100	100	81	72	92	97			99		
cM capacity (veh/h)	164	146	799	124	142	382	574			292		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	0	24	70	20	936	478	2	922	499
Volume Left	0	0	24	0	20	0	0	2	0	0
Volume Right	0	0	0	30	0	0	10	0	0	38
cSH	1700	1700	124	195	574	1700	1700	292	1700	1700
Volume to Capacity	0.00	0.00	0.19	0.36	0.03	0.55	0.28	0.01	0.54	0.29
Queue Length 95th (m)	0.0	0.0	5.2	11.6	0.8	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	0.0	0.0	40.7	33.5	11.5	0.0	0.0	17.4	0.0	0.0
Lane LOS	A	A	E	D	B			C		
Approach Delay (s)	0.0		35.3		0.2			0.0		
Approach LOS	A		E							

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization		46.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	4	3	24	1	42	14	1236	32	47	1236	27
Future Volume (vph)	10	4	3	24	1	42	14	1236	32	47	1236	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.936			0.853			0.996			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1763	0	1825	1591	0	1789	3554	0	1825	3568	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1763	0	1825	1591	0	1789	3554	0	1825	3568	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		61.6			511.9			217.0			170.0	
Travel Time (s)		4.6			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	3%	2%	2%	13%	0%	2%	2%
Adj. Flow (vph)	10	4	3	26	1	46	14	1343	35	51	1343	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	7	0	26	47	0	14	1378	0	51	1370	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	4	3	24	1	42	14	1236	32	47	1236	27
Future Volume (Veh/h)	10	4	3	24	1	42	14	1236	32	47	1236	27
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	10	4	3	26	1	46	14	1343	35	51	1343	27
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											376	
pX, platoon unblocked	0.76	0.76	0.76	0.76	0.76		0.76					
vC, conflicting volume	2206	2864	685	2167	2860	690	1370			1378		
vC1, stage 1 conf vol	1458	1458		1388	1388							
vC2, stage 2 conf vol	747	1406		778	1472							
vCu, unblocked vol	1949	2821	0	1899	2816	690	845			1378		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	97	100	82	99	88	98			90		
cM capacity (veh/h)	148	118	820	142	137	385	596			504		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	10	7	26	47	14	895	483	51	895	475
Volume Left	10	0	26	0	14	0	0	51	0	0
Volume Right	0	3	0	46	0	0	35	0	0	27
cSH	148	187	142	371	596	1700	1700	504	1700	1700
Volume to Capacity	0.07	0.04	0.18	0.13	0.02	0.53	0.28	0.10	0.53	0.28
Queue Length 95th (m)	1.6	0.9	4.9	3.3	0.5	0.0	0.0	2.6	0.0	0.0
Control Delay (s)	31.0	25.0	36.0	16.1	11.2	0.0	0.0	12.9	0.0	0.0
Lane LOS	D	D	E	C	B			B		
Approach Delay (s)	28.6		23.2		0.1			0.5		
Approach LOS	D		C							

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization		53.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	11	1375	8	4	1218
Future Volume (vph)	19	11	1375	8	4	1218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	30.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.951		0.999			
Flt Protected	0.969				0.950	
Satd. Flow (prot)	1714	0	3541	0	1825	3579
Flt Permitted	0.969				0.950	
Satd. Flow (perm)	1714	0	3541	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	0%	0%	2%
Adj. Flow (vph)	21	12	1495	9	4	1324
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	1504	0	4	1324
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	11	1375	8	4	1218
Future Volume (Veh/h)	19	11	1375	8	4	1218
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	12	1495	9	4	1324
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2170	752			1504	
vC1, stage 1 conf vol	1500					
vC2, stage 2 conf vol	670					
vCu, unblocked vol	2170	752			1504	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4			2.2	
p0 queue free %	87	96			99	
cM capacity (veh/h)	161	338			451	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	33	997	507	4	662	662
Volume Left	21	0	0	4	0	0
Volume Right	12	0	9	0	0	0
cSH	199	1700	1700	451	1700	1700
Volume to Capacity	0.17	0.59	0.30	0.01	0.39	0.39
Queue Length 95th (m)	4.4	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	26.6	0.0	0.0	13.0	0.0	0.0
Lane LOS	D			B		
Approach Delay (s)	26.6	0.0		0.0		
Approach LOS	D					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	11	1254	6	3	1259
Future Volume (vph)	6	11	1254	6	3	1259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1498	3535	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1498	3535	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	33%	0%	2%
Adj. Flow (vph)	7	12	1363	7	3	1368
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	12	1370	0	3	1368
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	11	1254	6	3	1259
Future Volume (Veh/h)	6	11	1254	6	3	1259
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	12	1363	7	3	1368
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.71	0.71			0.71	
vC, conflicting volume	2056	685			1370	
vC1, stage 1 conf vol	1366					
vC2, stage 2 conf vol	690					
vCu, unblocked vol	1679	0			719	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4			2.2	
p0 queue free %	97	98			100	
cM capacity (veh/h)	263	759			637	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	19	909	461	3	684	684
Volume Left	7	0	0	3	0	0
Volume Right	12	0	7	0	0	0
cSH	714	1700	1700	637	1700	1700
Volume to Capacity	0.03	0.53	0.27	0.00	0.40	0.40
Queue Length 95th (m)	0.6	0.0	0.0	0.1	0.0	0.0
Control Delay (s)	13.2	0.0	0.0	10.7	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	13.2	0.0		0.0		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	2	18	206	1	100	6	1161	183	89	1153	3
Future Volume (vph)	11	2	18	206	1	100	6	1161	183	89	1153	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		35.0	28.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			45.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.865			0.851			0.980				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1629	0	1789	1508	0	1789	3473	0	1690	3579	0
Flt Permitted	0.686			0.744			0.156			0.106		
Satd. Flow (perm)	1292	1629	0	1401	1508	0	294	3473	0	189	3579	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			109			27				
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		170.8			534.8			346.0			306.2	
Travel Time (s)		12.8			38.5			17.8			15.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	7%	2%	3%	3%	8%	2%	2%
Adj. Flow (vph)	11	2	18	224	1	109	6	1262	199	97	1253	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	20	0	224	110	0	6	1461	0	97	1256	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

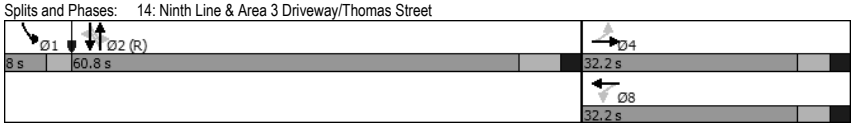
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		52.5	52.5		8.0	52.5	
Total Split (s)	32.2	32.2		32.2	32.2		60.8	60.8		8.0	60.8	
Total Split (%)	31.9%	31.9%		31.9%	31.9%		60.2%	60.2%		7.9%	60.2%	
Maximum Green (s)	25.7	25.7		25.7	25.7		53.3	53.3		5.0	53.3	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		0.0	2.5	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.5	6.5		2.0	6.5	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		33.0	33.0			33.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0			12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	21.5	21.5		21.5	21.5		60.1	60.1		70.4	60.1	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.60	0.60		0.70	0.60	
v/c Ratio	0.04	0.06		0.75	0.27		0.03	0.70		0.41	0.59	
Control Delay	29.1	13.7		53.7	9.7		13.7	23.9		10.6	15.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	29.1	13.7		53.7	9.7		13.7	23.9		10.6	15.5	
LOS	C	B		D	A		B	C		B	B	
Approach Delay		19.1			39.2			23.8			15.2	
Approach LOS		B			D			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 21.7 — Intersection LOS: C
Intersection Capacity Utilization 102.0% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 14: Ninth Line & Area 3 Driveway/Thomas Street



Queues
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	11	20	224	110	6	1461	97	1256
v/c Ratio	0.04	0.06	0.75	0.27	0.03	0.70	0.41	0.59
Control Delay	29.1	13.7	53.7	9.7	13.7	23.9	10.6	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	13.7	53.7	9.7	13.7	23.9	10.6	15.5
Queue Length 50th (m)	1.7	0.3	43.7	1.3	0.7	148.3	5.2	83.1
Queue Length 95th (m)	6.0	5.9	66.9	15.8	m1.9	173.6	11.6	109.5
Internal Link Dist (m)		146.8		510.8		322.0		282.2
Turn Bay Length (m)					30.0		28.0	
Base Capacity (vph)	341	443	370	478	175	2076	237	2128
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.05	0.61	0.23	0.03	0.70	0.41	0.59

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	46	1229	7	17	1371
Future Volume (vph)	18	46	1229	7	17	1371
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.904		0.999			
Flt Protected	0.986				0.950	
Satd. Flow (prot)	1688	0	3541	0	1722	3579
Flt Permitted	0.986				0.950	
Satd. Flow (perm)	1688	0	3541	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	3%	0%	6%	2%
Adj. Flow (vph)	20	50	1336	8	18	1490
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	0	1344	0	18	1490
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	46	1229	7	17	1371
Future Volume (Veh/h)	18	46	1229	7	17	1371
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	50	1336	8	18	1490
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.77					
vC, conflicting volume	2121	672			1344	
vC1, stage 1 conf vol	1340					
vC2, stage 2 conf vol	781					
vCu, unblocked vol	1852	672			1344	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.3	
p0 queue free %	90	87			96	
cM capacity (veh/h)	199	398			488	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	70	891	453	18	745	745
Volume Left	20	0	0	18	0	0
Volume Right	50	0	8	0	0	0
cSH	310	1700	1700	488	1700	1700
Volume to Capacity	0.23	0.52	0.27	0.04	0.44	0.44
Queue Length 95th (m)	6.5	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	20.0	0.0	0.0	12.7	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	20.0	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	39	78	1180	49	46	1369
Future Volume (vph)	39	78	1180	49	46	1369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1617	3514	0	1722	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1617	3514	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Adj. Flow (vph)	42	85	1283	53	50	1488
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	85	1336	0	50	1488
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	39	78	1180	49	46	1369
Future Volume (Veh/h)	39	78	1180	49	46	1369
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	85	1283	53	50	1488
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2154	668			1336	
vC1, stage 1 conf vol	1310					
vC2, stage 2 conf vol	844					
vCu, unblocked vol	2154	668			1336	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.3	
p0 queue free %	77	79			90	
cM capacity (veh/h)	183	403			491	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	127	855	481	50	744	744
Volume Left	42	0	0	50	0	0
Volume Right	85	0	53	0	0	0
cSH	554	1700	1700	491	1700	1700
Volume to Capacity	0.23	0.50	0.28	0.10	0.44	0.44
Queue Length 95th (m)	6.7	0.0	0.0	2.6	0.0	0.0
Control Delay (s)	21.0	0.0	0.0	13.2	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	21.0	0.0		0.4		
Approach LOS	C					

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	16	9	0	18	5	1198	1	8	1404	3
Future Volume (vph)	12	0	16	9	0	18	5	1198	1	8	1404	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	70.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.923			0.910							
Flt Protected		0.979			0.984		0.950			0.950		
Satd. Flow (prot)	0	1702	0	0	1720	0	1789	3544	0	1825	3579	0
Flt Permitted		0.979			0.984		0.950			0.950		
Satd. Flow (perm)	0	1702	0	0	1720	0	1789	3544	0	1825	3579	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		92.8			113.3			424.8			250.0	
Travel Time (s)		7.0			8.2			21.8			12.9	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	0%	0%	2%	2%
Adj. Flow (vph)	12	0	16	10	0	20	5	1302	1	9	1526	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	0	30	0	5	1303	0	9	1529	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	16	9	0	18	5	1198	1	8	1404	3
Future Volume (Veh/h)	12	0	16	9	0	18	5	1198	1	8	1404	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	12	0	16	10	0	20	5	1302	1	9	1526	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2226	2858	764	2110	2860	652	1529			1303		
vC1, stage 1 conf vol	1546	1546		1312	1312							
vC2, stage 2 conf vol	681	1313		797	1547							
vCu, unblocked vol	2226	2858	764	2110	2860	652	1529			1303		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	100	95	93	100	95	99			98		
cM capacity (veh/h)	110	129	346	146	128	416	432			538		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	28	30	5	868	435	9	1017	512
Volume Left	12	10	5	0	0	9	0	0
Volume Right	16	20	0	0	1	0	0	3
cSH	180	257	432	1700	1700	538	1700	1700
Volume to Capacity	0.16	0.12	0.01	0.51	0.26	0.02	0.60	0.30
Queue Length 95th (m)	4.1	3.0	0.3	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	28.7	20.8	13.4	0.0	0.0	11.8	0.0	0.0
Lane LOS	D	C	B			B		
Approach Delay (s)	28.7	20.8	0.1			0.1		
Approach LOS	D	C						

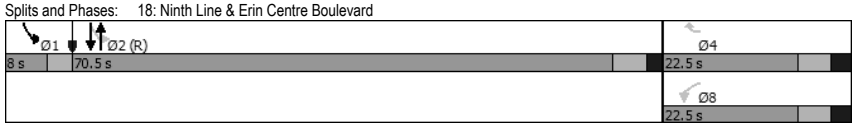
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	84	63	1071	59	56	1377
Future Volume (vph)	84	63	1071	59	56	1377
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.992			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1706	1570	3492	0	1772	3579
Flt Permitted	0.950				0.193	
Satd. Flow (perm)	1706	1570	3492	0	360	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		68	11			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	4%	3%	16%	3%	2%
Adj. Flow (vph)	91	68	1164	64	61	1497
Shared Lane Traffic (%)						
Lane Group Flow (vph)	91	68	1228	0	61	1497
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	22.5	22.5	70.5		8.0	70.5
Total Split (%)	22.3%	22.3%	69.8%		7.9%	69.8%
Maximum Green (s)	16.0	16.0	64.5		5.0	64.5
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	5.0	8.0	50.0			50.0
Flash Dont Walk (s)	11.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	12.0	12.0	75.1		82.8	75.1
Actuated g/C Ratio	0.12	0.12	0.74		0.82	0.74
v/c Ratio	0.45	0.28	0.47		0.16	0.56
Control Delay	47.9	12.7	7.8		5.7	18.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.9	12.7	7.8		5.7	18.9
LOS	D	B	A		A	B
Approach Delay	32.9		7.8			18.4
Approach LOS	C		A			B

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	91	68	1228	61	1497
v/c Ratio	0.45	0.28	0.47	0.16	0.56
Control Delay	47.9	12.7	7.8	5.7	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	12.7	7.8	5.7	18.9
Queue Length 50th (m)	16.9	0.0	52.7	4.2	138.3
Queue Length 95th (m)	30.9	11.5	77.1	m7.9	165.2
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	287	320	2599	392	2661
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.21	0.47	0.16	0.56

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	0	17	0	41	0	1007	8	14	1466	5
Future Volume (vph)	19	0	0	17	0	41	0	1007	8	14	1466	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.850			0.999				
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1883	0	1825	1601	0	1883	3541	0	1825	3579	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1883	0	1825	1601	0	1883	3541	0	1825	3579	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		73.8			216.6			90.1			404.2	
Travel Time (s)		5.5			15.6			4.6			20.8	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	2%	3%	0%	0%	2%	2%
Adj. Flow (vph)	19	0	0	18	0	45	0	1095	9	15	1593	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	0	0	18	45	0	0	1104	0	15	1598	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 55.1% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	0	0	17	0	41	0	1007	8	14	1466	5
Future Volume (Veh/h)	19	0	0	17	0	41	0	1007	8	14	1466	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	19	0	0	18	0	45	0	1095	9	15	1593	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								373				
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	2218	2730	799	1926	2728	552	1598			1104		
vC1, stage 1 conf vol	1626	1626		1100	1100							
vC2, stage 2 conf vol	592	1104		826	1628							
vCu, unblocked vol	2081	2682	799	1738	2680	124	1598			773		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	81	100	100	92	100	94	100			98		
cM capacity (veh/h)	101	136	328	224	137	769	406			725		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	19	0	18	45	0	730	374	15	1062	536
Volume Left	19	0	18	0	0	0	0	15	0	0
Volume Right	0	0	0	45	0	0	9	0	0	5
cSH	101	1700	224	769	1700	1700	1700	725	1700	1700
Volume to Capacity	0.19	0.00	0.08	0.06	0.00	0.43	0.22	0.02	0.62	0.32
Queue Length 95th (m)	5.0	0.0	2.0	1.4	0.0	0.0	0.0	0.5	0.0	0.0
Control Delay (s)	48.9	0.0	22.5	10.0	0.0	0.0	0.0	10.1	0.0	0.0
Lane LOS	E	A	C	A				B		
Approach Delay (s)	48.9		13.6		0.0			0.1		
Approach LOS	E		B							

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		55.1%	ICU Level of Service	B
Analysis Period (min)		15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	17	1056	1	6	1441
Future Volume (vph)	5	17	1056	1	6	1441
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.894					
Flt Protected	0.989				0.950	
Satd. Flow (prot)	1699	0	3544	0	1217	3614
Flt Permitted	0.989				0.950	
Satd. Flow (perm)	1699	0	3544	0	1217	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	50%	1%
Adj. Flow (vph)	5	18	1148	1	7	1566
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	1149	0	7	1566
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	17	1056	1	6	1441
Future Volume (Veh/h)	5	17	1056	1	6	1441
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	18	1148	1	7	1566
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.84	0.84			0.84	
vC, conflicting volume	1946	574			1149	
vC1, stage 1 conf vol	1148					
vC2, stage 2 conf vol	797					
vCu, unblocked vol	1743	110			794	
tC, single (s)	6.8	6.9			5.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.7	
p0 queue free %	98	98			99	
cM capacity (veh/h)	262	780			482	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	23	765	384	7	783	783
Volume Left	5	0	0	7	0	0
Volume Right	18	0	1	0	0	0
cSH	546	1700	1700	482	1700	1700
Volume to Capacity	0.04	0.45	0.23	0.01	0.46	0.46
Queue Length 95th (m)	1.0	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	11.9	0.0	0.0	12.6	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	11.9	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	0	46	2	0	25	12	935	6	0	1534	6
Future Volume (vph)	24	0	46	2	0	25	12	935	6	0	1534	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		20.0	0.0		0.0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.911				0.865			0.850		0.999	
Flt Protected		0.983			0.950		0.950					
Satd. Flow (prot)	0	1687	0	0	0	1662	1789	3544	1396	0	3610	0
Flt Permitted		0.983			0.950		0.950					
Satd. Flow (perm)	0	1687	0	0	0	1662	1789	3544	1396	0	3610	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		70.1			245.5			191.7			91.0	
Travel Time (s)		5.3			17.7			9.9			4.7	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	17%	0%	1%	2%
Adj. Flow (vph)	24	0	46	2	0	27	12	1016	7	0	1667	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	2	27	12	1016	7	0	1673	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	0	46	2	0	25	12	935	6	0	1534	6
Future Volume (Veh/h)	24	0	46	2	0	25	12	935	6	0	1534	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	24	0	46	2	0	27	12	1016	7	0	1667	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								192				
pX, platoon unblocked	0.83	0.83		0.83	0.83	0.83				0.83		
vC, conflicting volume	2229	2710	836	1920	2713	508	1673			1016		
vC1, stage 1 conf vol	1670	1670		1040	1040							
vC2, stage 2 conf vol	559	1040		880	1673							
vCu, unblocked vol	2076	2653	836	1705	2656	14	1673			623		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	100	85	99	100	97	97			100		
cM capacity (veh/h)	97	136	310	202	126	892	380			808		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	70	29	12	508	508	7	1111	562
Volume Left	24	2	12	0	0	0	0	0
Volume Right	46	27	0	0	0	7	0	6
cSH	177	722	380	1700	1700	1700	1700	1700
Volume to Capacity	0.40	0.04	0.03	0.30	0.30	0.00	0.65	0.33
Queue Length 95th (m)	13.2	1.0	0.7	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	38.2	10.2	14.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	E	B	B					
Approach Delay (s)	38.2	10.2	0.2				0.0	
Approach LOS	E	B						

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		Err%	ICU Level of Service	H
Analysis Period (min)		15		

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	909	51	39	316	246	14	521	67	489	815	84
Future Volume (vph)	69	909	51	39	316	246	14	521	67	489	815	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.983			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3617	0	1825	1883	1526	1825	3526	0	1789	3596	0
Flt Permitted	0.488			0.090			0.293			0.131		
Satd. Flow (perm)	928	3617	0	173	1883	1526	563	3526	0	247	3596	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				267		9			12	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	2%	7%	0%	2%	0%	2%	0%	1%
Adj. Flow (vph)	75	988	55	42	343	267	15	566	73	532	886	91
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	1043	0	42	343	267	15	639	0	532	977	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

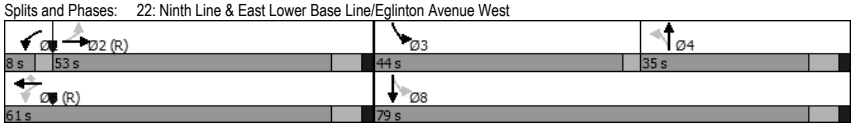
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		1	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		8.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	53.0	53.0		8.0	61.0	61.0	35.0	35.0		44.0	79.0	
Total Split (%)	37.9%	37.9%		5.7%	43.6%	43.6%	25.0%	25.0%		31.4%	56.4%	
Maximum Green (s)	46.0	46.0		5.0	54.0	54.0	28.0	28.0		41.0	72.0	
Yellow Time (s)	5.0	5.0		3.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		0.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min	Min	Min		None	Min	
Walk Time (s)	8.0	8.0			8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0			8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0			0	
Act Effct Green (s)	51.1	51.1		61.8	57.8	57.8	28.4	28.4		74.2	70.2	
Actuated g/C Ratio	0.36	0.36		0.44	0.41	0.41	0.20	0.20		0.53	0.50	
v/c Ratio	0.22	0.79		0.28	0.44	0.34	0.13	0.88		0.94	0.54	
Control Delay	35.3	45.9		28.6	32.6	4.3	48.8	68.2		61.9	24.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	35.3	45.9		28.6	32.6	4.3	48.8	68.2		61.9	24.5	
LOS	D	D		C	C	A	D	E		E	C	
Approach Delay		45.2			20.8			67.7			37.7	
Approach LOS		D			C			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 42.0 Intersection LOS: D
Intersection Capacity Utilization 91.2% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	1043	42	343	267	15	639	532	977
v/c Ratio	0.22	0.79	0.28	0.44	0.34	0.13	0.88	0.94	0.54
Control Delay	35.3	45.9	28.6	32.6	4.3	48.8	68.2	61.9	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	45.9	28.6	32.6	4.3	48.8	68.2	61.9	24.5
Queue Length 50th (m)	15.0	141.1	6.8	70.0	0.0	3.4	89.7	121.1	89.6
Queue Length 95th (m)	28.3	168.9	14.3	97.7	17.1	10.1	#118.7	#184.9	108.1
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	338	1322	152	777	786	117	741	593	1880
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.79	0.28	0.44	0.34	0.13	0.86	0.90	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	108	22	159	238	14	33	24	249	21	40	13
Future Volume (vph)	7	108	22	159	238	14	33	24	249	21	40	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.978			0.995			0.890			0.976	
Flt Protected		0.997			0.981			0.995			0.986	
Satd. Flow (prot)	0	1778	0	0	1822	0	0	1664	0	0	1849	0
Flt Permitted		0.997			0.981			0.995			0.986	
Satd. Flow (perm)	0	1778	0	0	1822	0	0	1664	0	0	1849	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	9		16	16		9	10		27	27		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	4%	9%	3%	3%	0%	3%	4%	2%	0%	0%	0%
Adj. Flow (vph)	8	117	24	173	259	15	36	26	271	23	43	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	149	0	0	447	0	0	333	0	0	80	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 64.3%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	108	22	159	238	14	33	24	249	21	40	13
Future Volume (vph)	7	108	22	159	238	14	33	24	249	21	40	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	117	24	173	259	15	36	26	271	23	43	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	149	447	333	80
Volume Left (vph)	8	173	36	23
Volume Right (vph)	24	15	271	14
Hadj (s)	0.00	0.11	-0.43	-0.05
Departure Headway (s)	5.9	5.4	5.3	6.2
Degree Utilization, x	0.24	0.68	0.49	0.14
Capacity (veh/h)	549	635	626	485
Control Delay (s)	10.7	19.1	13.3	10.2
Approach Delay (s)	10.7	19.1	13.3	10.2
Approach LOS	B	C	B	B

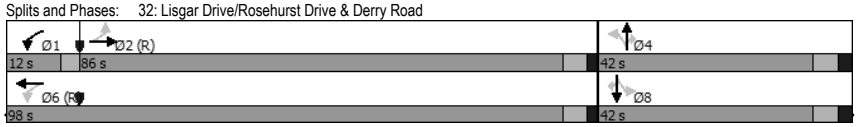
Intersection Summary			
Delay	15.2		
Level of Service	C		
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	2666	20	104	1208	132	95	63	361	224	105	92
Future Volume (vph)	22	2666	20	104	1208	132	95	63	361	224	105	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99		0.99		0.96	0.97		0.97
Frt		0.999			0.985				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5187	0	1684	4890	0	1750	1847	1617	1750	1795	1581
Flt Permitted	0.192			0.044			0.661			0.716		
Satd. Flow (perm)	359	5187	0	78	4890	0	1201	1847	1547	1281	1795	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			28				112			92
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	14		3	3		14	12		24	24		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	6%	5%	6%	2%	4%	1%	2%	7%	1%
Adj. Flow (vph)	22	2666	20	104	1208	132	95	63	361	224	105	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2686	0	104	1340	0	95	63	361	224	105	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		8.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	86.0	86.0		12.0	98.0		42.0	42.0	42.0	42.0	42.0	42.0
Total Split (%)	61.4%	61.4%		8.6%	70.0%		30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Maximum Green (s)	80.0	80.0		9.0	92.0		35.4	35.4	35.4	35.4	35.4	35.4
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		0.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		2.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0			12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0			18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	88.2	88.2		102.4	99.4		30.0	30.0	30.0	30.0	30.0	30.0
Actuated g/C Ratio	0.63	0.63		0.73	0.71		0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.10	0.82		0.64	0.39		0.37	0.16	0.86	0.82	0.27	0.23
Control Delay	5.3	6.6		43.2	8.8		49.5	43.4	55.7	74.5	46.0	8.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	6.6		43.2	8.8		49.5	43.4	55.7	74.5	46.0	8.9
LOS	A	A		D	A		D	D	E	E	D	A
Approach Delay		6.6			11.3			53.1			53.1	
Approach LOS		A			B			D			D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 16.5	Intersection LOS: B
Intersection Capacity Utilization 103.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	2686	104	1340	95	63	361	224	105	92
v/c Ratio	0.10	0.82	0.64	0.39	0.37	0.16	0.86	0.82	0.27	0.23
Control Delay	5.3	6.6	43.2	8.8	49.5	43.4	55.7	74.5	46.0	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	6.6	43.2	8.8	49.5	43.4	55.7	74.5	46.0	8.9
Queue Length 50th (m)	0.8	38.4	13.0	50.0	22.4	14.2	68.6	58.9	24.2	0.0
Queue Length 95th (m)	m1.0	43.7	#34.4	65.9	37.5	25.5	102.7	85.8	39.0	13.6
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	226	3268	173	3478	312	480	485	333	466	467
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.82	0.60	0.39	0.30	0.13	0.74	0.67	0.23	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	221	36	53	225	130	65	82	170	223	70	69
Future Volume (vph)	9	221	36	53	225	130	65	82	170	223	70	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.979			0.945			0.928			0.974	
Flt Protected	0.950			0.950				0.990			0.970	
Satd. Flow (prot)	1496	1841	0	1674	1791	0	0	1705	0	0	1777	0
Flt Permitted	0.950			0.950				0.990			0.970	
Satd. Flow (perm)	1496	1841	0	1674	1791	0	0	1705	0	0	1777	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	15		33	33		15	38		42	42		38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	2%	3%	9%	1%	2%	3%	7%	2%	1%	4%	4%
Adj. Flow (vph)	10	240	39	58	245	141	71	89	185	242	76	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	279	0	58	386	0	0	345	0	0	393	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 78.1% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	221	36	53	225	130	65	82	170	223	70	69
Future Volume (vph)	9	221	36	53	225	130	65	82	170	223	70	69
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	240	39	58	245	141	71	89	185	242	76	75

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	10	279	58	386	345	393
Volume Left (vph)	10	0	58	0	71	242
Volume Right (vph)	0	39	0	141	185	75
Hadj (s)	0.87	-0.06	0.65	-0.23	-0.22	0.05
Departure Headway (s)	9.9	9.0	9.3	8.4	8.1	8.1
Degree Utilization, x	0.03	0.69	0.15	0.90	0.78	0.89
Capacity (veh/h)	345	379	371	409	420	393
Control Delay (s)	12.0	28.7	12.7	49.5	34.0	48.3
Approach Delay (s)	28.1		44.7		34.0	48.3
Approach LOS	D		E		D	E

Intersection Summary			
Delay		39.9	
Level of Service		E	
Intersection Capacity Utilization		78.1%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	88	3	9	93	122	5	16	12	210	11	104
Future Volume (vph)	89	88	3	9	93	122	5	16	12	210	11	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.926			0.950			0.957	
Flt Protected		0.976			0.998			0.993			0.969	
Satd. Flow (prot)	0	1853	0	0	1775	0	0	1812	0	0	1748	0
Flt Permitted		0.976			0.998			0.993			0.969	
Satd. Flow (perm)	0	1853	0	0	1775	0	0	1812	0	0	1748	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	8		6	6		8	2		12	12		2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%
Adj. Flow (vph)	97	96	3	10	101	133	5	17	13	228	12	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	196	0	0	244	0	0	35	0	0	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 59.0%		ICU Level of Service B
Analysis Period (min) 15		

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	88	3	9	93	122	5	16	12	210	11	104
Future Volume (vph)	89	88	3	9	93	122	5	16	12	210	11	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	96	3	10	101	133	5	17	13	228	12	113

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	196	244	35	353
Volume Left (vph)	97	10	5	228
Volume Right (vph)	3	133	13	113
Hadj (s)	0.11	-0.32	-0.19	-0.03
Departure Headway (s)	5.4	4.9	5.5	5.1
Degree Utilization, x	0.30	0.34	0.05	0.50
Capacity (veh/h)	614	675	563	669
Control Delay (s)	10.7	10.4	8.8	13.0
Approach Delay (s)	10.7	10.4	8.8	13.0
Approach LOS	B	B	A	B

Intersection Summary				
Delay			11.5	
Level of Service			B	
Intersection Capacity Utilization			59.0%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2493	131	60	969	17	31	3	209	74	19	17
Future Volume (vph)	1	2493	131	60	969	17	31	3	209	74	19	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		0.99	0.97		0.99	0.99	
Frt		0.993			0.997			0.852			0.929	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5151	0	1552	5009	0	1733	1575	0	1785	1721	0
Flt Permitted	0.278			0.039			0.734			0.295		
Satd. Flow (perm)	520	5151	0	64	5009	0	1326	1575	0	549	1721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			5			72			17	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			101.9			114.1			106.4	
Travel Time (s)		28.2			6.1			8.2			7.7	
Confl. Peds. (#/hr)	8		4	4		8	6		10	10		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	4%	23%	3%	0%	1%	0%	5%	0%
Adj. Flow (vph)	1	2493	131	60	969	17	31	3	209	74	19	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2624	0	60	986	0	31	212	0	74	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

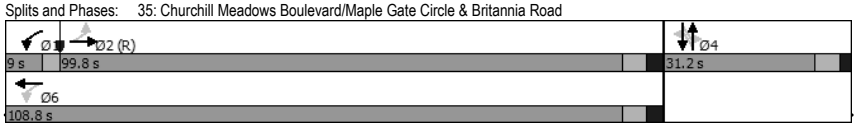
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			4	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		1	6		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		9.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	99.8	99.8		9.0	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	71.3%	71.3%		6.4%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	92.8	92.8		6.0	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		0.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-2.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0		5.2	5.2		4.2	5.2	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	11.0	11.0			11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0			18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	101.6	101.6		113.2	109.2		19.6	19.6		20.6	19.6	
Actuated g/C Ratio	0.73	0.73		0.81	0.78		0.14	0.14		0.15	0.14	
v/c Ratio	0.00	0.70		0.47	0.25		0.17	0.75		0.93	0.14	
Control Delay	2.0	2.2		27.9	4.8		52.2	53.8		139.0	31.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.0	2.2		27.9	4.8		52.2	53.8		139.0	31.9	
LOS	A	A		C	A		D	D		F	C	
Approach Delay		2.2			6.1			53.6			104.0	
Approach LOS		A			A			D			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 9.1 Intersection LOS: A
Intersection Capacity Utilization 86.6% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	2624	60	986	31	212	74	36
v/c Ratio	0.00	0.70	0.47	0.25	0.17	0.75	0.93	0.14
Control Delay	2.0	2.2	27.9	4.8	52.2	53.8	139.0	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	2.2	27.9	4.8	52.2	53.8	139.0	31.9
Queue Length 50th (m)	0.0	23.6	2.9	24.2	7.6	37.7	20.3	4.6
Queue Length 95th (m)	m0.0	m25.4	18.2	34.7	16.6	63.1	#44.9	14.2
Internal Link Dist (m)		445.7		77.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	377	3742	130	3909	246	351	105	333
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.70	0.46	0.25	0.13	0.60	0.70	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	17	21	42	67	20	11	181	34	16	220	7
Future Volume (vph)	12	17	21	42	67	20	11	181	34	16	220	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.942			0.979			0.980			0.996	
Flt Protected		0.988			0.984			0.998			0.997	
Satd. Flow (prot)	0	1753	0	0	1771	0	0	1835	0	0	1794	0
Flt Permitted		0.988			0.984			0.998			0.997	
Satd. Flow (perm)	0	1753	0	0	1771	0	0	1835	0	0	1794	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)			13	13			16		13	13		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	0%	5%	4%	5%	0%	3%	0%	0%	7%	0%
Adj. Flow (vph)	13	18	23	46	73	22	12	197	37	17	239	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	141	0	0	246	0	0	264	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	17	21	42	67	20	11	181	34	16	220	7
Future Volume (Veh/h)	12	17	21	42	67	20	11	181	34	16	220	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	18	23	46	73	22	12	197	37	17	239	8
Pedestrians		16			13			13				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			1			1				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	591	564	272	574	550	228	263			247		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	591	564	272	574	550	228	263			247		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	96	97	88	83	97	99			99		
cM capacity (veh/h)	338	409	753	376	420	794	1295			1316		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	54	141	246	264
Volume Left	13	46	12	17
Volume Right	23	22	37	8
cSH	478	435	1295	1316
Volume to Capacity	0.11	0.32	0.01	0.01
Queue Length 95th (m)	2.9	10.5	0.2	0.3
Control Delay (s)	13.5	17.2	0.5	0.6
Lane LOS	B	C	A	A
Approach Delay (s)	13.5	17.2	0.5	0.6
Approach LOS	B	C		

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	200	31	90	72	29	13	205	161	61	269	11
Future Volume (vph)	23	200	31	90	72	29	13	205	161	61	269	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.979			0.943			0.996	
Flt Protected		0.995			0.977			0.998			0.991	
Satd. Flow (prot)	0	1749	0	0	1779	0	0	1767	0	0	1867	0
Flt Permitted		0.995			0.977			0.998			0.991	
Satd. Flow (perm)	0	1749	0	0	1779	0	0	1767	0	0	1867	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	19		71	71		19	20		20	20		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	9%	0%	2%	5%	3%	15%	1%	3%	0%	2%	0%
Adj. Flow (vph)	25	217	34	98	78	32	14	223	175	66	292	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	276	0	0	208	0	0	412	0	0	370	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 79.3%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	200	31	90	72	29	13	205	161	61	269	11
Future Volume (vph)	23	200	31	90	72	29	13	205	161	61	269	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	217	34	98	78	32	14	223	175	66	292	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	276	208	412	370
Volume Left (vph)	25	98	14	66
Volume Right (vph)	34	32	175	12
Hadj (s)	0.07	0.06	-0.21	0.04
Departure Headway (s)	7.2	7.5	6.5	6.8
Degree Utilization, x	0.56	0.43	0.74	0.70
Capacity (veh/h)	443	411	521	497
Control Delay (s)	18.9	16.0	25.6	23.9
Approach Delay (s)	18.9	16.0	25.6	23.9
Approach LOS	C	C	D	C

Intersection Summary			
Delay	22.1		
Level of Service	C		
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	331	14	104	266	181	20	244	68	181	306	63
Future Volume (vph)	131	331	14	104	266	181	20	244	68	181	306	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	1.00		0.99	0.97		1.00	0.99		0.98	1.00	
Frt		0.994			0.939			0.967			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3578	0	1772	3163	0	1825	1794	0	1807	1821	0
Flt Permitted	0.441			0.517			0.384			0.447		
Satd. Flow (perm)	817	3578	0	954	3163	0	735	1794	0	832	1821	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			197			19			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	7%	3%	3%	8%	0%	2%	4%	1%	2%	5%
Adj. Flow (vph)	142	360	15	113	289	197	22	265	74	197	333	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	142	375	0	113	486	0	22	339	0	197	401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	47.0	47.0		47.0	47.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.5%	46.5%		46.5%	46.5%		53.5%	53.5%		53.5%	53.5%	
Maximum Green (s)	40.5	40.5		40.5	40.5		48.0	48.0		48.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	47.5	47.5		47.5	47.5		43.0	43.0		43.0	43.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.43	0.43		0.43	0.43	
v/c Ratio	0.37	0.22		0.25	0.31		0.07	0.44		0.56	0.51	
Control Delay	26.2	20.9		18.5	10.2		17.4	21.1		28.8	23.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.2	20.9		18.5	10.2		17.4	21.1		28.8	23.1	
LOS	C	C		B	B		B	C		C	C	
Approach Delay		22.4			11.8			20.9			24.9	
Approach LOS		C			B			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 113.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	375	113	486	22	339	197	401
v/c Ratio	0.37	0.22	0.25	0.31	0.07	0.44	0.56	0.51
Control Delay	26.2	20.9	18.5	10.2	17.4	21.1	28.8	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	20.9	18.5	10.2	17.4	21.1	28.8	23.1
Queue Length 50th (m)	18.6	24.6	12.6	16.4	2.5	43.8	28.9	55.3
Queue Length 95th (m)	m33.4	37.6	26.6	29.4	6.8	61.5	48.2	75.5
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	384	1686	449	1593	356	880	403	890
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.22	0.25	0.31	0.06	0.39	0.49	0.45

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	114	20	26	71	39	17	115	26	78	269	19
Future Volume (vph)	21	114	20	26	71	39	17	115	26	78	269	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.982			0.961			0.978			0.993	
Flt Protected		0.993			0.991			0.995			0.989	
Satd. Flow (prot)	0	1773	0	0	1788	0	0	1781	0	0	1786	0
Flt Permitted		0.993			0.991			0.995			0.989	
Satd. Flow (perm)	0	1773	0	0	1788	0	0	1781	0	0	1786	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	21		17	17		21	16		16	16		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	4%	3%	0%	6%	5%	4%	1%	7%	5%
Adj. Flow (vph)	23	124	22	28	77	42	18	125	28	85	292	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	169	0	0	147	0	0	171	0	0	398	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	114	20	26	71	39	17	115	26	78	269	19
Future Volume (vph)	21	114	20	26	71	39	17	115	26	78	269	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	124	22	28	77	42	18	125	28	85	292	21

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	169	147	171	398
Volume Left (vph)	23	28	18	85
Volume Right (vph)	22	42	28	21
Hadj (s)	0.05	-0.09	0.01	0.11
Departure Headway (s)	5.8	5.7	5.5	5.2
Degree Utilization, x	0.27	0.23	0.26	0.58
Capacity (veh/h)	560	562	595	660
Control Delay (s)	10.9	10.4	10.4	15.1
Approach Delay (s)	10.9	10.4	10.4	15.1
Approach LOS	B	B	B	C

Intersection Summary			
Delay		12.6	
Level of Service		B	
Intersection Capacity Utilization		53.1%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	206	15	29	119	14	22	122	121	67	279	36
Future Volume (vph)	22	206	15	29	119	14	22	122	121	67	279	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.988			0.938			0.987	
Flt Protected		0.995			0.991			0.996			0.991	
Satd. Flow (prot)	0	1748	0	0	1770	0	0	1717	0	0	1792	0
Flt Permitted		0.995			0.991			0.996			0.991	
Satd. Flow (perm)	0	1748	0	0	1770	0	0	1717	0	0	1792	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	8%	7%	7%	6%	7%	5%	6%	3%	1%	6%	3%
Adj. Flow (vph)	24	224	16	32	129	15	24	133	132	73	303	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	264	0	0	176	0	0	289	0	0	415	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	206	15	29	119	14	22	122	121	67	279	36
Future Volume (vph)	22	206	15	29	119	14	22	122	121	67	279	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	224	16	32	129	15	24	133	132	73	303	39

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	264	176	289	415
Volume Left (vph)	24	32	24	73
Volume Right (vph)	16	15	132	39
Hadj (s)	0.13	0.09	-0.18	0.06
Departure Headway (s)	6.7	6.9	6.1	6.1
Degree Utilization, x	0.49	0.34	0.49	0.70
Capacity (veh/h)	485	445	535	555
Control Delay (s)	15.9	13.3	15.0	22.3
Approach Delay (s)	15.9	13.3	15.0	22.3
Approach LOS	C	B	B	C

Intersection Summary				
Delay			17.6	
Level of Service			C	
Intersection Capacity Utilization			57.4%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	2202	1351	65	215	125
Future Volume (vph)	3	2202	1351	65	215	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt			0.993			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	3579	3443	0	1755	1183
Flt Permitted	0.151				0.950	
Satd. Flow (perm)	290	3579	3443	0	1755	1183
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			11			61
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	5%	8%	4%	38%
Adj. Flow (vph)	3	2202	1351	65	215	125
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	2202	1416	0	215	125
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

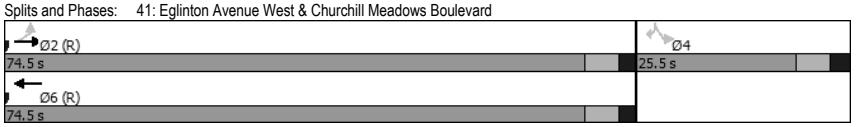
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				4	4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	24.0	24.0	24.0		25.5	25.5
Total Split (s)	74.5	74.5	74.5		25.5	25.5
Total Split (%)	74.5%	74.5%	74.5%		25.5%	25.5%
Maximum Green (s)	68.5	68.5	68.5		19.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	72.2	72.2	72.2		17.3	17.3
Actuated g/C Ratio	0.72	0.72	0.72		0.17	0.17
v/c Ratio	0.01	0.85	0.57		0.71	0.49
Control Delay	5.0	15.1	7.9		52.0	26.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	5.0	15.1	7.9		52.0	26.4
LOS	A	B	A		D	C
Approach Delay		15.1	7.9		42.6	
Approach LOS		B	A		D	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 14.9 — Intersection LOS: B
Intersection Capacity Utilization 81.5% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3	2202	1416	215	125
v/c Ratio	0.01	0.85	0.57	0.71	0.49
Control Delay	5.0	15.1	7.9	52.0	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	15.1	7.9	52.0	26.4
Queue Length 50th (m)	0.2	145.6	60.7	39.1	10.8
Queue Length 95th (m)	1.0	198.4	81.5	62.2	27.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	209	2585	2490	351	285
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.85	0.57	0.61	0.44

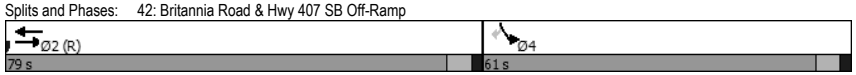
Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2085	671	0	434	6
Future Volume (vph)	0	2085	671	0	434	6
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5678	5622	0	1847	1524
Flt Permitted					0.950	
Satd. Flow (perm)	0	5678	5622	0	1847	1524
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						3
Link Speed (k/h)		80	80		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		9.3	13.4		15.0	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	0%	1%	2%	7%	16%
Adj. Flow (vph)	0	2106	678	0	438	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2106	678	0	438	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		79.0	79.0		61.0	61.0
Total Split (%)		56.4%	56.4%		43.6%	43.6%
Maximum Green (s)		73.0	73.0		55.0	55.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		88.6	88.6		39.4	39.4
Actuated g/C Ratio		0.63	0.63		0.28	0.28
v/c Ratio		0.59	0.19		0.84	0.01
Control Delay		16.8	6.4		61.9	24.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		16.8	6.4		61.9	24.5
LOS		B	A		E	C
Approach Delay		16.8	6.4		61.4	
Approach LOS		B	A		E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 20.7		Intersection LOS: C	
Intersection Capacity Utilization 69.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2106	678	438	6
v/c Ratio	0.59	0.19	0.84	0.01
Control Delay	16.8	6.4	61.9	24.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.8	6.4	61.9	24.5
Queue Length 50th (m)	118.1	12.0	114.5	0.6
Queue Length 95th (m)	158.7	14.4	140.5	3.6
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3593	3557	725	600
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.19	0.60	0.01

Intersection Summary

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2422	0	0	819	10	284
Future Volume (vph)	2422	0	0	819	10	284
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5678	0	0	5622	1847	1768
Flt Permitted					0.950	
Satd. Flow (perm)	5678	0	0	5622	1847	1768
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	80			80	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	13.4			9.8	11.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	1%	7%	0%
Adj. Flow (vph)	2523	0	0	853	10	296
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2523	0	0	853	10	296
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

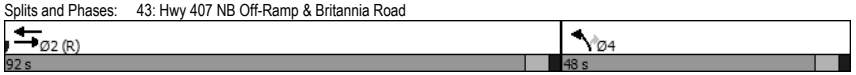
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	92.0			92.0	48.0	48.0
Total Split (%)	65.7%			65.7%	34.3%	34.3%
Maximum Green (s)	86.0			86.0	42.0	42.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	99.2			99.2	28.8	28.8
Actuated g/C Ratio	0.71			0.71	0.21	0.21
v/c Ratio	0.63			0.21	0.03	0.81
Control Delay	4.8			5.8	40.6	70.1
Queue Delay	0.2			0.0	0.0	0.0
Total Delay	5.0			5.8	40.6	70.1
LOS	A			A	D	E
Approach Delay	5.0			5.8	69.1	
Approach LOS	A			A	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 10.5 Intersection LOS: B
Intersection Capacity Utilization 69.5% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2523	853	10	296
v/c Ratio	0.63	0.21	0.03	0.81
Control Delay	4.8	5.8	40.6	70.1
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	5.0	5.8	40.6	70.1
Queue Length 50th (m)	47.6	19.1	2.3	78.9
Queue Length 95th (m)	49.7	m29.3	6.6	104.0
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4021	3982	554	530
Starvation Cap Reductn	13	0	0	0
Spillback Cap Reductn	560	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.21	0.02	0.56

Intersection Summary

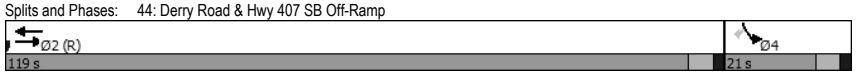
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3155	761	0	24	32
Future Volume (vph)	0	3155	761	0	24	32
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5622	5408	0	3686	1414
Flt Permitted					0.950	
Satd. Flow (perm)	0	5622	5408	0	3686	1414
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						33
Link Speed (k/h)		80	80		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		15.0	13.9		13.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	1%	5%	2%	4%	25%
Adj. Flow (vph)	0	3286	793	0	25	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	3286	793	0	25	33
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		119.0	119.0		21.0	21.0
Total Split (%)		85.0%	85.0%		15.0%	15.0%
Maximum Green (s)		113.0	113.0		15.0	15.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		123.8	123.8		8.2	8.2
Actuated g/C Ratio		0.88	0.88		0.06	0.06
v/c Ratio		0.66	0.17		0.12	0.29
Control Delay		3.8	0.5		63.5	25.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		3.8	0.5		63.5	25.8
LOS		A	A		E	C
Approach Delay		3.8	0.5		42.0	
Approach LOS		A	A		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 3.7	Intersection LOS: A
Intersection Capacity Utilization 73.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3286	793	25	33
v/c Ratio	0.66	0.17	0.12	0.29
Control Delay	3.8	0.5	63.5	25.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.8	0.5	63.5	25.8
Queue Length 50th (m)	85.7	3.2	3.4	0.0
Queue Length 95th (m)	99.6	3.8	8.2	10.9
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4970	4781	394	180
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.17	0.06	0.18

Intersection Summary

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2489	0	0	938	14	153
Future Volume (vph)	2489	0	0	938	14	153
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5622	0	0	5408	3582	1716
Flt Permitted					0.950	
Satd. Flow (perm)	5622	0	0	5408	3582	1716
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						156
Link Speed (k/h)	80			80	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	13.9			10.3	15.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	2%	2%	5%	7%	3%
Adj. Flow (vph)	2540	0	0	957	14	156
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2540	0	0	957	14	156
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

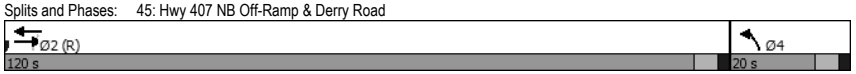
Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	120.0			120.0	20.0	120.0
Total Split (%)	85.7%			85.7%	14.3%	85.7%
Maximum Green (s)	114.0			114.0	14.0	114.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	132.0			132.0	8.0	132.0
Actuated g/C Ratio	0.94			0.94	0.06	0.94
v/c Ratio	0.48			0.19	0.07	0.10
Control Delay	0.9			0.2	63.4	0.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	0.9			0.2	63.4	0.3
LOS	A			A	E	A
Approach Delay	0.9			0.2	5.5	
Approach LOS	A			A	A	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 8 (6%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 1.0	Intersection LOS: A
Intersection Capacity Utilization 73.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2540	957	14	156
v/c Ratio	0.48	0.19	0.07	0.10
Control Delay	0.9	0.2	63.4	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	0.9	0.2	63.4	0.3
Queue Length 50th (m)	0.0	0.0	1.9	0.0
Queue Length 95th (m)	26.7	m2.9	5.6	2.4
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	5300	5099	358	1627
Starvation Cap Reductn	142	0	0	0
Spillback Cap Reductn	135	0	0	40
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.19	0.04	0.10

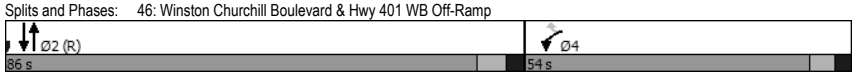
Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	472	498	1644	0	0	2324
Future Volume (vph)	472	498	1644	0	0	2324
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.957	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3409	1424	5513	0	0	5408
Flt Permitted	0.966					
Satd. Flow (perm)	3409	1424	5513	0	0	5408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	11	11				
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	8%	13%	3%	2%	0%	5%
Adj. Flow (vph)	536	566	1868	0	0	2641
Shared Lane Traffic (%)		38%				
Lane Group Flow (vph)	751	351	1868	0	0	2641
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	54.0	54.0	86.0			86.0
Total Split (%)	38.6%	38.6%	61.4%			61.4%
Maximum Green (s)	47.0	47.0	78.0			78.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	39.5	39.5	85.5			85.5
Actuated g/C Ratio	0.28	0.28	0.61			0.61
v/c Ratio	0.77	0.86	0.55			0.80
Control Delay	50.9	65.6	15.9			24.2
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	50.9	65.6	15.9			24.2
LOS	D	E	B			C
Approach Delay	55.5		15.9			24.2
Approach LOS	E		B			C

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 110.2 (79%), Referenced to phase 2:NBSB, Start of Green		
Natural Cycle: 75		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.86		
Intersection Signal Delay: 27.6		Intersection LOS: C
Intersection Capacity Utilization 71.2%		ICU Level of Service C
Analysis Period (min) 15		

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	751	351	1868	2641
v/c Ratio	0.77	0.86	0.55	0.80
Control Delay	50.9	65.6	15.9	24.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	50.9	65.6	15.9	24.2
Queue Length 50th (m)	96.2	97.4	102.2	198.4
Queue Length 95th (m)	107.7	127.6	116.0	233.9
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1151	485	3366	3302
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.72	0.55	0.80

Intersection Summary

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	704	370	0	1411	2333	0
Future Volume (vph)	704	370	0	1411	2333	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3685	1593	0	5567	5408	0
Flt Permitted	0.955					
Satd. Flow (perm)	3685	1593	0	5567	5408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1	1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	4%	1%	0%	2%	5%	8%
Adj. Flow (vph)	800	420	0	1603	2651	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	842	378	0	1603	2651	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

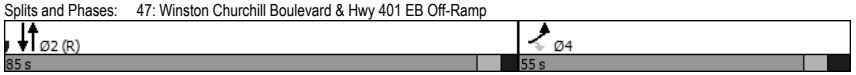
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	55.0	55.0		85.0	85.0	
Total Split (%)	39.3%	39.3%		60.7%	60.7%	
Maximum Green (s)	47.0	47.0		78.0	78.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	39.9	39.9		85.1	85.1	
Actuated g/C Ratio	0.28	0.28		0.61	0.61	
v/c Ratio	0.80	0.83		0.47	0.81	
Control Delay	52.2	62.4		16.4	21.5	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	52.2	62.4		16.4	21.5	
LOS	D	E		B	C	
Approach Delay	55.4			16.4	21.5	
Approach LOS	E			B	C	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 100.4 (72%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 27.5 Intersection LOS: C
Intersection Capacity Utilization 76.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	842	378	1603	2651
v/c Ratio	0.80	0.83	0.47	0.81
Control Delay	52.2	62.4	16.4	21.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.2	62.4	16.4	21.5
Queue Length 50th (m)	111.3	107.5	85.7	141.2
Queue Length 95th (m)	121.7	136.3	106.4	201.3
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	1237	535	3382	3285
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.71	0.47	0.81

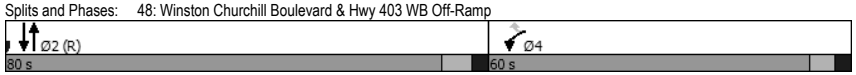
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	984	920	2616	0	0	2928
Future Volume (vph)	984	920	2616	0	0	2928
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.963	0.850				
Flt Protected	0.964					
Satd. Flow (prot)	3550	1547	5513	0	0	5513
Flt Permitted	0.964					
Satd. Flow (perm)	3548	1547	5513	0	0	5513
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	4%	3%	0%	0%	3%
Adj. Flow (vph)	1047	979	2783	0	0	3115
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	1390	636	2783	0	0	3115
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	60.0	60.0	80.0			80.0
Total Split (%)	42.9%	42.9%	57.1%			57.1%
Maximum Green (s)	53.0	53.0	72.0			72.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	53.0	53.0	72.0			72.0
Actuated g/C Ratio	0.38	0.38	0.51			0.51
v/c Ratio	1.03	1.09	0.98			1.10
Control Delay	76.4	104.2	44.5			83.7
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	76.4	104.2	44.5			83.7
LOS	E	F	D			F
Approach Delay	85.1		44.5			83.7
Approach LOS	F		D			F

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 125.6 (90%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 70.3		Intersection LOS: E	
Intersection Capacity Utilization 133.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1390	636	2783	3115
v/c Ratio	1.03	1.09	0.98	1.10
Control Delay	76.4	104.2	44.5	83.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	76.4	104.2	44.5	83.7
Queue Length 50th (m)	~212.6	~216.5	242.0	~357.1
Queue Length 95th (m)	#254.3	#295.6	#311.1	#379.8
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1343	585	2835	2835
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	1.09	0.98	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1261	453	0	1535	2514	0
Future Volume (vph)	1261	453	0	1535	2514	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor	1.00					
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3795	1733	0	5460	5513	0
Flt Permitted	0.950					
Satd. Flow (perm)	3789	1733	0	5460	5513	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	0%	4%	3%	0%
Adj. Flow (vph)	1314	472	0	1599	2619	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1314	472	0	1599	2619	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

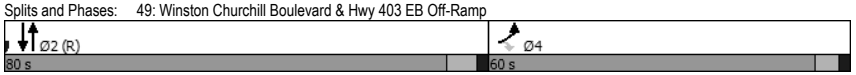
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	60.0	60.0		80.0	80.0	
Total Split (%)	42.9%	42.9%		57.1%	57.1%	
Maximum Green (s)	54.0	54.0		73.0	73.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	52.8	52.8		74.2	74.2	
Actuated g/C Ratio	0.38	0.38		0.53	0.53	
v/c Ratio	0.92	0.72		0.55	0.90	
Control Delay	52.5	44.4		23.0	35.5	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	52.5	44.4		23.0	35.5	
LOS	D	D		C	D	
Approach Delay	50.3			23.0	35.5	
Approach LOS	D			C	D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 58.4 (42%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 36.6 Intersection LOS: D
Intersection Capacity Utilization 133.3% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1314	472	1599	2619
v/c Ratio	0.92	0.72	0.55	0.90
Control Delay	52.5	44.4	23.0	35.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.5	44.4	23.0	35.5
Queue Length 50th (m)	174.9	109.4	106.6	259.0
Queue Length 95th (m)	205.3	150.0	120.5	m231.3
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	1463	669	2893	2921
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.90	0.71	0.55	0.90

Intersection Summary

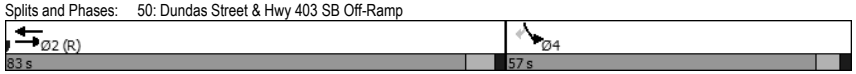
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3117	661	0	1312	588
Future Volume (vph)	0	3117	661	0	1312	588
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.994	0.850
Flt Protected					0.954	
Satd. Flow (prot)	0	5567	5307	0	3635	1449
Flt Permitted					0.954	
Satd. Flow (perm)	0	5567	5307	0	3635	1449
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					4	211
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	7%	0%	5%	11%
Adj. Flow (vph)	0	3213	681	0	1353	606
Shared Lane Traffic (%)						10%
Lane Group Flow (vph)	0	3213	681	0	1414	545
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		83.0	83.0		57.0	57.0
Total Split (%)		59.3%	59.3%		40.7%	40.7%
Maximum Green (s)		76.0	76.0		51.0	51.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		76.0	76.0		51.0	51.0
Actuated g/C Ratio		0.54	0.54		0.36	0.36
v/c Ratio		1.06	0.24		1.07	0.82
Control Delay		67.9	7.3		86.9	36.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		67.9	7.3		86.9	36.0
LOS		E	A		F	D
Approach Delay		67.9	7.3		72.7	
Approach LOS		E	A		E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 30.4 (22%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 62.4	Intersection LOS: E
Intersection Capacity Utilization 106.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3213	681	1414	545
v/c Ratio	1.06	0.24	1.07	0.82
Control Delay	67.9	7.3	86.9	36.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	67.9	7.3	86.9	36.0
Queue Length 50th (m)	~358.1	12.3	~222.2	98.3
Queue Length 95th (m)	#380.0	14.6	#264.5	#159.3
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	3022	2880	1326	661
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	0.24	1.07	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2909	0	0	1090	142	1128
Future Volume (vph)	2909	0	0	1090	142	1128
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Ped Bike Factor					1.00	
Frt					0.880	0.850
Flt Protected					0.990	
Satd. Flow (prot)	5513	0	0	5357	3453	1577
Flt Permitted					0.990	
Satd. Flow (perm)	5513	0	0	5357	3452	1577
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	0%	6%	1%	2%
Adj. Flow (vph)	3232	0	0	1211	158	1253
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	3232	0	0	1211	785	626
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	83.0			83.0	57.0	57.0
Total Split (%)	59.3%			59.3%	40.7%	40.7%
Maximum Green (s)	76.0			76.0	51.0	51.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	76.0			76.0	51.0	51.0
Actuated g/C Ratio	0.54			0.54	0.36	0.36
v/c Ratio	1.08			0.42	0.99dr	1.09
Control Delay	67.8			19.4	39.3	106.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	67.8			19.4	39.3	106.4
LOS	E			B	D	F
Approach Delay	67.8			19.4	69.1	
Approach LOS	E			B	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 16.4 (12%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 58.1 Intersection LOS: E
Intersection Capacity Utilization 106.7% ICU Level of Service G
Analysis Period (min) 15
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street

Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	3232	1211	785	626
v/c Ratio	1.08	0.42	0.99dr	1.09
Control Delay	67.8	19.4	39.3	106.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	67.8	19.4	39.3	106.4
Queue Length 50th (m)	~363.1	70.1	91.8	~213.8
Queue Length 95th (m)	m#295.7	81.0	112.8	#293.4
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	2992	2908	1257	574
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.42	0.62	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	25	40	490	176	104	625
Future Volume (vph)	25	40	490	176	104	625
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.960			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3435	0	1789	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	3435	0	1789	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	273.4		780.0			514.0
Travel Time (s)	20.5		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	40	490	176	104	625
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	40	666	0	104	625
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
52: Ninth Line & Argentia Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	40	490	176	104	625
Future Volume (Veh/h)	25	40	490	176	104	625
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	40	490	176	104	625
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1098	333			666	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1098	333			666	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	94			89	
cM capacity (veh/h)	184	663			919	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	25	40	327	339	104	312	312
Volume Left	25	0	0	0	104	0	0
Volume Right	0	40	0	176	0	0	0
cSH	184	663	1700	1700	919	1700	1700
Volume to Capacity	0.14	0.06	0.19	0.20	0.11	0.18	0.18
Queue Length 95th (m)	3.5	1.5	0.0	0.0	2.9	0.0	0.0
Control Delay (s)	27.7	10.8	0.0	0.0	9.4	0.0	0.0
Lane LOS	D	B			A		
Approach Delay (s)	17.3		0.0		1.3		
Approach LOS	C						

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
97: Ninth Line & Foxwood Ave

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	772	0	0	661
Future Volume (vph)	0	0	772	0	0	661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				15.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	3579	0	1883	3579
Flt Permitted						
Satd. Flow (perm)	1883	0	3579	0	1883	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	226.1		301.0			850.0
Travel Time (s)	17.0		15.5			43.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	772	0	0	661
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	772	0	0	661
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
97: Ninth Line & Foxwood Ave

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	772	0	0	661
Future Volume (Veh/h)	0	0	772	0	0	661
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	772	0	0	661
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			301			
pX, platoon unblocked						
vC, conflicting volume	1102	386			772	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1102	386			772	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	206	612			839	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	386	386	0	330	330
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.23	0.23	0.00	0.19	0.19
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
136: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1165	275	0	1169	0	0
Future Volume (vph)	1165	275	0	1169	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	125.7	
Travel Time (s)	15.5			6.8	9.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1165	275	0	1169	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1165	275	0	1169	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 71.2%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
136: Winston Churchill Boulevard

16/06/2017

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1328	85	58	738
Future Volume (vph)	90	47	1328	85	58	738
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.98				
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3546	0	1825	3544
Flt Permitted	0.950				0.142	
Satd. Flow (perm)	1807	1607	3546	0	273	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	14			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1443	92	63	802
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1535	0	63	802
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

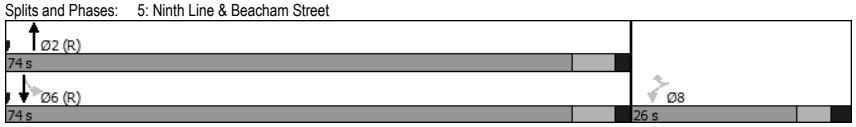
Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	26.0	26.0	74.0		74.0	74.0
Total Split (%)	26.0%	26.0%	74.0%		74.0%	74.0%
Maximum Green (s)	19.5	19.5	67.0		67.0	67.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	12.0	12.0	80.6		80.6	80.6
Actuated g/C Ratio	0.12	0.12	0.81		0.81	0.81
v/c Ratio	0.45	0.22	0.54		0.29	0.28
Control Delay	47.1	13.1	5.4		8.2	3.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.1	13.1	5.4		8.2	3.7
LOS	D	B	A		A	A
Approach Delay	35.5		5.4			4.0
Approach LOS	D		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 6.7		Intersection LOS: A	
Intersection Capacity Utilization 64.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	98	51	1535	63	802
v/c Ratio	0.45	0.22	0.54	0.29	0.28
Control Delay	47.1	13.1	5.4	8.2	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	13.1	5.4	8.2	3.7
Queue Length 50th (m)	18.0	0.0	51.2	3.0	19.8
Queue Length 95th (m)	32.2	9.9	79.2	10.7	31.7
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	370	369	2860	220	2856
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.14	0.54	0.29	0.28

Intersection Summary

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	3	646	7	3	684
Future Volume (vph)	11	3	646	7	3	684
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950					
Satd. Flow (prot)	1825	1633	1880	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1633	1880	0	0	1865
Link Speed (k/h)	48		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.3		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	3%
Adj. Flow (vph)	12	3	702	8	3	743
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	3	710	0	0	746
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.4%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	111	511	49	30	33	183	736	86	69	884	25
Future Volume (vph)	74	111	511	49	30	33	183	736	86	69	884	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.877			0.918			0.984			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1652	0	1825	1684	0	1789	3549	0	1722	3530	0
Flt Permitted	0.714			0.131			0.207			0.244		
Satd. Flow (perm)	1345	1652	0	252	1684	0	390	3549	0	442	3530	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71			36			17			3	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		131.8			287.6			434.9			780.0	
Travel Time (s)		9.9			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	7%	2%	1%	3%	6%	3%	2%
Adj. Flow (vph)	74	111	511	53	30	36	183	800	93	75	961	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	74	622	0	53	66	0	183	893	0	75	986	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

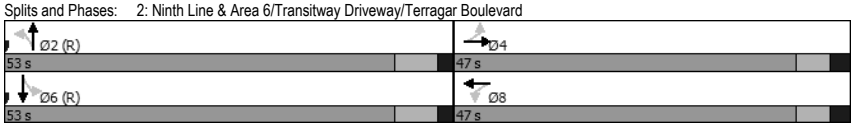
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		53.0	53.0		52.0	52.0	
Total Split (s)	47.0	47.0		47.0	47.0		53.0	53.0		53.0	53.0	
Total Split (%)	47.0%	47.0%		47.0%	47.0%		53.0%	53.0%		53.0%	53.0%	
Maximum Green (s)	40.5	40.5		40.5	40.5		46.0	46.0		46.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	38.7	38.7		38.7	38.7		49.8	49.8		49.8	49.8	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.50	0.50		0.50	0.50	
v/c Ratio	0.14	0.91		0.55	0.10		0.94	0.50		0.34	0.56	
Control Delay	19.5	44.4		46.4	10.2		81.0	18.3		22.3	19.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.5	44.4		46.4	10.2		81.0	18.3		22.3	19.6	
LOS	B	D		D	B		F	B		C	B	
Approach Delay		41.8			26.3			29.0			19.8	
Approach LOS		D			C			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 28.6 — Intersection LOS: C
Intersection Capacity Utilization 90.7% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	622	53	66	183	893	75	986
v/c Ratio	0.14	0.91	0.55	0.10	0.94	0.50	0.34	0.56
Control Delay	19.5	44.4	46.4	10.2	81.0	18.3	22.3	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	44.4	46.4	10.2	81.0	18.3	22.3	19.6
Queue Length 50th (m)	8.7	96.5	7.4	3.4	34.2	60.9	9.0	71.2
Queue Length 95th (m)	17.7	#161.0	#24.6	11.2	#78.4	78.5	21.3	90.7
Internal Link Dist (m)		107.8		263.6		410.9		756.0
Turn Bay Length (m)					40.0		40.0	
Base Capacity (vph)	558	727	104	719	194	1775	219	1758
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.86	0.51	0.09	0.94	0.50	0.34	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	62	28	0	17	29	847	45	35	1510	8
Future Volume (vph)	8	0	62	28	0	17	29	847	45	35	1510	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.992			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1541	0	1789	3517	0	1825	3575	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1541	0	1789	3517	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		124.9			310.4			412.4			434.9	
Travel Time (s)		9.4			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	6%	2%	3%	2%	0%	2%	2%
Adj. Flow (vph)	8	0	62	30	0	18	29	921	49	38	1641	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	62	0	30	18	0	29	970	0	38	1649	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.9%		ICU Level of Service B	
Analysis Period (min) 15			

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	730	244	235	2016	120	143	507	219	259	820	212
Future Volume (vph)	168	730	244	235	2016	120	143	507	219	259	820	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00							
Frt		0.962			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	4922	0	1785	5139	0	1767	3650	1597	1733	3650	1597
Flt Permitted	0.071			0.197			0.161			0.451		
Satd. Flow (perm)	133	4922	0	370	5139	0	300	3650	1597	823	3650	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		67			8				219			153
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	4%	1%	0%	0%	3%	0%	0%
Adj. Flow (vph)	168	730	244	235	2016	120	143	507	219	259	820	212
Shared Lane Traffic (%)												
Lane Group Flow (vph)	168	974	0	235	2136	0	143	507	219	259	820	212
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

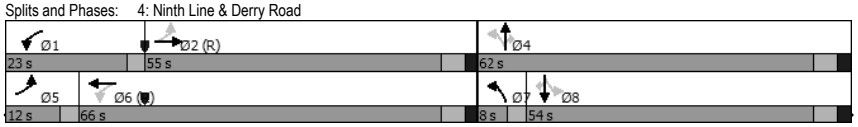
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	30.1		8.0	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	12.0	55.0		23.0	66.0		8.0	62.0	62.0	54.0	54.0	54.0
Total Split (%)	8.6%	39.3%		16.4%	47.1%		5.7%	44.3%	44.3%	38.6%	38.6%	38.6%
Maximum Green (s)	9.0	48.9		20.0	59.9		5.0	55.6	55.6	47.6	47.6	47.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.1		0.0	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.1		2.0	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0	0	0	0
Act Effct Green (s)	70.0	56.5		77.1	62.2		58.3	54.9	54.9	46.9	46.9	46.9
Actuated g/C Ratio	0.50	0.40		0.55	0.44		0.42	0.39	0.39	0.34	0.34	0.34
v/c Ratio	0.89	0.48		0.64	0.93		0.76	0.35	0.29	0.94	0.67	0.33
Control Delay	83.6	22.3		22.6	39.8		54.4	30.6	4.2	86.6	42.9	11.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.6	22.3		22.6	39.8		54.4	30.6	4.2	86.6	42.9	11.5
LOS	F	C		C	D		D	C	A	F	D	B
Approach Delay		31.3			38.1			27.9			46.5	
Approach LOS		C			D			C			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 37.1 Intersection LOS: D
Intersection Capacity Utilization 96.9% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	168	974	235	2136	143	507	219	259	820	212
v/c Ratio	0.89	0.48	0.64	0.93	0.76	0.35	0.29	0.94	0.67	0.33
Control Delay	83.6	22.3	22.6	39.8	54.4	30.6	4.2	86.6	42.9	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.6	22.3	22.6	39.8	54.4	30.6	4.2	86.6	42.9	11.5
Queue Length 50th (m)	29.0	44.3	21.1	207.4	24.3	50.6	0.0	68.2	100.3	11.1
Queue Length 95th (m)	#71.6	51.7	33.1	#242.2	#47.7	65.0	15.4	#121.3	122.3	30.2
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	189	2026	418	2287	187	1475	776	285	1267	654
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.48	0.56	0.93	0.76	0.34	0.28	0.91	0.65	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	859	67	49	1466
Future Volume (vph)	46	47	859	67	49	1466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.989			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3478	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1585	3478	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	934	73	53	1593
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	1007	0	53	1593
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.2%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	56	34	66	76	63	59	853	109	100	1236	53
Future Volume (vph)	32	56	34	66	76	63	59	853	109	100	1236	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		27.0	50.0		60.0	115.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.943			0.929			0.983			0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1776	0	1789	1738	0	1789	3526	0	1825	3557	0
Flt Permitted	0.554			0.699			0.165			0.257		
Satd. Flow (perm)	1043	1776	0	1317	1738	0	311	3526	0	494	3557	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			40			31			9	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		104.1			255.0			1151.0			603.1	
Travel Time (s)		7.8			18.4			59.2			31.0	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	32	56	34	72	76	68	59	927	118	109	1343	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	90	0	72	144	0	59	1045	0	109	1396	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

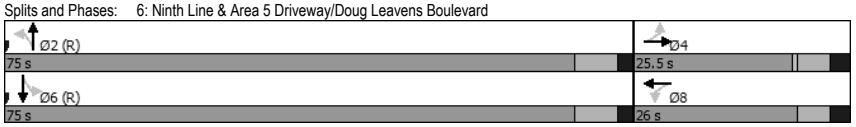
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		45.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		53.0	53.0		53.0	53.0	
Total Split (s)	25.5	25.5		26.0	26.0		75.0	75.0		75.0	75.0	
Total Split (%)	25.2%	25.2%		25.7%	25.7%		74.3%	74.3%		74.3%	74.3%	
Maximum Green (s)	19.0	19.0		19.5	19.5		68.0	68.0		68.0	68.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	12.9	12.9		12.9	12.9		76.6	76.6		76.6	76.6	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.76	0.76		0.76	0.76	
v/c Ratio	0.24	0.36		0.43	0.56		0.25	0.39		0.29	0.52	
Control Delay	42.7	32.0		47.7	37.7		14.1	10.3		6.8	6.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	42.7	32.0		47.7	37.7		14.1	10.3		6.8	6.0	
LOS	D	C		D	D		B	B		A	A	
Approach Delay		34.8			41.0			10.5			6.0	
Approach LOS		C			D			B			A	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 11.4 — Intersection LOS: B
Intersection Capacity Utilization 108.9% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard



Queues
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	32	90	72	144	59	1045	109	1396
v/c Ratio	0.24	0.36	0.43	0.56	0.25	0.39	0.29	0.52
Control Delay	42.7	32.0	47.7	37.7	14.1	10.3	6.8	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	32.0	47.7	37.7	14.1	10.3	6.8	6.0
Queue Length 50th (m)	5.8	11.4	13.3	19.3	5.7	59.5	5.3	45.7
Queue Length 95th (m)	14.0	24.4	25.5	36.4	m15.2	94.3	15.3	73.6
Internal Link Dist (m)		80.1		231.0		1127.0		579.1
Turn Bay Length (m)					50.0		115.0	
Base Capacity (vph)	211	381	267	384	235	2683	374	2701
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.24	0.27	0.38	0.25	0.39	0.29	0.52

Intersection Summary

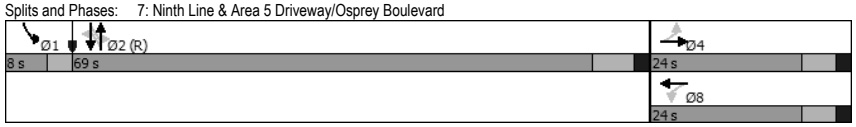
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	18	24	135	18	44	41	1075	148	71	1490	37
Future Volume (vph)	22	18	24	135	18	44	41	1075	148	71	1490	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	13.0		0.0	35.0		25.0	270.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			13.0			2.5			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.914			0.891			0.982			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1721	0	1738	1604	0	1789	3476	0	1825	3501	0
Flt Permitted	0.714			0.730			0.089			0.157		
Satd. Flow (perm)	1345	1721	0	1336	1604	0	168	3476	0	302	3501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			48			28			4	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		142.6			160.0			383.2			1151.0	
Travel Time (s)		10.7			11.5			19.7			59.2	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	7%	2%	3%	4%	0%	4%	2%
Adj. Flow (vph)	22	18	24	147	18	48	41	1168	161	77	1620	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	42	0	147	66	0	41	1329	0	77	1657	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		52.0	52.0		8.0	52.0	
Total Split (s)	24.0	24.0		24.0	24.0		69.0	69.0		8.0	69.0	
Total Split (%)	23.8%	23.8%		23.8%	23.8%		68.3%	68.3%		7.9%	68.3%	
Maximum Green (s)	18.0	18.0		18.0	18.0		62.0	62.0		5.0	62.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		37.0	37.0			37.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	16.0	16.0		16.0	16.0		67.1	67.1		76.4	67.1	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.66	0.66		0.76	0.66	
v/c Ratio	0.10	0.14		0.69	0.22		0.37	0.57		0.24	0.71	
Control Delay	35.8	20.7		57.0	16.6		21.4	11.1		6.1	17.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.8	20.7		57.0	16.6		21.4	11.1		6.1	17.6	
LOS	D	C		E	B		C	B		A	B	
Approach Delay		25.9			44.5			11.4			17.1	
Approach LOS		C			D			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 16.7		Intersection LOS: B	
Intersection Capacity Utilization 82.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 7: Ninth Line & Area 5 Driveway/Osprey Boulevard



Queues
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	42	147	66	41	1329	77	1657
v/c Ratio	0.10	0.14	0.69	0.22	0.37	0.57	0.24	0.71
Control Delay	35.8	20.7	57.0	16.6	21.4	11.1	6.1	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	20.7	57.0	16.6	21.4	11.1	6.1	17.6
Queue Length 50th (m)	3.7	3.0	27.1	3.0	3.6	74.2	3.0	115.2
Queue Length 95th (m)	10.2	11.9	46.7	14.1	14.4	93.8	10.9	170.6
Internal Link Dist (m)		118.6		136.0		359.2		1127.0
Turn Bay Length (m)			13.0		35.0		270.0	
Base Capacity (vph)	253	343	251	340	111	2317	327	2326
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.12	0.59	0.19	0.37	0.57	0.24	0.71

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	10	14	0	19	18	1047	20	32	1165	16
Future Volume (vph)	9	0	10	14	0	19	18	1047	20	32	1165	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			60.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.850			0.850			0.997			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3604	0	1825	3571	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3604	0	1825	3571	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		101.3			207.4			254.7			383.2	
Travel Time (s)		7.6			14.9			13.1			19.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	2%	2%
Adj. Flow (vph)	9	0	10	15	0	21	18	1138	22	35	1266	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	10	0	15	21	0	18	1160	0	35	1282	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

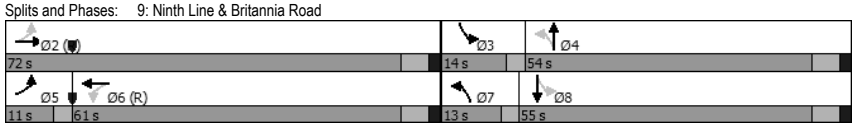
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.0% ICU Level of Service A
Analysis Period (min) 15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	925	255	127	1546	147	190	1132	113	187	1091	162
Future Volume (vph)	162	925	255	127	1546	147	190	1132	113	187	1091	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.968			0.987			0.986			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	4998	0	1767	5167	0	1767	3589	0	1684	3545	0
Flt Permitted	0.070			0.200			0.083			0.081		
Satd. Flow (perm)	130	4998	0	372	5167	0	154	3589	0	144	3545	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		67			13			8			13	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	1%	0%	2%	1%	0%	3%	6%	1%	1%
Adj. Flow (vph)	162	925	255	127	1546	147	190	1132	113	187	1091	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	162	1180	0	127	1693	0	190	1245	0	187	1253	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	8.0	24.6		24.6	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	11.0	72.0		61.0	61.0		13.0	54.0		14.0	55.0	
Total Split (%)	7.9%	51.4%		43.6%	43.6%		9.3%	38.6%		10.0%	39.3%	
Maximum Green (s)	8.0	65.4		54.4	54.4		10.0	47.4		11.0	48.4	
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	0.0	2.0		2.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	2.0	5.6		5.6	5.6		2.0	5.6		2.0	5.6	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0			12.0			12.0	
Flash Dont Walk (s)		11.0		11.0	11.0			18.0			18.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	70.0	66.4		55.4	55.4		63.0	48.4		65.0	49.4	
Actuated g/C Ratio	0.50	0.47		0.40	0.40		0.45	0.35		0.46	0.35	
v/c Ratio	0.95	0.49		0.86	0.83		0.97	1.00		0.94	1.00	
Control Delay	93.1	36.8		80.9	39.0		90.5	70.5		84.8	68.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	93.1	36.8		80.9	39.0		90.5	70.5		84.8	68.7	
LOS	F	D		F	D		F	E		F	E	
Approach Delay		43.6			41.9			73.2			70.8	
Approach LOS		D			D			E			E	

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 32.2 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.00		
Intersection Signal Delay: 56.6		Intersection LOS: E
Intersection Capacity Utilization 104.0%		ICU Level of Service G
Analysis Period (min) 15		

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	162	1180	127	1693	190	1245	187	1253
v/c Ratio	0.95	0.49	0.86	0.83	0.97	1.00	0.94	1.00
Control Delay	93.1	36.8	80.9	39.0	90.5	70.5	84.8	68.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.1	36.8	80.9	39.0	90.5	70.5	84.8	68.7
Queue Length 50th (m)	36.6	102.8	31.9	152.7	36.3	180.2	36.1	180.3
Queue Length 95th (m)	#75.2	117.8	#73.4	172.2	#85.4	#230.1	#83.0	#230.0
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	170	2405	147	2052	196	1246	198	1259
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.49	0.86	0.83	0.97	1.00	0.94	1.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	12	14	0	13	3	1268	22	26	1448	10
Future Volume (vph)	55	0	12	14	0	13	3	1268	22	26	1448	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.997			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		103.7			491.2			170.0			206.5	
Travel Time (s)		7.8			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	55	0	12	15	0	14	3	1378	24	28	1574	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	12	0	15	14	0	3	1402	0	28	1584	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 56.7% ICU Level of Service B
Analysis Period (min) 15

Lanes, Volumes, Timings
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	3	19	9	3	44	5	1286	35	37	1382	18
Future Volume (vph)	45	3	19	9	3	44	5	1286	35	37	1382	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.870			0.859			0.996			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1639	0	1825	1648	0	1789	3592	0	1825	3606	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1639	0	1825	1648	0	1789	3592	0	1825	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		90.3			511.9			217.0			170.0	
Travel Time (s)		6.8			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	9%	0%	1%	2%
Adj. Flow (vph)	45	3	19	10	3	48	5	1398	38	40	1502	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	22	0	10	51	0	5	1436	0	40	1520	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 54.6% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	5	1297	20	12	1425
Future Volume (vph)	9	5	1297	20	12	1425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		35.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3572	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3572	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	1%
Adj. Flow (vph)	10	5	1410	22	13	1549
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	5	1432	0	13	1549
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.4% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	9	1296	13	6	1359
Future Volume (vph)	3	9	1296	13	6	1359
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3611	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3611	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	3	10	1409	14	7	1477
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	10	1423	0	7	1477
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.6%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1	10	113	1	101	17	1245	149	93	1262	10
Future Volume (vph)	7	1	10	113	1	101	17	1245	149	93	1262	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		35.0	28.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			45.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor								1.00		1.00		
Frt		0.864			0.851			0.984			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1627	0	1807	1557	0	1789	3554	0	1807	3575	0
Flt Permitted	0.678			0.750			0.143			0.114		
Satd. Flow (perm)	1277	1627	0	1427	1557	0	269	3554	0	217	3575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			110			21			1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		170.8			534.8			346.0			306.2	
Travel Time (s)		12.8			38.5			17.8			15.7	
Confl. Peds. (#/hr)									6	6		
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	1%	2%	5%	2%	1%	0%	1%	2%	2%
Adj. Flow (vph)	7	1	10	123	1	110	17	1353	162	101	1372	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	11	0	123	111	0	17	1515	0	101	1382	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

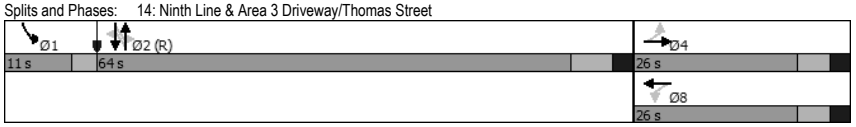
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		52.5	52.5		8.0	52.5	
Total Split (s)	26.0	26.0		26.0	26.0		64.0	64.0		11.0	64.0	
Total Split (%)	25.7%	25.7%		25.7%	25.7%		63.4%	63.4%		10.9%	63.4%	
Maximum Green (s)	19.5	19.5		19.5	19.5		56.5	56.5		8.0	56.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		0.0	2.5	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.5	6.5		2.0	6.5	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		33.0	33.0			33.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0			12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	14.9	14.9		14.9	14.9		66.0	66.0		77.0	66.0	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.65	0.65		0.76	0.65	
v/c Ratio	0.04	0.04		0.59	0.34		0.10	0.65		0.35	0.59	
Control Delay	34.4	18.7		46.6	12.5		14.7	21.6		6.6	12.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.4	18.7		46.6	12.5		14.7	21.6		6.6	12.5	
LOS	C	B		D	B		B	C		A	B	
Approach Delay		24.8			30.4			21.6			12.1	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 17.9 Intersection LOS: B
Intersection Capacity Utilization 100.2% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 14: Ninth Line & Area 3 Driveway/Thomas Street



Queues
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	11	123	111	17	1515	101	1382
v/c Ratio	0.04	0.04	0.59	0.34	0.10	0.65	0.35	0.59
Control Delay	34.4	18.7	46.6	12.5	14.7	21.6	6.6	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	18.7	46.6	12.5	14.7	21.6	6.6	12.5
Queue Length 50th (m)	1.2	0.2	23.2	0.3	2.0	147.1	3.7	76.9
Queue Length 95th (m)	4.8	4.8	41.0	17.8	m4.5	183.5	9.3	117.0
Internal Link Dist (m)		146.8		510.8		322.0		282.2
Turn Bay Length (m)					30.0		28.0	
Base Capacity (vph)	259	338	289	403	175	2330	308	2337
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.43	0.28	0.10	0.65	0.33	0.59

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	6	1312	27	19	1318
Future Volume (vph)	9	6	1312	27	19	1318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.944		0.997			
Flt Protected	0.971				0.950	
Satd. Flow (prot)	1761	0	3604	0	1825	3614
Flt Permitted	0.971				0.950	
Satd. Flow (perm)	1761	0	3604	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	10	7	1426	29	21	1433
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	1455	0	21	1433
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.1% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	34	37	1394	75	56	1394
Future Volume (vph)	34	37	1394	75	56	1394
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.992			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3553	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3553	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	37	40	1515	82	61	1515
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	40	1597	0	61	1515
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 56.5% ICU Level of Service B
Analysis Period (min) 15

Lanes, Volumes, Timings
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	9	0	0	6	15	1419	5	10	1359	13
Future Volume (vph)	8	0	9	0	0	6	15	1419	5	10	1359	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	70.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.929			0.865						0.999	
Flt Protected		0.977					0.950			0.950		
Satd. Flow (prot)	0	1709	0	0	1662	0	1789	3614	0	1825	3575	0
Flt Permitted		0.977					0.950			0.950		
Satd. Flow (perm)	0	1709	0	0	1662	0	1789	3614	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		89.2			113.3			424.8			250.0	
Travel Time (s)		6.7			8.2			21.8			12.9	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	2%	2%
Adj. Flow (vph)	8	0	9	0	0	7	15	1542	5	11	1477	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	17	0	0	7	0	15	1547	0	11	1490	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.7%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	56	76	1358	61	54	1209
Future Volume (vph)	56	76	1358	61	54	1209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3567	0	1825	3579
Flt Permitted	0.950				0.127	
Satd. Flow (perm)	1789	1585	3567	0	244	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		83	9			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	1%	18%	0%	2%
Adj. Flow (vph)	61	83	1476	66	59	1314
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	83	1542	0	59	1314
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

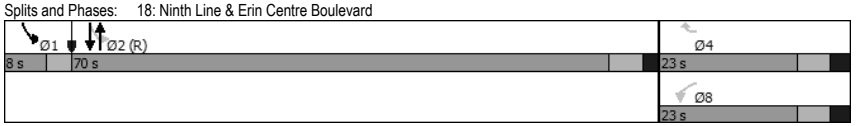
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	23.0	23.0	70.0		8.0	70.0
Total Split (%)	22.8%	22.8%	69.3%		7.9%	69.3%
Maximum Green (s)	16.5	16.5	64.0		5.0	64.0
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	8.0	8.0	50.0			50.0
Flash Dont Walk (s)	8.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	10.4	10.4	76.6		84.4	76.6
Actuated g/C Ratio	0.10	0.10	0.76		0.84	0.76
v/c Ratio	0.33	0.35	0.57		0.19	0.48
Control Delay	46.6	13.6	8.2		5.0	15.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.6	13.6	8.2		5.0	15.9
LOS	D	B	A		A	B
Approach Delay	27.6		8.2			15.4
Approach LOS	C		A			B

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 12.4 — Intersection LOS: B
Intersection Capacity Utilization 63.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	61	83	1542	59	1314
v/c Ratio	0.33	0.35	0.57	0.19	0.48
Control Delay	46.6	13.6	8.2	5.0	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	13.6	8.2	5.0	15.9
Queue Length 50th (m)	11.4	0.0	69.8	3.4	105.9
Queue Length 95th (m)	23.1	13.1	102.5	m6.2	149.0
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	309	343	2707	314	2714
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.20	0.24	0.57	0.19	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	0	0	5	0	11	0	1284	15	23	1165	18
Future Volume (vph)	10	0	0	5	0	11	0	1284	15	23	1165	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.850			0.998			0.998	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1883	0	1825	1633	0	1883	3607	0	1825	3606	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1883	0	1825	1633	0	1883	3607	0	1825	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		98.8			216.6			90.1			404.2	
Travel Time (s)		7.4			15.6			4.6			20.8	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	10	0	0	5	0	12	0	1396	16	25	1266	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	0	0	5	12	0	0	1412	0	25	1284	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.9% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	1321	2	16	1195
Future Volume (vph)	1	1	1321	2	16	1195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.932					
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1748	0	3614	0	1825	3614
Flt Permitted	0.976				0.950	
Satd. Flow (perm)	1748	0	3614	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	1	1	1436	2	17	1299
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1438	0	17	1299
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.6% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	0	29	0	0	2	51	1392	5	3	1185	24
Future Volume (vph)	14	0	29	0	0	2	51	1392	5	3	1185	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		20.0	0.0		0.0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	0.95
Ped Bike Factor												
Frt		0.909				0.865			0.850		0.997	
Flt Protected		0.984					0.950					
Satd. Flow (prot)	0	1685	0	0	0	1662	1789	3614	1633	0	3603	0
Flt Permitted		0.984					0.950					
Satd. Flow (perm)	0	1685	0	0	0	1662	1789	3614	1633	0	3603	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		116.8			245.5			191.7			91.0	
Travel Time (s)		8.8			17.7			9.9			4.7	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	14	0	29	0	0	2	51	1513	5	3	1288	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	0	0	0	2	51	1513	5	0	1315	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 55.1%		ICU Level of Service B	
Analysis Period (min) 15			

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	358	19	40	786	452	181	698	38	292	638	73
Future Volume (vph)	64	358	19	40	786	452	181	698	38	292	638	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.992			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3543	0	1789	1812	1458	1825	3552	0	1807	3535	0
Flt Permitted	0.079			0.494			0.199			0.115		
Satd. Flow (perm)	152	3543	0	930	1812	1458	382	3552	0	219	3535	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				335		4			9	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	6%	2%	6%	12%	0%	2%	1%	1%	1%	8%
Adj. Flow (vph)	70	389	21	43	854	491	197	759	41	317	693	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	410	0	43	854	491	197	800	0	317	772	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		7	4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

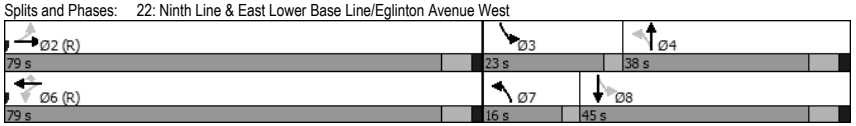
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	5.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	8.0	24.0		8.0	24.0	
Total Split (s)	79.0	79.0		79.0	79.0	79.0	16.0	38.0		23.0	45.0	
Total Split (%)	56.4%	56.4%		56.4%	56.4%	56.4%	11.4%	27.1%		16.4%	32.1%	
Maximum Green (s)	72.0	72.0		72.0	72.0	72.0	13.0	31.0		20.0	38.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	0.0		0.0	-1.0	0.0	-1.0	-1.0		-1.0	0.0	
Total Lost Time (s)	6.0	7.0		7.0	6.0	7.0	2.0	6.0		2.0	7.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	Min		None	Min	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0		8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0		9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)	71.9	70.9		70.9	71.9	70.9	50.4	32.8		60.1	39.5	
Actuated g/C Ratio	0.51	0.51		0.51	0.51	0.51	0.36	0.23		0.43	0.28	
v/c Ratio	0.90	0.23		0.09	0.92	0.54	0.71	0.96		0.95	0.77	
Control Delay	112.0	19.2		18.1	47.1	8.9	41.9	75.4		75.0	52.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	112.0	19.2		18.1	47.1	8.9	41.9	75.4		75.0	52.0	
LOS	F	B		B	D	A	D	E		E	D	
Approach Delay		32.7			32.7			68.8			58.7	
Approach LOS		C			C			E			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 49.0 Intersection LOS: D
Intersection Capacity Utilization 103.0% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	410	43	854	491	197	800	317	772
v/c Ratio	0.90	0.23	0.09	0.92	0.54	0.71	0.96	0.95	0.77
Control Delay	112.0	19.2	18.1	47.1	8.9	41.9	75.4	75.0	52.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.0	19.2	18.1	47.1	8.9	41.9	75.4	75.0	52.0
Queue Length 50th (m)	16.7	31.4	5.9	208.2	24.4	35.0	116.4	70.4	104.0
Queue Length 95th (m)	#49.6	41.5	12.7	#296.2	54.1	#53.8	#158.6	#128.9	128.2
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	79	1825	478	944	912	284	833	335	1003
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.22	0.09	0.90	0.54	0.69	0.96	0.95	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	256	27	135	195	14	16	13	72	10	15	9
Future Volume (vph)	9	256	27	135	195	14	16	13	72	10	15	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988			0.995			0.903			0.964	
Flt Protected		0.998			0.981			0.992			0.985	
Satd. Flow (prot)	0	1894	0	0	1868	0	0	1673	0	0	1824	0
Flt Permitted		0.998			0.981			0.992			0.985	
Satd. Flow (perm)	0	1894	0	0	1868	0	0	1673	0	0	1824	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	2		10	10		2	5		3	3		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	10	278	29	147	212	15	17	14	78	11	16	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	317	0	0	374	0	0	109	0	0	37	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.9%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1098	52	335	2357	185	47	36	160	99	37	45
Future Volume (vph)	57	1098	52	335	2357	185	47	36	160	99	37	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00		0.99		0.99	1.00		0.98
Frt		0.993			0.989				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5053	0	1785	5125	0	1785	1921	1617	1785	1830	1566
Flt Permitted	0.041			0.228			0.733			0.734		
Satd. Flow (perm)	77	5053	0	427	5125	0	1362	1921	1593	1376	1830	1529
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			20				130			23
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	4		6	6		4	9		2	2		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	1%	0%	0%	1%	0%	5%	2%
Adj. Flow (vph)	57	1098	52	335	2357	185	47	36	160	99	37	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1150	0	335	2542	0	47	36	160	99	37	45
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

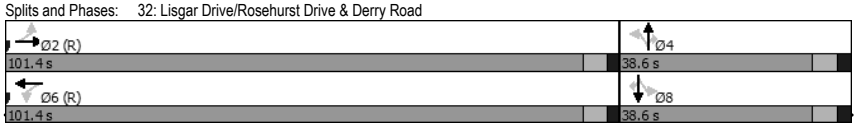
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	101.4	101.4		101.4	101.4		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (%)	72.4%	72.4%		72.4%	72.4%		27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Maximum Green (s)	95.4	95.4		95.4	95.4		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	113.0	113.0		113.0	113.0		16.4	16.4	16.4	16.4	16.4	16.4
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.12	0.12	0.12	0.12	0.12	0.12
v/c Ratio	0.92	0.28		0.97	0.61		0.30	0.16	0.53	0.61	0.17	0.23
Control Delay	116.7	1.9		58.8	6.3		59.3	54.8	20.4	74.1	55.2	33.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.7	1.9		58.8	6.3		59.3	54.8	20.4	74.1	55.2	33.6
LOS	F	A		E	A		E	D	C	E	E	C
Approach Delay		7.3			12.4			33.1			60.1	
Approach LOS		A			B			C			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 113.4 (81%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 14.1 Intersection LOS: B
Intersection Capacity Utilization 88.6% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	1150	335	2542	47	36	160	99	37	45
v/c Ratio	0.92	0.28	0.97	0.61	0.30	0.16	0.53	0.61	0.17	0.23
Control Delay	116.7	1.9	58.8	6.3	59.3	54.8	20.4	74.1	55.2	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.7	1.9	58.8	6.3	59.3	54.8	20.4	74.1	55.2	33.6
Queue Length 50th (m)	7.8	10.2	69.2	81.2	12.1	9.1	7.6	26.5	9.4	5.6
Queue Length 95th (m)	m#35.0	m23.1	#67.6	117.7	23.7	18.8	28.2	43.7	19.3	16.7
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	62	4080	344	4139	321	452	474	324	431	377
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.28	0.97	0.61	0.15	0.08	0.34	0.31	0.09	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	210	56	92	200	133	43	60	86	142	93	46
Future Volume (vph)	43	210	56	92	200	133	43	60	86	142	93	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.968			0.940			0.939			0.978	
Flt Protected	0.950			0.950				0.989			0.975	
Satd. Flow (prot)	1738	1647	0	1772	1675	0	0	1596	0	0	1668	0
Flt Permitted	0.950			0.950				0.989			0.975	
Satd. Flow (perm)	1738	1647	0	1772	1675	0	0	1596	0	0	1668	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	12		31	31		12	39		40	40		39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	14%	9%	3%	9%	6%	9%	22%	6%	6%	15%	11%
Adj. Flow (vph)	47	228	61	100	217	145	47	65	93	154	101	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	289	0	100	362	0	0	205	0	0	305	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 64.1%	ICU Level of Service C
Analysis Period (min) 15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	70	5	11	51	94	5	5	7	108	11	64
Future Volume (vph)	42	70	5	11	51	94	5	5	7	108	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.919			0.940			0.953	
Flt Protected		0.982			0.996			0.986			0.971	
Satd. Flow (prot)	0	1831	0	0	1758	0	0	1781	0	0	1683	0
Flt Permitted		0.982			0.996			0.986			0.971	
Satd. Flow (perm)	0	1831	0	0	1758	0	0	1781	0	0	1683	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	10		4	4		10	1		46	46		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	6%
Adj. Flow (vph)	46	76	5	12	55	102	5	5	8	117	12	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	127	0	0	169	0	0	18	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

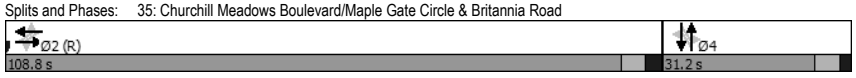
Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 42.6%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1157	94	219	1923	78	35	15	102	30	11	7
Future Volume (vph)	16	1157	94	219	1923	78	35	15	102	30	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00		1.00	0.99		1.00	0.99	
Frt		0.989			0.994			0.869			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5139	0	1552	5205	0	1733	1645	0	1785	1746	0
Flt Permitted	0.087			0.208			0.746			0.446		
Satd. Flow (perm)	163	5139	0	340	5205	0	1356	1645	0	835	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			12			102			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			97.9			114.1			106.4	
Travel Time (s)		28.2			5.9			8.2			7.7	
Confl. Peds. (#/hr)	4					4	2		3	3		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	0%	1%	3%	0%	0%	0%	5%	0%
Adj. Flow (vph)	16	1157	94	219	1923	78	35	15	102	30	11	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1251	0	219	2001	0	35	117	0	30	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Detector Phase	2	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		36.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	108.8	108.8		108.8	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	77.7%	77.7%		77.7%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	101.8	101.8		101.8	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.2	5.2		5.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	11.0	11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	117.9	117.9		117.9	117.9		10.9	10.9		10.9	10.9	
Actuated g/C Ratio	0.84	0.84		0.84	0.84		0.08	0.08		0.08	0.08	
v/c Ratio	0.12	0.29		0.77	0.46		0.33	0.53		0.47	0.13	
Control Delay	2.2	0.8		26.5	3.3		69.0	23.5		84.2	44.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.2	0.8		26.5	3.3		69.0	23.5		84.2	44.1	
LOS	A	A		C	A		E	C		F	D	
Approach Delay		0.8			5.6			34.0			69.1	
Approach LOS		A			A			C			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 1.4 (1%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 5.9	Intersection LOS: A
Intersection Capacity Utilization 73.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	1251	219	2001	35	117	30	18
v/c Ratio	0.12	0.29	0.77	0.46	0.33	0.53	0.47	0.13
Control Delay	2.2	0.8	26.5	3.3	69.0	23.5	84.2	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.2	0.8	26.5	3.3	69.0	23.5	84.2	44.1
Queue Length 50th (m)	0.1	2.7	20.0	38.2	9.4	4.0	8.2	2.9
Queue Length 95th (m)	m0.5	m9.8	#97.1	54.7	20.3	22.5	18.7	10.6
Internal Link Dist (m)		445.7		73.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	137	4332	286	4385	251	388	155	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.29	0.77	0.46	0.14	0.30	0.19	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	9	8	9	8	12	12	136	15	18	240	15
Future Volume (vph)	12	9	8	9	8	12	12	136	15	18	240	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.962			0.945			0.988			0.993	
Flt Protected		0.980			0.985			0.996			0.997	
Satd. Flow (prot)	0	1747	0	0	1720	0	0	1853	0	0	1878	0
Flt Permitted		0.980			0.985			0.996			0.997	
Satd. Flow (perm)	0	1747	0	0	1720	0	0	1853	0	0	1878	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)	6		3	3		6	11		10	10		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	13%	0%	14%	0%	0%	1%	13%	0%	1%	7%
Adj. Flow (vph)	13	10	9	10	9	13	13	148	16	20	261	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	32	0	0	177	0	0	297	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 30.3% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	79	23	69	108	24	16	119	62	17	144	22
Future Volume (vph)	10	79	23	69	108	24	16	119	62	17	144	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.972			0.984			0.958			0.984	
Flt Protected		0.996			0.983			0.996			0.995	
Satd. Flow (prot)	0	1601	0	0	1730	0	0	1725	0	0	1782	0
Flt Permitted		0.996			0.983			0.996			0.995	
Satd. Flow (perm)	0	1601	0	0	1730	0	0	1725	0	0	1782	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	20		92	92		20	33		36	36		33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	19%	9%	6%	10%	0%	6%	7%	5%	0%	7%	0%
Adj. Flow (vph)	11	86	25	75	117	26	17	129	67	18	157	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	0	218	0	0	213	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 39.4%		ICU Level of Service A
Analysis Period (min) 15		

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	158	17	114	285	204	7	71	27	109	132	26
Future Volume (vph)	26	158	17	114	285	204	7	71	27	109	132	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		0.99	0.97		0.99	0.99		0.97	1.00	
Frt		0.986			0.937			0.959			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3464	0	1789	3247	0	1601	1638	0	1789	1737	0
Flt Permitted	0.415			0.632			0.631			0.689		
Satd. Flow (perm)	748	3464	0	1173	3247	0	1057	1638	0	1255	1737	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			213			27			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	2%	18%	2%	2%	2%	14%	11%	11%	2%	6%	15%
Adj. Flow (vph)	28	172	18	124	310	222	8	77	29	118	143	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	190	0	124	532	0	8	106	0	118	171	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	46.0	46.0		46.0	46.0		55.0	55.0		55.0	55.0	
Total Split (%)	45.5%	45.5%		45.5%	45.5%		54.5%	54.5%		54.5%	54.5%	
Maximum Green (s)	39.5	39.5		39.5	39.5		49.0	49.0		49.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.5	48.5		48.5	48.5		42.0	42.0		42.0	42.0	
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.42	0.42		0.42	0.42	
v/c Ratio	0.08	0.11		0.22	0.32		0.02	0.15		0.23	0.23	
Control Delay	23.3	20.4		16.6	9.8		17.7	14.3		20.5	18.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.3	20.4		16.6	9.8		17.7	14.3		20.5	18.5	
LOS	C	C		B	A		B	B		C	B	
Approach Delay		20.8			11.1			14.5			19.3	
Approach LOS		C			B			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.32
Intersection Signal Delay: 14.9 Intersection LOS: B
Intersection Capacity Utilization 74.2% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	190	124	532	8	106	118	171
v/c Ratio	0.08	0.11	0.22	0.32	0.02	0.15	0.23	0.23
Control Delay	23.3	20.4	16.6	9.8	17.7	14.3	20.5	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	20.4	16.6	9.8	17.7	14.3	20.5	18.5
Queue Length 50th (m)	3.5	11.7	13.6	18.2	0.9	9.3	14.6	19.3
Queue Length 95th (m)	m8.2	m22.5	25.1	29.0	3.7	19.7	27.1	33.6
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	359	1670	563	1669	523	824	621	866
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.11	0.22	0.32	0.02	0.13	0.19	0.20

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	46	7	29	71	35	17	96	26	22	176	13
Future Volume (vph)	8	46	7	29	71	35	17	96	26	22	176	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.984			0.965			0.975			0.992	
Flt Protected		0.993			0.989			0.994			0.995	
Satd. Flow (prot)	0	1767	0	0	1728	0	0	1707	0	0	1721	0
Flt Permitted		0.993			0.989			0.994			0.995	
Satd. Flow (perm)	0	1767	0	0	1728	0	0	1707	0	0	1721	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	14		19	19		14	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	6%	0%	3%	5%	11%	6%	11%	4%	5%	11%	8%
Adj. Flow (vph)	9	50	8	32	77	38	18	104	28	24	191	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	147	0	0	150	0	0	229	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 33.9%	ICU Level of Service A
Analysis Period (min) 15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	88	15	40	105	26	35	142	54	24	173	35
Future Volume (vph)	18	88	15	40	105	26	35	142	54	24	173	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.984			0.980			0.968			0.980	
Flt Protected		0.992			0.989			0.992			0.995	
Satd. Flow (prot)	0	1673	0	0	1785	0	0	1769	0	0	1781	0
Flt Permitted		0.992			0.989			0.992			0.995	
Satd. Flow (perm)	0	1673	0	0	1785	0	0	1769	0	0	1781	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	12%	0%	0%	5%	8%	9%	4%	2%	8%	4%	9%
Adj. Flow (vph)	20	96	16	43	114	28	38	154	59	26	188	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	132	0	0	185	0	0	251	0	0	252	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

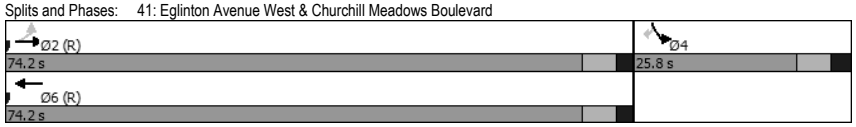
Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	1386	2472	191	123	70
Future Volume (vph)	13	1386	2472	191	123	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			1.00			
Frt			0.989			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1690	3579	3566	0	1789	1089
Flt Permitted	0.052				0.950	
Satd. Flow (perm)	92	3579	3566	0	1789	1089
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			18			8
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	4			4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	2%	1%	1%	2%	50%
Adj. Flow (vph)	13	1386	2472	191	123	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	1386	2663	0	123	70
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.5	25.5
Total Split (s)	74.2	74.2	74.2		25.8	25.8
Total Split (%)	74.2%	74.2%	74.2%		25.8%	25.8%
Maximum Green (s)	68.2	68.2	68.2		19.3	19.3
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	76.2	76.2	76.2		13.3	13.3
Actuated g/C Ratio	0.76	0.76	0.76		0.13	0.13
v/c Ratio	0.19	0.51	0.98		0.52	0.46
Control Delay	11.5	5.7	25.6		47.6	44.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	11.5	5.7	25.6		47.6	44.8
LOS	B	A	C		D	D
Approach Delay		5.8	25.6		46.6	
Approach LOS		A	C		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 20.0		Intersection LOS: C	
Intersection Capacity Utilization 90.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	13	1386	2663	123	70
v/c Ratio	0.19	0.51	0.98	0.52	0.46
Control Delay	11.5	5.7	25.6	47.6	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	5.7	25.6	47.6	44.8
Queue Length 50th (m)	0.6	44.5	205.8	22.6	11.2
Queue Length 95th (m)	4.0	70.0	#336.6	38.1	23.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	70	2728	2723	363	227
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.51	0.98	0.34	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	659	1881	0	389	31
Future Volume (vph)	0	659	1881	0	389	31
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	1987	1726
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	1987	1726
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (k/h)		60	60		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		12.4	17.9		15.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	0%	2%	0%	3%
Adj. Flow (vph)	0	732	2090	0	432	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	732	2090	0	432	34
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

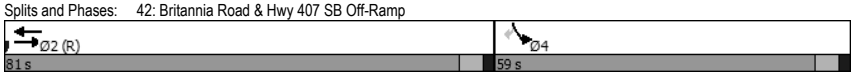
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		81.0	81.0		59.0	59.0
Total Split (%)		57.9%	57.9%		42.1%	42.1%
Maximum Green (s)		75.0	75.0		53.0	53.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		91.5	91.5		36.5	36.5
Actuated g/C Ratio		0.65	0.65		0.26	0.26
v/c Ratio		0.20	0.56		0.84	0.08
Control Delay		10.5	23.0		62.9	36.3
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		10.5	23.0		62.9	36.3
LOS		B	C		E	D
Approach Delay		10.5	23.0		61.0	
Approach LOS		B	C		E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 25.6 — Intersection LOS: C
Intersection Capacity Utilization 63.2% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	732	2090	432	34
v/c Ratio	0.20	0.56	0.84	0.08
Control Delay	10.5	23.0	62.9	36.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.5	23.0	62.9	36.3
Queue Length 50th (m)	27.7	196.2	113.5	7.1
Queue Length 95th (m)	40.8	218.4	139.7	14.6
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3696	3733	752	653
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.20	0.56	0.57	0.05

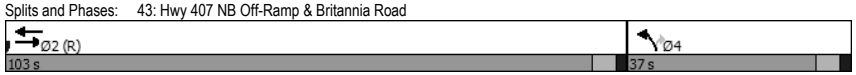
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1076	0	0	1917	73	119
Future Volume (vph)	1076	0	0	1917	73	119
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5711	1987	1778
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5711	1987	1778
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	17.9			13.0	11.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	0%	0%	0%
Adj. Flow (vph)	1196	0	0	2130	81	132
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1196	0	0	2130	81	132
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	103.0			103.0	37.0	37.0
Total Split (%)	73.6%			73.6%	26.4%	26.4%
Maximum Green (s)	97.0			97.0	31.0	31.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	112.3			112.3	15.7	15.7
Actuated g/C Ratio	0.80			0.80	0.11	0.11
v/c Ratio	0.26			0.47	0.36	0.66
Control Delay	6.1			7.7	60.8	74.9
Queue Delay	0.0			0.2	0.0	0.0
Total Delay	6.1			7.9	60.8	74.9
LOS	A			A	E	E
Approach Delay	6.1			7.9	69.6	
Approach LOS	A			A	E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 11.0	Intersection LOS: B
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1196	2130	81	132
v/c Ratio	0.26	0.47	0.36	0.66
Control Delay	6.1	7.7	60.8	74.9
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	6.1	7.9	60.8	74.9
Queue Length 50th (m)	45.5	71.9	21.1	35.6
Queue Length 95th (m)	49.6	m102.5	35.8	55.0
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4535	4580	439	393
Starvation Cap Reductn	0	1355	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.66	0.18	0.34

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	869	2599	0	230	434
Future Volume (vph)	0	869	2599	0	230	434
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	3817	1778
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	3817	1778
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						1
Link Speed (k/h)		60	60		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		20.0	18.5		13.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%
Adj. Flow (vph)	0	924	2765	0	245	462
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	924	2765	0	245	462
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

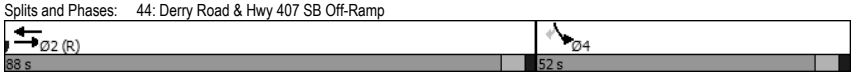
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		88.0	88.0		52.0	52.0
Total Split (%)		62.9%	62.9%		37.1%	37.1%
Maximum Green (s)		82.0	82.0		46.0	46.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	-2.9
Total Lost Time (s)		6.0	6.0		6.0	3.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		87.6	87.6		40.4	43.3
Actuated g/C Ratio		0.63	0.63		0.29	0.31
v/c Ratio		0.26	0.77		0.22	0.84
Control Delay		12.5	18.6		37.4	59.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		12.5	18.6		37.4	59.0
LOS		B	B		D	E
Approach Delay		12.5	18.6		51.5	
Approach LOS		B	B		D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 22.6 Intersection LOS: C
Intersection Capacity Utilization 79.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	924	2765	245	462
v/c Ratio	0.26	0.77	0.22	0.84
Control Delay	12.5	18.6	37.4	59.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.5	18.6	37.4	59.0
Queue Length 50th (m)	40.6	128.3	26.3	117.7
Queue Length 95th (m)	52.4	149.3	35.5	153.2
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3538	3573	1254	621
Starvation Cap Reductn	0	19	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.78	0.20	0.74

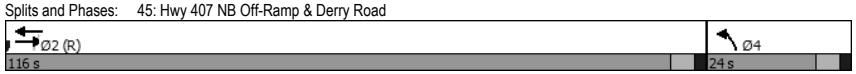
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1143	0	0	2581	104	130
Future Volume (vph)	1143	0	0	2581	104	130
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						0.99
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5655	3856	1743
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5655	3856	1722
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						137
Link Speed (k/h)	60			60	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	18.5			13.8	15.5	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	2%	1%	0%	2%
Adj. Flow (vph)	1203	0	0	2717	109	137
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1203	0	0	2717	109	137
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	116.0			116.0	24.0	116.0
Total Split (%)	82.9%			82.9%	17.1%	82.9%
Maximum Green (s)	110.0			110.0	18.0	110.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	118.5			118.5	9.5	118.5
Actuated g/C Ratio	0.85			0.85	0.07	0.85
v/c Ratio	0.25			0.57	0.42	0.09
Control Delay	2.0			0.9	67.1	0.4
Queue Delay	0.0			0.2	0.0	0.0
Total Delay	2.0			1.1	67.1	0.4
LOS	A			A	E	A
Approach Delay	2.0			1.1	30.0	
Approach LOS	A			A	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 3.1	Intersection LOS: A
Intersection Capacity Utilization 79.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1203	2717	109	137
v/c Ratio	0.25	0.57	0.42	0.09
Control Delay	2.0	0.9	67.1	0.4
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	2.0	1.1	67.1	0.4
Queue Length 50th (m)	12.8	9.6	15.2	0.0
Queue Length 95th (m)	17.7	13.3	24.5	3.0
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4785	4785	495	1478
Starvation Cap Reductn	0	876	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.25	0.70	0.22	0.09

Intersection Summary

Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1198	1104	3018	0	0	1778
Future Volume (vph)	1198	1104	3018	0	0	1778
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.964	0.850				
Flt Protected	0.963					
Satd. Flow (prot)	3741	1571	5491	0	0	5545
Flt Permitted	0.963					
Satd. Flow (perm)	3737	1571	5491	0	0	5545
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	4%	1%	0%	3%
Adj. Flow (vph)	1261	1162	3177	0	0	1872
Shared Lane Traffic (%)		34%				
Lane Group Flow (vph)	1656	767	3177	0	0	1872
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				

Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

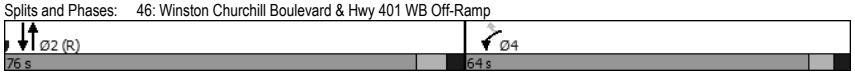
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	64.0	64.0	76.0			76.0
Total Split (%)	45.7%	45.7%	54.3%			54.3%
Maximum Green (s)	57.0	57.0	68.0			68.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	57.0	57.0	68.0			68.0
Actuated g/C Ratio	0.41	0.41	0.49			0.49
v/c Ratio	1.09	1.20	1.19			0.70
Control Delay	90.1	141.7	121.5			29.7
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	90.1	141.7	121.5			29.7
LOS	F	F	F			C
Approach Delay	106.5		121.5			29.7
Approach LOS	F		F			C

Intersection Summary

Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 49 (35%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 93.6	Intersection LOS: F
Intersection Capacity Utilization 120.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1656	767	3177	1872
v/c Ratio	1.09	1.20	1.19	0.70
Control Delay	90.1	141.7	121.5	29.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	90.1	141.7	121.5	29.7
Queue Length 50th (m)	~264.8	~282.3	~388.1	144.2
Queue Length 95th (m)	#306.2	#364.9	#410.8	160.9
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1523	639	2667	2693
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.09	1.20	1.19	0.70

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

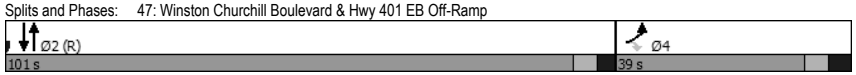
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	434	474	0	3264	2554	0
Future Volume (vph)	434	474	0	3264	2554	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.955	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3457	1586	0	5545	5599	0
Flt Permitted	0.966					
Satd. Flow (perm)	3457	1586	0	5545	5599	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	4	4				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	2%	0%	3%	2%	7%
Adj. Flow (vph)	467	510	0	3510	2746	0
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	666	311	0	3510	2746	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	39.0	39.0		101.0	101.0	
Total Split (%)	27.9%	27.9%		72.1%	72.1%	
Maximum Green (s)	31.0	31.0		94.0	94.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	30.0	30.0		95.0	95.0	
Actuated g/C Ratio	0.21	0.21		0.68	0.68	
v/c Ratio	0.90	0.91		0.93	0.72	
Control Delay	68.8	83.0		25.9	10.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	68.8	83.0		25.9	10.9	
LOS	E	F		C	B	
Approach Delay	73.3			25.9	10.9	
Approach LOS	E			C	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 32.2 (23%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 26.6		Intersection LOS: C	
Intersection Capacity Utilization 86.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	666	311	3510	2746
v/c Ratio	0.90	0.91	0.93	0.72
Control Delay	68.8	83.0	25.9	10.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	68.8	83.0	25.9	10.9
Queue Length 50th (m)	91.9	91.2	296.2	128.7
Queue Length 95th (m)	#120.6	#147.8	318.9	m131.3
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	768	354	3763	3800
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.87	0.88	0.93	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1108	1845	2192	0	0	2375
Future Volume (vph)	1108	1845	2192	0	0	2375
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.937	0.850				
Flt Protected	0.972					
Satd. Flow (prot)	3681	1602	5655	0	0	5655
Flt Permitted	0.972					
Satd. Flow (perm)	3681	1602	5655	0	0	5655
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Peak Hour Factor	0.89	0.96	0.93	0.93	0.89	0.89
Heavy Vehicles (%)	0%	1%	1%	0%	0%	1%
Adj. Flow (vph)	1245	1922	2357	0	0	2669
Shared Lane Traffic (%)		47%				
Lane Group Flow (vph)	2148	1019	2357	0	0	2669
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

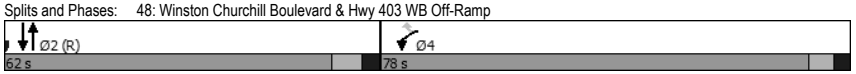
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	78.0	78.0	62.0			62.0
Total Split (%)	55.7%	55.7%	44.3%			44.3%
Maximum Green (s)	71.0	71.0	54.0			54.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	-2.9	-2.9			0.0
Total Lost Time (s)	7.0	4.1	5.1			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	71.0	73.9	56.9			54.0
Actuated g/C Ratio	0.51	0.53	0.41			0.39
v/c Ratio	1.15	1.21	1.03			1.22
Control Delay	107.5	135.0	67.4			142.7
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	107.5	135.0	67.4			142.7
LOS	F	F	E			F
Approach Delay	116.4		67.4			142.7
Approach LOS	F		E			F

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 2.8 (2%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.22
Intersection Signal Delay: 110.8 — Intersection LOS: F
Intersection Capacity Utilization 165.8% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	2148	1019	2357	2669
v/c Ratio	1.15	1.21	1.03	1.22
Control Delay	107.5	135.0	67.4	142.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	107.5	135.0	67.4	142.7
Queue Length 50th (m)	~359.6	~376.3	~256.9	~332.1
Queue Length 95th (m)	#391.6	#463.4	#284.4	#351.0
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1866	845	2298	2181
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.15	1.21	1.03	1.22

Intersection Summary

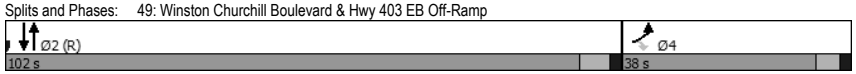
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	517	205	0	2131	2737	0
Future Volume (vph)	517	205	0	2131	2737	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3817	1726	0	5655	5655	0
Flt Permitted	0.950					
Satd. Flow (perm)	3817	1726	0	5655	5655	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		2				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	3%	0%	1%	1%	0%
Adj. Flow (vph)	568	225	0	2342	3008	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	568	225	0	2342	3008	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	38.0	38.0		102.0	102.0	
Total Split (%)	27.1%	27.1%		72.9%	72.9%	
Maximum Green (s)	32.0	32.0		95.0	95.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	26.4	26.4		100.6	100.6	
Actuated g/C Ratio	0.19	0.19		0.72	0.72	
v/c Ratio	0.79	0.69		0.58	0.74	
Control Delay	62.3	63.2		10.6	24.6	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	62.3	63.2		10.6	24.6	
LOS	E	E		B	C	
Approach Delay	62.5			10.6	24.6	
Approach LOS	E			B	C	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 81.2 (58%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 24.2	Intersection LOS: C
Intersection Capacity Utilization 165.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	568	225	2342	3008
v/c Ratio	0.79	0.69	0.58	0.74
Control Delay	62.3	63.2	10.6	24.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	62.3	63.2	10.6	24.6
Queue Length 50th (m)	77.7	58.0	104.9	229.6
Queue Length 95th (m)	93.5	82.4	132.5	m185.2
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	872	396	4061	4061
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.57	0.58	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1908	1865	0	520	1502
Future Volume (vph)	0	1908	1865	0	520	1502
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Ped Bike Factor						
Frt					0.911	0.850
Flt Protected					0.980	
Satd. Flow (prot)	0	5338	5599	0	3409	1571
Flt Permitted					0.980	
Satd. Flow (perm)	0	5338	5599	0	3409	1571
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					1	1
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	7%	2%	0%	11%	3%
Adj. Flow (vph)	0	1947	1903	0	531	1533
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	0	1947	1903	0	1298	766
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

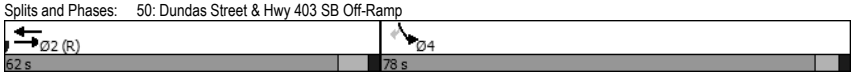
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		62.0	62.0		78.0	78.0
Total Split (%)		44.3%	44.3%		55.7%	55.7%
Maximum Green (s)		55.0	55.0		72.0	72.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		55.9	55.9		71.1	71.1
Actuated g/C Ratio		0.40	0.40		0.51	0.51
v/c Ratio		0.91	0.85		0.87dr	0.96
Control Delay		47.7	67.1		30.6	56.7
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		47.7	67.1		30.6	56.7
LOS		D	E		C	E
Approach Delay		47.7	67.1		40.3	
Approach LOS		D	E		D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 4.2 (3%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 51.3 Intersection LOS: D
Intersection Capacity Utilization 100.9% ICU Level of Service G
Analysis Period (min) 15
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1947	1903	1298	766
v/c Ratio	0.91	0.85	0.87dr	0.96
Control Delay	47.7	67.1	30.6	56.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.7	67.1	30.6	56.7
Queue Length 50th (m)	187.3	204.5	141.3	214.9
Queue Length 95th (m)	208.9	220.0	168.0	#311.7
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	2130	2233	1753	808
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.91	0.85	0.74	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1728	0	0	2386	130	853
Future Volume (vph)	1728	0	0	2386	130	853
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Frt					0.885	0.850
Flt Protected					0.988	
Satd. Flow (prot)	5491	0	0	5655	3479	1586
Flt Permitted					0.988	
Satd. Flow (perm)	5491	0	0	5655	3479	1586
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					11	11
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	4%	0%	0%	1%	2%	2%
Adj. Flow (vph)	1781	0	0	2460	134	879
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	1781	0	0	2460	574	439
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	82.0			82.0	58.0	58.0
Total Split (%)	58.6%			58.6%	41.4%	41.4%
Maximum Green (s)	75.0			75.0	52.0	52.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	83.4			83.4	43.6	43.6
Actuated g/C Ratio	0.60			0.60	0.31	0.31
v/c Ratio	0.54			0.73	0.53	0.88
Control Delay	10.4			23.0	39.9	62.7
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.4			23.0	39.9	62.7
LOS	B			C	D	E
Approach Delay	10.4			23.0	49.8	
Approach LOS	B			C	D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 43.4 (31%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 100.9%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street

Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1781	2460	574	439
v/c Ratio	0.54	0.73	0.53	0.88
Control Delay	10.4	23.0	39.9	62.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.4	23.0	39.9	62.7
Queue Length 50th (m)	90.5	173.7	65.4	122.5
Queue Length 95th (m)	181.5	217.7	76.4	158.0
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	3270	3368	1299	596
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.54	0.73	0.44	0.74

Intersection Summary

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	196	149	722	53	19	595
Future Volume (vph)	196	149	722	53	19	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.990			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3543	0	1789	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	3543	0	1789	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	289.7		780.0			514.0
Travel Time (s)	21.7		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	196	149	722	53	19	595
Shared Lane Traffic (%)						
Lane Group Flow (vph)	196	149	775	0	19	595
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 39.2% ICU Level of Service A
Analysis Period (min) 15

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1118	362	0	1820	0	0
Future Volume (vph)	1118	362	0	1820	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	120.9	
Travel Time (s)	15.5			6.8	9.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1118	362	0	1820	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1118	362	0	1820	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 120.3%		ICU Level of Service H	
Analysis Period (min) 15			

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	859	67	49	1466
Future Volume (vph)	46	47	859	67	49	1466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.98				
Frt		0.850	0.989			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3478	0	1825	3544
Flt Permitted	0.950				0.277	
Satd. Flow (perm)	1789	1560	3478	0	532	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	18			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	934	73	53	1593
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	1007	0	53	1593
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	26.0	26.0	75.0		75.0	75.0
Total Split (%)	25.7%	25.7%	74.3%		74.3%	74.3%
Maximum Green (s)	19.5	19.5	68.0		68.0	68.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	10.0	10.0	83.6		83.6	83.6
Actuated g/C Ratio	0.10	0.10	0.83		0.83	0.83
v/c Ratio	0.28	0.26	0.35		0.12	0.54
Control Delay	46.1	15.2	0.5		3.5	4.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.1	15.2	0.5		3.5	4.6
LOS	D	B	A		A	A
Approach Delay	30.5		0.5			4.5
Approach LOS	C		A			A

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 4.0 — Intersection LOS: A
Intersection Capacity Utilization 57.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: Ninth Line & Beacham Street

Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	50	51	1007	53	1593
v/c Ratio	0.28	0.26	0.35	0.12	0.54
Control Delay	46.1	15.2	0.5	3.5	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	15.2	0.5	3.5	4.6
Queue Length 50th (m)	9.3	0.0	0.9	1.8	47.3
Queue Length 95th (m)	19.9	10.5	1.0	5.3	71.2
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	363	357	2883	440	2934
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.14	0.35	0.12	0.54

Intersection Summary

APPENDIX Q

2041 Scenario 2 Future Total Traffic Conditions – 10%

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	608	2	2	657
Future Volume (vph)	1	0	608	2	2	657
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1825	1921	1902	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1921	1902	0	0	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.2		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	3%
Adj. Flow (vph)	1	0	661	2	2	714
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	663	0	0	716
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	608	2	2	657
Future Volume (Veh/h)	1	0	608	2	2	657
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	661	2	2	714
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1380	662			663	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1380	662			663	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	160	465			935	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	663	716
Volume Left	1	0	2
Volume Right	0	2	0
cSH	120	1700	935
Volume to Capacity	0.01	0.39	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	35.2	0.0	0.1
Lane LOS	E		A
Approach Delay (s)	35.2	0.0	0.1
Approach LOS	E		

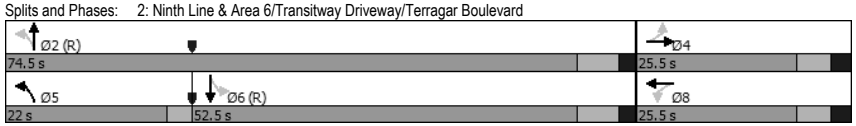
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	20	106	143	115	84	506	774	62	27	634	80
Future Volume (vph)	14	20	106	143	115	84	506	774	62	27	634	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.874			0.934			0.989			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1646	0	1755	1752	0	1789	3490	0	1825	3521	0
Flt Permitted	0.439			0.647			0.295			0.314		
Satd. Flow (perm)	827	1646	0	1195	1752	0	556	3490	0	603	3521	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		106			36			19			17	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		138.3			287.6			434.9			780.0	
Travel Time (s)		10.4			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	3%	2%	3%	9%	0%	2%	2%
Adj. Flow (vph)	14	20	106	155	115	91	506	841	67	29	689	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	126	0	155	206	0	506	908	0	29	769	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	8.0		8.0	8.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		9.0	53.0		52.0	52.0	
Total Split (s)	25.5	25.5		25.5	25.5		22.0	74.5		52.5	52.5	
Total Split (%)	25.5%	25.5%		25.5%	25.5%		22.0%	74.5%		52.5%	52.5%	
Maximum Green (s)	19.0	19.0		19.0	19.0		19.0	67.5		45.5	45.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		2.0	6.0		6.0	6.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0			35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)	17.2	17.2		17.2	17.2		75.3	71.3		52.4	52.4	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.75	0.71		0.52	0.52	
v/c Ratio	0.10	0.34		0.75	0.62		0.81	0.36		0.09	0.42	
Control Delay	34.9	12.2		61.5	39.5		17.8	6.3		15.6	16.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.9	12.2		61.5	39.5		17.8	6.3		15.6	16.1	
LOS	C	B		E	D		B	A		B	B	
Approach Delay		14.5			49.0			10.4			16.1	
Approach LOS		B			D			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 17.4	Intersection LOS: B
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	14	126	155	206	506	908	29	769
v/c Ratio	0.10	0.34	0.75	0.62	0.81	0.36	0.09	0.42
Control Delay	34.9	12.2	61.5	39.5	17.8	6.3	15.6	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	12.2	61.5	39.5	17.8	6.3	15.6	16.1
Queue Length 50th (m)	2.3	3.2	28.2	30.0	30.6	32.6	2.9	47.2
Queue Length 95th (m)	7.6	17.9	#52.9	52.1	#66.1	43.6	8.5	66.2
Internal Link Dist (m)		114.3		263.6		410.9		756.0
Turn Bay Length (m)					40.0		40.0	
Base Capacity (vph)	165	414	239	379	665	2492	315	1852
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.30	0.65	0.54	0.76	0.36	0.09	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	27	46	0	18	59	1354	63	11	877	4
Future Volume (vph)	7	0	27	46	0	18	59	1354	63	11	877	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.993			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3520	0	1674	3540	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3520	0	1674	3540	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		134.3			310.4			412.4			434.9	
Travel Time (s)		10.1			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	2%	9%	3%	2%
Adj. Flow (vph)	7	0	27	50	0	20	59	1472	68	12	953	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	27	0	50	20	0	59	1540	0	12	957	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 62.0% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	27	46	0	18	59	1354	63	11	877	4
Future Volume (Veh/h)	7	0	27	46	0	18	59	1354	63	11	877	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	7	0	27	50	0	20	59	1472	68	12	953	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1853	2637	478	2152	2605	770	957			1540		
vC1, stage 1 conf vol	979	979		1624	1624							
vC2, stage 2 conf vol	874	1658		528	981							
vCu, unblocked vol	1853	2637	478	2152	2605	770	957			1540		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	96	100	95	48	100	94	92			97		
cM capacity (veh/h)	181	116	533	95	124	348	714			395		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	7	27	50	20	59	981	559	12	635	322
Volume Left	7	0	50	0	59	0	0	12	0	0
Volume Right	0	27	0	20	0	0	68	0	0	4
cSH	181	533	95	348	714	1700	1700	395	1700	1700
Volume to Capacity	0.04	0.05	0.52	0.06	0.08	0.58	0.33	0.03	0.37	0.19
Queue Length 95th (m)	0.9	1.2	17.8	1.4	2.0	0.0	0.0	0.7	0.0	0.0
Control Delay (s)	25.7	12.1	78.5	16.0	10.5	0.0	0.0	14.4	0.0	0.0
Lane LOS	D	B	F	C	B			B		
Approach Delay (s)	14.9		60.7		0.4			0.2		
Approach LOS	B		F							

Intersection Summary				
Average Delay		2.1		
Intersection Capacity Utilization		62.0%	ICU Level of Service	B
Analysis Period (min)		15		

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	291	2238	137	159	912	344	229	658	301	114	573	186
Future Volume (vph)	291	2238	137	159	912	344	229	658	301	114	573	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.991			0.959				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1733	5143	0	1716	4888	0	1785	3614	1566	1638	3614	1597
Flt Permitted	0.132			0.064			0.153			0.217		
Satd. Flow (perm)	241	5143	0	116	4888	0	287	3614	1566	374	3614	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			81				158			179
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	4%	4%	0%	0%	1%	2%	9%	1%	0%
Adj. Flow (vph)	291	2238	137	159	912	344	229	658	301	114	573	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	291	2375	0	159	1256	0	229	658	301	114	573	186
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

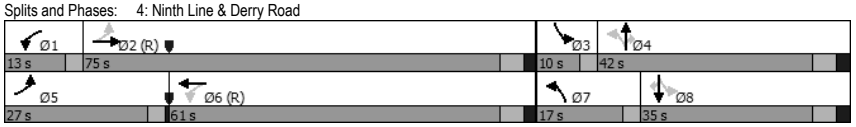
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	5.0	8.0	8.0
Minimum Split (s)	9.0	30.1		8.0	30.1		8.0	29.4	29.4	8.0	29.4	29.4
Total Split (s)	27.0	75.0		13.0	61.0		17.0	42.0	42.0	10.0	35.0	35.0
Total Split (%)	19.3%	53.6%		9.3%	43.6%		12.1%	30.0%	30.0%	7.1%	25.0%	25.0%
Maximum Green (s)	23.5	68.9		10.0	54.9		14.0	35.6	35.6	7.0	28.6	28.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.5	2.1		0.0	2.1		0.0	2.4	2.4	0.0	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.5	5.1		2.0	5.1		2.0	5.4	5.4	2.0	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	87.5	71.6		76.9	62.5		48.0	34.6	34.6	39.0	27.6	27.6
Actuated g/C Ratio	0.62	0.51		0.55	0.45		0.34	0.25	0.25	0.28	0.20	0.20
v/c Ratio	0.80	0.90		0.82	0.56		0.88	0.74	0.60	0.65	0.80	0.41
Control Delay	47.0	33.4		73.7	22.5		68.7	53.9	26.3	51.6	63.0	9.9
Queue Delay	0.0	0.2		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	33.6		73.7	22.5		68.7	53.9	26.3	51.6	63.0	9.9
LOS	D	C		E	C		E	D	C	D	E	A
Approach Delay		35.0			28.2			49.7			50.2	
Approach LOS		D			C			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 38.5 — Intersection LOS: D
Intersection Capacity Utilization 99.0% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	291	2375	159	1256	229	658	301	114	573	186
v/c Ratio	0.80	0.90	0.82	0.56	0.88	0.74	0.60	0.65	0.80	0.41
Control Delay	47.0	33.4	73.7	22.5	68.7	53.9	26.3	51.6	63.0	9.9
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	33.6	73.7	22.5	68.7	53.9	26.3	51.6	63.0	9.9
Queue Length 50th (m)	54.8	163.0	31.2	94.7	46.6	87.1	33.9	21.8	79.0	1.6
Queue Length 95th (m)	87.4	185.4	#71.1	94.6	#87.6	108.4	64.5	#37.0	100.0	21.4
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	411	2634	195	2225	259	944	526	176	764	478
Starvation Cap Reductn	0	24	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.91	0.82	0.56	0.88	0.70	0.57	0.65	0.75	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1312	85	58	734
Future Volume (vph)	90	47	1312	85	58	734
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3546	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1807	1633	3546	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1426	92	63	798
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1518	0	63	798
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.8%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	90	47	1312	85	58	734
Future Volume (Veh/h)	90	47	1312	85	58	734
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	51	1426	92	63	798
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1997	761			1518	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1997	761			1518	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	86			86	
cM capacity (veh/h)	46	352			446	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	149	951	567	63	399	399
Volume Left	98	0	0	63	0	0
Volume Right	51	0	92	0	0	0
cSH	65	1700	1700	446	1700	1700
Volume to Capacity	2.28	0.56	0.33	0.14	0.23	0.23
Queue Length 95th (m)	109.1	0.0	0.0	3.7	0.0	0.0
Control Delay (s)	723.5	0.0	0.0	14.4	0.0	0.0
Lane LOS	F			B		
Approach Delay (s)	723.5	0.0		1.1		
Approach LOS	F					

Intersection Summary			
Average Delay	43.0		
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	75	36	138	28	207	9	1063	97	80	633	8
Future Volume (vph)	33	75	36	138	28	207	9	1063	97	80	633	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		27.0	50.0		60.0	115.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.951			0.867			0.987			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1791	0	1772	1613	0	1789	3492	0	1825	3571	0
Flt Permitted	0.340			0.685			0.378			0.185		
Satd. Flow (perm)	640	1791	0	1278	1613	0	712	3492	0	355	3571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			90			17			2	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		99.7			255.0			850.0			603.1	
Travel Time (s)		7.5			18.4			43.7			31.0	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	3%	5%	0%	2%	2%
Adj. Flow (vph)	33	75	36	150	28	225	9	1155	105	87	688	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	111	0	150	253	0	9	1260	0	87	696	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

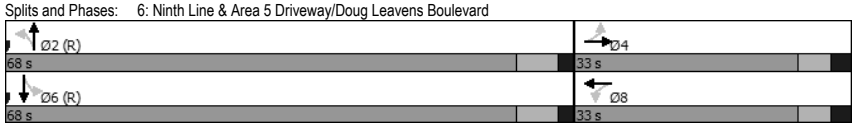
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		45.0	45.0	
Minimum Split (s)	25.5	25.5		23.0	23.0		52.0	52.0		52.0	52.0	
Total Split (s)	33.0	33.0		33.0	33.0		68.0	68.0		68.0	68.0	
Total Split (%)	32.7%	32.7%		32.7%	32.7%		67.3%	67.3%		67.3%	67.3%	
Maximum Green (s)	26.5	26.5		26.5	26.5		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	18.4	18.4		18.4	18.4		71.1	71.1		71.1	71.1	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.70	0.70		0.70	0.70	
v/c Ratio	0.28	0.32		0.64	0.69		0.02	0.51		0.35	0.28	
Control Delay	39.5	28.6		50.0	33.6		10.4	14.7		12.4	6.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.5	28.6		50.0	33.6		10.4	14.7		12.4	6.5	
LOS	D	C		D	C		B	B		B	A	
Approach Delay		31.1			39.7			14.7			7.1	
Approach LOS		C			D			B			A	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 17.2 — Intersection LOS: B
Intersection Capacity Utilization 101.7% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard



Queues
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	111	150	253	9	1260	87	696
v/c Ratio	0.28	0.32	0.64	0.69	0.02	0.51	0.35	0.28
Control Delay	39.5	28.6	50.0	33.6	10.4	14.7	12.4	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	28.6	50.0	33.6	10.4	14.7	12.4	6.5
Queue Length 50th (m)	5.7	14.8	27.6	30.1	0.8	86.6	5.8	22.6
Queue Length 95th (m)	13.3	27.2	43.6	50.9	m2.4	131.2	19.7	39.6
Internal Link Dist (m)		75.7		231.0		826.0		579.1
Turn Bay Length (m)					50.0		115.0	
Base Capacity (vph)	174	505	347	504	500	2462	249	2513
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.22	0.43	0.50	0.02	0.51	0.35	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	27	36	200	13	122	9	1164	150	55	893	8
Future Volume (vph)	33	27	36	200	13	122	9	1164	150	55	893	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	13.0		0.0	35.0		25.0	270.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			13.0			60.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.914			0.863			0.983			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1721	0	1706	1605	0	1789	3439	0	1789	3541	0
Flt Permitted	0.609			0.716			0.240			0.111		
Satd. Flow (perm)	1147	1721	0	1286	1605	0	452	3439	0	209	3541	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			133			20			1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		142.8			160.0			383.2			301.0	
Travel Time (s)		10.7			11.5			19.7			15.5	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	7%	2%	3%	2%
Adj. Flow (vph)	33	27	36	217	13	133	9	1265	163	60	971	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	63	0	217	146	0	9	1428	0	60	979	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

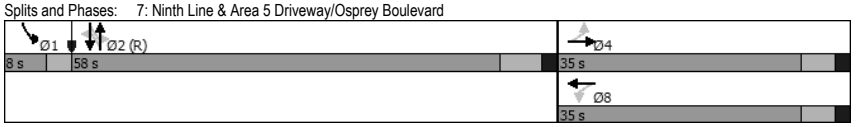
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.0	25.0		52.0	52.0		8.0	52.0	
Total Split (s)	35.0	35.0		35.0	35.0		58.0	58.0		8.0	58.0	
Total Split (%)	34.7%	34.7%		34.7%	34.7%		57.4%	57.4%		7.9%	57.4%	
Maximum Green (s)	29.0	29.0		29.0	29.0		51.0	51.0		5.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		37.0	37.0			37.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	22.8	22.8		22.8	22.8		59.8	59.8		69.6	59.8	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.59	0.59		0.69	0.59	
v/c Ratio	0.13	0.15		0.75	0.31		0.03	0.70		0.24	0.47	
Control Delay	29.6	15.6		51.7	8.1		12.2	18.2		10.8	17.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	29.6	15.6		51.7	8.1		12.2	18.2		10.8	17.3	
LOS	C	B		D	A		B	B		B	B	
Approach Delay		20.4			34.2			18.1			16.9	
Approach LOS		C			C			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 19.8 Intersection LOS: B
Intersection Capacity Utilization 76.8% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 7: Ninth Line & Area 5 Driveway/Osprey Boulevard



Queues
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	63	217	146	9	1428	60	979
v/c Ratio	0.13	0.15	0.75	0.31	0.03	0.70	0.24	0.47
Control Delay	29.6	15.6	51.7	8.1	12.2	18.2	10.8	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	15.6	51.7	8.1	12.2	18.2	10.8	17.3
Queue Length 50th (m)	5.1	4.2	39.5	2.0	0.7	100.9	3.0	61.8
Queue Length 95th (m)	11.8	13.2	60.0	15.6	3.4	144.1	12.1	95.5
Internal Link Dist (m)		118.8		136.0		359.2		277.0
Turn Bay Length (m)			13.0		35.0		270.0	
Base Capacity (vph)	340	536	381	570	267	2045	253	2098
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.12	0.57	0.26	0.03	0.70	0.24	0.47

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	9	18	0	91	2	1064	6	27	921	2
Future Volume (vph)	7	0	9	18	0	91	2	1064	6	27	921	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			60.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.850			0.850			0.999				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3611	0	1825	3614	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3611	0	1825	3614	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		144.4			207.4			254.7			383.2	
Travel Time (s)		10.8			14.9			13.1			19.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	7	0	9	20	0	99	2	1157	7	29	1001	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	9	0	20	99	0	2	1164	0	29	1003	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	9	18	0	91	2	1064	6	27	921	2
Future Volume (Veh/h)	7	0	9	18	0	91	2	1064	6	27	921	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	7	0	9	20	0	99	2	1157	7	29	1001	2
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								255			383	
pX, platoon unblocked	0.77	0.77	0.88	0.77	0.77	0.72	0.88			0.72		
vC, conflicting volume	1742	2228	502	1732	2226	583	1003			1164		
vC1, stage 1 conf vol	1060	1060		1164	1164							
vC2, stage 2 conf vol	682	1168		568	1061							
vCu, unblocked vol	692	1319	168	678	1316	0	737			434		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	95	100	87	100			96		
cM capacity (veh/h)	284	270	747	384	276	780	763			813		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	7	9	20	99	2	771	393	29	667	336
Volume Left	7	0	20	0	2	0	0	29	0	0
Volume Right	0	9	0	99	0	0	7	0	0	2
cSH	284	747	384	780	763	1700	1700	813	1700	1700
Volume to Capacity	0.02	0.01	0.05	0.13	0.00	0.45	0.23	0.04	0.39	0.20
Queue Length 95th (m)	0.6	0.3	1.2	3.3	0.1	0.0	0.0	0.8	0.0	0.0
Control Delay (s)	18.0	9.9	14.9	10.3	9.7	0.0	0.0	9.6	0.0	0.0
Lane LOS	C	A	B	B	A			A		
Approach Delay (s)	13.4		11.1		0.0			0.3		
Approach LOS	B		B							

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	2322	328	80	753	125	210	920	144	104	836	137
Future Volume (vph)	120	2322	328	80	753	125	210	920	144	104	836	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.981			0.979			0.980			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	5088	0	1767	4917	0	1785	3502	0	1653	3503	0
Flt Permitted	0.311			0.055			0.102			0.107		
Satd. Flow (perm)	579	5088	0	102	4917	0	192	3502	0	186	3503	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			37			13			13	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	2%	1%	2%	19%	0%	2%	3%	8%	2%	2%
Adj. Flow (vph)	120	2322	328	80	753	125	210	920	144	104	836	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	2650	0	80	878	0	210	1064	0	104	973	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	24.6	24.6		8.0	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	76.0	76.0		8.0	84.0		13.0	48.0		8.0	43.0	
Total Split (%)	54.3%	54.3%		5.7%	60.0%		9.3%	34.3%		5.7%	30.7%	
Maximum Green (s)	69.4	69.4		5.0	77.4		10.0	41.4		5.0	36.4	
Yellow Time (s)	4.6	4.6		3.0	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	2.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-2.0	-1.0		-2.0	-1.0		-1.0	-3.0	
Total Lost Time (s)	5.6	5.6		1.0	5.6		1.0	5.6		2.0	3.6	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			12.0			12.0	
Flash Dont Walk (s)	11.0	11.0			11.0			18.0			18.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)	70.4	70.4		83.0	78.4		55.0	42.4		47.0	39.4	
Actuated g/C Ratio	0.50	0.50		0.59	0.56		0.39	0.30		0.34	0.28	
v/c Ratio	0.41	1.03		0.56	0.32		1.00	1.00		0.83	0.98	
Control Delay	16.1	48.0		48.7	14.4		95.5	74.2		78.0	72.7	
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.1	48.2		48.7	14.4		95.5	74.2		78.0	72.7	
LOS	B	D		D	B		F	E		E	E	
Approach Delay		46.8			17.3			77.7			73.2	
Approach LOS		D			B			E			E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 53.3	Intersection LOS: D
Intersection Capacity Utilization 110.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 9: Ninth Line & Britannia Road

Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	2650	80	878	210	1064	104	973
v/c Ratio	0.41	1.03	0.56	0.32	1.00	1.00	0.83	0.98
Control Delay	16.1	48.0	48.7	14.4	95.5	74.2	78.0	72.7
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	48.2	48.7	14.4	95.5	74.2	78.0	72.7
Queue Length 50th (m)	10.0	~288.1	9.6	32.8	41.6	153.5	18.7	139.5
Queue Length 95th (m)	16.0	#305.4	29.0	37.9	#93.6	#200.8	#45.3	#184.2
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	291	2571	143	2769	211	1069	125	995
Starvation Cap Reductn	0	1	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	1.03	0.56	0.32	1.00	1.00	0.83	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	22	40	28	20	1283	9	2	1270	38
Future Volume (vph)	0	0	0	22	40	28	20	1283	9	2	1270	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.936			0.999			0.996	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		111.0			491.2			170.0			206.5	
Travel Time (s)		8.3			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	0%	2%	2%	13%	50%	3%	2%
Adj. Flow (vph)	0	0	0	24	40	30	20	1395	10	2	1380	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	24	70	0	20	1405	0	2	1418	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.8% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	22	40	28	20	1283	9	2	1270	38
Future Volume (Veh/h)	0	0	0	22	40	28	20	1283	9	2	1270	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	0	0	0	24	40	30	20	1395	10	2	1380	38
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											206	
pX, platoon unblocked	0.74	0.74	0.74	0.74	0.74		0.74					
vC, conflicting volume	2190	2848	709	2134	2862	702	1418			1405		
vC1, stage 1 conf vol	1403	1403		1440	1440							
vC2, stage 2 conf vol	788	1445		694	1422							
vCu, unblocked vol	1903	2794	0	1826	2813	702	856			1405		
tC, single (s)	7.5	6.5	6.9	7.6	6.5	6.9	4.1			5.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.7		
p0 queue free %	100	100	100	81	72	92	97			99		
cM capacity (veh/h)	165	147	800	126	144	385	575			295		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	0	24	70	20	930	475	2	920	498
Volume Left	0	0	24	0	20	0	0	2	0	0
Volume Right	0	0	0	30	0	0	10	0	0	38
cSH	1700	1700	126	196	575	1700	1700	295	1700	1700
Volume to Capacity	0.00	0.00	0.19	0.36	0.03	0.55	0.28	0.01	0.54	0.29
Queue Length 95th (m)	0.0	0.0	5.1	11.5	0.8	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	0.0	0.0	40.2	33.2	11.5	0.0	0.0	17.3	0.0	0.0
Lane LOS	A	A	E	D	B			C		
Approach Delay (s)	0.0		34.9		0.2			0.0		
Approach LOS	A		D							

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization		46.8%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	4	3	24	1	41	14	1229	32	46	1235	27
Future Volume (vph)	9	4	3	24	1	41	14	1229	32	46	1235	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.936			0.853			0.996			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1763	0	1825	1591	0	1789	3554	0	1825	3568	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1763	0	1825	1591	0	1789	3554	0	1825	3568	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		61.6			511.9			217.0			170.0	
Travel Time (s)		4.6			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	3%	2%	2%	13%	0%	2%	2%
Adj. Flow (vph)	9	4	3	26	1	45	14	1336	35	50	1342	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	7	0	26	46	0	14	1371	0	50	1369	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	4	3	24	1	41	14	1229	32	46	1235	27
Future Volume (Veh/h)	9	4	3	24	1	41	14	1229	32	46	1235	27
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	9	4	3	26	1	45	14	1336	35	50	1342	27
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											376	
pX, platoon unblocked	0.76	0.76	0.76	0.76	0.76		0.76					
vC, conflicting volume	2198	2854	684	2158	2850	686	1369			1371		
vC1, stage 1 conf vol	1456	1456		1382	1382							
vC2, stage 2 conf vol	742	1399		776	1469							
vCu, unblocked vol	1941	2808	0	1887	2803	686	846			1371		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	97	100	82	99	88	98			90		
cM capacity (veh/h)	150	120	821	143	139	387	596			507		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	7	26	46	14	891	480	50	895	474
Volume Left	9	0	26	0	14	0	0	50	0	0
Volume Right	0	3	0	45	0	0	35	0	0	27
cSH	150	189	143	372	596	1700	1700	507	1700	1700
Volume to Capacity	0.06	0.04	0.18	0.12	0.02	0.52	0.28	0.10	0.53	0.28
Queue Length 95th (m)	1.4	0.9	4.9	3.2	0.5	0.0	0.0	2.5	0.0	0.0
Control Delay (s)	30.6	24.8	35.7	16.0	11.2	0.0	0.0	12.9	0.0	0.0
Lane LOS	D	C	E	C	B			B		
Approach Delay (s)	28.0		23.1		0.1			0.5		
Approach LOS	D		C							

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization		53.1%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	11	1368	8	4	1217
Future Volume (vph)	19	11	1368	8	4	1217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	30.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.951		0.999			
Flt Protected	0.969				0.950	
Satd. Flow (prot)	1714	0	3541	0	1825	3579
Flt Permitted	0.969				0.950	
Satd. Flow (perm)	1714	0	3541	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	0%	0%	2%
Adj. Flow (vph)	21	12	1487	9	4	1323
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	1496	0	4	1323
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	11	1368	8	4	1217
Future Volume (Veh/h)	19	11	1368	8	4	1217
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	12	1487	9	4	1323
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2161	748			1496	
vC1, stage 1 conf vol	1492					
vC2, stage 2 conf vol	670					
vCu, unblocked vol	2161	748			1496	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4			2.2	
p0 queue free %	87	96			99	
cM capacity (veh/h)	163	340			454	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	33	991	505	4	662	662
Volume Left	21	0	0	4	0	0
Volume Right	12	0	9	0	0	0
cSH	201	1700	1700	454	1700	1700
Volume to Capacity	0.16	0.58	0.30	0.01	0.39	0.39
Queue Length 95th (m)	4.4	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	26.4	0.0	0.0	13.0	0.0	0.0
Lane LOS	D			B		
Approach Delay (s)	26.4	0.0		0.0		
Approach LOS	D					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	11	1247	6	3	1258
Future Volume (vph)	6	11	1247	6	3	1258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1498	3535	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1498	3535	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	33%	0%	2%
Adj. Flow (vph)	7	12	1355	7	3	1367
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	12	1362	0	3	1367
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	11	1247	6	3	1258
Future Volume (Veh/h)	6	11	1247	6	3	1258
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	12	1355	7	3	1367
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.72	0.72			0.72	
vC, conflicting volume	2048	681			1362	
vC1, stage 1 conf vol	1358					
vC2, stage 2 conf vol	690					
vCu, unblocked vol	1672	0			715	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4			2.2	
p0 queue free %	97	98			100	
cM capacity (veh/h)	265	761			641	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	19	903	459	3	684	684
Volume Left	7	0	0	3	0	0
Volume Right	12	0	7	0	0	0
cSH	718	1700	1700	641	1700	1700
Volume to Capacity	0.03	0.53	0.27	0.00	0.40	0.40
Queue Length 95th (m)	0.6	0.0	0.0	0.1	0.0	0.0
Control Delay (s)	13.2	0.0	0.0	10.6	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	13.2	0.0		0.0		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2	17	206	1	100	5	1155	183	89	1152	3
Future Volume (vph)	10	2	17	206	1	100	5	1155	183	89	1152	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		35.0	28.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			45.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.866			0.851			0.979				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1631	0	1789	1508	0	1789	3469	0	1690	3579	0
Flt Permitted	0.686			0.745			0.157			0.108		
Satd. Flow (perm)	1292	1631	0	1403	1508	0	296	3469	0	192	3579	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			109			27				
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		170.8			534.8			346.0			306.2	
Travel Time (s)		12.8			38.5			17.8			15.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	7%	2%	3%	3%	8%	2%	2%
Adj. Flow (vph)	10	2	17	224	1	109	5	1255	199	97	1252	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	19	0	224	110	0	5	1454	0	97	1255	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

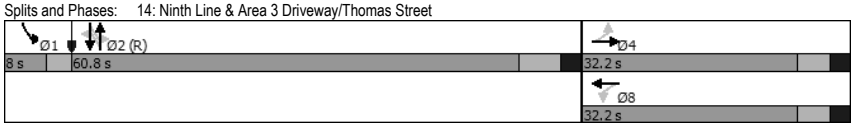
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		52.5	52.5		8.0	52.5	
Total Split (s)	32.2	32.2		32.2	32.2		60.8	60.8		8.0	60.8	
Total Split (%)	31.9%	31.9%		31.9%	31.9%		60.2%	60.2%		7.9%	60.2%	
Maximum Green (s)	25.7	25.7		25.7	25.7		53.3	53.3		5.0	53.3	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		0.0	2.5	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.5	6.5		2.0	6.5	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		33.0	33.0			33.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0			12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	21.5	21.5		21.5	21.5		60.1	60.1		70.4	60.1	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.60	0.60		0.70	0.60	
v/c Ratio	0.04	0.05		0.75	0.27		0.03	0.70		0.41	0.59	
Control Delay	28.9	14.0		53.6	9.7		13.6	23.8		10.5	15.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.9	14.0		53.6	9.7		13.6	23.8		10.5	15.5	
LOS	C	B		D	A		B	C		B	B	
Approach Delay		19.1			39.1			23.8			15.2	
Approach LOS		B			D			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 21.7 — Intersection LOS: C
Intersection Capacity Utilization 102.0% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 14: Ninth Line & Area 3 Driveway/Thomas Street



Queues
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	19	224	110	5	1454	97	1255
v/c Ratio	0.04	0.05	0.75	0.27	0.03	0.70	0.41	0.59
Control Delay	28.9	14.0	53.6	9.7	13.6	23.8	10.5	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	14.0	53.6	9.7	13.6	23.8	10.5	15.5
Queue Length 50th (m)	1.6	0.3	43.7	1.3	0.6	147.3	5.2	82.8
Queue Length 95th (m)	5.5	5.8	66.8	15.8	m0.0	172.4	11.6	109.4
Internal Link Dist (m)		146.8		510.8		322.0		282.2
Turn Bay Length (m)					30.0		28.0	
Base Capacity (vph)	341	443	370	478	176	2073	239	2128
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.04	0.61	0.23	0.03	0.70	0.41	0.59

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	46	1222	7	17	1369
Future Volume (vph)	18	46	1222	7	17	1369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.904		0.999			
Flt Protected	0.986				0.950	
Satd. Flow (prot)	1688	0	3541	0	1722	3579
Flt Permitted	0.986				0.950	
Satd. Flow (perm)	1688	0	3541	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	3%	0%	6%	2%
Adj. Flow (vph)	20	50	1328	8	18	1488
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	0	1336	0	18	1488
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	46	1222	7	17	1369
Future Volume (Veh/h)	18	46	1222	7	17	1369
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	50	1328	8	18	1488
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.77					
vC, conflicting volume	2112	668			1336	
vC1, stage 1 conf vol	1332					
vC2, stage 2 conf vol	780					
vCu, unblocked vol	1840	668			1336	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.3	
p0 queue free %	90	88			96	
cM capacity (veh/h)	201	401			491	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	70	885	451	18	744	744
Volume Left	20	0	0	18	0	0
Volume Right	50	0	8	0	0	0
cSH	312	1700	1700	491	1700	1700
Volume to Capacity	0.22	0.52	0.27	0.04	0.44	0.44
Queue Length 95th (m)	6.4	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	19.8	0.0	0.0	12.6	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	19.8	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	39	78	1173	49	46	1367
Future Volume (vph)	39	78	1173	49	46	1367
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1617	3514	0	1722	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1617	3514	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Adj. Flow (vph)	42	85	1275	53	50	1486
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	85	1328	0	50	1486
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	39	78	1173	49	46	1367
Future Volume (Veh/h)	39	78	1173	49	46	1367
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	85	1275	53	50	1486
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2144	664			1328	
vC1, stage 1 conf vol	1302					
vC2, stage 2 conf vol	843					
vCu, unblocked vol	2144	664			1328	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.3	
p0 queue free %	77	79			90	
cM capacity (veh/h)	185	406			495	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	127	850	478	50	743	743
Volume Left	42	0	0	50	0	0
Volume Right	85	0	53	0	0	0
cSH	559	1700	1700	495	1700	1700
Volume to Capacity	0.23	0.50	0.28	0.10	0.44	0.44
Queue Length 95th (m)	6.6	0.0	0.0	2.5	0.0	0.0
Control Delay (s)	20.8	0.0	0.0	13.1	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	20.8	0.0		0.4		
Approach LOS	C					

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	14	9	0	18	5	1191	1	8	1402	3
Future Volume (vph)	12	0	14	9	0	18	5	1191	1	8	1402	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	70.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.927			0.910							
Flt Protected		0.977			0.984		0.950			0.950		
Satd. Flow (prot)	0	1706	0	0	1720	0	1789	3544	0	1825	3579	0
Flt Permitted		0.977			0.984		0.950			0.950		
Satd. Flow (perm)	0	1706	0	0	1720	0	1789	3544	0	1825	3579	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		92.8			113.3			424.8			250.0	
Travel Time (s)		7.0			8.2			21.8			12.9	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	0%	0%	2%	2%
Adj. Flow (vph)	12	0	14	10	0	20	5	1295	1	9	1524	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	0	30	0	5	1296	0	9	1527	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	14	9	0	18	5	1191	1	8	1402	3
Future Volume (Veh/h)	12	0	14	9	0	18	5	1191	1	8	1402	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	12	0	14	10	0	20	5	1295	1	9	1524	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2221	2850	764	2100	2850	648	1527			1296		
vC1, stage 1 conf vol	1544	1544		1306	1306							
vC2, stage 2 conf vol	678	1306		794	1545							
vCu, unblocked vol	2221	2850	764	2100	2850	648	1527			1296		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	100	96	93	100	95	99			98		
cM capacity (veh/h)	110	129	347	148	129	418	432			541		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	26	30	5	863	433	9	1016	511
Volume Left	12	10	5	0	0	9	0	0
Volume Right	14	20	0	0	1	0	0	3
cSH	174	260	432	1700	1700	541	1700	1700
Volume to Capacity	0.15	0.12	0.01	0.51	0.25	0.02	0.60	0.30
Queue Length 95th (m)	3.9	2.9	0.3	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	29.3	20.7	13.4	0.0	0.0	11.8	0.0	0.0
Lane LOS	D	C	B			B		
Approach Delay (s)	29.3	20.7	0.1			0.1		
Approach LOS	D	C						

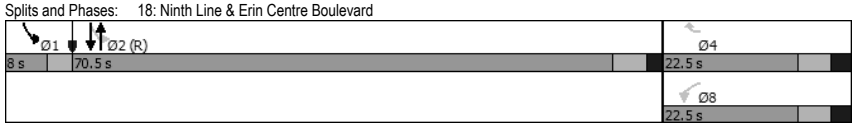
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	83	63	1064	58	55	1374
Future Volume (vph)	83	63	1064	58	55	1374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.992			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1706	1570	3493	0	1772	3579
Flt Permitted	0.950				0.195	
Satd. Flow (perm)	1706	1570	3493	0	364	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		68	11			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	4%	3%	16%	3%	2%
Adj. Flow (vph)	90	68	1157	63	60	1493
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	68	1220	0	60	1493
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	22.5	22.5	70.5		8.0	70.5
Total Split (%)	22.3%	22.3%	69.8%		7.9%	69.8%
Maximum Green (s)	16.0	16.0	64.5		5.0	64.5
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	5.0	8.0	50.0			50.0
Flash Dont Walk (s)	11.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	11.9	11.9	75.1		82.9	75.1
Actuated g/C Ratio	0.12	0.12	0.74		0.82	0.74
v/c Ratio	0.45	0.28	0.47		0.15	0.56
Control Delay	48.0	12.7	7.7		5.6	18.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	48.0	12.7	7.7		5.6	18.9
LOS	D	B	A		A	B
Approach Delay	32.8		7.7			18.4
Approach LOS	C		A			B

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	90	68	1220	60	1493
v/c Ratio	0.45	0.28	0.47	0.15	0.56
Control Delay	48.0	12.7	7.7	5.6	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	12.7	7.7	5.6	18.9
Queue Length 50th (m)	16.7	0.0	51.8	4.1	137.9
Queue Length 95th (m)	30.6	11.5	76.5	m7.8	164.6
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	287	320	2601	396	2662
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.31	0.21	0.47	0.15	0.56

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	0	0	17	0	41	0	1005	8	14	1462	5
Future Volume (vph)	16	0	0	17	0	41	0	1005	8	14	1462	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.850			0.999				
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1883	0	1825	1601	0	1883	3541	0	1825	3579	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1883	0	1825	1601	0	1883	3541	0	1825	3579	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		73.8			216.6			90.1			404.2	
Travel Time (s)		5.5			15.6			4.6			20.8	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	2%	3%	0%	0%	2%	2%
Adj. Flow (vph)	16	0	0	18	0	45	0	1092	9	15	1589	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	0	0	18	45	0	0	1101	0	15	1594	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 54.8% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	0	17	0	41	0	1005	8	14	1462	5
Future Volume (Veh/h)	16	0	0	17	0	41	0	1005	8	14	1462	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	16	0	0	18	0	45	0	1092	9	15	1589	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								373				
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	2212	2722	797	1921	2720	550	1594			1101		
vC1, stage 1 conf vol	1622	1622		1096	1096							
vC2, stage 2 conf vol	591	1101		824	1624							
vCu, unblocked vol	2075	2674	797	1733	2672	124	1594			770		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	100	100	92	100	94	100			98		
cM capacity (veh/h)	101	137	329	224	138	770	407			727		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	16	0	18	45	0	728	373	15	1059	535
Volume Left	16	0	18	0	0	0	0	15	0	0
Volume Right	0	0	0	45	0	0	9	0	0	5
cSH	101	1700	224	770	1700	1700	1700	727	1700	1700
Volume to Capacity	0.16	0.00	0.08	0.06	0.00	0.43	0.22	0.02	0.62	0.31
Queue Length 95th (m)	4.1	0.0	2.0	1.4	0.0	0.0	0.0	0.5	0.0	0.0
Control Delay (s)	47.1	0.0	22.4	10.0	0.0	0.0	0.0	10.1	0.0	0.0
Lane LOS	E	A	C	A				B		
Approach Delay (s)	47.1		13.5		0.0			0.1		
Approach LOS	E		B							

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		54.8%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	17	1054	1	6	1437
Future Volume (vph)	5	17	1054	1	6	1437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.894					
Flt Protected	0.989				0.950	
Satd. Flow (prot)	1699	0	3544	0	1217	3614
Flt Permitted	0.989				0.950	
Satd. Flow (perm)	1699	0	3544	0	1217	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	50%	1%
Adj. Flow (vph)	5	18	1146	1	7	1562
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	1147	0	7	1562
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	17	1054	1	6	1437
Future Volume (Veh/h)	5	17	1054	1	6	1437
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	18	1146	1	7	1562
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.84	0.84			0.84	
vC, conflicting volume	1942	574			1147	
vC1, stage 1 conf vol	1146					
vC2, stage 2 conf vol	795					
vCu, unblocked vol	1739	109			793	
tC, single (s)	6.8	6.9			5.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.7	
p0 queue free %	98	98			99	
cM capacity (veh/h)	263	780			483	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	23	764	383	7	781	781
Volume Left	5	0	0	7	0	0
Volume Right	18	0	1	0	0	0
cSH	547	1700	1700	483	1700	1700
Volume to Capacity	0.04	0.45	0.23	0.01	0.46	0.46
Queue Length 95th (m)	1.0	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	11.9	0.0	0.0	12.6	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	11.9	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	0	43	2	0	25	11	934	6	0	1531	5
Future Volume (vph)	23	0	43	2	0	25	11	934	6	0	1531	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		20.0	0.0		0.0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.912				0.865			0.850			
Flt Protected		0.983			0.950		0.950					
Satd. Flow (prot)	0	1688	0	0	0	1662	1789	3544	1396	0	3614	0
Flt Permitted		0.983			0.950		0.950					
Satd. Flow (perm)	0	1688	0	0	0	1662	1789	3544	1396	0	3614	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		70.1			245.5			191.7			91.0	
Travel Time (s)		5.3			17.7			9.9			4.7	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	17%	0%	1%	2%
Adj. Flow (vph)	23	0	43	2	0	27	11	1015	7	0	1664	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	66	0	0	2	27	11	1015	7	0	1669	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	0	43	2	0	25	11	934	6	0	1531	5
Future Volume (Veh/h)	23	0	43	2	0	25	11	934	6	0	1531	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	23	0	43	2	0	27	11	1015	7	0	1664	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								192				
pX, platoon unblocked	0.83	0.83		0.83	0.83	0.83				0.83		
vC, conflicting volume	2223	2704	834	1912	2706	508	1669			1015		
vC1, stage 1 conf vol	1666	1666		1037	1037							
vC2, stage 2 conf vol	556	1037		875	1669							
vCu, unblocked vol	2069	2645	834	1697	2648	15	1669			623		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	100	86	99	100	97	97			100		
cM capacity (veh/h)	97	136	311	206	128	891	381			808		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	66	29	11	508	508	7	1109	560
Volume Left	23	2	11	0	0	0	0	0
Volume Right	43	27	0	0	0	7	0	5
cSH	176	725	381	1700	1700	1700	1700	1700
Volume to Capacity	0.37	0.04	0.03	0.30	0.30	0.00	0.65	0.33
Queue Length 95th (m)	12.2	0.9	0.7	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	37.2	10.2	14.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	E	B	B					
Approach Delay (s)	37.2	10.2	0.2				0.0	
Approach LOS	E	B						

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization		Err%	ICU Level of Service	H
Analysis Period (min)		15		

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	909	51	39	316	245	14	520	67	486	814	82
Future Volume (vph)	69	909	51	39	316	245	14	520	67	486	814	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.983			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3617	0	1825	1883	1526	1825	3526	0	1789	3596	0
Flt Permitted	0.489			0.091			0.294			0.131		
Satd. Flow (perm)	930	3617	0	175	1883	1526	565	3526	0	247	3596	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				266		9			11	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	2%	7%	0%	2%	0%	2%	0%	1%
Adj. Flow (vph)	75	988	55	42	343	266	15	565	73	528	885	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	1043	0	42	343	266	15	638	0	528	974	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

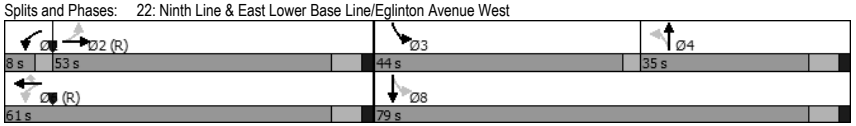
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		1	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		8.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	53.0	53.0		8.0	61.0	61.0	35.0	35.0		44.0	79.0	
Total Split (%)	37.9%	37.9%		5.7%	43.6%	43.6%	25.0%	25.0%		31.4%	56.4%	
Maximum Green (s)	46.0	46.0		5.0	54.0	54.0	28.0	28.0		41.0	72.0	
Yellow Time (s)	5.0	5.0		3.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		0.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min	Min	Min		None	Min	
Walk Time (s)	8.0	8.0			8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0			8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0			0	
Act Effct Green (s)	51.3	51.3		62.0	58.0	58.0	28.4	28.4		74.0	70.0	
Actuated g/C Ratio	0.37	0.37		0.44	0.41	0.41	0.20	0.20		0.53	0.50	
v/c Ratio	0.22	0.79		0.28	0.44	0.34	0.13	0.88		0.93	0.54	
Control Delay	35.2	45.6		28.5	32.5	4.3	48.7	68.1		61.5	24.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	35.2	45.6		28.5	32.5	4.3	48.7	68.1		61.5	24.7	
LOS	D	D		C	C	A	D	E		E	C	
Approach Delay		44.9			20.7			67.7			37.6	
Approach LOS		D			C			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 41.9 — Intersection LOS: D
Intersection Capacity Utilization 91.0% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	1043	42	343	266	15	638	528	974
v/c Ratio	0.22	0.79	0.28	0.44	0.34	0.13	0.88	0.93	0.54
Control Delay	35.2	45.6	28.5	32.5	4.3	48.7	68.1	61.5	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	45.6	28.5	32.5	4.3	48.7	68.1	61.5	24.7
Queue Length 50th (m)	15.0	141.1	6.8	70.0	0.0	3.4	89.5	119.6	89.5
Queue Length 95th (m)	28.3	168.9	14.3	97.7	17.1	10.1	#118.5	#182.5	107.7
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	341	1328	152	780	788	118	741	593	1880
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.79	0.28	0.44	0.34	0.13	0.86	0.89	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	106	22	159	236	14	33	24	249	21	40	13
Future Volume (vph)	7	106	22	159	236	14	33	24	249	21	40	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.978			0.995			0.890			0.976	
Flt Protected		0.997			0.981			0.995			0.986	
Satd. Flow (prot)	0	1778	0	0	1822	0	0	1664	0	0	1849	0
Flt Permitted		0.997			0.981			0.995			0.986	
Satd. Flow (perm)	0	1778	0	0	1822	0	0	1664	0	0	1849	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	9		16	16		9	10		27	27		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	4%	9%	3%	3%	0%	3%	4%	2%	0%	0%	0%
Adj. Flow (vph)	8	115	24	173	257	15	36	26	271	23	43	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	147	0	0	445	0	0	333	0	0	80	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 64.1%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	106	22	159	236	14	33	24	249	21	40	13
Future Volume (vph)	7	106	22	159	236	14	33	24	249	21	40	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	115	24	173	257	15	36	26	271	23	43	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	147	445	333	80
Volume Left (vph)	8	173	36	23
Volume Right (vph)	24	15	271	14
Hadj (s)	0.00	0.11	-0.43	-0.05
Departure Headway (s)	5.8	5.4	5.3	6.2
Degree Utilization, x	0.24	0.67	0.49	0.14
Capacity (veh/h)	549	635	628	486
Control Delay (s)	10.7	18.9	13.3	10.1
Approach Delay (s)	10.7	18.9	13.3	10.1
Approach LOS	B	C	B	B

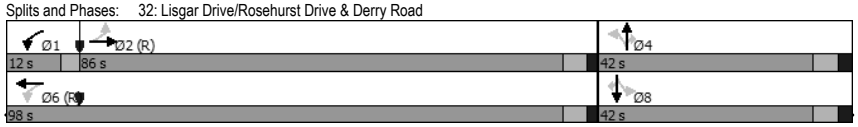
Intersection Summary			
Delay	15.1		
Level of Service	C		
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	2653	20	104	1202	132	95	63	361	224	105	92
Future Volume (vph)	22	2653	20	104	1202	132	95	63	361	224	105	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99		0.99		0.96	0.97		0.97
Frt		0.999			0.985				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5187	0	1684	4890	0	1750	1847	1617	1750	1795	1581
Flt Permitted	0.193			0.044			0.661			0.716		
Satd. Flow (perm)	361	5187	0	78	4890	0	1201	1847	1547	1281	1795	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			28				112			92
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	14		3	3		14	12		24	24		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	6%	5%	6%	2%	4%	1%	2%	7%	1%
Adj. Flow (vph)	22	2653	20	104	1202	132	95	63	361	224	105	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2673	0	104	1334	0	95	63	361	224	105	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		8.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	86.0	86.0		12.0	98.0		42.0	42.0	42.0	42.0	42.0	42.0
Total Split (%)	61.4%	61.4%		8.6%	70.0%		30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Maximum Green (s)	80.0	80.0		9.0	92.0		35.4	35.4	35.4	35.4	35.4	35.4
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		0.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		2.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0			12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0			18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	88.2	88.2		102.4	99.4		30.0	30.0	30.0	30.0	30.0	30.0
Actuated g/C Ratio	0.63	0.63		0.73	0.71		0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.10	0.82		0.64	0.38		0.37	0.16	0.86	0.82	0.27	0.23
Control Delay	5.2	6.3		43.2	8.8		49.5	43.4	55.7	74.5	46.0	8.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	6.3		43.2	8.8		49.5	43.4	55.7	74.5	46.0	8.9
LOS	A	A		D	A		D	D	E	E	D	A
Approach Delay		6.3			11.3			53.1			53.1	
Approach LOS		A			B			D			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 16.4	Intersection LOS: B
Intersection Capacity Utilization 103.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	2673	104	1334	95	63	361	224	105	92
v/c Ratio	0.10	0.82	0.64	0.38	0.37	0.16	0.86	0.82	0.27	0.23
Control Delay	5.2	6.3	43.2	8.8	49.5	43.4	55.7	74.5	46.0	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	6.3	43.2	8.8	49.5	43.4	55.7	74.5	46.0	8.9
Queue Length 50th (m)	0.7	36.8	13.0	49.7	22.4	14.2	68.6	58.9	24.2	0.0
Queue Length 95th (m)	m1.0	42.1	#34.4	65.5	37.5	25.5	102.7	85.8	39.0	13.6
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	227	3268	173	3478	312	480	485	333	466	467
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.82	0.60	0.38	0.30	0.13	0.74	0.67	0.23	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	215	36	53	223	130	65	82	170	223	70	69
Future Volume (vph)	9	215	36	53	223	130	65	82	170	223	70	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.979			0.945			0.928			0.974	
Flt Protected	0.950			0.950				0.990			0.970	
Satd. Flow (prot)	1496	1841	0	1674	1791	0	0	1705	0	0	1777	0
Flt Permitted	0.950			0.950				0.990			0.970	
Satd. Flow (perm)	1496	1841	0	1674	1791	0	0	1705	0	0	1777	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	15		33	33		15	38		42	42		38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	2%	3%	9%	1%	2%	3%	7%	2%	1%	4%	4%
Adj. Flow (vph)	10	234	39	58	242	141	71	89	185	242	76	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	273	0	58	383	0	0	345	0	0	393	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 78.0% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	215	36	53	223	130	65	82	170	223	70	69
Future Volume (vph)	9	215	36	53	223	130	65	82	170	223	70	69
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	234	39	58	242	141	71	89	185	242	76	75

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	10	273	58	383	345	393
Volume Left (vph)	10	0	58	0	71	242
Volume Right (vph)	0	39	0	141	185	75
Hadj (s)	0.87	-0.06	0.65	-0.23	-0.22	0.05
Departure Headway (s)	9.9	8.9	9.2	8.3	8.0	8.0
Degree Utilization, x	0.03	0.67	0.15	0.88	0.77	0.88
Capacity (veh/h)	345	380	374	412	423	393
Control Delay (s)	12.0	27.2	12.6	46.8	32.9	46.4
Approach Delay (s)	26.7		42.3		32.9	46.4
Approach LOS	D		E		D	E

Intersection Summary			
Delay		38.1	
Level of Service		E	
Intersection Capacity Utilization		78.0%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	86	3	9	92	122	5	16	12	210	11	104
Future Volume (vph)	89	86	3	9	92	122	5	16	12	210	11	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.926			0.950			0.957	
Flt Protected		0.975			0.998			0.993			0.969	
Satd. Flow (prot)	0	1851	0	0	1775	0	0	1812	0	0	1748	0
Flt Permitted		0.975			0.998			0.993			0.969	
Satd. Flow (perm)	0	1851	0	0	1775	0	0	1812	0	0	1748	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	8		6	6		8	2		12	12		2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%
Adj. Flow (vph)	97	93	3	10	100	133	5	17	13	228	12	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	193	0	0	243	0	0	35	0	0	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 58.9%		ICU Level of Service B
Analysis Period (min) 15		

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	86	3	9	92	122	5	16	12	210	11	104
Future Volume (vph)	89	86	3	9	92	122	5	16	12	210	11	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	93	3	10	100	133	5	17	13	228	12	113

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	193	243	35	353
Volume Left (vph)	97	10	5	228
Volume Right (vph)	3	133	13	113
Hadj (s)	0.11	-0.32	-0.19	-0.03
Departure Headway (s)	5.4	4.9	5.4	5.1
Degree Utilization, x	0.29	0.33	0.05	0.50
Capacity (veh/h)	614	676	565	670
Control Delay (s)	10.6	10.4	8.7	13.0
Approach Delay (s)	10.6	10.4	8.7	13.0
Approach LOS	B	B	A	B

Intersection Summary				
Delay			11.5	
Level of Service			B	
Intersection Capacity Utilization			58.9%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2489	131	60	967	17	31	3	209	74	19	17
Future Volume (vph)	1	2489	131	60	967	17	31	3	209	74	19	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		0.99	0.97		0.99	0.99	
Frt		0.992			0.997			0.852			0.929	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5146	0	1552	5009	0	1733	1575	0	1785	1721	0
Flt Permitted	0.279			0.039			0.734			0.295		
Satd. Flow (perm)	522	5146	0	64	5009	0	1326	1575	0	549	1721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			5			72			17	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			101.9			114.1			106.4	
Travel Time (s)		28.2			6.1			8.2			7.7	
Confl. Peds. (#/hr)	8		4	4		8	6		10	10		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	4%	23%	3%	0%	1%	0%	5%	0%
Adj. Flow (vph)	1	2489	131	60	967	17	31	3	209	74	19	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2620	0	60	984	0	31	212	0	74	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

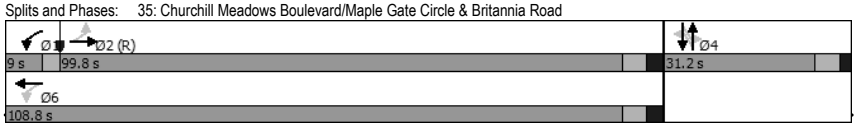
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			4	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		1	6		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		9.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	99.8	99.8		9.0	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	71.3%	71.3%		6.4%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	92.8	92.8		6.0	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		0.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-2.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0		5.2	5.2		4.2	5.2	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	11.0	11.0			11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0			18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	101.6	101.6		113.2	109.2		19.6	19.6		20.6	19.6	
Actuated g/C Ratio	0.73	0.73		0.81	0.78		0.14	0.14		0.15	0.14	
v/c Ratio	0.00	0.70		0.47	0.25		0.17	0.75		0.93	0.14	
Control Delay	2.0	2.2		27.9	4.8		52.2	53.8		139.0	31.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.0	2.2		27.9	4.8		52.2	53.8		139.0	31.9	
LOS	A	A		C	A		D	D		F	C	
Approach Delay		2.2			6.1			53.6			104.0	
Approach LOS		A			A			D			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 9.1 Intersection LOS: A
Intersection Capacity Utilization 86.5% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	2620	60	984	31	212	74	36
v/c Ratio	0.00	0.70	0.47	0.25	0.17	0.75	0.93	0.14
Control Delay	2.0	2.2	27.9	4.8	52.2	53.8	139.0	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	2.2	27.9	4.8	52.2	53.8	139.0	31.9
Queue Length 50th (m)	0.0	23.2	2.9	24.1	7.6	37.7	20.3	4.6
Queue Length 95th (m)	m0.0	m24.9	18.2	34.6	16.6	63.1	#44.9	14.2
Internal Link Dist (m)		445.7		77.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	378	3739	130	3909	246	351	105	333
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.70	0.46	0.25	0.13	0.60	0.70	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	17	21	42	67	20	11	181	34	16	220	7
Future Volume (vph)	12	17	21	42	67	20	11	181	34	16	220	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.942			0.979			0.980			0.996	
Flt Protected		0.988			0.984			0.998			0.997	
Satd. Flow (prot)	0	1753	0	0	1771	0	0	1835	0	0	1794	0
Flt Permitted		0.988			0.984			0.998			0.997	
Satd. Flow (perm)	0	1753	0	0	1771	0	0	1835	0	0	1794	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)			13	13			16		13	13		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	0%	5%	4%	5%	0%	3%	0%	0%	7%	0%
Adj. Flow (vph)	13	18	23	46	73	22	12	197	37	17	239	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	141	0	0	246	0	0	264	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	17	21	42	67	20	11	181	34	16	220	7
Future Volume (Veh/h)	12	17	21	42	67	20	11	181	34	16	220	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	18	23	46	73	22	12	197	37	17	239	8
Pedestrians		16			13			13				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			1			1				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	591	564	272	574	550	228	263			247		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	591	564	272	574	550	228	263			247		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	96	97	88	83	97	99			99		
cM capacity (veh/h)	338	409	753	376	420	794	1295			1316		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	54	141	246	264
Volume Left	13	46	12	17
Volume Right	23	22	37	8
cSH	478	435	1295	1316
Volume to Capacity	0.11	0.32	0.01	0.01
Queue Length 95th (m)	2.9	10.5	0.2	0.3
Control Delay (s)	13.5	17.2	0.5	0.6
Lane LOS	B	C	A	A
Approach Delay (s)	13.5	17.2	0.5	0.6
Approach LOS	B	C		

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	199	31	90	71	29	13	205	161	61	269	11
Future Volume (vph)	23	199	31	90	71	29	13	205	161	61	269	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.979			0.943			0.996	
Flt Protected		0.995			0.977			0.998			0.991	
Satd. Flow (prot)	0	1749	0	0	1779	0	0	1767	0	0	1867	0
Flt Permitted		0.995			0.977			0.998			0.991	
Satd. Flow (perm)	0	1749	0	0	1779	0	0	1767	0	0	1867	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	19		71	71		19	20		20	20		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	9%	0%	2%	5%	3%	15%	1%	3%	0%	2%	0%
Adj. Flow (vph)	25	216	34	98	77	32	14	223	175	66	292	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	275	0	0	207	0	0	412	0	0	370	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 79.2%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	199	31	90	71	29	13	205	161	61	269	11
Future Volume (vph)	23	199	31	90	71	29	13	205	161	61	269	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	216	34	98	77	32	14	223	175	66	292	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	275	207	412	370
Volume Left (vph)	25	98	14	66
Volume Right (vph)	34	32	175	12
Hadj (s)	0.07	0.06	-0.21	0.04
Departure Headway (s)	7.2	7.5	6.4	6.8
Degree Utilization, x	0.55	0.43	0.74	0.70
Capacity (veh/h)	444	411	522	498
Control Delay (s)	18.8	15.9	25.4	23.8
Approach Delay (s)	18.8	15.9	25.4	23.8
Approach LOS	C	C	D	C

Intersection Summary			
Delay	22.0		
Level of Service	C		
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	331	14	104	266	181	20	244	68	181	306	63
Future Volume (vph)	131	331	14	104	266	181	20	244	68	181	306	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	1.00		0.99	0.97		1.00	0.99		0.98	1.00	
Frt		0.994			0.939			0.967			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3578	0	1772	3163	0	1825	1794	0	1807	1821	0
Flt Permitted	0.441			0.517			0.384			0.447		
Satd. Flow (perm)	817	3578	0	954	3163	0	735	1794	0	832	1821	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			197			19			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	7%	3%	3%	8%	0%	2%	4%	1%	2%	5%
Adj. Flow (vph)	142	360	15	113	289	197	22	265	74	197	333	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	142	375	0	113	486	0	22	339	0	197	401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	47.0	47.0		47.0	47.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.5%	46.5%		46.5%	46.5%		53.5%	53.5%		53.5%	53.5%	
Maximum Green (s)	40.5	40.5		40.5	40.5		48.0	48.0		48.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	47.5	47.5		47.5	47.5		43.0	43.0		43.0	43.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.43	0.43		0.43	0.43	
v/c Ratio	0.37	0.22		0.25	0.31		0.07	0.44		0.56	0.51	
Control Delay	26.2	20.9		18.5	10.2		17.4	21.1		28.8	23.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.2	20.9		18.5	10.2		17.4	21.1		28.8	23.1	
LOS	C	C		B	B		B	C		C	C	
Approach Delay		22.4			11.8			20.9			24.9	
Approach LOS		C			B			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 113.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	375	113	486	22	339	197	401
v/c Ratio	0.37	0.22	0.25	0.31	0.07	0.44	0.56	0.51
Control Delay	26.2	20.9	18.5	10.2	17.4	21.1	28.8	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	20.9	18.5	10.2	17.4	21.1	28.8	23.1
Queue Length 50th (m)	18.6	24.6	12.6	16.4	2.5	43.8	28.9	55.3
Queue Length 95th (m)	m33.4	37.6	26.6	29.4	6.8	61.5	48.2	75.5
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	384	1686	449	1593	356	880	403	890
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.22	0.25	0.31	0.06	0.39	0.49	0.45

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	114	20	26	71	39	17	115	26	78	269	19
Future Volume (vph)	21	114	20	26	71	39	17	115	26	78	269	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.982			0.961			0.978			0.993	
Flt Protected		0.993			0.991			0.995			0.989	
Satd. Flow (prot)	0	1773	0	0	1788	0	0	1781	0	0	1786	0
Flt Permitted		0.993			0.991			0.995			0.989	
Satd. Flow (perm)	0	1773	0	0	1788	0	0	1781	0	0	1786	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	21		17	17		21	16		16	16		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	4%	3%	0%	6%	5%	4%	1%	7%	5%
Adj. Flow (vph)	23	124	22	28	77	42	18	125	28	85	292	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	169	0	0	147	0	0	171	0	0	398	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	114	20	26	71	39	17	115	26	78	269	19
Future Volume (vph)	21	114	20	26	71	39	17	115	26	78	269	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	124	22	28	77	42	18	125	28	85	292	21

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	169	147	171	398
Volume Left (vph)	23	28	18	85
Volume Right (vph)	22	42	28	21
Hadj (s)	0.05	-0.09	0.01	0.11
Departure Headway (s)	5.8	5.7	5.5	5.2
Degree Utilization, x	0.27	0.23	0.26	0.58
Capacity (veh/h)	560	562	595	660
Control Delay (s)	10.9	10.4	10.4	15.1
Approach Delay (s)	10.9	10.4	10.4	15.1
Approach LOS	B	B	B	C

Intersection Summary			
Delay		12.6	
Level of Service		B	
Intersection Capacity Utilization		53.1%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	204	15	29	118	14	22	122	121	67	279	36
Future Volume (vph)	22	204	15	29	118	14	22	122	121	67	279	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.988			0.938			0.987	
Flt Protected		0.995			0.991			0.996			0.991	
Satd. Flow (prot)	0	1748	0	0	1770	0	0	1717	0	0	1792	0
Flt Permitted		0.995			0.991			0.996			0.991	
Satd. Flow (perm)	0	1748	0	0	1770	0	0	1717	0	0	1792	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	8%	7%	7%	6%	7%	5%	6%	3%	1%	6%	3%
Adj. Flow (vph)	24	222	16	32	128	15	24	133	132	73	303	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	262	0	0	175	0	0	289	0	0	415	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 57.3%		ICU Level of Service B
Analysis Period (min) 15		

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	204	15	29	118	14	22	122	121	67	279	36
Future Volume (vph)	22	204	15	29	118	14	22	122	121	67	279	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	222	16	32	128	15	24	133	132	73	303	39

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	262	175	289	415
Volume Left (vph)	24	32	24	73
Volume Right (vph)	16	15	132	39
Hadj (s)	0.13	0.09	-0.18	0.06
Departure Headway (s)	6.7	6.9	6.1	6.1
Degree Utilization, x	0.48	0.33	0.49	0.70
Capacity (veh/h)	486	445	537	557
Control Delay (s)	15.8	13.3	14.9	22.1
Approach Delay (s)	15.8	13.3	14.9	22.1
Approach LOS	C	B	B	C

Intersection Summary				
Delay			17.5	
Level of Service			C	
Intersection Capacity Utilization			57.3%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	2199	1350	65	215	125
Future Volume (vph)	3	2199	1350	65	215	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt			0.993			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	3579	3443	0	1755	1183
Flt Permitted	0.151				0.950	
Satd. Flow (perm)	290	3579	3443	0	1755	1183
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			11			61
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	5%	8%	4%	38%
Adj. Flow (vph)	3	2199	1350	65	215	125
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	2199	1415	0	215	125
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

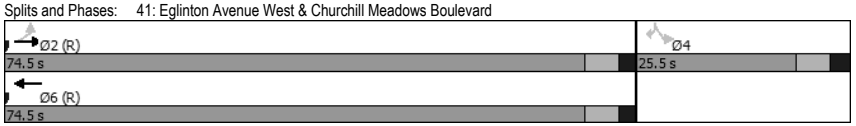
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				4	4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	24.0	24.0	24.0		25.5	25.5
Total Split (s)	74.5	74.5	74.5		25.5	25.5
Total Split (%)	74.5%	74.5%	74.5%		25.5%	25.5%
Maximum Green (s)	68.5	68.5	68.5		19.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	72.2	72.2	72.2		17.3	17.3
Actuated g/C Ratio	0.72	0.72	0.72		0.17	0.17
v/c Ratio	0.01	0.85	0.57		0.71	0.49
Control Delay	5.0	15.0	7.9		52.0	26.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	5.0	15.0	7.9		52.0	26.4
LOS	A	B	A		D	C
Approach Delay		15.0	7.9		42.6	
Approach LOS		B	A		D	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 14.9 — Intersection LOS: B
Intersection Capacity Utilization 81.4% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3	2199	1415	215	125
v/c Ratio	0.01	0.85	0.57	0.71	0.49
Control Delay	5.0	15.0	7.9	52.0	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	15.0	7.9	52.0	26.4
Queue Length 50th (m)	0.2	145.5	60.7	39.1	10.8
Queue Length 95th (m)	1.0	197.4	81.5	62.2	27.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	209	2585	2490	351	285
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.85	0.57	0.61	0.44

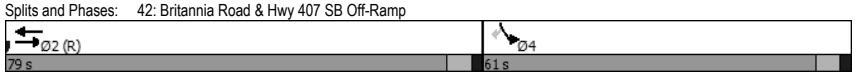
Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2084	669	0	434	6
Future Volume (vph)	0	2084	669	0	434	6
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5678	5622	0	1847	1524
Flt Permitted					0.950	
Satd. Flow (perm)	0	5678	5622	0	1847	1524
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						3
Link Speed (k/h)		80	80		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		9.3	13.4		15.0	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	0%	1%	2%	7%	16%
Adj. Flow (vph)	0	2105	676	0	438	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2105	676	0	438	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		79.0	79.0		61.0	61.0
Total Split (%)		56.4%	56.4%		43.6%	43.6%
Maximum Green (s)		73.0	73.0		55.0	55.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		88.6	88.6		39.4	39.4
Actuated g/C Ratio		0.63	0.63		0.28	0.28
v/c Ratio		0.59	0.19		0.84	0.01
Control Delay		16.7	6.4		61.9	24.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		16.7	6.4		61.9	24.5
LOS		B	A		E	C
Approach Delay		16.7	6.4		61.4	
Approach LOS		B	A		E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 20.7		Intersection LOS: C	
Intersection Capacity Utilization 69.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2105	676	438	6
v/c Ratio	0.59	0.19	0.84	0.01
Control Delay	16.7	6.4	61.9	24.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.7	6.4	61.9	24.5
Queue Length 50th (m)	117.9	11.9	114.5	0.6
Queue Length 95th (m)	158.6	14.4	140.5	3.6
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3593	3557	725	600
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.19	0.60	0.01

Intersection Summary

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2421	0	0	817	10	284
Future Volume (vph)	2421	0	0	817	10	284
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5678	0	0	5622	1847	1768
Flt Permitted					0.950	
Satd. Flow (perm)	5678	0	0	5622	1847	1768
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	80			80	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	13.4			9.8	11.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	1%	7%	0%
Adj. Flow (vph)	2522	0	0	851	10	296
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2522	0	0	851	10	296
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

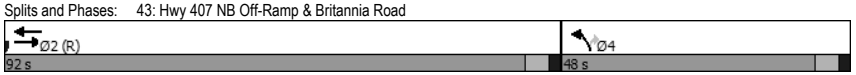
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	92.0			92.0	48.0	48.0
Total Split (%)	65.7%			65.7%	34.3%	34.3%
Maximum Green (s)	86.0			86.0	42.0	42.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	99.2			99.2	28.8	28.8
Actuated g/C Ratio	0.71			0.71	0.21	0.21
v/c Ratio	0.63			0.21	0.03	0.81
Control Delay	4.8			5.7	40.6	70.1
Queue Delay	0.2			0.0	0.0	0.0
Total Delay	5.0			5.7	40.6	70.1
LOS	A			A	D	E
Approach Delay	5.0			5.7	69.1	
Approach LOS	A			A	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 10.5 Intersection LOS: B
Intersection Capacity Utilization 69.4% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2522	851	10	296
v/c Ratio	0.63	0.21	0.03	0.81
Control Delay	4.8	5.7	40.6	70.1
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	5.0	5.7	40.6	70.1
Queue Length 50th (m)	47.6	18.9	2.3	78.9
Queue Length 95th (m)	49.7	m28.7	6.6	104.0
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4021	3982	554	530
Starvation Cap Reductn	13	0	0	0
Spillback Cap Reductn	559	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.21	0.02	0.56

Intersection Summary

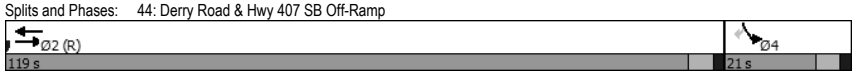
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3153	758	0	24	32
Future Volume (vph)	0	3153	758	0	24	32
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5622	5408	0	3686	1414
Flt Permitted					0.950	
Satd. Flow (perm)	0	5622	5408	0	3686	1414
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						33
Link Speed (k/h)		80	80		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		15.0	13.9		13.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	1%	5%	2%	4%	25%
Adj. Flow (vph)	0	3284	790	0	25	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	3284	790	0	25	33
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		119.0	119.0		21.0	21.0
Total Split (%)		85.0%	85.0%		15.0%	15.0%
Maximum Green (s)		113.0	113.0		15.0	15.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		123.8	123.8		8.2	8.2
Actuated g/C Ratio		0.88	0.88		0.06	0.06
v/c Ratio		0.66	0.17		0.12	0.29
Control Delay		3.8	0.5		63.5	25.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		3.8	0.5		63.5	25.8
LOS		A	A		E	C
Approach Delay		3.8	0.5		42.0	
Approach LOS		A	A		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 3.7	Intersection LOS: A
Intersection Capacity Utilization 72.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3284	790	25	33
v/c Ratio	0.66	0.17	0.12	0.29
Control Delay	3.8	0.5	63.5	25.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.8	0.5	63.5	25.8
Queue Length 50th (m)	85.7	3.1	3.4	0.0
Queue Length 95th (m)	99.6	3.8	8.2	10.9
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4970	4781	394	180
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.17	0.06	0.18

Intersection Summary

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2487	0	0	934	14	153
Future Volume (vph)	2487	0	0	934	14	153
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5622	0	0	5408	3582	1716
Flt Permitted					0.950	
Satd. Flow (perm)	5622	0	0	5408	3582	1716
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						156
Link Speed (k/h)	80			80	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	13.9			10.3	15.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	2%	2%	5%	7%	3%
Adj. Flow (vph)	2538	0	0	953	14	156
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2538	0	0	953	14	156
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

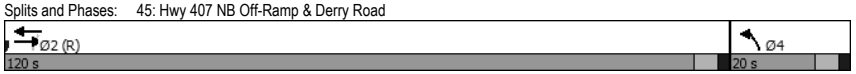
Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	120.0			120.0	20.0	120.0
Total Split (%)	85.7%			85.7%	14.3%	85.7%
Maximum Green (s)	114.0			114.0	14.0	114.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	132.0			132.0	8.0	132.0
Actuated g/C Ratio	0.94			0.94	0.06	0.94
v/c Ratio	0.48			0.19	0.07	0.10
Control Delay	0.9			0.2	63.4	0.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	0.9			0.2	63.4	0.3
LOS	A			A	E	A
Approach Delay	0.9			0.2	5.5	
Approach LOS	A			A	A	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 8 (6%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 1.0	Intersection LOS: A
Intersection Capacity Utilization 72.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2538	953	14	156
v/c Ratio	0.48	0.19	0.07	0.10
Control Delay	0.9	0.2	63.4	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	0.9	0.2	63.4	0.3
Queue Length 50th (m)	0.0	0.0	1.9	0.0
Queue Length 95th (m)	26.6	m2.9	5.6	2.4
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	5300	5099	358	1627
Starvation Cap Reductn	143	0	0	0
Spillback Cap Reductn	135	0	0	40
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.19	0.04	0.10

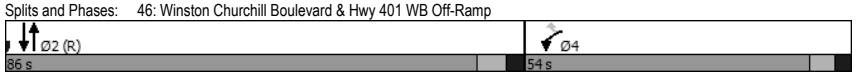
Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	471	498	1644	0	0	2324
Future Volume (vph)	471	498	1644	0	0	2324
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.956	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3404	1424	5513	0	0	5408
Flt Permitted	0.966					
Satd. Flow (perm)	3404	1424	5513	0	0	5408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	11	11				
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	8%	13%	3%	2%	0%	5%
Adj. Flow (vph)	535	566	1868	0	0	2641
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	756	345	1868	0	0	2641
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	54.0	54.0	86.0			86.0
Total Split (%)	38.6%	38.6%	61.4%			61.4%
Maximum Green (s)	47.0	47.0	78.0			78.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	39.2	39.2	85.8			85.8
Actuated g/C Ratio	0.28	0.28	0.61			0.61
v/c Ratio	0.79	0.85	0.55			0.80
Control Delay	51.7	64.8	15.7			24.0
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	51.7	64.8	15.7			24.0
LOS	D	E	B			C
Approach Delay	55.8		15.7			24.0
Approach LOS	E		B			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 110.2 (79%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 27.5		Intersection LOS: C	
Intersection Capacity Utilization 71.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	756	345	1868	2641
v/c Ratio	0.79	0.85	0.55	0.80
Control Delay	51.7	64.8	15.7	24.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	51.7	64.8	15.7	24.0
Queue Length 50th (m)	97.8	95.8	98.0	195.9
Queue Length 95th (m)	108.6	125.0	116.0	233.9
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1150	485	3377	3313
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.71	0.55	0.80

Intersection Summary

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	704	370	0	1411	2332	0
Future Volume (vph)	704	370	0	1411	2332	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3685	1593	0	5567	5408	0
Flt Permitted	0.955					
Satd. Flow (perm)	3685	1593	0	5567	5408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1	1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	4%	1%	0%	2%	5%	8%
Adj. Flow (vph)	800	420	0	1603	2650	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	842	378	0	1603	2650	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

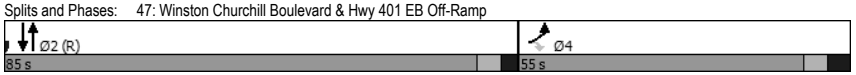
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	55.0	55.0		85.0	85.0	
Total Split (%)	39.3%	39.3%		60.7%	60.7%	
Maximum Green (s)	47.0	47.0		78.0	78.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	39.9	39.9		85.1	85.1	
Actuated g/C Ratio	0.28	0.28		0.61	0.61	
v/c Ratio	0.80	0.83		0.47	0.81	
Control Delay	52.2	62.4		16.4	21.4	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	52.2	62.4		16.4	21.4	
LOS	D	E		B	C	
Approach Delay	55.4			16.4	21.4	
Approach LOS	E			B	C	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 100.4 (72%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 27.5 Intersection LOS: C
Intersection Capacity Utilization 76.2% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	842	378	1603	2650
v/c Ratio	0.80	0.83	0.47	0.81
Control Delay	52.2	62.4	16.4	21.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.2	62.4	16.4	21.4
Queue Length 50th (m)	111.3	107.5	85.7	140.1
Queue Length 95th (m)	121.7	136.3	106.4	201.3
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	1237	535	3382	3285
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.71	0.47	0.81

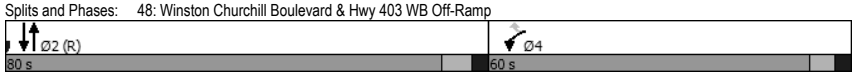
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	984	920	2616	0	0	2928
Future Volume (vph)	984	920	2616	0	0	2928
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.963	0.850				
Flt Protected	0.964					
Satd. Flow (prot)	3550	1547	5513	0	0	5513
Flt Permitted	0.964					
Satd. Flow (perm)	3548	1547	5513	0	0	5513
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	4%	3%	0%	0%	3%
Adj. Flow (vph)	1047	979	2783	0	0	3115
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	1390	636	2783	0	0	3115
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	60.0	60.0	80.0			80.0
Total Split (%)	42.9%	42.9%	57.1%			57.1%
Maximum Green (s)	53.0	53.0	72.0			72.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	53.0	53.0	72.0			72.0
Actuated g/C Ratio	0.38	0.38	0.51			0.51
v/c Ratio	1.03	1.09	0.98			1.10
Control Delay	76.4	104.2	44.5			83.7
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	76.4	104.2	44.5			83.7
LOS	E	F	D			F
Approach Delay	85.1		44.5			83.7
Approach LOS	F		D			F

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 125.6 (90%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 70.3		Intersection LOS: E	
Intersection Capacity Utilization 133.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1390	636	2783	3115
v/c Ratio	1.03	1.09	0.98	1.10
Control Delay	76.4	104.2	44.5	83.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	76.4	104.2	44.5	83.7
Queue Length 50th (m)	~212.6	~216.5	242.0	~357.1
Queue Length 95th (m)	#254.3	#295.6	#311.1	#379.8
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1343	585	2835	2835
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	1.09	0.98	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1261	453	0	1535	2514	0
Future Volume (vph)	1261	453	0	1535	2514	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor	1.00					
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3795	1733	0	5460	5513	0
Flt Permitted	0.950					
Satd. Flow (perm)	3789	1733	0	5460	5513	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	0%	4%	3%	0%
Adj. Flow (vph)	1314	472	0	1599	2619	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1314	472	0	1599	2619	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

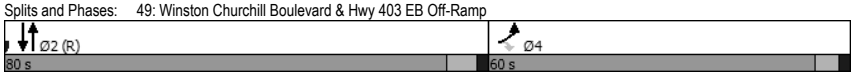
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	60.0	60.0		80.0	80.0	
Total Split (%)	42.9%	42.9%		57.1%	57.1%	
Maximum Green (s)	54.0	54.0		73.0	73.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	52.8	52.8		74.2	74.2	
Actuated g/C Ratio	0.38	0.38		0.53	0.53	
v/c Ratio	0.92	0.72		0.55	0.90	
Control Delay	52.5	44.4		23.0	35.5	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	52.5	44.4		23.0	35.5	
LOS	D	D		C	D	
Approach Delay	50.3			23.0	35.5	
Approach LOS	D			C	D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 58.4 (42%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 36.6 Intersection LOS: D
Intersection Capacity Utilization 133.3% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1314	472	1599	2619
v/c Ratio	0.92	0.72	0.55	0.90
Control Delay	52.5	44.4	23.0	35.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.5	44.4	23.0	35.5
Queue Length 50th (m)	174.9	109.4	106.6	259.0
Queue Length 95th (m)	205.3	150.0	120.5	m231.3
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	1463	669	2893	2921
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.90	0.71	0.55	0.90

Intersection Summary

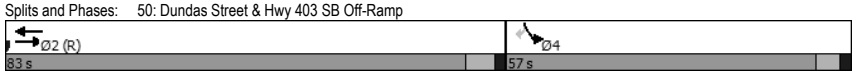
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3116	661	0	1312	587
Future Volume (vph)	0	3116	661	0	1312	587
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.994	0.850
Flt Protected					0.954	
Satd. Flow (prot)	0	5567	5307	0	3635	1449
Flt Permitted					0.954	
Satd. Flow (perm)	0	5567	5307	0	3635	1449
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					4	211
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	7%	0%	5%	11%
Adj. Flow (vph)	0	3212	681	0	1353	605
Shared Lane Traffic (%)						10%
Lane Group Flow (vph)	0	3212	681	0	1414	544
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		83.0	83.0		57.0	57.0
Total Split (%)		59.3%	59.3%		40.7%	40.7%
Maximum Green (s)		76.0	76.0		51.0	51.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		76.0	76.0		51.0	51.0
Actuated g/C Ratio		0.54	0.54		0.36	0.36
v/c Ratio		1.06	0.24		1.07	0.82
Control Delay		67.8	7.3		86.9	35.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		67.8	7.3		86.9	35.8
LOS		E	A		F	D
Approach Delay		67.8	7.3		72.7	
Approach LOS		E	A		E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 30.4 (22%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 62.4	Intersection LOS: E
Intersection Capacity Utilization 106.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3212	681	1414	544
v/c Ratio	1.06	0.24	1.07	0.82
Control Delay	67.8	7.3	86.9	35.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	67.8	7.3	86.9	35.8
Queue Length 50th (m)	~357.9	12.3	~222.2	98.0
Queue Length 95th (m)	#380.0	14.6	#264.5	#158.0
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	3022	2880	1326	661
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	0.24	1.07	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2909	0	0	1090	142	1128
Future Volume (vph)	2909	0	0	1090	142	1128
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Ped Bike Factor					1.00	
Frt					0.880	0.850
Flt Protected					0.990	
Satd. Flow (prot)	5513	0	0	5357	3453	1577
Flt Permitted					0.990	
Satd. Flow (perm)	5513	0	0	5357	3452	1577
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	0%	6%	1%	2%
Adj. Flow (vph)	3232	0	0	1211	158	1253
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	3232	0	0	1211	785	626
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	83.0			83.0	57.0	57.0
Total Split (%)	59.3%			59.3%	40.7%	40.7%
Maximum Green (s)	76.0			76.0	51.0	51.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	76.0			76.0	51.0	51.0
Actuated g/C Ratio	0.54			0.54	0.36	0.36
v/c Ratio	1.08			0.42	0.99dr	1.09
Control Delay	67.8			19.4	39.3	106.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	67.8			19.4	39.3	106.4
LOS	E			B	D	F
Approach Delay	67.8			19.4	69.1	
Approach LOS	E			B	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 16.4 (12%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 58.1 Intersection LOS: E
Intersection Capacity Utilization 106.7% ICU Level of Service G
Analysis Period (min) 15
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street

Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	3232	1211	785	626
v/c Ratio	1.08	0.42	0.99dr	1.09
Control Delay	67.8	19.4	39.3	106.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	67.8	19.4	39.3	106.4
Queue Length 50th (m)	~363.1	70.1	91.8	~213.8
Queue Length 95th (m)	m#296.2	81.0	112.8	#293.4
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	2992	2908	1257	574
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.42	0.62	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	25	40	488	176	104	623
Future Volume (vph)	25	40	488	176	104	623
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.960			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3435	0	1789	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	3435	0	1789	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	273.4		780.0			514.0
Travel Time (s)	20.5		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	40	488	176	104	623
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	40	664	0	104	623
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
52: Ninth Line & Argentia Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	40	488	176	104	623
Future Volume (Veh/h)	25	40	488	176	104	623
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	40	488	176	104	623
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1096	332			664	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1096	332			664	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	94			89	
cM capacity (veh/h)	184	664			921	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	25	40	325	339	104	312	312
Volume Left	25	0	0	0	104	0	0
Volume Right	0	40	0	176	0	0	0
cSH	184	664	1700	1700	921	1700	1700
Volume to Capacity	0.14	0.06	0.19	0.20	0.11	0.18	0.18
Queue Length 95th (m)	3.5	1.5	0.0	0.0	2.9	0.0	0.0
Control Delay (s)	27.6	10.8	0.0	0.0	9.4	0.0	0.0
Lane LOS	D	B			A		
Approach Delay (s)	17.2		0.0		1.3		
Approach LOS	C						

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
97: Ninth Line & Foxwood Ave

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	772	0	0	661
Future Volume (vph)	0	0	772	0	0	661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				15.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	3579	0	1883	3579
Flt Permitted						
Satd. Flow (perm)	1883	0	3579	0	1883	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	226.1		301.0			850.0
Travel Time (s)	17.0		15.5			43.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	772	0	0	661
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	772	0	0	661
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
97: Ninth Line & Foxwood Ave

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	772	0	0	661
Future Volume (Veh/h)	0	0	772	0	0	661
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	772	0	0	661
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			301			
pX, platoon unblocked						
vC, conflicting volume	1102	386			772	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1102	386			772	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	206	612			839	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	386	386	0	330	330
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.23	0.23	0.00	0.19	0.19
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
136: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1165	275	0	1169	0	0
Future Volume (vph)	1165	275	0	1169	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	125.7	
Travel Time (s)	15.5			6.8	9.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1165	275	0	1169	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1165	275	0	1169	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 71.2%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
136: Winston Churchill Boulevard

16/06/2017

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1312	85	58	734
Future Volume (vph)	90	47	1312	85	58	734
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.98				
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3546	0	1825	3544
Flt Permitted	0.950				0.145	
Satd. Flow (perm)	1807	1607	3546	0	279	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	15			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1426	92	63	798
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1518	0	63	798
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

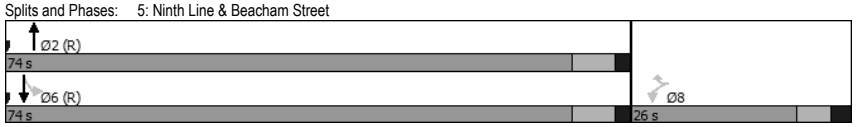
Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	26.0	26.0	74.0		74.0	74.0
Total Split (%)	26.0%	26.0%	74.0%		74.0%	74.0%
Maximum Green (s)	19.5	19.5	67.0		67.0	67.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	12.0	12.0	80.6		80.6	80.6
Actuated g/C Ratio	0.12	0.12	0.81		0.81	0.81
v/c Ratio	0.45	0.22	0.53		0.28	0.28
Control Delay	47.1	13.1	5.4		8.0	3.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.1	13.1	5.4		8.0	3.7
LOS	D	B	A		A	A
Approach Delay	35.5		5.4			4.0
Approach LOS	D		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 6.7		Intersection LOS: A	
Intersection Capacity Utilization 64.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	98	51	1518	63	798
v/c Ratio	0.45	0.22	0.53	0.28	0.28
Control Delay	47.1	13.1	5.4	8.0	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	13.1	5.4	8.0	3.7
Queue Length 50th (m)	18.0	0.0	50.1	3.0	19.7
Queue Length 95th (m)	32.2	9.9	77.6	10.5	31.6
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	370	369	2861	224	2856
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.14	0.53	0.28	0.28

Intersection Summary

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	3	643	7	3	682
Future Volume (vph)	11	3	643	7	3	682
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950					
Satd. Flow (prot)	1825	1633	1880	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1633	1880	0	0	1865
Link Speed (k/h)	48		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.3		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	3%
Adj. Flow (vph)	12	3	699	8	3	741
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	3	707	0	0	744
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.3%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	110	508	48	29	32	175	734	86	66	875	24
Future Volume (vph)	73	110	508	48	29	32	175	734	86	66	875	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.877			0.918			0.984			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1652	0	1825	1684	0	1789	3549	0	1722	3530	0
Flt Permitted	0.715			0.134			0.212			0.245		
Satd. Flow (perm)	1347	1652	0	257	1684	0	399	3549	0	444	3530	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73			35			17			3	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		131.8			287.6			434.9			780.0	
Travel Time (s)		9.9			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	7%	2%	1%	3%	6%	3%	2%
Adj. Flow (vph)	73	110	508	52	29	35	175	798	93	72	951	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	618	0	52	64	0	175	891	0	72	975	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

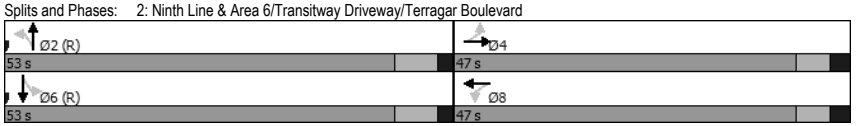
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		53.0	53.0		52.0	52.0	
Total Split (s)	47.0	47.0		47.0	47.0		53.0	53.0		53.0	53.0	
Total Split (%)	47.0%	47.0%		47.0%	47.0%		53.0%	53.0%		53.0%	53.0%	
Maximum Green (s)	40.5	40.5		40.5	40.5		46.0	46.0		46.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	38.6	38.6		38.6	38.6		49.9	49.9		49.9	49.9	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.50	0.50		0.50	0.50	
v/c Ratio	0.14	0.91		0.53	0.10		0.88	0.50		0.33	0.55	
Control Delay	19.5	43.7		44.2	10.2		67.1	18.2		21.8	19.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.5	43.7		44.2	10.2		67.1	18.2		21.8	19.4	
LOS	B	D		D	B		E	B		C	B	
Approach Delay		41.1			25.5			26.3			19.6	
Approach LOS		D			C			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 27.4 Intersection LOS: C
Intersection Capacity Utilization 89.1% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	618	52	64	175	891	72	975
v/c Ratio	0.14	0.91	0.53	0.10	0.88	0.50	0.33	0.55
Control Delay	19.5	43.7	44.2	10.2	67.1	18.2	21.8	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	43.7	44.2	10.2	67.1	18.2	21.8	19.4
Queue Length 50th (m)	8.6	95.2	7.2	3.3	31.0	60.8	8.6	70.1
Queue Length 95th (m)	17.5	#158.8	#23.4	11.1	#73.5	78.3	20.3	89.4
Internal Link Dist (m)		107.8		263.6		410.9		756.0
Turn Bay Length (m)					40.0		40.0	
Base Capacity (vph)	559	728	106	719	199	1780	221	1763
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.85	0.49	0.09	0.88	0.50	0.33	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	61	28	0	17	28	837	45	35	1497	8
Future Volume (vph)	8	0	61	28	0	17	28	837	45	35	1497	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.992			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1541	0	1789	3517	0	1825	3575	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1541	0	1789	3517	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		124.9			310.4			412.4			434.9	
Travel Time (s)		9.4			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	6%	2%	3%	2%	0%	2%	2%
Adj. Flow (vph)	8	0	61	30	0	18	28	910	49	38	1627	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	61	0	30	18	0	28	959	0	38	1635	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 56.5%	ICU Level of Service B
Analysis Period (min) 15	

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	730	242	230	2016	115	142	502	217	253	814	210
Future Volume (vph)	167	730	242	230	2016	115	142	502	217	253	814	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00							
Frt		0.963			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	4927	0	1785	5139	0	1767	3650	1597	1733	3650	1597
Flt Permitted	0.070			0.200			0.159			0.454		
Satd. Flow (perm)	132	4927	0	376	5139	0	296	3650	1597	828	3650	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66			8				217			153
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	4%	1%	0%	0%	3%	0%	0%
Adj. Flow (vph)	167	730	242	230	2016	115	142	502	217	253	814	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	972	0	230	2131	0	142	502	217	253	814	210
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

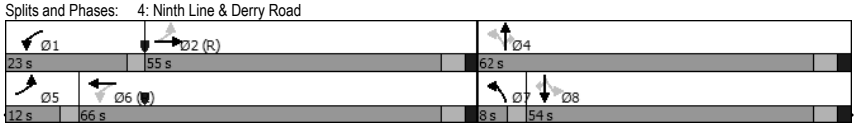
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	30.1		8.0	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	12.0	55.0		23.0	66.0		8.0	62.0	62.0	54.0	54.0	54.0
Total Split (%)	8.6%	39.3%		16.4%	47.1%		5.7%	44.3%	44.3%	38.6%	38.6%	38.6%
Maximum Green (s)	9.0	48.9		20.0	59.9		5.0	55.6	55.6	47.6	47.6	47.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.1		0.0	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.1		2.0	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0	0	0	0
Act Effct Green (s)	71.0	57.4		77.8	62.8		57.6	54.2	54.2	46.2	46.2	46.2
Actuated g/C Ratio	0.51	0.41		0.56	0.45		0.41	0.39	0.39	0.33	0.33	0.33
v/c Ratio	0.88	0.47		0.62	0.92		0.77	0.36	0.29	0.93	0.68	0.33
Control Delay	81.5	21.9		21.5	38.6		55.7	30.9	4.3	83.8	43.4	11.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.5	21.9		21.5	38.6		55.7	30.9	4.3	83.8	43.4	11.3
LOS	F	C		C	D		E	C	A	F	D	B
Approach Delay		30.7			36.9			28.3			46.1	
Approach LOS		C			D			C			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 36.4 Intersection LOS: D
Intersection Capacity Utilization 96.6% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	167	972	230	2131	142	502	217	253	814	210
v/c Ratio	0.88	0.47	0.62	0.92	0.77	0.36	0.29	0.93	0.68	0.33
Control Delay	81.5	21.9	21.5	38.6	55.7	30.9	4.3	83.8	43.4	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.5	21.9	21.5	38.6	55.7	30.9	4.3	83.8	43.4	11.3
Queue Length 50th (m)	28.8	44.4	20.5	206.4	24.1	50.0	0.0	65.7	99.4	10.7
Queue Length 95th (m)	#71.8	51.8	30.9	#234.1	#47.1	64.2	15.4	#116.8	121.3	29.8
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	190	2060	422	2309	184	1475	774	287	1267	654
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.47	0.55	0.92	0.77	0.34	0.28	0.88	0.64	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	851	67	49	1453
Future Volume (vph)	46	47	851	67	49	1453
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.989			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3478	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1585	3478	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	925	73	53	1579
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	998	0	53	1579
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.8%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	53	32	66	71	62	55	847	108	100	1226	50
Future Volume (vph)	31	53	32	66	71	62	55	847	108	100	1226	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		27.0	50.0		60.0	115.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.944			0.927			0.983			0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1778	0	1789	1734	0	1789	3525	0	1825	3561	0
Flt Permitted	0.570			0.702			0.169			0.260		
Satd. Flow (perm)	1074	1778	0	1322	1734	0	318	3525	0	499	3561	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			42			31			8	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		104.1			255.0			1151.0			603.1	
Travel Time (s)		7.8			18.4			59.2			31.0	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	31	53	32	72	71	67	55	921	117	109	1333	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	85	0	72	138	0	55	1038	0	109	1383	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

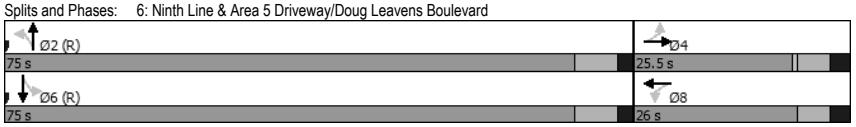
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		45.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		53.0	53.0		53.0	53.0	
Total Split (s)	25.5	25.5		26.0	26.0		75.0	75.0		75.0	75.0	
Total Split (%)	25.2%	25.2%		25.7%	25.7%		74.3%	74.3%		74.3%	74.3%	
Maximum Green (s)	19.0	19.0		19.5	19.5		68.0	68.0		68.0	68.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	12.5	12.5		12.5	12.5		77.0	77.0		77.0	77.0	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.76	0.76		0.76	0.76	
v/c Ratio	0.23	0.35		0.44	0.55		0.23	0.39		0.29	0.51	
Control Delay	42.8	31.7		48.7	36.6		13.1	9.9		6.6	5.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	42.8	31.7		48.7	36.6		13.1	9.9		6.6	5.7	
LOS	D	C		D	D		B	A		A	A	
Approach Delay		34.7			40.7			10.1			5.8	
Approach LOS		C			D			B			A	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 11.1 Intersection LOS: B
Intersection Capacity Utilization 108.6% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard



Queues
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	31	85	72	138	55	1038	109	1383
v/c Ratio	0.23	0.35	0.44	0.55	0.23	0.39	0.29	0.51
Control Delay	42.8	31.7	48.7	36.6	13.1	9.9	6.6	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	31.7	48.7	36.6	13.1	9.9	6.6	5.7
Queue Length 50th (m)	5.6	10.5	13.4	17.8	5.1	57.3	5.1	43.6
Queue Length 95th (m)	13.6	23.2	25.7	34.5	m13.3	92.1	14.9	70.9
Internal Link Dist (m)		80.1		231.0		1127.0		579.1
Turn Bay Length (m)					50.0		115.0	
Base Capacity (vph)	217	382	268	385	242	2695	380	2717
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.22	0.27	0.36	0.23	0.39	0.29	0.51

Intersection Summary

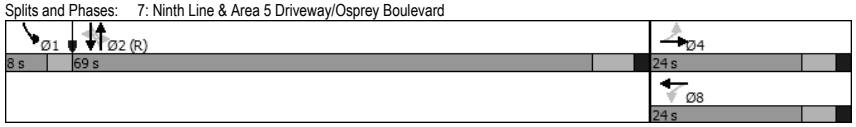
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	17	23	134	17	44	39	1065	148	71	1480	35
Future Volume (vph)	21	17	23	134	17	44	39	1065	148	71	1480	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	13.0		0.0	35.0		25.0	270.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			13.0			2.5			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.914			0.889			0.982			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1721	0	1738	1599	0	1789	3476	0	1825	3501	0
Flt Permitted	0.715			0.731			0.091			0.159		
Satd. Flow (perm)	1347	1721	0	1337	1599	0	171	3476	0	305	3501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			48			29			4	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		142.6			160.0			383.2			1151.0	
Travel Time (s)		10.7			11.5			19.7			59.2	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	7%	2%	3%	4%	0%	4%	2%
Adj. Flow (vph)	21	17	23	146	17	48	39	1158	161	77	1609	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	40	0	146	65	0	39	1319	0	77	1644	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		52.0	52.0		8.0	52.0	
Total Split (s)	24.0	24.0		24.0	24.0		69.0	69.0		8.0	69.0	
Total Split (%)	23.8%	23.8%		23.8%	23.8%		68.3%	68.3%		7.9%	68.3%	
Maximum Green (s)	18.0	18.0		18.0	18.0		62.0	62.0		5.0	62.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		37.0	37.0			37.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	16.0	16.0		16.0	16.0		67.1	67.1		76.4	67.1	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.66	0.66		0.76	0.66	
v/c Ratio	0.10	0.14		0.69	0.22		0.35	0.57		0.23	0.71	
Control Delay	35.7	20.7		56.8	16.5		19.9	11.0		6.0	17.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.7	20.7		56.8	16.5		19.9	11.0		6.0	17.0	
LOS	D	C		E	B		B	B		A	B	
Approach Delay		25.9			44.4			11.2			16.5	
Approach LOS		C			D			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 16.3	Intersection LOS: B
Intersection Capacity Utilization 82.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: Ninth Line & Area 5 Driveway/Osprey Boulevard



Queues
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	21	40	146	65	39	1319	77	1644
v/c Ratio	0.10	0.14	0.69	0.22	0.35	0.57	0.23	0.71
Control Delay	35.7	20.7	56.8	16.5	19.9	11.0	6.0	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	20.7	56.8	16.5	19.9	11.0	6.0	17.0
Queue Length 50th (m)	3.5	2.8	26.9	2.8	3.4	73.0	3.0	109.8
Queue Length 95th (m)	9.9	11.5	46.7	13.9	12.9	92.6	10.5	165.8
Internal Link Dist (m)		118.6		136.0		359.2		1127.0
Turn Bay Length (m)			13.0		35.0		270.0	
Base Capacity (vph)	253	342	251	339	113	2319	329	2327
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.12	0.58	0.19	0.35	0.57	0.23	0.71

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	10	14	0	19	17	1036	20	32	1154	15
Future Volume (vph)	8	0	10	14	0	19	17	1036	20	32	1154	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			60.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.850			0.850			0.997			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3604	0	1825	3571	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3604	0	1825	3571	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		101.3			207.4			254.7			383.2	
Travel Time (s)		7.6			14.9			13.1			19.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	2%	2%
Adj. Flow (vph)	8	0	10	15	0	21	17	1126	22	35	1254	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	10	0	15	21	0	17	1148	0	35	1269	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

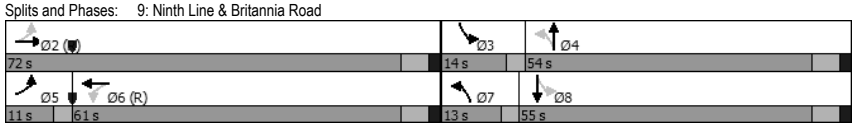
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.7% ICU Level of Service A
Analysis Period (min) 15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	925	255	125	1546	143	190	1125	112	184	1084	162
Future Volume (vph)	161	925	255	125	1546	143	190	1125	112	184	1084	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.968			0.987			0.986			0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	4998	0	1767	5168	0	1767	3589	0	1684	3542	0
Flt Permitted	0.070			0.200			0.083			0.081		
Satd. Flow (perm)	130	4998	0	372	5168	0	154	3589	0	144	3542	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		67			13			8			13	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	1%	0%	2%	1%	0%	3%	6%	1%	1%
Adj. Flow (vph)	161	925	255	125	1546	143	190	1125	112	184	1084	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	1180	0	125	1689	0	190	1237	0	184	1246	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	8.0	24.6		24.6	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	11.0	72.0		61.0	61.0		13.0	54.0		14.0	55.0	
Total Split (%)	7.9%	51.4%		43.6%	43.6%		9.3%	38.6%		10.0%	39.3%	
Maximum Green (s)	8.0	65.4		54.4	54.4		10.0	47.4		11.0	48.4	
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	0.0	2.0		2.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	2.0	5.6		5.6	5.6		2.0	5.6		2.0	5.6	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0			12.0			12.0	
Flash Dont Walk (s)		11.0		11.0	11.0			18.0			18.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	70.0	66.4		55.4	55.4		63.0	48.4		65.0	49.4	
Actuated g/C Ratio	0.50	0.47		0.40	0.40		0.45	0.35		0.46	0.35	
v/c Ratio	0.95	0.49		0.85	0.82		0.97	0.99		0.93	0.99	
Control Delay	91.7	36.8		78.6	38.9		90.5	68.9		81.3	67.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	91.7	36.8		78.6	38.9		90.5	68.9		81.3	67.6	
LOS	F	D		E	D		F	E		F	E	
Approach Delay		43.4			41.7			71.8			69.4	
Approach LOS		D			D			E			E	

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 32.2 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.99		
Intersection Signal Delay: 55.8		Intersection LOS: E
Intersection Capacity Utilization 103.6%		ICU Level of Service G
Analysis Period (min) 15		

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	161	1180	125	1689	190	1237	184	1246
v/c Ratio	0.95	0.49	0.85	0.82	0.97	0.99	0.93	0.99
Control Delay	91.7	36.8	78.6	38.9	90.5	68.9	81.3	67.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.7	36.8	78.6	38.9	90.5	68.9	81.3	67.6
Queue Length 50th (m)	36.4	102.8	31.1	152.3	36.3	178.3	35.2	178.7
Queue Length 95th (m)	#74.7	117.8	#71.6	171.7	#85.4	#227.7	#80.7	#228.1
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	170	2405	147	2052	196	1246	198	1258
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.49	0.85	0.82	0.97	0.99	0.93	0.99

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	12	13	0	13	3	1260	22	26	1439	10
Future Volume (vph)	55	0	12	13	0	13	3	1260	22	26	1439	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.997			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		103.7			491.2			170.0			206.5	
Travel Time (s)		7.8			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	55	0	12	14	0	14	3	1370	24	28	1564	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	12	0	14	14	0	3	1394	0	28	1574	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 56.5% ICU Level of Service B
Analysis Period (min) 15

Lanes, Volumes, Timings
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	3	19	8	3	42	5	1280	35	37	1373	17
Future Volume (vph)	45	3	19	8	3	42	5	1280	35	37	1373	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.870			0.859			0.996			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1639	0	1825	1648	0	1789	3592	0	1825	3606	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1639	0	1825	1648	0	1789	3592	0	1825	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		90.3			511.9			217.0			170.0	
Travel Time (s)		6.8			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	9%	0%	1%	2%
Adj. Flow (vph)	45	3	19	9	3	46	5	1391	38	40	1492	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	22	0	9	49	0	5	1429	0	40	1509	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 54.3% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	5	1291	20	12	1415
Future Volume (vph)	9	5	1291	20	12	1415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		35.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3572	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3572	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	1%
Adj. Flow (vph)	10	5	1403	22	13	1538
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	5	1425	0	13	1538
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.1% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	9	1290	13	6	1349
Future Volume (vph)	3	9	1290	13	6	1349
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3611	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3611	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	3	10	1402	14	7	1466
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	10	1416	0	7	1466
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.3%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1	10	113	1	101	17	1239	148	93	1252	10
Future Volume (vph)	7	1	10	113	1	101	17	1239	148	93	1252	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		35.0	28.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			45.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor								1.00		1.00		
Frt		0.864			0.851			0.984			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1627	0	1807	1557	0	1789	3554	0	1807	3575	0
Flt Permitted	0.679			0.750			0.146			0.116		
Satd. Flow (perm)	1279	1627	0	1427	1557	0	275	3554	0	221	3575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			110			22			1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		170.8			534.8			346.0			306.2	
Travel Time (s)		12.8			38.5			17.8			15.7	
Confl. Peds. (#/hr)									6	6		
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	1%	2%	5%	2%	1%	0%	1%	2%	2%
Adj. Flow (vph)	7	1	10	123	1	110	17	1347	161	101	1361	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	11	0	123	111	0	17	1508	0	101	1371	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

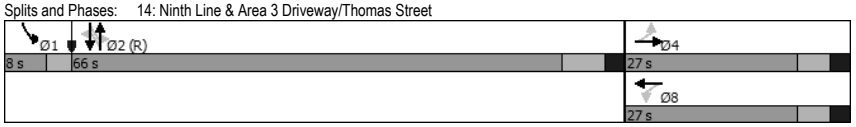
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		52.5	52.5		8.0	52.5	
Total Split (s)	27.0	27.0		27.0	27.0		66.0	66.0		8.0	66.0	
Total Split (%)	26.7%	26.7%		26.7%	26.7%		65.3%	65.3%		7.9%	65.3%	
Maximum Green (s)	20.5	20.5		20.5	20.5		58.5	58.5		5.0	58.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		0.0	2.5	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.5	6.5		2.0	6.5	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		33.0	33.0			33.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0			12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	15.0	15.0		15.0	15.0		66.4	66.4		76.9	66.4	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.66	0.66		0.76	0.66	
v/c Ratio	0.04	0.04		0.58	0.34		0.09	0.64		0.36	0.58	
Control Delay	34.3	18.6		46.7	12.9		15.0	22.4		6.8	12.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.3	18.6		46.7	12.9		15.0	22.4		6.8	12.1	
LOS	C	B		D	B		B	C		A	B	
Approach Delay		24.7			30.7			22.4			11.7	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 18.1 — Intersection LOS: B
Intersection Capacity Utilization 100.2% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 14: Ninth Line & Area 3 Driveway/Thomas Street



Queues
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	11	123	111	17	1508	101	1371
v/c Ratio	0.04	0.04	0.58	0.34	0.09	0.64	0.36	0.58
Control Delay	34.3	18.6	46.7	12.9	15.0	22.4	6.8	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	18.6	46.7	12.9	15.0	22.4	6.8	12.1
Queue Length 50th (m)	1.2	0.2	23.4	0.3	2.0	151.0	3.7	76.0
Queue Length 95th (m)	4.8	4.8	40.3	18.1	m4.4	181.5	9.5	109.3
Internal Link Dist (m)		146.8		510.8		322.0		282.2
Turn Bay Length (m)					30.0		28.0	
Base Capacity (vph)	272	354	303	418	180	2344	284	2350
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.41	0.27	0.09	0.64	0.36	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	6	1305	27	19	1308
Future Volume (vph)	9	6	1305	27	19	1308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.944		0.997			
Flt Protected	0.971				0.950	
Satd. Flow (prot)	1761	0	3604	0	1825	3614
Flt Permitted	0.971				0.950	
Satd. Flow (perm)	1761	0	3604	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	10	7	1418	29	21	1422
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	1447	0	21	1422
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.9% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	34	37	1387	74	56	1384
Future Volume (vph)	34	37	1387	74	56	1384
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.992			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3553	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3553	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	37	40	1508	80	61	1504
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	40	1588	0	61	1504
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 56.5% ICU Level of Service B
Analysis Period (min) 15

Lanes, Volumes, Timings
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	9	0	0	6	14	1411	5	10	1349	13
Future Volume (vph)	8	0	9	0	0	6	14	1411	5	10	1349	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	70.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.929			0.865						0.999	
Flt Protected		0.977					0.950			0.950		
Satd. Flow (prot)	0	1709	0	0	1662	0	1789	3614	0	1825	3575	0
Flt Permitted		0.977					0.950			0.950		
Satd. Flow (perm)	0	1709	0	0	1662	0	1789	3614	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		89.2			113.3			424.8			250.0	
Travel Time (s)		6.7			8.2			21.8			12.9	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	2%	2%
Adj. Flow (vph)	8	0	9	0	0	7	14	1534	5	11	1466	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	17	0	0	7	0	14	1539	0	11	1479	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.5%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	56	76	1349	61	54	1199
Future Volume (vph)	56	76	1349	61	54	1199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3566	0	1825	3579
Flt Permitted	0.950				0.129	
Satd. Flow (perm)	1789	1585	3566	0	248	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		83	9			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	1%	18%	0%	2%
Adj. Flow (vph)	61	83	1466	66	59	1303
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	83	1532	0	59	1303
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

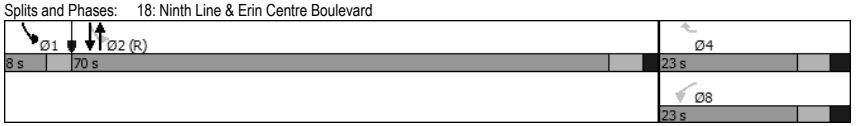
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	23.0	23.0	70.0		8.0	70.0
Total Split (%)	22.8%	22.8%	69.3%		7.9%	69.3%
Maximum Green (s)	16.5	16.5	64.0		5.0	64.0
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	8.0	8.0	50.0			50.0
Flash Dont Walk (s)	8.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	10.4	10.4	76.6		84.4	76.6
Actuated g/C Ratio	0.10	0.10	0.76		0.84	0.76
v/c Ratio	0.33	0.35	0.57		0.19	0.48
Control Delay	46.6	13.6	8.1		5.1	15.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.6	13.6	8.1		5.1	15.8
LOS	D	B	A		A	B
Approach Delay	27.6		8.1			15.3
Approach LOS	C		A			B

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 12.3 — Intersection LOS: B
Intersection Capacity Utilization 63.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	61	83	1532	59	1303
v/c Ratio	0.33	0.35	0.57	0.19	0.48
Control Delay	46.6	13.6	8.1	5.1	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	13.6	8.1	5.1	15.8
Queue Length 50th (m)	11.4	0.0	69.1	3.4	110.5
Queue Length 95th (m)	23.1	13.1	101.4	m6.2	147.8
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	309	343	2706	317	2714
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.20	0.24	0.57	0.19	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	0	5	0	11	0	1277	15	23	1159	16
Future Volume (vph)	9	0	0	5	0	11	0	1277	15	23	1159	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.850			0.998			0.998	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1883	0	1825	1633	0	1883	3607	0	1825	3606	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1883	0	1825	1633	0	1883	3607	0	1825	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		98.8			216.6			90.1			404.2	
Travel Time (s)		7.4			15.6			4.6			20.8	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	9	0	0	5	0	12	0	1388	16	25	1260	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	0	0	5	12	0	0	1404	0	25	1276	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.6% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	1314	2	16	1189
Future Volume (vph)	1	1	1314	2	16	1189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.932					
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1748	0	3614	0	1825	3614
Flt Permitted	0.976				0.950	
Satd. Flow (perm)	1748	0	3614	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	1	1	1428	2	17	1292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1430	0	17	1292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.4% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	0	27	0	0	2	48	1385	5	3	1181	22
Future Volume (vph)	14	0	27	0	0	2	48	1385	5	3	1181	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		20.0	0.0		0.0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	0.95
Ped Bike Factor												
Frt		0.911				0.865			0.850		0.997	
Flt Protected		0.983					0.950					
Satd. Flow (prot)	0	1687	0	0	0	1662	1789	3614	1633	0	3603	0
Flt Permitted		0.983					0.950					
Satd. Flow (perm)	0	1687	0	0	0	1662	1789	3614	1633	0	3603	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		116.8			245.5			191.7			91.0	
Travel Time (s)		8.8			17.7			9.9			4.7	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	14	0	27	0	0	2	48	1505	5	3	1284	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	0	0	0	2	48	1505	5	0	1309	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 55.0%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	358	19	40	786	451	181	690	38	291	633	73
Future Volume (vph)	63	358	19	40	786	451	181	690	38	291	633	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.992			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3543	0	1789	1812	1458	1825	3552	0	1807	3535	0
Flt Permitted	0.082			0.495			0.200			0.116		
Satd. Flow (perm)	158	3543	0	932	1812	1458	384	3552	0	221	3535	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				334		4			9	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	6%	2%	6%	12%	0%	2%	1%	1%	1%	8%
Adj. Flow (vph)	68	389	21	43	854	490	197	750	41	316	688	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	410	0	43	854	490	197	791	0	316	767	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		7	4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

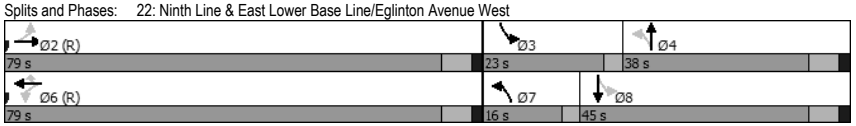
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	5.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	8.0	24.0		8.0	24.0	
Total Split (s)	79.0	79.0		79.0	79.0	79.0	16.0	38.0		23.0	45.0	
Total Split (%)	56.4%	56.4%		56.4%	56.4%	56.4%	11.4%	27.1%		16.4%	32.1%	
Maximum Green (s)	72.0	72.0		72.0	72.0	72.0	13.0	31.0		20.0	38.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	0.0		0.0	-1.0	0.0	-1.0	-1.0		-1.0	0.0	
Total Lost Time (s)	6.0	7.0		7.0	6.0	7.0	2.0	6.0		2.0	7.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	Min		None	Min	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0		8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0		9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)	72.3	71.3		71.3	72.3	71.3	50.0	32.4		59.7	39.1	
Actuated g/C Ratio	0.52	0.51		0.51	0.52	0.51	0.36	0.23		0.43	0.28	
v/c Ratio	0.84	0.23		0.09	0.91	0.54	0.71	0.96		0.94	0.77	
Control Delay	96.0	19.1		18.1	46.3	8.9	42.1	75.4		74.5	52.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	96.0	19.1		18.1	46.3	8.9	42.1	75.4		74.5	52.3	
LOS	F	B		B	D	A	D	E		E	D	
Approach Delay		30.0			32.2			68.8			58.7	
Approach LOS		C			C			E			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 48.4 — Intersection LOS: D
Intersection Capacity Utilization 102.8% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	68	410	43	854	490	197	791	316	767
v/c Ratio	0.84	0.23	0.09	0.91	0.54	0.71	0.96	0.94	0.77
Control Delay	96.0	19.1	18.1	46.3	8.9	42.1	75.4	74.5	52.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.0	19.1	18.1	46.3	8.9	42.1	75.4	74.5	52.3
Queue Length 50th (m)	15.4	31.4	5.9	208.2	24.4	35.0	114.6	69.9	103.2
Queue Length 95th (m)	#47.0	41.5	12.7	#296.2	54.3	#53.6	#155.8	#128.0	127.0
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	82	1825	479	944	912	283	825	335	994
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.22	0.09	0.90	0.54	0.70	0.96	0.94	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	252	27	135	192	14	16	13	72	10	15	9
Future Volume (vph)	9	252	27	135	192	14	16	13	72	10	15	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.995			0.903			0.964	
Flt Protected		0.998			0.981			0.992			0.985	
Satd. Flow (prot)	0	1892	0	0	1868	0	0	1673	0	0	1824	0
Flt Permitted		0.998			0.981			0.992			0.985	
Satd. Flow (perm)	0	1892	0	0	1868	0	0	1673	0	0	1824	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	2		10	10		2	5		3	3		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	10	274	29	147	209	15	17	14	78	11	16	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	313	0	0	371	0	0	109	0	0	37	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.6%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1090	52	335	2347	185	47	36	160	99	37	45
Future Volume (vph)	57	1090	52	335	2347	185	47	36	160	99	37	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00		0.99		0.99	1.00		0.98
Frt		0.993			0.989				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5053	0	1785	5125	0	1785	1921	1617	1785	1830	1566
Flt Permitted	0.042			0.230			0.733			0.734		
Satd. Flow (perm)	79	5053	0	431	5125	0	1362	1921	1593	1376	1830	1529
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			21				132			23
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	4		6	6		4	9		2	2		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	1%	0%	0%	1%	0%	5%	2%
Adj. Flow (vph)	57	1090	52	335	2347	185	47	36	160	99	37	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1142	0	335	2532	0	47	36	160	99	37	45
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

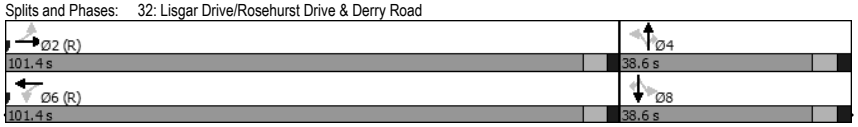
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	101.4	101.4		101.4	101.4		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (%)	72.4%	72.4%		72.4%	72.4%		27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Maximum Green (s)	95.4	95.4		95.4	95.4		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	113.0	113.0		113.0	113.0		16.4	16.4	16.4	16.4	16.4	16.4
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.12	0.12	0.12	0.12	0.12	0.12
v/c Ratio	0.90	0.28		0.97	0.61		0.30	0.16	0.53	0.61	0.17	0.23
Control Delay	109.3	1.9		56.5	6.3		59.3	54.8	19.9	74.1	55.2	33.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.3	1.9		56.5	6.3		59.3	54.8	19.9	74.1	55.2	33.6
LOS	F	A		E	A		E	D	B	E	E	C
Approach Delay		7.0			12.2			32.7			60.1	
Approach LOS		A			B			C			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 113.4 (81%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 13.8 Intersection LOS: B
Intersection Capacity Utilization 88.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	1142	335	2532	47	36	160	99	37	45
v/c Ratio	0.90	0.28	0.97	0.61	0.30	0.16	0.53	0.61	0.17	0.23
Control Delay	109.3	1.9	56.5	6.3	59.3	54.8	19.9	74.1	55.2	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.3	1.9	56.5	6.3	59.3	54.8	19.9	74.1	55.2	33.6
Queue Length 50th (m)	7.7	10.2	66.9	80.5	12.1	9.1	7.1	26.5	9.4	5.6
Queue Length 95th (m)	m#35.8	22.8	#65.8	116.6	23.7	18.8	27.6	43.7	19.3	16.7
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	63	4080	347	4139	321	452	476	324	431	377
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.28	0.97	0.61	0.15	0.08	0.34	0.31	0.09	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	206	56	92	194	133	43	60	86	142	93	46
Future Volume (vph)	43	206	56	92	194	133	43	60	86	142	93	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.968			0.939			0.939			0.978	
Flt Protected	0.950			0.950				0.989			0.975	
Satd. Flow (prot)	1738	1647	0	1772	1674	0	0	1596	0	0	1668	0
Flt Permitted	0.950			0.950				0.989			0.975	
Satd. Flow (perm)	1738	1647	0	1772	1674	0	0	1596	0	0	1668	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	12		31	31		12	39		40	40		39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	14%	9%	3%	9%	6%	9%	22%	6%	6%	15%	11%
Adj. Flow (vph)	47	224	61	100	211	145	47	65	93	154	101	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	285	0	100	356	0	0	205	0	0	305	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	69	5	11	49	94	5	5	7	108	11	64
Future Volume (vph)	42	69	5	11	49	94	5	5	7	108	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.918			0.940			0.953	
Flt Protected		0.982			0.996			0.986			0.971	
Satd. Flow (prot)	0	1830	0	0	1757	0	0	1781	0	0	1683	0
Flt Permitted		0.982			0.996			0.986			0.971	
Satd. Flow (perm)	0	1830	0	0	1757	0	0	1781	0	0	1683	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	10		4	4		10	1		46	46		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	6%
Adj. Flow (vph)	46	75	5	12	53	102	5	5	8	117	12	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	126	0	0	167	0	0	18	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

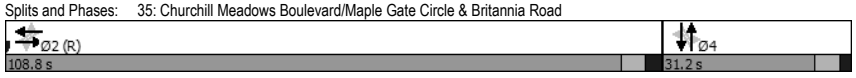
Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 42.4%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1153	94	219	1917	78	35	15	102	30	11	7
Future Volume (vph)	16	1153	94	219	1917	78	35	15	102	30	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00		1.00	0.99		1.00	0.99	
Frt		0.989			0.994			0.869			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5139	0	1552	5205	0	1733	1645	0	1785	1746	0
Flt Permitted	0.088			0.209			0.746			0.446		
Satd. Flow (perm)	165	5139	0	341	5205	0	1356	1645	0	835	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			12			102			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			97.9			114.1			106.4	
Travel Time (s)		28.2			5.9			8.2			7.7	
Confl. Peds. (#/hr)	4					4	2		3	3		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	0%	1%	3%	0%	0%	0%	5%	0%
Adj. Flow (vph)	16	1153	94	219	1917	78	35	15	102	30	11	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1247	0	219	1995	0	35	117	0	30	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Detector Phase	2	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		36.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	108.8	108.8		108.8	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	77.7%	77.7%		77.7%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	101.8	101.8		101.8	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.2	5.2		5.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	11.0	11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	117.9	117.9		117.9	117.9		10.9	10.9		10.9	10.9	
Actuated g/C Ratio	0.84	0.84		0.84	0.84		0.08	0.08		0.08	0.08	
v/c Ratio	0.12	0.29		0.76	0.45		0.33	0.53		0.47	0.13	
Control Delay	2.2	0.8		26.2	3.3		69.0	23.5		84.2	44.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.2	0.8		26.2	3.3		69.0	23.5		84.2	44.1	
LOS	A	A		C	A		E	C		F	D	
Approach Delay		0.8			5.5			34.0			69.1	
Approach LOS		A			A			C			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 1.4 (1%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 5.9	Intersection LOS: A
Intersection Capacity Utilization 72.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	1247	219	1995	35	117	30	18
v/c Ratio	0.12	0.29	0.76	0.45	0.33	0.53	0.47	0.13
Control Delay	2.2	0.8	26.2	3.3	69.0	23.5	84.2	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.2	0.8	26.2	3.3	69.0	23.5	84.2	44.1
Queue Length 50th (m)	0.1	2.7	19.9	37.9	9.4	4.0	8.2	2.9
Queue Length 95th (m)	m0.5	m9.7	#96.9	54.3	20.3	22.5	18.7	10.6
Internal Link Dist (m)		445.7		73.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	138	4332	287	4385	251	388	155	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.29	0.76	0.45	0.14	0.30	0.19	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	9	8	9	7	12	12	136	15	18	240	15
Future Volume (vph)	12	9	8	9	7	12	12	136	15	18	240	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.962			0.943			0.988			0.993	
Flt Protected		0.980			0.984			0.996			0.997	
Satd. Flow (prot)	0	1747	0	0	1720	0	0	1853	0	0	1878	0
Flt Permitted		0.980			0.984			0.996			0.997	
Satd. Flow (perm)	0	1747	0	0	1720	0	0	1853	0	0	1878	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)	6		3	3		6	11		10	10		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	13%	0%	14%	0%	0%	1%	13%	0%	1%	7%
Adj. Flow (vph)	13	10	9	10	8	13	13	148	16	20	261	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	31	0	0	177	0	0	297	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 30.3% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	79	23	69	105	24	16	119	62	17	144	22
Future Volume (vph)	10	79	23	69	105	24	16	119	62	17	144	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.972			0.984			0.958			0.984	
Flt Protected		0.996			0.983			0.996			0.995	
Satd. Flow (prot)	0	1601	0	0	1730	0	0	1725	0	0	1782	0
Flt Permitted		0.996			0.983			0.996			0.995	
Satd. Flow (perm)	0	1601	0	0	1730	0	0	1725	0	0	1782	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	20		92	92		20	33		36	36		33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	19%	9%	6%	10%	0%	6%	7%	5%	0%	7%	0%
Adj. Flow (vph)	11	86	25	75	114	26	17	129	67	18	157	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	0	215	0	0	213	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.3%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	157	17	114	285	204	7	71	27	109	132	26
Future Volume (vph)	26	157	17	114	285	204	7	71	27	109	132	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		0.99	0.97		0.99	0.99		0.97	1.00	
Frt		0.986			0.937			0.959			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3464	0	1789	3247	0	1601	1638	0	1789	1737	0
Flt Permitted	0.415			0.633			0.631			0.689		
Satd. Flow (perm)	748	3464	0	1175	3247	0	1057	1638	0	1255	1737	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			213			27			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	2%	18%	2%	2%	2%	14%	11%	11%	2%	6%	15%
Adj. Flow (vph)	28	171	18	124	310	222	8	77	29	118	143	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	189	0	124	532	0	8	106	0	118	171	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	46.0	46.0		46.0	46.0		55.0	55.0		55.0	55.0	
Total Split (%)	45.5%	45.5%		45.5%	45.5%		54.5%	54.5%		54.5%	54.5%	
Maximum Green (s)	39.5	39.5		39.5	39.5		49.0	49.0		49.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.5	48.5		48.5	48.5		42.0	42.0		42.0	42.0	
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.42	0.42		0.42	0.42	
v/c Ratio	0.08	0.11		0.22	0.32		0.02	0.15		0.23	0.23	
Control Delay	23.4	20.8		16.6	9.8		17.7	14.3		20.5	18.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.4	20.8		16.6	9.8		17.7	14.3		20.5	18.5	
LOS	C	C		B	A		B	B		C	B	
Approach Delay		21.2			11.1			14.5			19.3	
Approach LOS		C			B			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.32
Intersection Signal Delay: 15.0 Intersection LOS: B
Intersection Capacity Utilization 74.2% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	189	124	532	8	106	118	171
v/c Ratio	0.08	0.11	0.22	0.32	0.02	0.15	0.23	0.23
Control Delay	23.4	20.8	16.6	9.8	17.7	14.3	20.5	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	20.8	16.6	9.8	17.7	14.3	20.5	18.5
Queue Length 50th (m)	3.6	12.3	13.6	18.2	0.9	9.3	14.6	19.3
Queue Length 95th (m)	m8.2	22.5	25.1	29.0	3.7	19.7	27.1	33.6
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	359	1670	564	1669	523	824	621	866
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.11	0.22	0.32	0.02	0.13	0.19	0.20

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	45	7	29	71	35	17	96	26	22	176	13
Future Volume (vph)	8	45	7	29	71	35	17	96	26	22	176	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.984			0.965			0.975			0.992	
Flt Protected		0.993			0.989			0.994			0.995	
Satd. Flow (prot)	0	1767	0	0	1728	0	0	1707	0	0	1721	0
Flt Permitted		0.993			0.989			0.994			0.995	
Satd. Flow (perm)	0	1767	0	0	1728	0	0	1707	0	0	1721	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	14		19	19		14	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	6%	0%	3%	5%	11%	6%	11%	4%	5%	11%	8%
Adj. Flow (vph)	9	49	8	32	77	38	18	104	28	24	191	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	66	0	0	147	0	0	150	0	0	229	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 33.8%	ICU Level of Service A
Analysis Period (min) 15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	88	15	40	105	26	35	142	54	24	173	35
Future Volume (vph)	18	88	15	40	105	26	35	142	54	24	173	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.984			0.980			0.968			0.980	
Flt Protected		0.992			0.989			0.992			0.995	
Satd. Flow (prot)	0	1673	0	0	1785	0	0	1769	0	0	1781	0
Flt Permitted		0.992			0.989			0.992			0.995	
Satd. Flow (perm)	0	1673	0	0	1785	0	0	1769	0	0	1781	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	12%	0%	0%	5%	8%	9%	4%	2%	8%	4%	9%
Adj. Flow (vph)	20	96	16	43	114	28	38	154	59	26	188	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	132	0	0	185	0	0	251	0	0	252	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

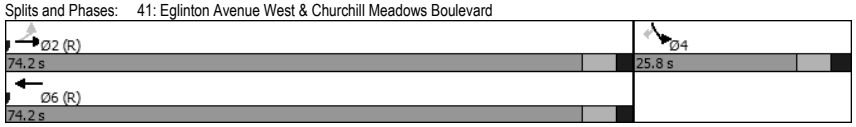
Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	1385	2471	191	123	70
Future Volume (vph)	13	1385	2471	191	123	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			1.00			
Frt			0.989			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1690	3579	3566	0	1789	1089
Flt Permitted	0.052				0.950	
Satd. Flow (perm)	92	3579	3566	0	1789	1089
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			18			8
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	4			4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	2%	1%	1%	2%	50%
Adj. Flow (vph)	13	1385	2471	191	123	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	1385	2662	0	123	70
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.5	25.5
Total Split (s)	74.2	74.2	74.2		25.8	25.8
Total Split (%)	74.2%	74.2%	74.2%		25.8%	25.8%
Maximum Green (s)	68.2	68.2	68.2		19.3	19.3
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	76.2	76.2	76.2		13.3	13.3
Actuated g/C Ratio	0.76	0.76	0.76		0.13	0.13
v/c Ratio	0.19	0.51	0.98		0.52	0.46
Control Delay	11.5	5.7	25.5		47.6	44.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	11.5	5.7	25.5		47.6	44.8
LOS	B	A	C		D	D
Approach Delay		5.8	25.5		46.6	
Approach LOS		A	C		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 20.0	Intersection LOS: B
Intersection Capacity Utilization 90.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	13	1385	2662	123	70
v/c Ratio	0.19	0.51	0.98	0.52	0.46
Control Delay	11.5	5.7	25.5	47.6	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	5.7	25.5	47.6	44.8
Queue Length 50th (m)	0.6	44.5	205.5	22.6	11.2
Queue Length 95th (m)	4.0	70.0	#336.4	38.1	23.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	70	2728	2723	363	227
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.51	0.98	0.34	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	658	1881	0	389	31
Future Volume (vph)	0	658	1881	0	389	31
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	1987	1726
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	1987	1726
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (k/h)		60	60		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		12.4	17.9		15.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	0%	2%	0%	3%
Adj. Flow (vph)	0	731	2090	0	432	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	731	2090	0	432	34
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

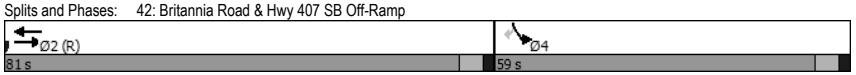
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		81.0	81.0		59.0	59.0
Total Split (%)		57.9%	57.9%		42.1%	42.1%
Maximum Green (s)		75.0	75.0		53.0	53.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		91.5	91.5		36.5	36.5
Actuated g/C Ratio		0.65	0.65		0.26	0.26
v/c Ratio		0.20	0.56		0.84	0.08
Control Delay		10.5	23.1		62.9	36.3
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		10.5	23.1		62.9	36.3
LOS		B	C		E	D
Approach Delay		10.5	23.1		61.0	
Approach LOS		B	C		E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 25.7 — Intersection LOS: C
Intersection Capacity Utilization 63.2% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	731	2090	432	34
v/c Ratio	0.20	0.56	0.84	0.08
Control Delay	10.5	23.1	62.9	36.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.5	23.1	62.9	36.3
Queue Length 50th (m)	27.6	196.2	113.5	7.1
Queue Length 95th (m)	40.7	218.3	139.7	14.6
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3696	3733	752	653
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.20	0.56	0.57	0.05

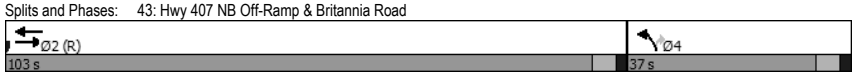
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1075	0	0	1917	73	119
Future Volume (vph)	1075	0	0	1917	73	119
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5711	1987	1778
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5711	1987	1778
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	17.9			13.0	11.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	0%	0%	0%
Adj. Flow (vph)	1194	0	0	2130	81	132
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1194	0	0	2130	81	132
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	103.0			103.0	37.0	37.0
Total Split (%)	73.6%			73.6%	26.4%	26.4%
Maximum Green (s)	97.0			97.0	31.0	31.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	112.3			112.3	15.7	15.7
Actuated g/C Ratio	0.80			0.80	0.11	0.11
v/c Ratio	0.26			0.47	0.36	0.66
Control Delay	6.1			7.6	60.8	74.9
Queue Delay	0.0			0.2	0.0	0.0
Total Delay	6.1			7.8	60.8	74.9
LOS	A			A	E	E
Approach Delay	6.1			7.8	69.6	
Approach LOS	A			A	E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 11.0	Intersection LOS: B
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1194	2130	81	132
v/c Ratio	0.26	0.47	0.36	0.66
Control Delay	6.1	7.6	60.8	74.9
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	6.1	7.8	60.8	74.9
Queue Length 50th (m)	45.4	71.4	21.1	35.6
Queue Length 95th (m)	49.6	m102.2	35.8	55.0
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4535	4580	439	393
Starvation Cap Reductn	0	1352	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.66	0.18	0.34

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	866	2596	0	230	434
Future Volume (vph)	0	866	2596	0	230	434
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	3817	1778
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	3817	1778
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						1
Link Speed (k/h)		60	60		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		20.0	18.5		13.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%
Adj. Flow (vph)	0	921	2762	0	245	462
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	921	2762	0	245	462
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

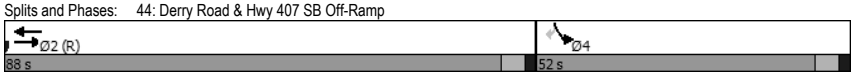
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		88.0	88.0		52.0	52.0
Total Split (%)		62.9%	62.9%		37.1%	37.1%
Maximum Green (s)		82.0	82.0		46.0	46.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	-2.9
Total Lost Time (s)		6.0	6.0		6.0	3.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		87.6	87.6		40.4	43.3
Actuated g/C Ratio		0.63	0.63		0.29	0.31
v/c Ratio		0.26	0.77		0.22	0.84
Control Delay		12.5	18.5		37.4	59.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		12.5	18.5		37.4	59.0
LOS		B	B		D	E
Approach Delay		12.5	18.5		51.5	
Approach LOS		B	B		D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 22.6 — Intersection LOS: C
Intersection Capacity Utilization 79.1% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	921	2762	245	462
v/c Ratio	0.26	0.77	0.22	0.84
Control Delay	12.5	18.5	37.4	59.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.5	18.5	37.4	59.0
Queue Length 50th (m)	40.5	127.6	26.3	117.7
Queue Length 95th (m)	52.2	148.8	35.5	153.2
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3538	3573	1254	621
Starvation Cap Reductn	0	19	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.78	0.20	0.74

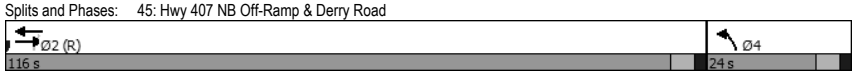
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1140	0	0	2578	104	130
Future Volume (vph)	1140	0	0	2578	104	130
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						0.99
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5655	3856	1743
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5655	3856	1722
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						137
Link Speed (k/h)	60			60	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	18.5			13.8	15.5	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	2%	1%	0%	2%
Adj. Flow (vph)	1200	0	0	2714	109	137
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1200	0	0	2714	109	137
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	116.0			116.0	24.0	116.0
Total Split (%)	82.9%			82.9%	17.1%	82.9%
Maximum Green (s)	110.0			110.0	18.0	110.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	118.5			118.5	9.5	118.5
Actuated g/C Ratio	0.85			0.85	0.07	0.85
v/c Ratio	0.25			0.57	0.42	0.09
Control Delay	2.0			0.9	67.1	0.4
Queue Delay	0.0			0.2	0.0	0.0
Total Delay	2.0			1.1	67.1	0.4
LOS	A			A	E	A
Approach Delay	2.0			1.1	30.0	
Approach LOS	A			A	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 3.1	Intersection LOS: A
Intersection Capacity Utilization 79.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1200	2714	109	137
v/c Ratio	0.25	0.57	0.42	0.09
Control Delay	2.0	0.9	67.1	0.4
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	2.0	1.1	67.1	0.4
Queue Length 50th (m)	12.8	9.5	15.2	0.0
Queue Length 95th (m)	17.8	13.2	24.5	3.0
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4785	4785	495	1478
Starvation Cap Reductn	0	874	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.25	0.69	0.22	0.09

Intersection Summary

Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1196	1104	3018	0	0	1778
Future Volume (vph)	1196	1104	3018	0	0	1778
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.964	0.850				
Flt Protected	0.963					
Satd. Flow (prot)	3741	1571	5491	0	0	5545
Flt Permitted	0.963					
Satd. Flow (perm)	3737	1571	5491	0	0	5545
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	4%	1%	0%	3%
Adj. Flow (vph)	1259	1162	3177	0	0	1872
Shared Lane Traffic (%)		34%				
Lane Group Flow (vph)	1654	767	3177	0	0	1872
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				

Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

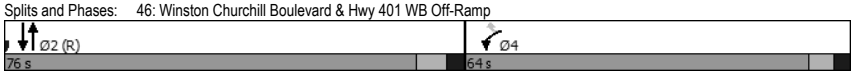
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	64.0	64.0	76.0			76.0
Total Split (%)	45.7%	45.7%	54.3%			54.3%
Maximum Green (s)	57.0	57.0	68.0			68.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	57.0	57.0	68.0			68.0
Actuated g/C Ratio	0.41	0.41	0.49			0.49
v/c Ratio	1.09	1.20	1.19			0.70
Control Delay	89.7	141.7	121.5			29.7
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	89.7	141.7	121.5			29.7
LOS	F	F	F			C
Approach Delay	106.2		121.5			29.7
Approach LOS	F		F			C

Intersection Summary

Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 49 (35%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 93.5	Intersection LOS: F
Intersection Capacity Utilization 120.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1654	767	3177	1872
v/c Ratio	1.09	1.20	1.19	0.70
Control Delay	89.7	141.7	121.5	29.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	89.7	141.7	121.5	29.7
Queue Length 50th (m)	~264.2	~282.3	~388.1	144.2
Queue Length 95th (m)	#305.7	#364.9	#410.8	160.9
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1523	639	2667	2693
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.09	1.20	1.19	0.70

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

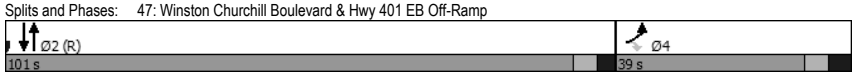
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	434	474	0	3264	2552	0
Future Volume (vph)	434	474	0	3264	2552	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.955	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3457	1586	0	5545	5599	0
Flt Permitted	0.966					
Satd. Flow (perm)	3457	1586	0	5545	5599	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	4	4				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	2%	0%	3%	2%	7%
Adj. Flow (vph)	467	510	0	3510	2744	0
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	666	311	0	3510	2744	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	39.0	39.0		101.0	101.0	
Total Split (%)	27.9%	27.9%		72.1%	72.1%	
Maximum Green (s)	31.0	31.0		94.0	94.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	30.0	30.0		95.0	95.0	
Actuated g/C Ratio	0.21	0.21		0.68	0.68	
v/c Ratio	0.90	0.91		0.93	0.72	
Control Delay	68.8	83.0		25.9	10.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	68.8	83.0		25.9	10.9	
LOS	E	F		C	B	
Approach Delay	73.3			25.9	10.9	
Approach LOS	E			C	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 32.2 (23%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 26.6		Intersection LOS: C	
Intersection Capacity Utilization 86.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	666	311	3510	2744
v/c Ratio	0.90	0.91	0.93	0.72
Control Delay	68.8	83.0	25.9	10.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	68.8	83.0	25.9	10.9
Queue Length 50th (m)	91.9	91.2	296.2	128.3
Queue Length 95th (m)	#120.6	#147.8	318.9	m131.4
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	768	354	3763	3800
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.87	0.88	0.93	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1108	1843	2192	0	0	2375
Future Volume (vph)	1108	1843	2192	0	0	2375
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.937	0.850				
Flt Protected	0.972					
Satd. Flow (prot)	3681	1602	5655	0	0	5655
Flt Permitted	0.972					
Satd. Flow (perm)	3681	1602	5655	0	0	5655
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Peak Hour Factor	0.89	0.96	0.93	0.93	0.89	0.89
Heavy Vehicles (%)	0%	1%	1%	0%	0%	1%
Adj. Flow (vph)	1245	1920	2357	0	0	2669
Shared Lane Traffic (%)		47%				
Lane Group Flow (vph)	2147	1018	2357	0	0	2669
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

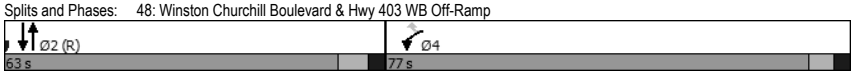
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	77.0	77.0	63.0			63.0
Total Split (%)	55.0%	55.0%	45.0%			45.0%
Maximum Green (s)	70.0	70.0	55.0			55.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	-2.9	-2.9			0.0
Total Lost Time (s)	7.0	4.1	5.1			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	70.0	72.9	57.9			55.0
Actuated g/C Ratio	0.50	0.52	0.41			0.39
v/c Ratio	1.17	1.22	1.01			1.20
Control Delay	114.4	141.4	63.2			133.2
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	114.4	141.4	63.2			133.2
LOS	F	F	E			F
Approach Delay	123.1		63.2			133.2
Approach LOS	F		E			F

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 2.8 (2%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.22
Intersection Signal Delay: 109.1 — Intersection LOS: F
Intersection Capacity Utilization 165.7% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	2147	1018	2357	2669
v/c Ratio	1.17	1.22	1.01	1.20
Control Delay	114.4	141.4	63.2	133.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	114.4	141.4	63.2	133.2
Queue Length 50th (m)	~363.2	~379.3	~254.0	~327.8
Queue Length 95th (m)	#395.2	#466.4	#281.6	#346.8
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1840	834	2338	2221
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.17	1.22	1.01	1.20

Intersection Summary

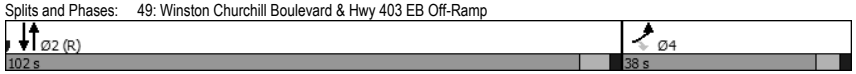
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	517	205	0	2131	2737	0
Future Volume (vph)	517	205	0	2131	2737	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3817	1726	0	5655	5655	0
Flt Permitted	0.950					
Satd. Flow (perm)	3817	1726	0	5655	5655	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		2				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	3%	0%	1%	1%	0%
Adj. Flow (vph)	568	225	0	2342	3008	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	568	225	0	2342	3008	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	38.0	38.0		102.0	102.0	
Total Split (%)	27.1%	27.1%		72.9%	72.9%	
Maximum Green (s)	32.0	32.0		95.0	95.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	26.4	26.4		100.6	100.6	
Actuated g/C Ratio	0.19	0.19		0.72	0.72	
v/c Ratio	0.79	0.69		0.58	0.74	
Control Delay	62.3	63.2		10.6	24.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	62.3	63.2		10.6	24.3	
LOS	E	E		B	C	
Approach Delay	62.5			10.6	24.3	
Approach LOS	E			B	C	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 81.2 (58%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 24.0	Intersection LOS: C
Intersection Capacity Utilization 165.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	568	225	2342	3008
v/c Ratio	0.79	0.69	0.58	0.74
Control Delay	62.3	63.2	10.6	24.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	62.3	63.2	10.6	24.3
Queue Length 50th (m)	77.7	58.0	104.9	229.7
Queue Length 95th (m)	93.5	82.4	132.5	m187.3
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	872	396	4061	4061
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.57	0.58	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1908	1863	0	520	1501
Future Volume (vph)	0	1908	1863	0	520	1501
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Ped Bike Factor						
Frt					0.911	0.850
Flt Protected					0.980	
Satd. Flow (prot)	0	5338	5599	0	3409	1571
Flt Permitted					0.980	
Satd. Flow (perm)	0	5338	5599	0	3409	1571
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					1	1
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	7%	2%	0%	11%	3%
Adj. Flow (vph)	0	1947	1901	0	531	1532
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	0	1947	1901	0	1297	766
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

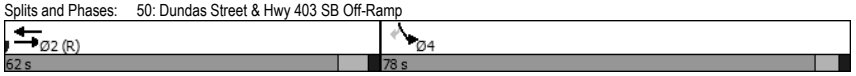
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		62.0	62.0		78.0	78.0
Total Split (%)		44.3%	44.3%		55.7%	55.7%
Maximum Green (s)		55.0	55.0		72.0	72.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		55.9	55.9		71.1	71.1
Actuated g/C Ratio		0.40	0.40		0.51	0.51
v/c Ratio		0.91	0.85		0.87dr	0.96
Control Delay		47.7	67.1		30.5	56.7
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		47.7	67.1		30.5	56.7
LOS		D	E		C	E
Approach Delay		47.7	67.1		40.2	
Approach LOS		D	E		D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 4.2 (3%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 51.3 Intersection LOS: D
Intersection Capacity Utilization 100.8% ICU Level of Service G
Analysis Period (min) 15
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1947	1901	1297	766
v/c Ratio	0.91	0.85	0.87dr	0.96
Control Delay	47.7	67.1	30.5	56.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.7	67.1	30.5	56.7
Queue Length 50th (m)	187.3	204.3	141.2	214.9
Queue Length 95th (m)	208.9	220.0	167.6	#311.7
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	2130	2233	1753	808
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.91	0.85	0.74	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1728	0	0	2386	128	853
Future Volume (vph)	1728	0	0	2386	128	853
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Frt					0.885	0.850
Flt Protected					0.989	
Satd. Flow (prot)	5491	0	0	5655	3483	1586
Flt Permitted					0.989	
Satd. Flow (perm)	5491	0	0	5655	3483	1586
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					11	11
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	4%	0%	0%	1%	2%	2%
Adj. Flow (vph)	1781	0	0	2460	132	879
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	1781	0	0	2460	572	439
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	82.0			82.0	58.0	58.0
Total Split (%)	58.6%			58.6%	41.4%	41.4%
Maximum Green (s)	75.0			75.0	52.0	52.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	83.4			83.4	43.6	43.6
Actuated g/C Ratio	0.60			0.60	0.31	0.31
v/c Ratio	0.54			0.73	0.52	0.88
Control Delay	10.4			23.0	39.8	62.7
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.4			23.0	39.8	62.7
LOS	B			C	D	E
Approach Delay	10.4			23.0	49.8	
Approach LOS	B			C	D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 43.4 (31%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 100.8%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street

Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1781	2460	572	439
v/c Ratio	0.54	0.73	0.52	0.88
Control Delay	10.4	23.0	39.8	62.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.4	23.0	39.8	62.7
Queue Length 50th (m)	90.5	173.7	65.2	122.5
Queue Length 95th (m)	181.5	217.7	76.1	158.0
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	3270	3368	1300	596
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.54	0.73	0.44	0.74

Intersection Summary

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	196	149	719	53	19	593
Future Volume (vph)	196	149	719	53	19	593
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.990			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3543	0	1789	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	3543	0	1789	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	289.7		780.0			514.0
Travel Time (s)	21.7		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	196	149	719	53	19	593
Shared Lane Traffic (%)						
Lane Group Flow (vph)	196	149	772	0	19	593
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 39.1% ICU Level of Service A
Analysis Period (min) 15

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1118	362	0	1820	0	0
Future Volume (vph)	1118	362	0	1820	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	120.9	
Travel Time (s)	15.5			6.8	9.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1118	362	0	1820	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1118	362	0	1820	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

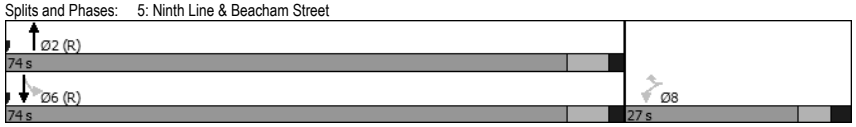
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 120.2%		ICU Level of Service H	
Analysis Period (min) 15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	851	67	49	1453
Future Volume (vph)	46	47	851	67	49	1453
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.98				
Frt		0.850	0.989			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3478	0	1825	3544
Flt Permitted	0.950				0.279	
Satd. Flow (perm)	1789	1560	3478	0	536	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	18			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	925	73	53	1579
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	998	0	53	1579
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	27.0	27.0	74.0		74.0	74.0
Total Split (%)	26.7%	26.7%	73.3%		73.3%	73.3%
Maximum Green (s)	20.5	20.5	67.0		67.0	67.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	10.0	10.0	83.6		83.6	83.6
Actuated g/C Ratio	0.10	0.10	0.83		0.83	0.83
v/c Ratio	0.28	0.26	0.35		0.12	0.54
Control Delay	46.1	15.2	0.5		3.5	4.5
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.1	15.2	0.5		3.5	4.5
LOS	D	B	A		A	A
Approach Delay	30.5		0.5			4.5
Approach LOS	C		A			A

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 4.0	Intersection LOS: A
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	50	51	998	53	1579
v/c Ratio	0.28	0.26	0.35	0.12	0.54
Control Delay	46.1	15.2	0.5	3.5	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	15.2	0.5	3.5	4.5
Queue Length 50th (m)	9.3	0.0	1.0	1.8	46.7
Queue Length 95th (m)	19.9	10.5	1.0	5.3	69.7
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	380	372	2883	444	2934
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.14	0.35	0.12	0.54

Intersection Summary

APPENDIX R

2041 Scenario 3 Future Total Traffic Conditions – 20%

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	604	2	2	652
Future Volume (vph)	1	0	604	2	2	652
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1825	1921	1902	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1921	1902	0	0	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.2		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	3%
Adj. Flow (vph)	1	0	657	2	2	709
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	659	0	0	711
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.9%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	17	90	143	113	78	503	754	62	26	630	80
Future Volume (vph)	12	17	90	143	113	78	503	754	62	26	630	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.874			0.936			0.989			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1646	0	1755	1756	0	1789	3489	0	1825	3521	0
Flt Permitted	0.455			0.688			0.299			0.321		
Satd. Flow (perm)	857	1646	0	1271	1756	0	563	3489	0	617	3521	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		90			34			19			17	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		138.3			287.6			434.9			780.0	
Travel Time (s)		10.4			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	3%	2%	3%	9%	0%	2%	2%
Adj. Flow (vph)	12	17	90	155	113	85	503	820	67	28	685	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	107	0	155	198	0	503	887	0	28	765	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	

Lanes, Volumes, Timings
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

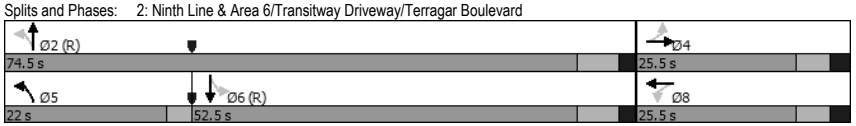
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	8.0		8.0	8.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		9.0	53.0		52.0	52.0	
Total Split (s)	25.5	25.5		25.5	25.5		22.0	74.5		52.5	52.5	
Total Split (%)	25.5%	25.5%		25.5%	25.5%		22.0%	74.5%		52.5%	52.5%	
Maximum Green (s)	19.0	19.0		19.0	19.0		19.0	67.5		45.5	45.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		2.0	6.0		6.0	6.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0			35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)	16.9	16.9		16.9	16.9		75.6	71.6		52.9	52.9	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.76	0.72		0.53	0.53	
v/c Ratio	0.08	0.30		0.72	0.61		0.80	0.35		0.09	0.41	
Control Delay	34.5	12.6		57.9	39.4		16.9	6.1		15.3	15.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.5	12.6		57.9	39.4		16.9	6.1		15.3	15.8	
LOS	C	B		E	D		B	A		B	B	
Approach Delay		14.8			47.5			10.0			15.8	
Approach LOS		B			D			A			B	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 16.9 Intersection LOS: B
Intersection Capacity Utilization 75.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	12	107	155	198	503	887	28	765
v/c Ratio	0.08	0.30	0.72	0.61	0.80	0.35	0.09	0.41
Control Delay	34.5	12.6	57.9	39.4	16.9	6.1	15.3	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	12.6	57.9	39.4	16.9	6.1	15.3	15.8
Queue Length 50th (m)	1.9	2.8	28.2	29.1	29.3	30.6	2.7	45.7
Queue Length 95th (m)	6.7	16.3	48.6	50.3	62.1	42.4	8.2	65.6
Internal Link Dist (m)		114.3		263.6		410.9		756.0
Turn Bay Length (m)					40.0		40.0	
Base Capacity (vph)	171	401	254	378	670	2501	326	1870
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.27	0.61	0.52	0.75	0.35	0.09	0.41

Intersection Summary

Lanes, Volumes, Timings
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	23	46	0	18	59	1332	63	11	858	3
Future Volume (vph)	6	0	23	46	0	18	59	1332	63	11	858	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.993				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3521	0	1674	3544	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3521	0	1674	3544	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		134.3			310.4			412.4			434.9	
Travel Time (s)		10.1			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	2%	9%	3%	2%
Adj. Flow (vph)	6	0	23	50	0	20	59	1448	68	12	933	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	23	0	50	20	0	59	1516	0	12	936	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 61.4%		ICU Level of Service B	
Analysis Period (min) 15			

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	289	2238	136	158	912	332	227	650	293	101	566	183
Future Volume (vph)	289	2238	136	158	912	332	227	650	293	101	566	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.991			0.960				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1733	5143	0	1716	4891	0	1785	3614	1566	1638	3614	1597
Flt Permitted	0.136			0.064			0.158			0.223		
Satd. Flow (perm)	248	5143	0	116	4891	0	297	3614	1566	384	3614	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			78				163			178
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	4%	4%	0%	0%	1%	2%	9%	1%	0%
Adj. Flow (vph)	289	2238	136	158	912	332	227	650	293	101	566	183
Shared Lane Traffic (%)												
Lane Group Flow (vph)	289	2374	0	158	1244	0	227	650	293	101	566	183
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

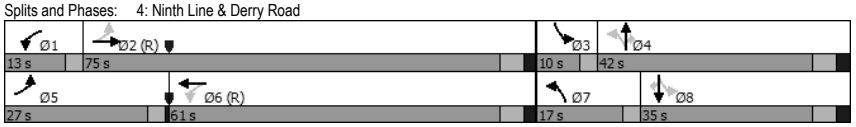
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	5.0	8.0	8.0
Minimum Split (s)	9.0	30.1		8.0	30.1		8.0	29.4	29.4	8.0	29.4	29.4
Total Split (s)	27.0	75.0		13.0	61.0		17.0	42.0	42.0	10.0	35.0	35.0
Total Split (%)	19.3%	53.6%		9.3%	43.6%		12.1%	30.0%	30.0%	7.1%	25.0%	25.0%
Maximum Green (s)	23.5	68.9		10.0	54.9		14.0	35.6	35.6	7.0	28.6	28.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.5	2.1		0.0	2.1		0.0	2.4	2.4	0.0	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.5	5.1		2.0	5.1		2.0	5.4	5.4	2.0	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	87.6	71.7		77.2	62.8		47.9	34.5	34.5	38.9	27.5	27.5
Actuated g/C Ratio	0.63	0.51		0.55	0.45		0.34	0.25	0.25	0.28	0.20	0.20
v/c Ratio	0.79	0.90		0.82	0.56		0.87	0.73	0.58	0.57	0.80	0.40
Control Delay	45.6	33.2		73.0	22.3		66.5	53.6	24.3	45.8	62.6	9.6
Queue Delay	0.0	0.2		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	33.4		73.0	22.3		66.5	53.6	24.3	45.8	62.6	9.6
LOS	D	C		E	C		E	D	C	D	E	A
Approach Delay		34.7			28.0			48.8			49.2	
Approach LOS		C			C			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 37.9 — Intersection LOS: D
Intersection Capacity Utilization 98.7% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	289	2374	158	1244	227	650	293	101	566	183
v/c Ratio	0.79	0.90	0.82	0.56	0.87	0.73	0.58	0.57	0.80	0.40
Control Delay	45.6	33.2	73.0	22.3	66.5	53.6	24.3	45.8	62.6	9.6
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	33.4	73.0	22.3	66.5	53.6	24.3	45.8	62.6	9.6
Queue Length 50th (m)	53.5	162.3	30.9	92.6	46.1	85.7	30.3	19.1	77.8	1.1
Queue Length 95th (m)	86.0	184.9	#70.8	93.1	#84.9	107.2	60.1	33.0	98.5	20.5
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	415	2638	195	2236	260	944	529	178	764	478
Starvation Cap Reductn	0	24	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.91	0.81	0.56	0.87	0.69	0.55	0.57	0.74	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1293	85	58	725
Future Volume (vph)	90	47	1293	85	58	725
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3546	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1807	1633	3546	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1405	92	63	788
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1497	0	63	788
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.3%		ICU Level of Service B	
Analysis Period (min) 15			

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	64	30	138	24	207	9	1049	97	79	626	7
Future Volume (vph)	28	64	30	138	24	207	9	1049	97	79	626	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		27.0	50.0		60.0	115.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.952			0.864			0.987			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1793	0	1772	1607	0	1789	3492	0	1825	3571	0
Flt Permitted	0.346			0.696			0.382			0.190		
Satd. Flow (perm)	652	1793	0	1298	1607	0	719	3492	0	365	3571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			93			18			2	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		99.7			255.0			850.0			603.1	
Travel Time (s)		7.5			18.4			43.7			31.0	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	3%	5%	0%	2%	2%
Adj. Flow (vph)	28	64	30	150	24	225	9	1140	105	86	680	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	94	0	150	249	0	9	1245	0	86	687	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

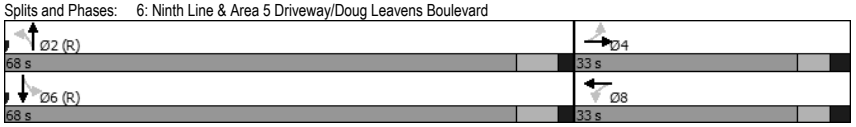
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		45.0	45.0	
Minimum Split (s)	25.5	25.5		23.0	23.0		52.0	52.0		52.0	52.0	
Total Split (s)	33.0	33.0		33.0	33.0		68.0	68.0		68.0	68.0	
Total Split (%)	32.7%	32.7%		32.7%	32.7%		67.3%	67.3%		67.3%	67.3%	
Maximum Green (s)	26.5	26.5		26.5	26.5		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	18.2	18.2		18.2	18.2		71.3	71.3		71.3	71.3	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.71	0.71		0.71	0.71	
v/c Ratio	0.24	0.27		0.64	0.68		0.02	0.50		0.33	0.27	
Control Delay	37.9	27.1		50.0	32.7		10.3	14.6		11.8	6.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	37.9	27.1		50.0	32.7		10.3	14.6		11.8	6.4	
LOS	D	C		D	C		B	B		B	A	
Approach Delay		29.6			39.2			14.5			7.0	
Approach LOS		C			D			B			A	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 16.8 Intersection LOS: B
Intersection Capacity Utilization 98.5% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard



Queues
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	94	150	249	9	1245	86	687
v/c Ratio	0.24	0.27	0.64	0.68	0.02	0.50	0.33	0.27
Control Delay	37.9	27.1	50.0	32.7	10.3	14.6	11.8	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	27.1	50.0	32.7	10.3	14.6	11.8	6.4
Queue Length 50th (m)	4.8	12.0	27.6	28.7	0.7	84.7	5.6	22.0
Queue Length 95th (m)	11.8	23.4	43.7	49.7	m2.3	129.5	18.6	38.7
Internal Link Dist (m)		75.7		231.0		826.0		579.1
Turn Bay Length (m)					50.0		115.0	
Base Capacity (vph)	177	504	353	505	507	2469	257	2520
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.19	0.42	0.49	0.02	0.50	0.33	0.27

Intersection Summary

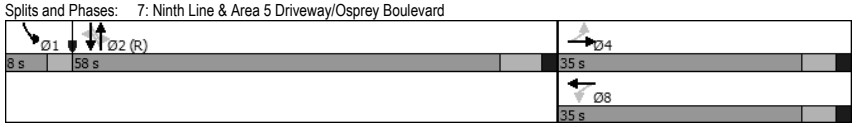
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	23	30	200	12	122	9	1155	150	55	881	7
Future Volume (vph)	28	23	30	200	12	122	9	1155	150	55	881	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	13.0		0.0	35.0		25.0	270.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			13.0			60.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.915			0.862			0.983			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1723	0	1706	1603	0	1789	3439	0	1789	3541	0
Flt Permitted	0.611			0.722			0.245			0.114		
Satd. Flow (perm)	1151	1723	0	1296	1603	0	461	3439	0	215	3541	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			133			21			1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		142.8			160.0			383.2			301.0	
Travel Time (s)		10.7			11.5			19.7			15.5	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	7%	2%	3%	2%
Adj. Flow (vph)	28	23	30	217	12	133	9	1255	163	60	958	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	53	0	217	145	0	9	1418	0	60	965	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.0	25.0		52.0	52.0		8.0	52.0	
Total Split (s)	35.0	35.0		35.0	35.0		58.0	58.0		8.0	58.0	
Total Split (%)	34.7%	34.7%		34.7%	34.7%		57.4%	57.4%		7.9%	57.4%	
Maximum Green (s)	29.0	29.0		29.0	29.0		51.0	51.0		5.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		37.0	37.0			37.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	22.8	22.8		22.8	22.8		59.9	59.9		69.6	59.9	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.59	0.59		0.69	0.59	
v/c Ratio	0.11	0.13		0.75	0.31		0.03	0.69		0.23	0.46	
Control Delay	29.2	15.8		51.4	8.1		12.2	18.0		10.7	17.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	29.2	15.8		51.4	8.1		12.2	18.0		10.7	17.1	
LOS	C	B		D	A		B	B		B	B	
Approach Delay		20.4			34.0			17.9			16.8	
Approach LOS		C			C			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 19.6	Intersection LOS: B
Intersection Capacity Utilization 76.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 7: Ninth Line & Area 5 Driveway/Osprey Boulevard



Queues
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	53	217	145	9	1418	60	965
v/c Ratio	0.11	0.13	0.75	0.31	0.03	0.69	0.23	0.46
Control Delay	29.2	15.8	51.4	8.1	12.2	18.0	10.7	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	15.8	51.4	8.1	12.2	18.0	10.7	17.1
Queue Length 50th (m)	4.4	3.6	39.5	1.8	0.7	99.4	2.9	59.7
Queue Length 95th (m)	10.6	11.8	59.8	15.3	3.4	142.5	12.3	94.5
Internal Link Dist (m)		118.8		136.0		359.2		277.0
Turn Bay Length (m)			13.0		35.0		270.0	
Base Capacity (vph)	341	532	384	569	273	2048	257	2101
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.10	0.57	0.25	0.03	0.69	0.23	0.46

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	7	18	0	91	2	1056	6	27	903	2
Future Volume (vph)	6	0	7	18	0	91	2	1056	6	27	903	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			60.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.850			0.850			0.999				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3611	0	1825	3614	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3611	0	1825	3614	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		144.4			207.4			254.7			383.2	
Travel Time (s)		10.8			14.9			13.1			19.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	6	0	7	20	0	99	2	1148	7	29	982	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	7	0	20	99	0	2	1155	0	29	984	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 43.9% ICU Level of Service A
Analysis Period (min) 15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	2322	328	79	753	123	210	914	139	98	827	133
Future Volume (vph)	120	2322	328	79	753	123	210	914	139	98	827	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.981			0.979			0.980			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	5088	0	1767	4919	0	1785	3502	0	1653	3503	0
Flt Permitted	0.312			0.055			0.102			0.107		
Satd. Flow (perm)	580	5088	0	102	4919	0	192	3502	0	186	3503	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			36			12			13	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	2%	1%	2%	19%	0%	2%	3%	8%	2%	2%
Adj. Flow (vph)	120	2322	328	79	753	123	210	914	139	98	827	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	2650	0	79	876	0	210	1053	0	98	960	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	24.6	24.6		8.0	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	76.0	76.0		8.0	84.0		13.0	48.0		8.0	43.0	
Total Split (%)	54.3%	54.3%		5.7%	60.0%		9.3%	34.3%		5.7%	30.7%	
Maximum Green (s)	69.4	69.4		5.0	77.4		10.0	41.4		5.0	36.4	
Yellow Time (s)	4.6	4.6		3.0	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	2.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-2.0	-1.0		-1.0	-3.0	
Total Lost Time (s)	5.6	5.6		2.0	5.6		1.0	5.6		2.0	3.6	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			12.0			12.0	
Flash Dont Walk (s)	11.0	11.0			11.0			18.0			18.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)	70.4	70.4		82.0	78.4		55.0	42.4		47.0	39.4	
Actuated g/C Ratio	0.50	0.50		0.59	0.56		0.39	0.30		0.34	0.28	
v/c Ratio	0.41	1.03		0.60	0.32		1.00	0.99		0.78	0.96	
Control Delay	16.1	48.0		52.9	14.4		95.5	72.1		70.1	70.0	
Queue Delay	0.0	0.1		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.1	48.2		52.9	14.4		95.5	72.1		70.1	70.0	
LOS	B	D		D	B		F	E		E	E	
Approach Delay		46.8			17.6			76.0			70.0	
Approach LOS		D			B			E			E	

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection		
Natural Cycle: 140		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.03		
Intersection Signal Delay: 52.3		Intersection LOS: D
Intersection Capacity Utilization 109.9%		ICU Level of Service H
Analysis Period (min) 15		

Splits and Phases: 9: Ninth Line & Britannia Road

Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	2650	79	876	210	1053	98	960
v/c Ratio	0.41	1.03	0.60	0.32	1.00	0.99	0.78	0.96
Control Delay	16.1	48.0	52.9	14.4	95.5	72.1	70.1	70.0
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	48.2	52.9	14.4	95.5	72.1	70.1	70.0
Queue Length 50th (m)	10.0	~288.1	9.6	32.7	41.6	151.3	17.6	137.0
Queue Length 95th (m)	16.0	#305.4	#30.6	37.9	#93.6	#198.0	#41.4	#179.8
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	291	2571	131	2770	211	1068	125	995
Starvation Cap Reductn	0	1	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	1.03	0.60	0.32	1.00	0.99	0.78	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	22	40	28	20	1272	9	2	1260	38
Future Volume (vph)	0	0	0	22	40	28	20	1272	9	2	1260	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.936			0.999			0.996	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		111.0			491.2			170.0			206.5	
Travel Time (s)		8.3			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	0%	2%	2%	13%	50%	3%	2%
Adj. Flow (vph)	0	0	0	24	40	30	20	1383	10	2	1370	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	24	70	0	20	1393	0	2	1408	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.5% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	4	3	24	0	41	14	1219	32	43	1228	27
Future Volume (vph)	8	4	3	24	0	41	14	1219	32	43	1228	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.936			0.850			0.996			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1763	0	1825	1585	0	1789	3554	0	1825	3568	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1763	0	1825	1585	0	1789	3554	0	1825	3568	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		61.6			511.9			217.0			170.0	
Travel Time (s)		4.6			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	3%	2%	2%	13%	0%	2%	2%
Adj. Flow (vph)	8	4	3	26	0	45	14	1325	35	47	1335	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	7	0	26	45	0	14	1360	0	47	1362	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 50.6% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	11	1358	8	4	1210
Future Volume (vph)	19	11	1358	8	4	1210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	30.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.951		0.999			
Flt Protected	0.969				0.950	
Satd. Flow (prot)	1714	0	3541	0	1825	3579
Flt Permitted	0.969				0.950	
Satd. Flow (perm)	1714	0	3541	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	0%	0%	2%
Adj. Flow (vph)	21	12	1476	9	4	1315
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	1485	0	4	1315
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.8% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	11	1237	6	3	1251
Future Volume (vph)	6	11	1237	6	3	1251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1498	3535	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1498	3535	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	33%	0%	2%
Adj. Flow (vph)	7	12	1345	7	3	1360
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	12	1352	0	3	1360
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.6%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	2	14	206	1	99	4	1147	182	88	1146	3
Future Volume (vph)	9	2	14	206	1	99	4	1147	182	88	1146	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		35.0	28.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			45.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.869			0.851			0.979				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1637	0	1789	1508	0	1789	3469	0	1690	3579	0
Flt Permitted	0.687			0.747			0.158			0.110		
Satd. Flow (perm)	1294	1637	0	1407	1508	0	298	3469	0	196	3579	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			108			27				
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		170.8			534.8			346.0			306.2	
Travel Time (s)		12.8			38.5			17.8			15.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	7%	2%	3%	3%	8%	2%	2%
Adj. Flow (vph)	9	2	14	224	1	108	4	1247	198	96	1246	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	16	0	224	109	0	4	1445	0	96	1249	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

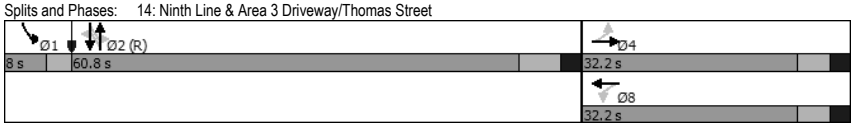
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		52.5	52.5		8.0	52.5	
Total Split (s)	32.2	32.2		32.2	32.2		60.8	60.8		8.0	60.8	
Total Split (%)	31.9%	31.9%		31.9%	31.9%		60.2%	60.2%		7.9%	60.2%	
Maximum Green (s)	25.7	25.7		25.7	25.7		53.3	53.3		5.0	53.3	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		0.0	2.5	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.5	6.5		2.0	6.5	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		33.0	33.0			33.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0			12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	21.5	21.5		21.5	21.5		60.1	60.1		70.4	60.1	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.60	0.60		0.70	0.60	
v/c Ratio	0.03	0.04		0.75	0.27		0.02	0.70		0.40	0.59	
Control Delay	28.9	15.1		53.7	9.7		13.5	23.6		10.2	15.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.9	15.1		53.7	9.7		13.5	23.6		10.2	15.4	
LOS	C	B		D	A		B	C		B	B	
Approach Delay		20.0			39.3			23.6			15.1	
Approach LOS		C			D			C			B	

Intersection Summary

Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 21.6		Intersection LOS: C	
Intersection Capacity Utilization 101.2%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 14: Ninth Line & Area 3 Driveway/Thomas Street



Queues
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	9	16	224	109	4	1445	96	1249
v/c Ratio	0.03	0.04	0.75	0.27	0.02	0.70	0.40	0.59
Control Delay	28.9	15.1	53.7	9.7	13.5	23.6	10.2	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	15.1	53.7	9.7	13.5	23.6	10.2	15.4
Queue Length 50th (m)	1.4	0.3	43.7	1.3	0.5	145.0	5.1	81.9
Queue Length 95th (m)	5.1	5.3	66.6	16.0	m0.0	171.5	11.4	108.4
Internal Link Dist (m)		146.8		510.8		322.0		282.2
Turn Bay Length (m)					30.0		28.0	
Base Capacity (vph)	342	443	371	478	177	2075	242	2130
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.04	0.60	0.23	0.02	0.70	0.40	0.59

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	46	1212	7	17	1360
Future Volume (vph)	18	46	1212	7	17	1360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.904		0.999			
Flt Protected	0.986				0.950	
Satd. Flow (prot)	1688	0	3541	0	1722	3579
Flt Permitted	0.986				0.950	
Satd. Flow (perm)	1688	0	3541	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	3%	0%	6%	2%
Adj. Flow (vph)	20	50	1317	8	18	1478
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	0	1325	0	18	1478
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 48.1% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	39	77	1164	48	45	1359
Future Volume (vph)	39	77	1164	48	45	1359
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1617	3514	0	1722	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1617	3514	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Adj. Flow (vph)	42	84	1265	52	49	1477
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	84	1317	0	49	1477
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.6% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	14	9	0	18	5	1182	1	8	1394	3
Future Volume (vph)	11	0	14	9	0	18	5	1182	1	8	1394	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	70.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.924			0.910							
Flt Protected		0.978			0.984		0.950			0.950		
Satd. Flow (prot)	0	1702	0	0	1720	0	1789	3544	0	1825	3579	0
Flt Permitted		0.978			0.984		0.950			0.950		
Satd. Flow (perm)	0	1702	0	0	1720	0	1789	3544	0	1825	3579	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		92.8			113.3			424.8			250.0	
Travel Time (s)		7.0			8.2			21.8			12.9	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	0%	0%	2%	2%
Adj. Flow (vph)	11	0	14	10	0	20	5	1285	1	9	1515	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	0	0	30	0	5	1286	0	9	1518	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.6%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	81	63	1055	56	54	1367
Future Volume (vph)	81	63	1055	56	54	1367
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.992			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1706	1570	3493	0	1772	3579
Flt Permitted	0.950				0.199	
Satd. Flow (perm)	1706	1570	3493	0	371	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		68	11			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	4%	3%	16%	3%	2%
Adj. Flow (vph)	88	68	1147	61	59	1486
Shared Lane Traffic (%)						
Lane Group Flow (vph)	88	68	1208	0	59	1486
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

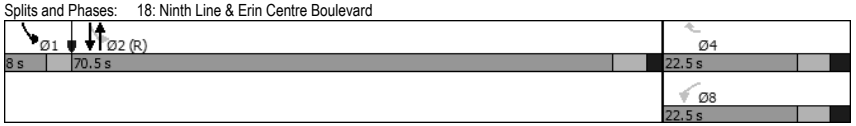
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	22.5	22.5	70.5		8.0	70.5
Total Split (%)	22.3%	22.3%	69.8%		7.9%	69.8%
Maximum Green (s)	16.0	16.0	64.5		5.0	64.5
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	5.0	8.0	50.0			50.0
Flash Dont Walk (s)	11.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	11.8	11.8	75.2		83.0	75.2
Actuated g/C Ratio	0.12	0.12	0.74		0.82	0.74
v/c Ratio	0.44	0.28	0.46		0.15	0.56
Control Delay	47.9	12.8	7.6		5.6	18.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.9	12.8	7.6		5.6	18.8
LOS	D	B	A		A	B
Approach Delay	32.6		7.6			18.3
Approach LOS	C		A			B

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 14.6 Intersection LOS: B
Intersection Capacity Utilization 63.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	88	68	1208	59	1486
v/c Ratio	0.44	0.28	0.46	0.15	0.56
Control Delay	47.9	12.8	7.6	5.6	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	12.8	7.6	5.6	18.8
Queue Length 50th (m)	16.4	0.0	50.9	4.0	137.3
Queue Length 95th (m)	30.0	11.5	75.3	m7.6	163.8
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	287	320	2604	402	2665
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.31	0.21	0.46	0.15	0.56

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	0	0	17	0	41	0	998	8	14	1455	4
Future Volume (vph)	14	0	0	17	0	41	0	998	8	14	1455	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.850			0.999				
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1883	0	1825	1601	0	1883	3541	0	1825	3579	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1883	0	1825	1601	0	1883	3541	0	1825	3579	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		73.8			216.6			90.1			404.2	
Travel Time (s)		5.5			15.6			4.6			20.8	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	2%	3%	0%	0%	2%	2%
Adj. Flow (vph)	14	0	0	18	0	45	0	1085	9	15	1582	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	0	0	18	45	0	0	1094	0	15	1586	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 54.6% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	17	1047	1	6	1430
Future Volume (vph)	5	17	1047	1	6	1430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.894					
Flt Protected	0.989				0.950	
Satd. Flow (prot)	1699	0	3544	0	1217	3614
Flt Permitted	0.989				0.950	
Satd. Flow (perm)	1699	0	3544	0	1217	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	50%	1%
Adj. Flow (vph)	5	18	1138	1	7	1554
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	1139	0	7	1554
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.5% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	0	36	2	0	25	10	930	6	0	1524	5
Future Volume (vph)	20	0	36	2	0	25	10	930	6	0	1524	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		20.0	0.0		0.0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.913				0.865			0.850			
Flt Protected		0.982			0.950		0.950					
Satd. Flow (prot)	0	1689	0	0	0	1662	1789	3544	1396	0	3614	0
Flt Permitted		0.982			0.950		0.950					
Satd. Flow (perm)	0	1689	0	0	0	1662	1789	3544	1396	0	3614	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		70.1			245.5			191.7			91.0	
Travel Time (s)		5.3			17.7			9.9			4.7	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	17%	0%	1%	2%
Adj. Flow (vph)	20	0	36	2	0	27	10	1011	7	0	1657	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	0	0	2	27	10	1011	7	0	1662	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	909	50	38	316	244	14	517	67	482	805	81
Future Volume (vph)	68	909	50	38	316	244	14	517	67	482	805	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.983			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3617	0	1825	1883	1526	1825	3526	0	1789	3596	0
Flt Permitted	0.490			0.093			0.297			0.132		
Satd. Flow (perm)	932	3617	0	179	1883	1526	571	3526	0	249	3596	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				265		9			11	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	2%	7%	0%	2%	0%	2%	0%	1%
Adj. Flow (vph)	74	988	54	41	343	265	15	562	73	524	875	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	74	1042	0	41	343	265	15	635	0	524	963	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

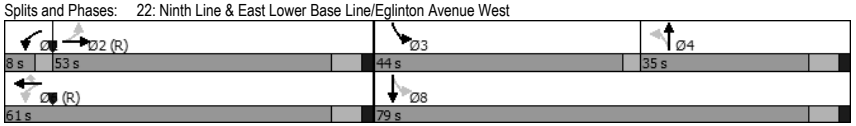
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		1	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		8.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	53.0	53.0		8.0	61.0	61.0	35.0	35.0		44.0	79.0	
Total Split (%)	37.9%	37.9%		5.7%	43.6%	43.6%	25.0%	25.0%		31.4%	56.4%	
Maximum Green (s)	46.0	46.0		5.0	54.0	54.0	28.0	28.0		41.0	72.0	
Yellow Time (s)	5.0	5.0		3.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		0.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min	Min	Min		None	Min	
Walk Time (s)	8.0	8.0			8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0			8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0			0	
Act Effct Green (s)	51.6	51.6		62.3	58.3	58.3	28.4	28.4		73.7	69.7	
Actuated g/C Ratio	0.37	0.37		0.44	0.42	0.42	0.20	0.20		0.53	0.50	
v/c Ratio	0.22	0.78		0.27	0.44	0.34	0.13	0.88		0.93	0.54	
Control Delay	35.1	45.3		28.2	32.4	4.3	48.6	67.8		60.9	24.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	35.1	45.3		28.2	32.4	4.3	48.6	67.8		60.9	24.7	
LOS	D	D		C	C	A	D	E		E	C	
Approach Delay		44.7			20.6			67.4			37.4	
Approach LOS		D			C			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 41.7 — Intersection LOS: D
Intersection Capacity Utilization 90.7% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	1042	41	343	265	15	635	524	963
v/c Ratio	0.22	0.78	0.27	0.44	0.34	0.13	0.88	0.93	0.54
Control Delay	35.1	45.3	28.2	32.4	4.3	48.6	67.8	60.9	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.1	45.3	28.2	32.4	4.3	48.6	67.8	60.9	24.7
Queue Length 50th (m)	14.8	140.8	6.7	70.0	0.0	3.4	89.0	118.0	88.0
Queue Length 95th (m)	28.0	168.6	14.1	97.7	17.1	10.1	#117.5	#179.9	106.3
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	342	1334	154	783	789	119	741	592	1880
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.78	0.27	0.44	0.34	0.13	0.86	0.89	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	101	22	159	228	14	33	24	249	21	40	13
Future Volume (vph)	7	101	22	159	228	14	33	24	249	21	40	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.977			0.995			0.890			0.976	
Flt Protected		0.997			0.981			0.995			0.986	
Satd. Flow (prot)	0	1775	0	0	1822	0	0	1664	0	0	1849	0
Flt Permitted		0.997			0.981			0.995			0.986	
Satd. Flow (perm)	0	1775	0	0	1822	0	0	1664	0	0	1849	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	9		16	16		9	10		27	27		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	4%	9%	3%	3%	0%	3%	4%	2%	0%	0%	0%
Adj. Flow (vph)	8	110	24	173	248	15	36	26	271	23	43	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	142	0	0	436	0	0	333	0	0	80	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.6%		ICU Level of Service B	
Analysis Period (min) 15			

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	2632	20	104	1189	132	95	63	361	224	105	92
Future Volume (vph)	22	2632	20	104	1189	132	95	63	361	224	105	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99		0.99		0.96	0.97		0.97
Frt		0.999			0.985				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5187	0	1684	4890	0	1750	1847	1617	1750	1795	1581
Flt Permitted	0.196			0.044			0.661			0.716		
Satd. Flow (perm)	366	5187	0	78	4890	0	1201	1847	1547	1281	1795	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			29				112			92
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	14		3	3		14	12		24	24		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	6%	5%	6%	2%	4%	1%	2%	7%	1%
Adj. Flow (vph)	22	2632	20	104	1189	132	95	63	361	224	105	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2652	0	104	1321	0	95	63	361	224	105	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

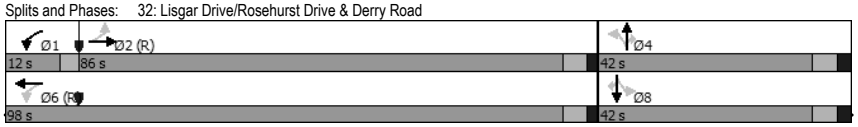
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		8.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	86.0	86.0		12.0	98.0		42.0	42.0	42.0	42.0	42.0	42.0
Total Split (%)	61.4%	61.4%		8.6%	70.0%		30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Maximum Green (s)	80.0	80.0		9.0	92.0		35.4	35.4	35.4	35.4	35.4	35.4
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		0.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		2.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0			12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0			18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	88.2	88.2		102.4	99.4		30.0	30.0	30.0	30.0	30.0	30.0
Actuated g/C Ratio	0.63	0.63		0.73	0.71		0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.10	0.81		0.64	0.38		0.37	0.16	0.86	0.82	0.27	0.23
Control Delay	4.9	5.8		43.2	8.8		49.5	43.4	55.7	74.5	46.0	8.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	5.8		43.2	8.8		49.5	43.4	55.7	74.5	46.0	8.9
LOS	A	A		D	A		D	D	E	E	D	A
Approach Delay		5.8			11.3			53.1			53.1	
Approach LOS		A			B			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 16.2 Intersection LOS: B
Intersection Capacity Utilization 103.0% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	2652	104	1321	95	63	361	224	105	92
v/c Ratio	0.10	0.81	0.64	0.38	0.37	0.16	0.86	0.82	0.27	0.23
Control Delay	4.9	5.8	43.2	8.8	49.5	43.4	55.7	74.5	46.0	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	5.8	43.2	8.8	49.5	43.4	55.7	74.5	46.0	8.9
Queue Length 50th (m)	0.7	34.1	13.0	48.9	22.4	14.2	68.6	58.9	24.2	0.0
Queue Length 95th (m)	m0.9	39.5	#34.4	64.6	37.5	25.5	102.7	85.8	39.0	13.6
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	230	3268	173	3479	312	480	485	333	466	467
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.81	0.60	0.38	0.30	0.13	0.74	0.67	0.23	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	203	36	53	219	130	65	82	170	223	70	69
Future Volume (vph)	9	203	36	53	219	130	65	82	170	223	70	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.977			0.944			0.928			0.974	
Flt Protected	0.950			0.950				0.990			0.970	
Satd. Flow (prot)	1496	1837	0	1674	1789	0	0	1705	0	0	1777	0
Flt Permitted	0.950			0.950				0.990			0.970	
Satd. Flow (perm)	1496	1837	0	1674	1789	0	0	1705	0	0	1777	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	15		33	33		15	38		42	42		38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	2%	3%	9%	1%	2%	3%	7%	2%	1%	4%	4%
Adj. Flow (vph)	10	221	39	58	238	141	71	89	185	242	76	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	260	0	58	379	0	0	345	0	0	393	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 77.7%	ICU Level of Service D
Analysis Period (min) 15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	82	3	9	91	122	5	16	12	210	11	104
Future Volume (vph)	89	82	3	9	91	122	5	16	12	210	11	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.926			0.950			0.957	
Flt Protected		0.975			0.998			0.993			0.969	
Satd. Flow (prot)	0	1850	0	0	1775	0	0	1812	0	0	1748	0
Flt Permitted		0.975			0.998			0.993			0.969	
Satd. Flow (perm)	0	1850	0	0	1775	0	0	1812	0	0	1748	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	8		6	6		8	2		12	12		2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%
Adj. Flow (vph)	97	89	3	10	99	133	5	17	13	228	12	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	189	0	0	242	0	0	35	0	0	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

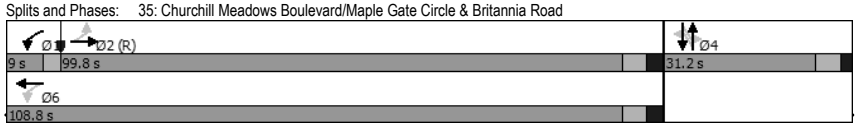
Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 58.7%	ICU Level of Service B
Analysis Period (min) 15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2478	131	60	964	17	31	3	209	74	19	17
Future Volume (vph)	1	2478	131	60	964	17	31	3	209	74	19	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		0.99	0.97		0.99	0.99	
Frt		0.992			0.997			0.852			0.929	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5146	0	1552	5009	0	1733	1575	0	1785	1721	0
Flt Permitted	0.280			0.039			0.734			0.295		
Satd. Flow (perm)	523	5146	0	64	5009	0	1326	1575	0	549	1721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			5			72			17	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			101.9			114.1			106.4	
Travel Time (s)		28.2			6.1			8.2			7.7	
Confl. Peds. (#/hr)	8		4	4		8	6		10	10		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	4%	23%	3%	0%	1%	0%	5%	0%
Adj. Flow (vph)	1	2478	131	60	964	17	31	3	209	74	19	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2609	0	60	981	0	31	212	0	74	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			4	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		1	6		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		9.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	99.8	99.8		9.0	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	71.3%	71.3%		6.4%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	92.8	92.8		6.0	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		0.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-2.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0		5.2	5.2		4.2	5.2	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	11.0	11.0			11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0			18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	101.6	101.6		113.2	109.2		19.6	19.6		20.6	19.6	
Actuated g/C Ratio	0.73	0.73		0.81	0.78		0.14	0.14		0.15	0.14	
v/c Ratio	0.00	0.70		0.47	0.25		0.17	0.75		0.93	0.14	
Control Delay	2.0	2.3		27.9	4.8		52.2	53.8		139.0	31.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.0	2.3		27.9	4.8		52.2	53.8		139.0	31.9	
LOS	A	A		C	A		D	D		F	C	
Approach Delay		2.3			6.1			53.6			104.0	
Approach LOS		A			A			D			F	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 8 (6%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 86.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	2609	60	981	31	212	74	36
v/c Ratio	0.00	0.70	0.47	0.25	0.17	0.75	0.93	0.14
Control Delay	2.0	2.3	27.9	4.8	52.2	53.8	139.0	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	2.3	27.9	4.8	52.2	53.8	139.0	31.9
Queue Length 50th (m)	0.0	22.3	2.9	24.0	7.6	37.7	20.3	4.6
Queue Length 95th (m)	m0.0	m23.8	18.2	34.5	16.6	63.1	#44.9	14.2
Internal Link Dist (m)		445.7		77.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	379	3739	130	3909	246	351	105	333
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.70	0.46	0.25	0.13	0.60	0.70	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	17	21	42	67	20	11	181	34	16	220	7
Future Volume (vph)	12	17	21	42	67	20	11	181	34	16	220	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.942			0.979			0.980			0.996	
Flt Protected		0.988			0.984			0.998			0.997	
Satd. Flow (prot)	0	1753	0	0	1771	0	0	1835	0	0	1794	0
Flt Permitted		0.988			0.984			0.998			0.997	
Satd. Flow (perm)	0	1753	0	0	1771	0	0	1835	0	0	1794	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)			13	13			16		13	13		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	0%	5%	4%	5%	0%	3%	0%	0%	7%	0%
Adj. Flow (vph)	13	18	23	46	73	22	12	197	37	17	239	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	141	0	0	246	0	0	264	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 35.0% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	196	31	90	70	29	13	205	161	61	269	11
Future Volume (vph)	23	196	31	90	70	29	13	205	161	61	269	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.979			0.943			0.996	
Flt Protected		0.995			0.977			0.998			0.991	
Satd. Flow (prot)	0	1749	0	0	1779	0	0	1767	0	0	1867	0
Flt Permitted		0.995			0.977			0.998			0.991	
Satd. Flow (perm)	0	1749	0	0	1779	0	0	1767	0	0	1867	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	19		71	71		19	20		20	20		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	9%	0%	2%	5%	3%	15%	1%	3%	0%	2%	0%
Adj. Flow (vph)	25	213	34	98	76	32	14	223	175	66	292	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	272	0	0	206	0	0	412	0	0	370	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 79.1%		ICU Level of Service D	
Analysis Period (min) 15			

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	329	14	104	265	181	20	244	68	181	306	63
Future Volume (vph)	131	329	14	104	265	181	20	244	68	181	306	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	1.00		0.99	0.97		1.00	0.99		0.98	1.00	
Frt		0.994			0.939			0.967			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3578	0	1772	3163	0	1825	1794	0	1807	1821	0
Flt Permitted	0.442			0.518			0.384			0.447		
Satd. Flow (perm)	819	3578	0	956	3163	0	735	1794	0	832	1821	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			197			19			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	7%	3%	3%	8%	0%	2%	4%	1%	2%	5%
Adj. Flow (vph)	142	358	15	113	288	197	22	265	74	197	333	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	142	373	0	113	485	0	22	339	0	197	401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	47.0	47.0		47.0	47.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.5%	46.5%		46.5%	46.5%		53.5%	53.5%		53.5%	53.5%	
Maximum Green (s)	40.5	40.5		40.5	40.5		48.0	48.0		48.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	47.5	47.5		47.5	47.5		43.0	43.0		43.0	43.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.43	0.43		0.43	0.43	
v/c Ratio	0.37	0.22		0.25	0.30		0.07	0.44		0.56	0.51	
Control Delay	26.1	20.9		18.5	10.2		17.4	21.1		28.8	23.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.1	20.9		18.5	10.2		17.4	21.1		28.8	23.1	
LOS	C	C		B	B		B	C		C	C	
Approach Delay		22.4			11.8			20.9			24.9	
Approach LOS		C			B			C			C	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 19.8 — Intersection LOS: B
Intersection Capacity Utilization 113.1% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	373	113	485	22	339	197	401
v/c Ratio	0.37	0.22	0.25	0.30	0.07	0.44	0.56	0.51
Control Delay	26.1	20.9	18.5	10.2	17.4	21.1	28.8	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	20.9	18.5	10.2	17.4	21.1	28.8	23.1
Queue Length 50th (m)	18.5	24.4	12.6	16.3	2.5	43.8	28.9	55.3
Queue Length 95th (m)	m33.1	37.4	26.5	29.2	6.8	61.5	48.2	75.5
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	385	1686	450	1593	356	880	403	890
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.22	0.25	0.30	0.06	0.39	0.49	0.45

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	112	20	26	70	39	17	115	26	78	269	19
Future Volume (vph)	21	112	20	26	70	39	17	115	26	78	269	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.982			0.961			0.978			0.993	
Flt Protected		0.993			0.991			0.995			0.989	
Satd. Flow (prot)	0	1773	0	0	1788	0	0	1781	0	0	1786	0
Flt Permitted		0.993			0.991			0.995			0.989	
Satd. Flow (perm)	0	1773	0	0	1788	0	0	1781	0	0	1786	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	21		17	17		21	16		16	16		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	4%	3%	0%	6%	5%	4%	1%	7%	5%
Adj. Flow (vph)	23	122	22	28	76	42	18	125	28	85	292	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	167	0	0	146	0	0	171	0	0	398	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 53.0%	ICU Level of Service A
Analysis Period (min) 15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	201	15	29	116	14	22	122	121	67	279	36
Future Volume (vph)	22	201	15	29	116	14	22	122	121	67	279	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.988			0.938			0.987	
Flt Protected		0.995			0.991			0.996			0.991	
Satd. Flow (prot)	0	1748	0	0	1770	0	0	1717	0	0	1792	0
Flt Permitted		0.995			0.991			0.996			0.991	
Satd. Flow (perm)	0	1748	0	0	1770	0	0	1717	0	0	1792	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	8%	7%	7%	6%	7%	5%	6%	3%	1%	6%	3%
Adj. Flow (vph)	24	218	16	32	126	15	24	133	132	73	303	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	258	0	0	173	0	0	289	0	0	415	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

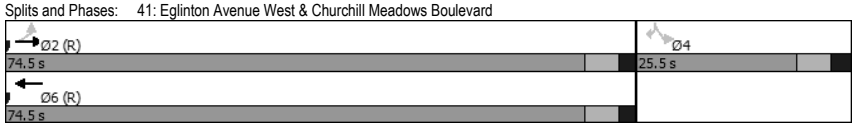
Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 57.1%	ICU Level of Service B
Analysis Period (min) 15	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	2195	1348	65	215	125
Future Volume (vph)	3	2195	1348	65	215	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt			0.993			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	3579	3443	0	1755	1183
Flt Permitted	0.151				0.950	
Satd. Flow (perm)	290	3579	3443	0	1755	1183
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			11			61
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	5%	8%	4%	38%
Adj. Flow (vph)	3	2195	1348	65	215	125
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	2195	1413	0	215	125
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				4	4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	24.0	24.0	24.0		25.5	25.5
Total Split (s)	74.5	74.5	74.5		25.5	25.5
Total Split (%)	74.5%	74.5%	74.5%		25.5%	25.5%
Maximum Green (s)	68.5	68.5	68.5		19.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	72.2	72.2	72.2		17.3	17.3
Actuated g/C Ratio	0.72	0.72	0.72		0.17	0.17
v/c Ratio	0.01	0.85	0.57		0.71	0.49
Control Delay	5.0	15.0	7.9		52.0	26.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	5.0	15.0	7.9		52.0	26.4
LOS	A	B	A		D	C
Approach Delay		14.9	7.9		42.6	
Approach LOS		B	A		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 81.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3	2195	1413	215	125
v/c Ratio	0.01	0.85	0.57	0.71	0.49
Control Delay	5.0	15.0	7.9	52.0	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	15.0	7.9	52.0	26.4
Queue Length 50th (m)	0.2	144.7	60.4	39.1	10.8
Queue Length 95th (m)	1.0	196.2	81.2	62.2	27.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	209	2585	2490	351	285
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.85	0.57	0.61	0.44

Intersection Summary

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2084	667	0	434	6
Future Volume (vph)	0	2084	667	0	434	6
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5678	5622	0	1847	1524
Flt Permitted					0.950	
Satd. Flow (perm)	0	5678	5622	0	1847	1524
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						3
Link Speed (k/h)		80	80		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		9.3	13.4		15.0	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	0%	1%	2%	7%	16%
Adj. Flow (vph)	0	2105	674	0	438	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2105	674	0	438	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

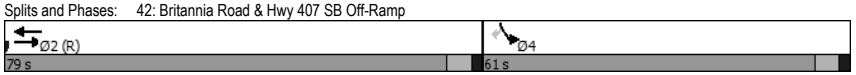
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		79.0	79.0		61.0	61.0
Total Split (%)		56.4%	56.4%		43.6%	43.6%
Maximum Green (s)		73.0	73.0		55.0	55.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		88.6	88.6		39.4	39.4
Actuated g/C Ratio		0.63	0.63		0.28	0.28
v/c Ratio		0.59	0.19		0.84	0.01
Control Delay		16.7	6.5		61.9	24.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		16.7	6.5		61.9	24.5
LOS		B	A		E	C
Approach Delay		16.7	6.5		61.4	
Approach LOS		B	A		E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 20.8 — Intersection LOS: C
Intersection Capacity Utilization 69.4% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2105	674	438	6
v/c Ratio	0.59	0.19	0.84	0.01
Control Delay	16.7	6.5	61.9	24.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.7	6.5	61.9	24.5
Queue Length 50th (m)	117.9	12.0	114.5	0.6
Queue Length 95th (m)	158.6	14.4	140.5	3.6
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3593	3557	725	600
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.19	0.60	0.01

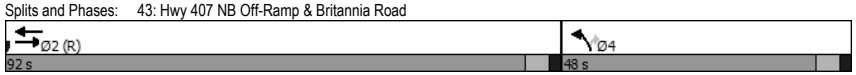
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2421	0	0	814	10	284
Future Volume (vph)	2421	0	0	814	10	284
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5678	0	0	5622	1847	1768
Flt Permitted					0.950	
Satd. Flow (perm)	5678	0	0	5622	1847	1768
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	80			80	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	13.4			9.8	11.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	1%	7%	0%
Adj. Flow (vph)	2522	0	0	848	10	296
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2522	0	0	848	10	296
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	92.0			92.0	48.0	48.0
Total Split (%)	65.7%			65.7%	34.3%	34.3%
Maximum Green (s)	86.0			86.0	42.0	42.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	99.2			99.2	28.8	28.8
Actuated g/C Ratio	0.71			0.71	0.21	0.21
v/c Ratio	0.63			0.21	0.03	0.81
Control Delay	4.8			5.7	40.6	70.1
Queue Delay	0.2			0.0	0.0	0.0
Total Delay	5.0			5.7	40.6	70.1
LOS	A			A	D	E
Approach Delay	5.0			5.7	69.1	
Approach LOS	A			A	E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 10.5		Intersection LOS: B	
Intersection Capacity Utilization 69.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2522	848	10	296
v/c Ratio	0.63	0.21	0.03	0.81
Control Delay	4.8	5.7	40.6	70.1
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	5.0	5.7	40.6	70.1
Queue Length 50th (m)	47.6	18.7	2.3	78.9
Queue Length 95th (m)	49.7	m28.3	6.6	104.0
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4021	3982	554	530
Starvation Cap Reductn	13	0	0	0
Spillback Cap Reductn	559	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.21	0.02	0.56

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3150	754	0	24	32
Future Volume (vph)	0	3150	754	0	24	32
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5622	5408	0	3686	1414
Flt Permitted					0.950	
Satd. Flow (perm)	0	5622	5408	0	3686	1414
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						33
Link Speed (k/h)		80	80		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		15.0	13.9		13.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	1%	5%	2%	4%	25%
Adj. Flow (vph)	0	3281	785	0	25	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	3281	785	0	25	33
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

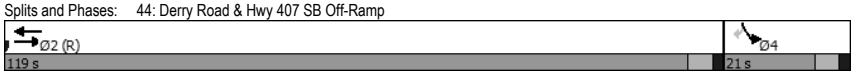
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		119.0	119.0		21.0	21.0
Total Split (%)		85.0%	85.0%		15.0%	15.0%
Maximum Green (s)		113.0	113.0		15.0	15.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		123.8	123.8		8.2	8.2
Actuated g/C Ratio		0.88	0.88		0.06	0.06
v/c Ratio		0.66	0.16		0.12	0.29
Control Delay		3.8	0.5		63.5	25.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		3.8	0.5		63.5	25.8
LOS		A	A		E	C
Approach Delay		3.8	0.5		42.0	
Approach LOS		A	A		D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 3.7 Intersection LOS: A
Intersection Capacity Utilization 72.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3281	785	25	33
v/c Ratio	0.66	0.16	0.12	0.29
Control Delay	3.8	0.5	63.5	25.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.8	0.5	63.5	25.8
Queue Length 50th (m)	85.6	3.1	3.4	0.0
Queue Length 95th (m)	99.2	3.8	8.2	10.9
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4970	4781	394	180
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.16	0.06	0.18

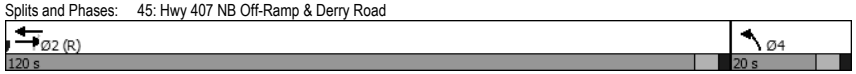
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2484	0	0	929	14	153
Future Volume (vph)	2484	0	0	929	14	153
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5622	0	0	5408	3582	1716
Flt Permitted					0.950	
Satd. Flow (perm)	5622	0	0	5408	3582	1716
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						156
Link Speed (k/h)	80			80	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	13.9			10.3	15.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	2%	2%	5%	7%	3%
Adj. Flow (vph)	2535	0	0	948	14	156
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2535	0	0	948	14	156
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	120.0			120.0	20.0	120.0
Total Split (%)	85.7%			85.7%	14.3%	85.7%
Maximum Green (s)	114.0			114.0	14.0	114.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	132.0			132.0	8.0	132.0
Actuated g/C Ratio	0.94			0.94	0.06	0.94
v/c Ratio	0.48			0.19	0.07	0.10
Control Delay	0.9			0.2	63.4	0.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	0.9			0.2	63.4	0.3
LOS	A			A	E	A
Approach Delay	0.9			0.2	5.5	
Approach LOS	A			A	A	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 8 (6%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 1.0	Intersection LOS: A
Intersection Capacity Utilization 72.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2535	948	14	156
v/c Ratio	0.48	0.19	0.07	0.10
Control Delay	0.9	0.2	63.4	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	0.9	0.2	63.4	0.3
Queue Length 50th (m)	0.0	0.0	1.9	0.0
Queue Length 95th (m)	26.6	2.9	5.6	2.4
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	5300	5099	358	1627
Starvation Cap Reductn	143	0	0	0
Spillback Cap Reductn	135	0	0	40
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.19	0.04	0.10

Intersection Summary

Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	468	498	1644	0	0	2324
Future Volume (vph)	468	498	1644	0	0	2324
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.956	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3404	1424	5513	0	0	5408
Flt Permitted	0.966					
Satd. Flow (perm)	3404	1424	5513	0	0	5408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	11	11				
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	8%	13%	3%	2%	0%	5%
Adj. Flow (vph)	532	566	1868	0	0	2641
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	753	345	1868	0	0	2641
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						

Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

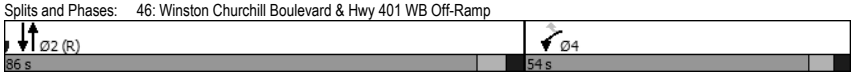
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	54.0	54.0	86.0			86.0
Total Split (%)	38.6%	38.6%	61.4%			61.4%
Maximum Green (s)	47.0	47.0	78.0			78.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	39.2	39.2	85.8			85.8
Actuated g/C Ratio	0.28	0.28	0.61			0.61
v/c Ratio	0.78	0.85	0.55			0.80
Control Delay	51.6	64.9	15.7			23.9
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	51.6	64.9	15.7			23.9
LOS	D	E	B			C
Approach Delay	55.8		15.7			23.9
Approach LOS	E		B			C

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 110.2 (79%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 27.4 — Intersection LOS: C
Intersection Capacity Utilization 71.1% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	753	345	1868	2641
v/c Ratio	0.78	0.85	0.55	0.80
Control Delay	51.6	64.9	15.7	23.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	51.6	64.9	15.7	23.9
Queue Length 50th (m)	97.2	95.8	98.0	195.9
Queue Length 95th (m)	108.1	125.0	116.0	233.9
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1150	485	3378	3314
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.71	0.55	0.80

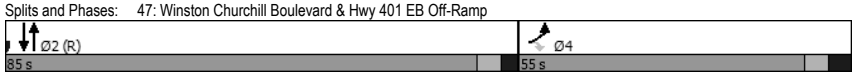
Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	704	370	0	1411	2329	0
Future Volume (vph)	704	370	0	1411	2329	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.993	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3685	1593	0	5567	5408	0
Flt Permitted	0.955					
Satd. Flow (perm)	3685	1593	0	5567	5408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1	1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	4%	1%	0%	2%	5%	8%
Adj. Flow (vph)	800	420	0	1603	2647	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	842	378	0	1603	2647	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	55.0	55.0		85.0	85.0	
Total Split (%)	39.3%	39.3%		60.7%	60.7%	
Maximum Green (s)	47.0	47.0		78.0	78.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	39.9	39.9		85.1	85.1	
Actuated g/C Ratio	0.28	0.28		0.61	0.61	
v/c Ratio	0.80	0.83		0.47	0.81	
Control Delay	52.2	62.4		16.4	21.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	52.2	62.4		16.4	21.3	
LOS	D	E		B	C	
Approach Delay	55.4			16.4	21.3	
Approach LOS	E			B	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 100.4 (72%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 27.5		Intersection LOS: C	
Intersection Capacity Utilization 76.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	842	378	1603	2647
v/c Ratio	0.80	0.83	0.47	0.81
Control Delay	52.2	62.4	16.4	21.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.2	62.4	16.4	21.3
Queue Length 50th (m)	111.3	107.5	85.7	139.7
Queue Length 95th (m)	121.7	136.3	106.4	200.4
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	1237	535	3382	3285
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.71	0.47	0.81

Intersection Summary

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	984	920	2616	0	0	2925
Future Volume (vph)	984	920	2616	0	0	2925
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.963	0.850				
Flt Protected	0.964					
Satd. Flow (prot)	3550	1547	5513	0	0	5513
Flt Permitted	0.964					
Satd. Flow (perm)	3548	1547	5513	0	0	5513
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	4%	3%	0%	0%	3%
Adj. Flow (vph)	1047	979	2783	0	0	3112
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	1390	636	2783	0	0	3112
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

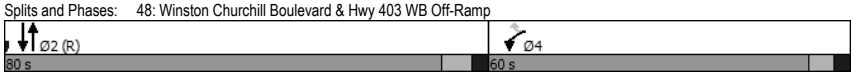
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	60.0	60.0	80.0			80.0
Total Split (%)	42.9%	42.9%	57.1%			57.1%
Maximum Green (s)	53.0	53.0	72.0			72.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	53.0	53.0	72.0			72.0
Actuated g/C Ratio	0.38	0.38	0.51			0.51
v/c Ratio	1.03	1.09	0.98			1.10
Control Delay	76.4	104.2	44.5			83.2
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	76.4	104.2	44.5			83.2
LOS	E	F	D			F
Approach Delay	85.1		44.5			83.2
Approach LOS	F		D			F

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 125.6 (90%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 70.1 Intersection LOS: E
Intersection Capacity Utilization 133.2% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1390	636	2783	3112
v/c Ratio	1.03	1.09	0.98	1.10
Control Delay	76.4	104.2	44.5	83.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	76.4	104.2	44.5	83.2
Queue Length 50th (m)	~212.6	~216.5	242.0	~356.5
Queue Length 95th (m)	#254.3	#295.6	#311.1	#379.0
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1343	585	2835	2835
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	1.09	0.98	1.10

Intersection Summary

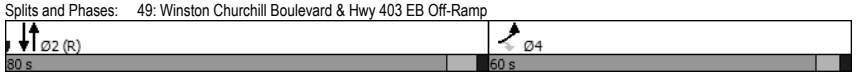
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1261	453	0	1535	2514	0
Future Volume (vph)	1261	453	0	1535	2514	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor	1.00					
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3795	1733	0	5460	5513	0
Flt Permitted	0.950					
Satd. Flow (perm)	3789	1733	0	5460	5513	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	0%	4%	3%	0%
Adj. Flow (vph)	1314	472	0	1599	2619	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1314	472	0	1599	2619	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	60.0	60.0		80.0	80.0	
Total Split (%)	42.9%	42.9%		57.1%	57.1%	
Maximum Green (s)	54.0	54.0		73.0	73.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	52.8	52.8		74.2	74.2	
Actuated g/C Ratio	0.38	0.38		0.53	0.53	
v/c Ratio	0.92	0.72		0.55	0.90	
Control Delay	52.5	44.4		23.0	35.6	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	52.5	44.4		23.0	35.6	
LOS	D	D		C	D	
Approach Delay	50.3			23.0	35.6	
Approach LOS	D			C	D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 58.4 (42%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 36.6		Intersection LOS: D	
Intersection Capacity Utilization 133.2%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1314	472	1599	2619
v/c Ratio	0.92	0.72	0.55	0.90
Control Delay	52.5	44.4	23.0	35.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.5	44.4	23.0	35.6
Queue Length 50th (m)	174.9	109.4	106.6	259.0
Queue Length 95th (m)	205.3	150.0	120.5	m231.4
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	1463	669	2893	2921
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.90	0.71	0.55	0.90

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3115	660	0	1312	586
Future Volume (vph)	0	3115	660	0	1312	586
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.994	0.850
Flt Protected					0.954	
Satd. Flow (prot)	0	5567	5307	0	3635	1449
Flt Permitted					0.954	
Satd. Flow (perm)	0	5567	5307	0	3635	1449
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					4	212
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	7%	0%	5%	11%
Adj. Flow (vph)	0	3211	680	0	1353	604
Shared Lane Traffic (%)						10%
Lane Group Flow (vph)	0	3211	680	0	1413	544
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

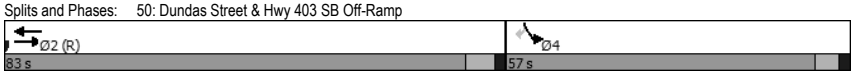
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		83.0	83.0		57.0	57.0
Total Split (%)		59.3%	59.3%		40.7%	40.7%
Maximum Green (s)		76.0	76.0		51.0	51.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		76.0	76.0		51.0	51.0
Actuated g/C Ratio		0.54	0.54		0.36	0.36
v/c Ratio		1.06	0.24		1.07	0.82
Control Delay		67.6	7.3		86.6	35.6
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		67.6	7.3		86.6	35.6
LOS		E	A		F	D
Approach Delay		67.6	7.3		72.4	
Approach LOS		E	A		E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 30.4 (22%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 62.2 Intersection LOS: E
Intersection Capacity Utilization 106.7% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3211	680	1413	544
v/c Ratio	1.06	0.24	1.07	0.82
Control Delay	67.6	7.3	86.6	35.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	67.6	7.3	86.6	35.6
Queue Length 50th (m)	~357.6	12.2	~221.9	97.6
Queue Length 95th (m)	#379.7	14.5	#264.3	#157.3
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	3022	2880	1326	662
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	0.24	1.07	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

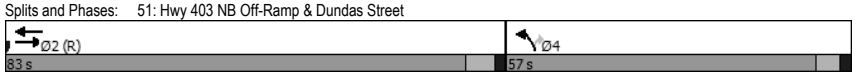
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2909	0	0	1090	141	1128
Future Volume (vph)	2909	0	0	1090	141	1128
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Ped Bike Factor					1.00	
Frt					0.880	0.850
Flt Protected					0.990	
Satd. Flow (prot)	5513	0	0	5357	3453	1577
Flt Permitted					0.990	
Satd. Flow (perm)	5513	0	0	5357	3452	1577
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	0%	6%	1%	2%
Adj. Flow (vph)	3232	0	0	1211	157	1253
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	3232	0	0	1211	784	626
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	83.0			83.0	57.0	57.0
Total Split (%)	59.3%			59.3%	40.7%	40.7%
Maximum Green (s)	76.0			76.0	51.0	51.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	76.0			76.0	51.0	51.0
Actuated g/C Ratio	0.54			0.54	0.36	0.36
v/c Ratio	1.08			0.42	0.99dr	1.09
Control Delay	67.8			19.4	39.3	106.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	67.8			19.4	39.3	106.4
LOS	E			B	D	F
Approach Delay	67.8			19.4	69.1	
Approach LOS	E			B	E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 16.4 (12%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 58.1		Intersection LOS: E	
Intersection Capacity Utilization 106.7%		ICU Level of Service G	
Analysis Period (min) 15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street



Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	3232	1211	784	626
v/c Ratio	1.08	0.42	0.99dr	1.09
Control Delay	67.8	19.4	39.3	106.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	67.8	19.4	39.3	106.4
Queue Length 50th (m)	~363.1	70.1	91.7	~213.8
Queue Length 95th (m)	m#297.0	81.0	112.6	#293.4
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	2992	2908	1257	574
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.42	0.62	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	25	40	484	176	104	618
Future Volume (vph)	25	40	484	176	104	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.960			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3435	0	1789	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	3435	0	1789	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	273.4		780.0			514.0
Travel Time (s)	20.5		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	40	484	176	104	618
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	40	660	0	104	618
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 38.1% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
97: Ninth Line & Foxwood Ave

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	772	0	0	661
Future Volume (vph)	0	0	772	0	0	661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				15.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	3579	0	1883	3579
Flt Permitted						
Satd. Flow (perm)	1883	0	3579	0	1883	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	226.1		301.0			850.0
Travel Time (s)	17.0		15.5			43.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	772	0	0	661
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	772	0	0	661
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 24.7%	ICU Level of Service A
Analysis Period (min) 15	

Lanes, Volumes, Timings
136: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1165	275	0	1169	0	0
Future Volume (vph)	1165	275	0	1169	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	125.7	
Travel Time (s)	15.5			6.8	9.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1165	275	0	1169	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1165	275	0	1169	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 71.1%	ICU Level of Service C
Analysis Period (min) 15	

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1293	85	58	725
Future Volume (vph)	90	47	1293	85	58	725
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.98				
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3546	0	1825	3544
Flt Permitted	0.950				0.149	
Satd. Flow (perm)	1807	1607	3546	0	286	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	15			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1405	92	63	788
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1497	0	63	788
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

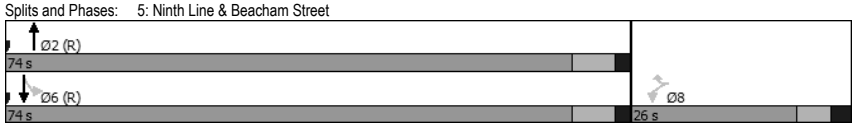
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	26.0	26.0	74.0		74.0	74.0
Total Split (%)	26.0%	26.0%	74.0%		74.0%	74.0%
Maximum Green (s)	19.5	19.5	67.0		67.0	67.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	12.0	12.0	80.6		80.6	80.6
Actuated g/C Ratio	0.12	0.12	0.81		0.81	0.81
v/c Ratio	0.45	0.22	0.52		0.27	0.28
Control Delay	47.1	13.1	5.3		7.8	3.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.1	13.1	5.3		7.8	3.7
LOS	D	B	A		A	A
Approach Delay	35.5		5.3			4.0
Approach LOS	D		A			A

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 6.6 — Intersection LOS: A
Intersection Capacity Utilization 64.9% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	98	51	1497	63	788
v/c Ratio	0.45	0.22	0.52	0.27	0.28
Control Delay	47.1	13.1	5.3	7.8	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	13.1	5.3	7.8	3.7
Queue Length 50th (m)	18.0	0.0	48.9	2.9	19.4
Queue Length 95th (m)	32.2	9.9	75.7	10.3	31.1
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	370	369	2861	230	2856
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.14	0.52	0.27	0.28

Intersection Summary

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	3	636	7	3	676
Future Volume (vph)	11	3	636	7	3	676
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950					
Satd. Flow (prot)	1825	1633	1880	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1633	1880	0	0	1865
Link Speed (k/h)	48		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.3		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	3%
Adj. Flow (vph)	12	3	691	8	3	735
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	3	699	0	0	738
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.0%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	108	499	48	26	31	157	729	86	63	853	21
Future Volume (vph)	71	108	499	48	26	31	157	729	86	63	853	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.877			0.915			0.984			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1652	0	1825	1677	0	1789	3549	0	1722	3534	0
Flt Permitted	0.718			0.138			0.224			0.249		
Satd. Flow (perm)	1352	1652	0	265	1677	0	422	3549	0	451	3534	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		79			34			17			3	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		131.8			287.6			434.9			780.0	
Travel Time (s)		9.9			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	7%	2%	1%	3%	6%	3%	2%
Adj. Flow (vph)	71	108	499	52	26	34	157	792	93	68	927	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	607	0	52	60	0	157	885	0	68	948	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

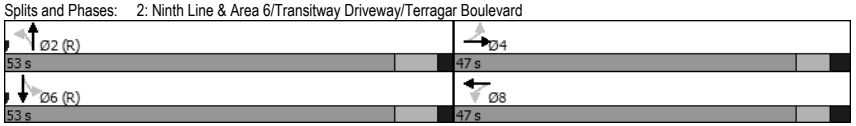
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		53.0	53.0		52.0	52.0	
Total Split (s)	47.0	47.0		47.0	47.0		53.0	53.0		53.0	53.0	
Total Split (%)	47.0%	47.0%		47.0%	47.0%		53.0%	53.0%		53.0%	53.0%	
Maximum Green (s)	40.5	40.5		40.5	40.5		46.0	46.0		46.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	38.1	38.1		38.1	38.1		50.4	50.4		50.4	50.4	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.50	0.50		0.50	0.50	
v/c Ratio	0.14	0.90		0.52	0.09		0.74	0.49		0.30	0.53	
Control Delay	19.5	42.1		43.1	10.0		45.6	17.9		20.9	18.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.5	42.1		43.1	10.0		45.6	17.9		20.9	18.9	
LOS	B	D		D	B		D	B		C	B	
Approach Delay		39.8			25.4			22.1			19.0	
Approach LOS		D			C			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 25.3 Intersection LOS: C
Intersection Capacity Utilization 87.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	607	52	60	157	885	68	948
v/c Ratio	0.14	0.90	0.52	0.09	0.74	0.49	0.30	0.53
Control Delay	19.5	42.1	43.1	10.0	45.6	17.9	20.9	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	42.1	43.1	10.0	45.6	17.9	20.9	18.9
Queue Length 50th (m)	8.3	91.3	7.2	2.9	24.8	60.1	7.9	67.3
Queue Length 95th (m)	17.2	#152.4	#21.5	10.3	#62.4	77.6	18.9	86.1
Internal Link Dist (m)		107.8		263.6		410.9		756.0
Turn Bay Length (m)					40.0		40.0	
Base Capacity (vph)	561	731	109	715	212	1797	227	1782
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.83	0.48	0.08	0.74	0.49	0.30	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	60	28	0	17	25	814	45	35	1466	8
Future Volume (vph)	8	0	60	28	0	17	25	814	45	35	1466	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.992			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1541	0	1789	3517	0	1825	3575	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1541	0	1789	3517	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		124.9			310.4			412.4			434.9	
Travel Time (s)		9.4			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	6%	2%	3%	2%	0%	2%	2%
Adj. Flow (vph)	8	0	60	30	0	18	25	885	49	38	1593	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	60	0	30	18	0	25	934	0	38	1601	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 55.7%		ICU Level of Service B	
Analysis Period (min) 15			

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	730	236	221	2016	104	139	490	213	239	800	206
Future Volume (vph)	164	730	236	221	2016	104	139	490	213	239	800	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00							
Frt		0.963			0.993				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	4927	0	1785	5145	0	1767	3650	1597	1733	3650	1597
Flt Permitted	0.067			0.208			0.155			0.460		
Satd. Flow (perm)	126	4927	0	391	5145	0	288	3650	1597	839	3650	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65			7				213			153
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	4%	1%	0%	0%	3%	0%	0%
Adj. Flow (vph)	164	730	236	221	2016	104	139	490	213	239	800	206
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	966	0	221	2120	0	139	490	213	239	800	206
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

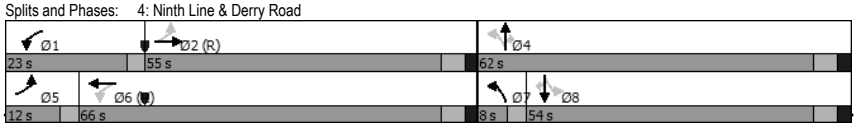
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	30.1		8.0	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	12.0	55.0		23.0	66.0		8.0	62.0	62.0	54.0	54.0	54.0
Total Split (%)	8.6%	39.3%		16.4%	47.1%		5.7%	44.3%	44.3%	38.6%	38.6%	38.6%
Maximum Green (s)	9.0	48.9		20.0	59.9		5.0	55.6	55.6	47.6	47.6	47.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.1		0.0	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.1		2.0	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0	0	0	0
Act Effct Green (s)	73.8	59.8		79.1	64.2		55.8	52.4	52.4	44.4	44.4	44.4
Actuated g/C Ratio	0.53	0.43		0.56	0.46		0.40	0.37	0.37	0.32	0.32	0.32
v/c Ratio	0.84	0.45		0.59	0.90		0.78	0.36	0.29	0.90	0.69	0.34
Control Delay	75.1	20.7		19.3	36.1		58.3	31.9	4.3	79.6	44.8	11.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.1	20.7		19.3	36.1		58.3	31.9	4.3	79.6	44.8	11.1
LOS	E	C		B	D		E	C	A	E	D	B
Approach Delay		28.6			34.5			29.2			45.9	
Approach LOS		C			C			C			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 35.1 Intersection LOS: D
Intersection Capacity Utilization 95.6% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	164	966	221	2120	139	490	213	239	800	206
v/c Ratio	0.84	0.45	0.59	0.90	0.78	0.36	0.29	0.90	0.69	0.34
Control Delay	75.1	20.7	19.3	36.1	58.3	31.9	4.3	79.6	44.8	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.1	20.7	19.3	36.1	58.3	31.9	4.3	79.6	44.8	11.1
Queue Length 50th (m)	28.9	44.0	19.6	204.6	23.6	48.6	0.0	60.3	97.2	9.9
Queue Length 95th (m)	#70.1	51.4	26.9	#229.5	#46.0	62.7	15.4	#106.5	118.8	28.6
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	195	2142	433	2362	178	1475	772	291	1267	654
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.45	0.51	0.90	0.78	0.33	0.28	0.82	0.63	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	832	67	49	1424
Future Volume (vph)	46	47	832	67	49	1424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.989			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3479	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1585	3479	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	904	73	53	1548
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	977	0	53	1548
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.0%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	46	28	65	61	62	47	832	108	100	1204	43
Future Volume (vph)	27	46	28	65	61	62	47	832	108	100	1204	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		27.0	50.0		60.0	115.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.943			0.921			0.983			0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1776	0	1789	1722	0	1789	3526	0	1825	3561	0
Flt Permitted	0.602			0.709			0.177			0.266		
Satd. Flow (perm)	1134	1776	0	1335	1722	0	333	3526	0	511	3561	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			49			31			7	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		104.1			255.0			1151.0			603.1	
Travel Time (s)		7.8			18.4			59.2			31.0	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	27	46	28	71	61	67	47	904	117	109	1309	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	74	0	71	128	0	47	1021	0	109	1352	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

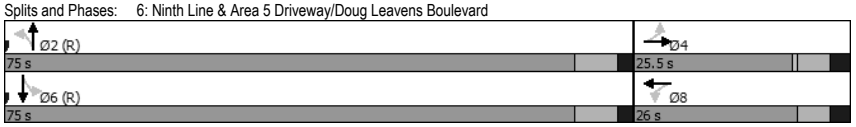
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		45.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		53.0	53.0		53.0	53.0	
Total Split (s)	25.5	25.5		26.0	26.0		75.0	75.0		75.0	75.0	
Total Split (%)	25.2%	25.2%		25.7%	25.7%		74.3%	74.3%		74.3%	74.3%	
Maximum Green (s)	19.0	19.0		19.5	19.5		68.0	68.0		68.0	68.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	12.1	12.1		12.1	12.1		77.4	77.4		77.4	77.4	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.77	0.77		0.77	0.77	
v/c Ratio	0.20	0.31		0.45	0.51		0.18	0.38		0.28	0.50	
Control Delay	42.2	30.3		49.5	32.8		11.3	9.5		6.2	5.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	42.2	30.3		49.5	32.8		11.3	9.5		6.2	5.4	
LOS	D	C		D	C		B	A		A	A	
Approach Delay		33.5			38.8			9.5			5.5	
Approach LOS		C			D			A			A	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 10.4 — Intersection LOS: B
Intersection Capacity Utilization 108.1% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard



Queues
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	74	71	128	47	1021	109	1352
v/c Ratio	0.20	0.31	0.45	0.51	0.18	0.38	0.28	0.50
Control Delay	42.2	30.3	49.5	32.8	11.3	9.5	6.2	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	30.3	49.5	32.8	11.3	9.5	6.2	5.4
Queue Length 50th (m)	4.9	8.5	13.2	14.6	4.0	54.7	5.0	41.5
Queue Length 95th (m)	12.4	20.4	25.8	30.8	m10.7	88.0	14.1	66.0
Internal Link Dist (m)		80.1		231.0		1127.0		579.1
Turn Bay Length (m)					50.0		115.0	
Base Capacity (vph)	230	381	270	388	255	2709	391	2730
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.19	0.26	0.33	0.18	0.38	0.28	0.50

Intersection Summary

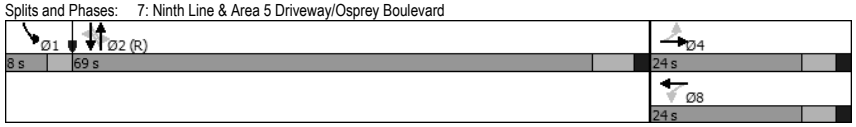
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	15	20	134	15	44	33	1044	148	71	1458	30
Future Volume (vph)	19	15	20	134	15	44	33	1044	148	71	1458	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	13.0		0.0	35.0		25.0	270.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			13.0			2.5			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.914			0.886			0.981			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1721	0	1738	1592	0	1789	3472	0	1825	3500	0
Flt Permitted	0.716			0.734			0.097			0.165		
Satd. Flow (perm)	1349	1721	0	1343	1592	0	183	3472	0	317	3500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			48			29			3	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		142.6			160.0			383.2			1151.0	
Travel Time (s)		10.7			11.5			19.7			59.2	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	7%	2%	3%	4%	0%	4%	2%
Adj. Flow (vph)	19	15	20	146	15	48	33	1135	161	77	1585	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	35	0	146	63	0	33	1296	0	77	1615	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		52.0	52.0		8.0	52.0	
Total Split (s)	24.0	24.0		24.0	24.0		69.0	69.0		8.0	69.0	
Total Split (%)	23.8%	23.8%		23.8%	23.8%		68.3%	68.3%		7.9%	68.3%	
Maximum Green (s)	18.0	18.0		18.0	18.0		62.0	62.0		5.0	62.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		37.0	37.0			37.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	16.0	16.0		16.0	16.0		67.1	67.1		76.4	67.1	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.66	0.66		0.76	0.66	
v/c Ratio	0.09	0.12		0.69	0.22		0.27	0.56		0.23	0.69	
Control Delay	35.5	21.1		56.6	16.2		15.9	10.8		5.7	16.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.5	21.1		56.6	16.2		15.9	10.8		5.7	16.2	
LOS	D	C		E	B		B	B		A	B	
Approach Delay		26.2			44.4			10.9			15.7	
Approach LOS		C			D			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 15.8		Intersection LOS: B	
Intersection Capacity Utilization 82.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 7: Ninth Line & Area 5 Driveway/Osprey Boulevard



Queues
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	19	35	146	63	33	1296	77	1615
v/c Ratio	0.09	0.12	0.69	0.22	0.27	0.56	0.23	0.69
Control Delay	35.5	21.1	56.6	16.2	15.9	10.8	5.7	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	21.1	56.6	16.2	15.9	10.8	5.7	16.2
Queue Length 50th (m)	3.2	2.5	27.0	2.5	2.7	70.7	2.9	103.2
Queue Length 95th (m)	9.4	10.7	46.7	13.4	9.6	90.2	9.9	156.3
Internal Link Dist (m)		118.6		136.0		359.2		1127.0
Turn Bay Length (m)			13.0		35.0		270.0	
Base Capacity (vph)	253	339	252	338	121	2317	338	2327
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.10	0.58	0.19	0.27	0.56	0.23	0.69

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	9	14	0	19	14	1010	20	32	1131	13
Future Volume (vph)	7	0	9	14	0	19	14	1010	20	32	1131	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			60.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.850			0.850			0.997			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3604	0	1825	3571	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3604	0	1825	3571	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		101.3			207.4			254.7			383.2	
Travel Time (s)		7.6			14.9			13.1			19.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	2%	2%
Adj. Flow (vph)	7	0	9	15	0	21	14	1098	22	35	1229	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	9	0	15	21	0	14	1120	0	35	1242	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

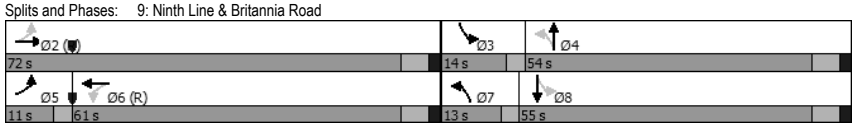
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.0% ICU Level of Service A
Analysis Period (min) 15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	925	254	121	1546	136	190	1110	109	179	1069	158
Future Volume (vph)	154	925	254	121	1546	136	190	1110	109	179	1069	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.968			0.988			0.987			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	4998	0	1767	5173	0	1767	3593	0	1684	3545	0
Flt Permitted	0.070			0.200			0.083			0.081		
Satd. Flow (perm)	130	4998	0	372	5173	0	154	3593	0	144	3545	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		67			12			8			13	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	1%	0%	2%	1%	0%	3%	6%	1%	1%
Adj. Flow (vph)	154	925	254	121	1546	136	190	1110	109	179	1069	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	1179	0	121	1682	0	190	1219	0	179	1227	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	8.0	24.6		24.6	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	11.0	72.0		61.0	61.0		13.0	54.0		14.0	55.0	
Total Split (%)	7.9%	51.4%		43.6%	43.6%		9.3%	38.6%		10.0%	39.3%	
Maximum Green (s)	8.0	65.4		54.4	54.4		10.0	47.4		11.0	48.4	
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	0.0	2.0		2.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	2.0	5.6		5.6	5.6		2.0	5.6		2.0	5.6	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0			12.0			12.0	
Flash Dont Walk (s)		11.0		11.0	11.0			18.0			18.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	70.0	66.4		55.4	55.4		63.0	48.4		65.0	49.4	
Actuated g/C Ratio	0.50	0.47		0.40	0.40		0.45	0.35		0.46	0.35	
v/c Ratio	0.91	0.49		0.82	0.82		0.97	0.98		0.90	0.97	
Control Delay	82.6	36.9		74.2	38.8		90.5	65.5		75.8	64.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	82.6	36.9		74.2	38.8		90.5	65.5		75.8	64.1	
LOS	F	D		E	D		F	E		E	E	
Approach Delay		42.1			41.2			68.9			65.6	
Approach LOS		D			D			E			E	

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 32.2 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.98		
Intersection Signal Delay: 53.7		Intersection LOS: D
Intersection Capacity Utilization 102.5%		ICU Level of Service G
Analysis Period (min) 15		

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	154	1179	121	1682	190	1219	179	1227
v/c Ratio	0.91	0.49	0.82	0.82	0.97	0.98	0.90	0.97
Control Delay	82.6	36.9	74.2	38.8	90.5	65.5	75.8	64.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.6	36.9	74.2	38.8	90.5	65.5	75.8	64.1
Queue Length 50th (m)	34.7	102.7	29.7	151.2	36.3	174.2	33.6	174.3
Queue Length 95th (m)	#69.8	117.6	#68.6	170.8	#85.4	#222.0	#77.8	#222.1
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	170	2405	147	2054	196	1247	198	1259
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.49	0.82	0.82	0.97	0.98	0.90	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	12	13	0	13	3	1242	22	26	1419	10
Future Volume (vph)	55	0	12	13	0	13	3	1242	22	26	1419	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.997			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		103.7			491.2			170.0			206.5	
Travel Time (s)		7.8			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	55	0	12	14	0	14	3	1350	24	28	1542	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	12	0	14	14	0	3	1374	0	28	1552	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 55.9% ICU Level of Service B
Analysis Period (min) 15

Lanes, Volumes, Timings
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	2	19	8	2	38	3	1268	35	34	1357	16
Future Volume (vph)	43	2	19	8	2	38	3	1268	35	34	1357	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.864			0.857			0.996			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1627	0	1825	1645	0	1789	3592	0	1825	3606	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1627	0	1825	1645	0	1789	3592	0	1825	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		90.3			511.9			217.0			170.0	
Travel Time (s)		6.8			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	9%	0%	1%	2%
Adj. Flow (vph)	43	2	19	9	2	41	3	1378	38	37	1475	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	21	0	9	43	0	3	1416	0	37	1491	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 53.7% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	5	1277	20	12	1399
Future Volume (vph)	9	5	1277	20	12	1399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		35.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3572	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3572	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	1%
Adj. Flow (vph)	10	5	1388	22	13	1521
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	5	1410	0	13	1521
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 48.7% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	9	1276	13	6	1333
Future Volume (vph)	3	9	1276	13	6	1333
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3611	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3611	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	3	10	1387	14	7	1449
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	10	1401	0	7	1449
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.8%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1	10	112	1	99	17	1227	148	91	1238	10
Future Volume (vph)	7	1	10	112	1	99	17	1227	148	91	1238	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		35.0	28.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			45.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor								1.00		1.00		
Frt		0.864			0.851			0.984			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1627	0	1807	1557	0	1789	3554	0	1807	3575	0
Flt Permitted	0.684			0.750			0.150			0.119		
Satd. Flow (perm)	1288	1627	0	1427	1557	0	283	3554	0	226	3575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			108			22			1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		170.8			534.8			346.0			306.2	
Travel Time (s)		12.8			38.5			17.8			15.7	
Confl. Peds. (#/hr)									6	6		
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	1%	2%	5%	2%	1%	0%	1%	2%	2%
Adj. Flow (vph)	7	1	10	122	1	108	17	1334	161	99	1346	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	11	0	122	109	0	17	1495	0	99	1356	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

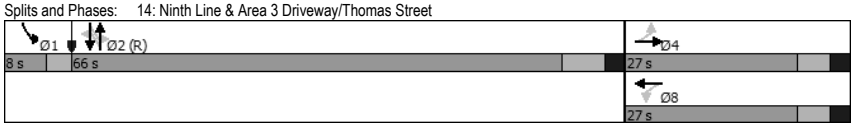
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		52.5	52.5		8.0	52.5	
Total Split (s)	27.0	27.0		27.0	27.0		66.0	66.0		8.0	66.0	
Total Split (%)	26.7%	26.7%		26.7%	26.7%		65.3%	65.3%		7.9%	65.3%	
Maximum Green (s)	20.5	20.5		20.5	20.5		58.5	58.5		5.0	58.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		0.0	2.5	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.5	6.5		2.0	6.5	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		33.0	33.0			33.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0			12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	14.9	14.9		14.9	14.9		66.5	66.5		77.0	66.5	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.66	0.66		0.76	0.66	
v/c Ratio	0.04	0.04		0.58	0.34		0.09	0.64		0.34	0.58	
Control Delay	34.3	18.6		46.8	12.8		15.1	22.3		6.6	11.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.3	18.6		46.8	12.8		15.1	22.3		6.6	11.9	
LOS	C	B		D	B		B	C		A	B	
Approach Delay		24.7			30.8			22.2			11.5	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 18.0 Intersection LOS: B
Intersection Capacity Utilization 98.5% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 14: Ninth Line & Area 3 Driveway/Thomas Street



Queues
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	11	122	109	17	1495	99	1356
v/c Ratio	0.04	0.04	0.58	0.34	0.09	0.64	0.34	0.58
Control Delay	34.3	18.6	46.8	12.8	15.1	22.3	6.6	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	18.6	46.8	12.8	15.1	22.3	6.6	11.9
Queue Length 50th (m)	1.2	0.2	23.3	0.1	2.0	148.3	3.6	74.3
Queue Length 95th (m)	4.8	4.8	39.8	17.8	m4.5	179.7	9.2	107.5
Internal Link Dist (m)		146.8		510.8		322.0		282.2
Turn Bay Length (m)					30.0		28.0	
Base Capacity (vph)	274	354	303	416	186	2347	287	2354
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.40	0.26	0.09	0.64	0.34	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	6	1293	27	19	1293
Future Volume (vph)	9	6	1293	27	19	1293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.944		0.997			
Flt Protected	0.971				0.950	
Satd. Flow (prot)	1761	0	3604	0	1825	3614
Flt Permitted	0.971				0.950	
Satd. Flow (perm)	1761	0	3604	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	10	7	1405	29	21	1405
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	1434	0	21	1405
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.6% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	33	36	1376	73	54	1371
Future Volume (vph)	33	36	1376	73	54	1371
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.992			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3553	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3553	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	36	39	1496	79	59	1490
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	39	1575	0	59	1490
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 54.9% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	8	0	0	6	12	1400	5	10	1339	9
Future Volume (vph)	7	0	8	0	0	6	12	1400	5	10	1339	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	70.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.928			0.865						0.999	
Flt Protected		0.977					0.950			0.950		
Satd. Flow (prot)	0	1708	0	0	1662	0	1789	3614	0	1825	3575	0
Flt Permitted		0.977					0.950			0.950		
Satd. Flow (perm)	0	1708	0	0	1662	0	1789	3614	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		89.2			113.3			424.8			250.0	
Travel Time (s)		6.7			8.2			21.8			12.9	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	2%	2%
Adj. Flow (vph)	7	0	8	0	0	7	12	1522	5	11	1455	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	15	0	0	7	0	12	1527	0	11	1464	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.8%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	55	75	1337	60	53	1189
Future Volume (vph)	55	75	1337	60	53	1189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3567	0	1825	3579
Flt Permitted	0.950				0.131	
Satd. Flow (perm)	1789	1585	3567	0	252	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		82	9			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	1%	18%	0%	2%
Adj. Flow (vph)	60	82	1453	65	58	1292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	60	82	1518	0	58	1292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lanes, Volumes, Timings
18: Ninth Line & Erin Centre Boulevard

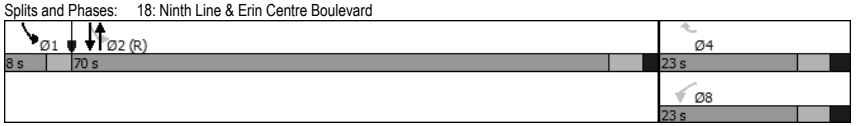
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	23.0	23.0	70.0		8.0	70.0
Total Split (%)	22.8%	22.8%	69.3%		7.9%	69.3%
Maximum Green (s)	16.5	16.5	64.0		5.0	64.0
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	8.0	8.0	50.0			50.0
Flash Dont Walk (s)	8.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	10.4	10.4	76.7		84.4	76.7
Actuated g/C Ratio	0.10	0.10	0.76		0.84	0.76
v/c Ratio	0.33	0.35	0.56		0.18	0.48
Control Delay	46.5	13.6	8.0		5.0	15.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.5	13.6	8.0		5.0	15.6
LOS	D	B	A		A	B
Approach Delay	27.5		8.0			15.2
Approach LOS	C		A			B

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 12.1 Intersection LOS: B
Intersection Capacity Utilization 63.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	60	82	1518	58	1292
v/c Ratio	0.33	0.35	0.56	0.18	0.48
Control Delay	46.5	13.6	8.0	5.0	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	13.6	8.0	5.0	15.6
Queue Length 50th (m)	11.2	0.0	67.7	3.3	107.8
Queue Length 95th (m)	22.7	13.1	99.3	m6.3	146.6
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	309	342	2709	321	2716
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.24	0.56	0.18	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	0	5	0	11	0	1264	15	23	1152	14
Future Volume (vph)	9	0	0	5	0	11	0	1264	15	23	1152	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.850			0.998			0.998	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1883	0	1825	1633	0	1883	3607	0	1825	3606	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1883	0	1825	1633	0	1883	3607	0	1825	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		98.8			216.6			90.1			404.2	
Travel Time (s)		7.4			15.6			4.6			20.8	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	9	0	0	5	0	12	0	1374	16	25	1252	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	0	0	5	12	0	0	1390	0	25	1266	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.2% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	1301	2	16	1182
Future Volume (vph)	1	1	1301	2	16	1182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.932					
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1748	0	3614	0	1825	3614
Flt Permitted	0.976				0.950	
Satd. Flow (perm)	1748	0	3614	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	1	1	1414	2	17	1285
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1416	0	17	1285
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.0% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	25	0	0	2	41	1374	5	3	1178	18
Future Volume (vph)	12	0	25	0	0	2	41	1374	5	3	1178	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		20.0	0.0		0.0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	0.95
Ped Bike Factor												
Frt		0.909				0.865			0.850		0.998	
Flt Protected		0.984					0.950					
Satd. Flow (prot)	0	1685	0	0	0	1662	1789	3614	1633	0	3606	0
Flt Permitted		0.984					0.950					
Satd. Flow (perm)	0	1685	0	0	0	1662	1789	3614	1633	0	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		116.8			245.5			191.7			91.0	
Travel Time (s)		8.8			17.7			9.9			4.7	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	12	0	25	0	0	2	41	1493	5	3	1280	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	37	0	0	0	2	41	1493	5	0	1301	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 54.6%		ICU Level of Service A
Analysis Period (min) 15		

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	358	19	40	786	446	180	679	36	289	631	72
Future Volume (vph)	61	358	19	40	786	446	180	679	36	289	631	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.992			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3543	0	1789	1812	1458	1825	3552	0	1807	3535	0
Flt Permitted	0.084			0.495			0.209			0.117		
Satd. Flow (perm)	161	3543	0	932	1812	1458	402	3552	0	223	3535	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				331		4			9	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	6%	2%	6%	12%	0%	2%	1%	1%	1%	8%
Adj. Flow (vph)	66	389	21	43	854	485	196	738	39	314	686	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	410	0	43	854	485	196	777	0	314	764	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		7	4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

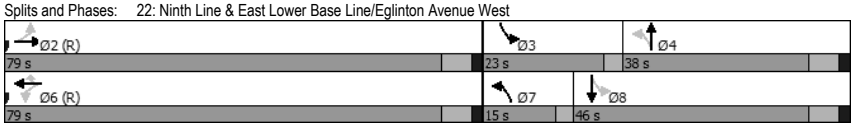
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	5.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	8.0	24.0		8.0	24.0	
Total Split (s)	79.0	79.0		79.0	79.0	79.0	15.0	38.0		23.0	46.0	
Total Split (%)	56.4%	56.4%		56.4%	56.4%	56.4%	10.7%	27.1%		16.4%	32.9%	
Maximum Green (s)	72.0	72.0		72.0	72.0	72.0	12.0	31.0		20.0	39.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	0.0		0.0	-1.0	0.0	-1.0	-1.0		-1.0	0.0	
Total Lost Time (s)	6.0	7.0		7.0	6.0	7.0	2.0	6.0		2.0	7.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	Min		None	Min	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0		8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0		9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)	72.6	71.6		71.6	72.6	71.6	49.1	32.2		59.4	39.5	
Actuated g/C Ratio	0.52	0.51		0.51	0.52	0.51	0.35	0.23		0.42	0.28	
v/c Ratio	0.80	0.23		0.09	0.91	0.53	0.72	0.95		0.94	0.76	
Control Delay	87.4	18.9		18.1	45.7	8.8	43.5	74.0		73.5	51.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	87.4	18.9		18.1	45.7	8.8	43.5	74.0		73.5	51.3	
LOS	F	B		B	D	A	D	E		E	D	
Approach Delay		28.4			31.9			67.8			57.8	
Approach LOS		C			C			E			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 47.6 Intersection LOS: D
Intersection Capacity Utilization 100.8% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	410	43	854	485	196	777	314	764
v/c Ratio	0.80	0.23	0.09	0.91	0.53	0.72	0.95	0.94	0.76
Control Delay	87.4	18.9	18.1	45.7	8.8	43.5	74.0	73.5	51.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.4	18.9	18.1	45.7	8.8	43.5	74.0	73.5	51.3
Queue Length 50th (m)	14.4	31.4	5.9	208.2	24.0	34.8	112.0	69.1	101.6
Queue Length 95th (m)	#45.4	41.5	12.7	#296.2	53.3	#55.8	#151.5	#126.6	125.3
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	83	1825	479	944	910	275	819	334	1004
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.22	0.09	0.90	0.53	0.71	0.95	0.94	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	247	27	135	188	14	16	13	72	10	15	9
Future Volume (vph)	9	247	27	135	188	14	16	13	72	10	15	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.994			0.903			0.964	
Flt Protected		0.998			0.980			0.992			0.985	
Satd. Flow (prot)	0	1892	0	0	1864	0	0	1673	0	0	1824	0
Flt Permitted		0.998			0.980			0.992			0.985	
Satd. Flow (perm)	0	1892	0	0	1864	0	0	1673	0	0	1824	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	2		10	10		2	5		3	3		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	10	268	29	147	204	15	17	14	78	11	16	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	307	0	0	366	0	0	109	0	0	37	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.1%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1072	52	335	2327	185	47	36	160	99	37	45
Future Volume (vph)	57	1072	52	335	2327	185	47	36	160	99	37	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00		0.99		0.99	1.00		0.98
Frt		0.993			0.989				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5053	0	1785	5125	0	1785	1921	1617	1785	1830	1566
Flt Permitted	0.043			0.235			0.733			0.734		
Satd. Flow (perm)	81	5053	0	440	5125	0	1362	1921	1593	1376	1830	1529
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			21				137			23
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	4		6	6		4	9		2	2		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	1%	0%	0%	1%	0%	5%	2%
Adj. Flow (vph)	57	1072	52	335	2327	185	47	36	160	99	37	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1124	0	335	2512	0	47	36	160	99	37	45
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

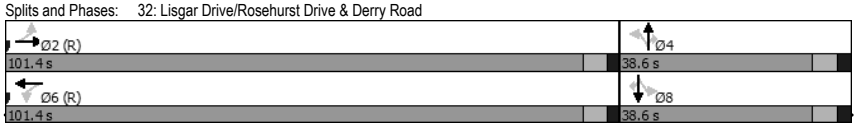
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	101.4	101.4		101.4	101.4		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (%)	72.4%	72.4%		72.4%	72.4%		27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Maximum Green (s)	95.4	95.4		95.4	95.4		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	113.0	113.0		113.0	113.0		16.4	16.4	16.4	16.4	16.4	16.4
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.12	0.12	0.12	0.12	0.12	0.12
v/c Ratio	0.88	0.28		0.94	0.61		0.30	0.16	0.52	0.61	0.17	0.23
Control Delay	104.3	1.9		51.3	6.2		59.3	54.8	18.6	74.1	55.2	33.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.3	1.9		51.3	6.2		59.3	54.8	18.6	74.1	55.2	33.6
LOS	F	A		D	A		E	D	B	E	E	C
Approach Delay		6.8			11.5			31.8			60.1	
Approach LOS		A			B			C			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 113.4 (81%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 13.4 — Intersection LOS: B
Intersection Capacity Utilization 88.0% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	1124	335	2512	47	36	160	99	37	45
v/c Ratio	0.88	0.28	0.94	0.61	0.30	0.16	0.52	0.61	0.17	0.23
Control Delay	104.3	1.9	51.3	6.2	59.3	54.8	18.6	74.1	55.2	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.3	1.9	51.3	6.2	59.3	54.8	18.6	74.1	55.2	33.6
Queue Length 50th (m)	7.7	10.2	62.4	79.3	12.1	9.1	5.8	26.5	9.4	5.6
Queue Length 95th (m)	m#40.4	21.9	#156.1	114.9	23.7	18.8	26.1	43.7	19.3	16.7
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	65	4080	355	4139	321	452	480	324	431	377
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.28	0.94	0.61	0.15	0.08	0.33	0.31	0.09	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	199	56	92	183	133	43	60	86	142	93	46
Future Volume (vph)	43	199	56	92	183	133	43	60	86	142	93	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.967			0.937			0.939			0.978	
Flt Protected	0.950			0.950				0.989			0.975	
Satd. Flow (prot)	1738	1645	0	1772	1671	0	0	1596	0	0	1668	0
Flt Permitted	0.950			0.950				0.989			0.975	
Satd. Flow (perm)	1738	1645	0	1772	1671	0	0	1596	0	0	1668	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	12		31	31		12	39		40	40		39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	14%	9%	3%	9%	6%	9%	22%	6%	6%	15%	11%
Adj. Flow (vph)	47	216	61	100	199	145	47	65	93	154	101	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	277	0	100	344	0	0	205	0	0	305	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	67	5	11	47	94	5	5	7	108	11	64
Future Volume (vph)	42	67	5	11	47	94	5	5	7	108	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.917			0.940			0.953	
Flt Protected		0.982			0.996			0.986			0.971	
Satd. Flow (prot)	0	1830	0	0	1755	0	0	1781	0	0	1683	0
Flt Permitted		0.982			0.996			0.986			0.971	
Satd. Flow (perm)	0	1830	0	0	1755	0	0	1781	0	0	1683	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	10		4	4		10	1		46	46		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	6%
Adj. Flow (vph)	46	73	5	12	51	102	5	5	8	117	12	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	124	0	0	165	0	0	18	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

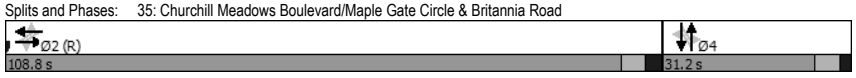
Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 42.2%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1145	94	219	1906	78	35	15	102	30	11	7
Future Volume (vph)	16	1145	94	219	1906	78	35	15	102	30	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00		1.00	0.99		1.00	0.99	
Frt		0.989			0.994			0.869			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5139	0	1552	5205	0	1733	1645	0	1785	1746	0
Flt Permitted	0.089			0.211			0.746			0.446		
Satd. Flow (perm)	167	5139	0	345	5205	0	1356	1645	0	835	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			12			102			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			97.9			114.1			106.4	
Travel Time (s)		28.2			5.9			8.2			7.7	
Confl. Peds. (#/hr)	4					4	2		3	3		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	0%	1%	3%	0%	0%	0%	5%	0%
Adj. Flow (vph)	16	1145	94	219	1906	78	35	15	102	30	11	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1239	0	219	1984	0	35	117	0	30	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Detector Phase	2	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		36.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	108.8	108.8		108.8	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	77.7%	77.7%		77.7%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	101.8	101.8		101.8	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.2	5.2		5.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	11.0	11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	117.9	117.9		117.9	117.9		10.9	10.9		10.9	10.9	
Actuated g/C Ratio	0.84	0.84		0.84	0.84		0.08	0.08		0.08	0.08	
v/c Ratio	0.11	0.29		0.76	0.45		0.33	0.53		0.47	0.13	
Control Delay	2.2	0.8		25.1	3.3		69.0	23.5		84.2	44.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.2	0.8		25.1	3.3		69.0	23.5		84.2	44.1	
LOS	A	A		C	A		E	C		F	D	
Approach Delay		0.8			5.4			34.0			69.1	
Approach LOS		A			A			C			E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 1.4 (1%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 5.9	Intersection LOS: A
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	1239	219	1984	35	117	30	18
v/c Ratio	0.11	0.29	0.76	0.45	0.33	0.53	0.47	0.13
Control Delay	2.2	0.8	25.1	3.3	69.0	23.5	84.2	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.2	0.8	25.1	3.3	69.0	23.5	84.2	44.1
Queue Length 50th (m)	0.1	2.7	19.5	37.7	9.4	4.0	8.2	2.9
Queue Length 95th (m)	m0.5	m9.5	#96.0	53.7	20.3	22.5	18.7	10.6
Internal Link Dist (m)		445.7		73.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	140	4332	290	4385	251	388	155	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.29	0.76	0.45	0.14	0.30	0.19	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	9	8	9	7	12	12	136	15	18	240	15
Future Volume (vph)	12	9	8	9	7	12	12	136	15	18	240	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.962			0.943			0.988			0.993	
Flt Protected		0.980			0.984			0.996			0.997	
Satd. Flow (prot)	0	1747	0	0	1720	0	0	1853	0	0	1878	0
Flt Permitted		0.980			0.984			0.996			0.997	
Satd. Flow (perm)	0	1747	0	0	1720	0	0	1853	0	0	1878	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)	6		3	3		6	11		10	10		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	13%	0%	14%	0%	0%	1%	13%	0%	1%	7%
Adj. Flow (vph)	13	10	9	10	8	13	13	148	16	20	261	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	31	0	0	177	0	0	297	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 30.3% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	75	23	69	100	24	16	119	62	17	144	22
Future Volume (vph)	10	75	23	69	100	24	16	119	62	17	144	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.971			0.983			0.958			0.984	
Flt Protected		0.995			0.982			0.996			0.995	
Satd. Flow (prot)	0	1599	0	0	1728	0	0	1725	0	0	1782	0
Flt Permitted		0.995			0.982			0.996			0.995	
Satd. Flow (perm)	0	1599	0	0	1728	0	0	1725	0	0	1782	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	20		92	92		20	33		36	36		33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	19%	9%	6%	10%	0%	6%	7%	5%	0%	7%	0%
Adj. Flow (vph)	11	82	25	75	109	26	17	129	67	18	157	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	118	0	0	210	0	0	213	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	155	17	114	282	204	7	71	27	109	132	26
Future Volume (vph)	26	155	17	114	282	204	7	71	27	109	132	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		0.99	0.97		0.99	0.99		0.97	1.00	
Frt		0.985			0.937			0.959			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3459	0	1789	3247	0	1601	1638	0	1789	1737	0
Flt Permitted	0.417			0.635			0.631			0.689		
Satd. Flow (perm)	752	3459	0	1178	3247	0	1057	1638	0	1255	1737	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			217			27			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	2%	18%	2%	2%	2%	14%	11%	11%	2%	6%	15%
Adj. Flow (vph)	28	168	18	124	307	222	8	77	29	118	143	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	186	0	124	529	0	8	106	0	118	171	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	46.0	46.0		46.0	46.0		55.0	55.0		55.0	55.0	
Total Split (%)	45.5%	45.5%		45.5%	45.5%		54.5%	54.5%		54.5%	54.5%	
Maximum Green (s)	39.5	39.5		39.5	39.5		49.0	49.0		49.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.5	48.5		48.5	48.5		42.0	42.0		42.0	42.0	
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.42	0.42		0.42	0.42	
v/c Ratio	0.08	0.11		0.22	0.32		0.02	0.15		0.23	0.23	
Control Delay	23.7	20.9		16.6	9.6		17.7	14.3		20.5	18.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.7	20.9		16.6	9.6		17.7	14.3		20.5	18.5	
LOS	C	C		B	A		B	B		C	B	
Approach Delay		21.3			11.0			14.5			19.3	
Approach LOS		C			B			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.32
Intersection Signal Delay: 14.9 Intersection LOS: B
Intersection Capacity Utilization 74.2% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	186	124	529	8	106	118	171
v/c Ratio	0.08	0.11	0.22	0.32	0.02	0.15	0.23	0.23
Control Delay	23.7	20.9	16.6	9.6	17.7	14.3	20.5	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	20.9	16.6	9.6	17.7	14.3	20.5	18.5
Queue Length 50th (m)	3.6	12.0	13.6	17.8	0.9	9.3	14.6	19.3
Queue Length 95th (m)	m8.2	22.2	25.1	28.4	3.7	19.7	27.1	33.6
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	361	1667	565	1672	523	824	621	866
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.11	0.22	0.32	0.02	0.13	0.19	0.20

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	42	7	29	69	35	17	96	26	22	176	13
Future Volume (vph)	8	42	7	29	69	35	17	96	26	22	176	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.965			0.975			0.992	
Flt Protected		0.993			0.989			0.994			0.995	
Satd. Flow (prot)	0	1765	0	0	1728	0	0	1707	0	0	1721	0
Flt Permitted		0.993			0.989			0.994			0.995	
Satd. Flow (perm)	0	1765	0	0	1728	0	0	1707	0	0	1721	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	14		19	19		14	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	6%	0%	3%	5%	11%	6%	11%	4%	5%	11%	8%
Adj. Flow (vph)	9	46	8	32	75	38	18	104	28	24	191	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	0	0	145	0	0	150	0	0	229	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 33.6%	ICU Level of Service A
Analysis Period (min) 15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	86	15	40	103	26	35	142	54	24	173	35
Future Volume (vph)	18	86	15	40	103	26	35	142	54	24	173	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.979			0.968			0.980	
Flt Protected		0.992			0.988			0.992			0.995	
Satd. Flow (prot)	0	1672	0	0	1782	0	0	1769	0	0	1781	0
Flt Permitted		0.992			0.988			0.992			0.995	
Satd. Flow (perm)	0	1672	0	0	1782	0	0	1769	0	0	1781	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	12%	0%	0%	5%	8%	9%	4%	2%	8%	4%	9%
Adj. Flow (vph)	20	93	16	43	112	28	38	154	59	26	188	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	129	0	0	183	0	0	251	0	0	252	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

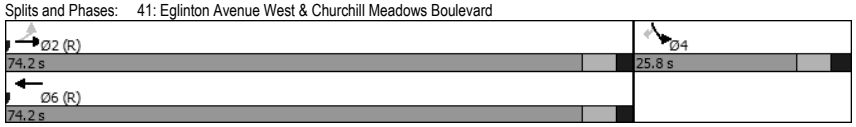
Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 41.8%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	1381	2466	191	123	70
Future Volume (vph)	13	1381	2466	191	123	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			1.00			
Frt			0.989			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1690	3579	3566	0	1789	1089
Flt Permitted	0.052				0.950	
Satd. Flow (perm)	92	3579	3566	0	1789	1089
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			18			8
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	4			4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	2%	1%	1%	2%	50%
Adj. Flow (vph)	13	1381	2466	191	123	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	1381	2657	0	123	70
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.5	25.5
Total Split (s)	74.2	74.2	74.2		25.8	25.8
Total Split (%)	74.2%	74.2%	74.2%		25.8%	25.8%
Maximum Green (s)	68.2	68.2	68.2		19.3	19.3
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	76.2	76.2	76.2		13.3	13.3
Actuated g/C Ratio	0.76	0.76	0.76		0.13	0.13
v/c Ratio	0.19	0.51	0.98		0.52	0.46
Control Delay	11.5	5.7	25.2		47.6	44.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	11.5	5.7	25.2		47.6	44.8
LOS	B	A	C		D	D
Approach Delay		5.8	25.2		46.6	
Approach LOS		A	C		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 89.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	13	1381	2657	123	70
v/c Ratio	0.19	0.51	0.98	0.52	0.46
Control Delay	11.5	5.7	25.2	47.6	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	5.7	25.2	47.6	44.8
Queue Length 50th (m)	0.6	44.2	203.9	22.6	11.2
Queue Length 95th (m)	4.0	69.6	#335.3	38.1	23.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	70	2728	2723	363	227
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.51	0.98	0.34	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	654	1879	0	387	31
Future Volume (vph)	0	654	1879	0	387	31
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	1987	1726
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	1987	1726
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (k/h)		60	60		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		12.4	17.9		15.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	0%	2%	0%	3%
Adj. Flow (vph)	0	727	2088	0	430	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	727	2088	0	430	34
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
42: Britannia Road & Hwy 407 SB Off-Ramp

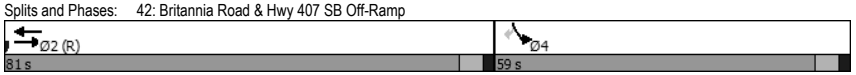
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		81.0	81.0		59.0	59.0
Total Split (%)		57.9%	57.9%		42.1%	42.1%
Maximum Green (s)		75.0	75.0		53.0	53.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		91.6	91.6		36.4	36.4
Actuated g/C Ratio		0.65	0.65		0.26	0.26
v/c Ratio		0.20	0.56		0.83	0.08
Control Delay		10.4	23.3		62.9	36.4
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		10.4	23.3		62.9	36.4
LOS		B	C		E	D
Approach Delay		10.4	23.3		60.9	
Approach LOS		B	C		E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 25.7 Intersection LOS: C
Intersection Capacity Utilization 63.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	727	2088	430	34
v/c Ratio	0.20	0.56	0.83	0.08
Control Delay	10.4	23.3	62.9	36.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.4	23.3	62.9	36.4
Queue Length 50th (m)	27.3	196.3	113.0	7.2
Queue Length 95th (m)	40.4	218.4	139.2	14.6
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3701	3738	752	653
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.20	0.56	0.57	0.05

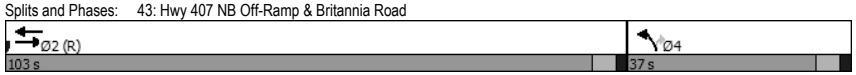
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1069	0	0	1914	73	117
Future Volume (vph)	1069	0	0	1914	73	117
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5711	1987	1778
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5711	1987	1778
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	17.9			13.0	11.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	0%	0%	0%
Adj. Flow (vph)	1188	0	0	2127	81	130
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1188	0	0	2127	81	130
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	103.0			103.0	37.0	37.0
Total Split (%)	73.6%			73.6%	26.4%	26.4%
Maximum Green (s)	97.0			97.0	31.0	31.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	112.4			112.4	15.6	15.6
Actuated g/C Ratio	0.80			0.80	0.11	0.11
v/c Ratio	0.26			0.46	0.37	0.66
Control Delay	6.0			7.5	61.1	74.9
Queue Delay	0.0			0.2	0.0	0.0
Total Delay	6.0			7.7	61.1	74.9
LOS	A			A	E	E
Approach Delay	6.0			7.7	69.6	
Approach LOS	A			A	E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 63.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1188	2127	81	130
v/c Ratio	0.26	0.46	0.37	0.66
Control Delay	6.0	7.5	61.1	74.9
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	6.0	7.7	61.1	74.9
Queue Length 50th (m)	45.2	70.6	21.1	35.1
Queue Length 95th (m)	49.0	m101.7	35.9	54.5
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4541	4586	439	393
Starvation Cap Reductn	0	1353	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.66	0.18	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	859	2589	0	228	434
Future Volume (vph)	0	859	2589	0	228	434
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	3817	1778
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	3817	1778
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						1
Link Speed (k/h)		60	60		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		20.0	18.5		13.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%
Adj. Flow (vph)	0	914	2754	0	243	462
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	914	2754	0	243	462
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lanes, Volumes, Timings
44: Derry Road & Hwy 407 SB Off-Ramp

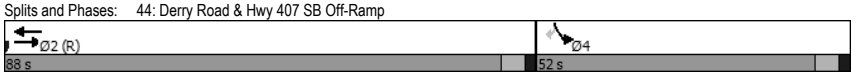
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		88.0	88.0		52.0	52.0
Total Split (%)		62.9%	62.9%		37.1%	37.1%
Maximum Green (s)		82.0	82.0		46.0	46.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	-2.9
Total Lost Time (s)		6.0	6.0		6.0	3.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		87.6	87.6		40.4	43.3
Actuated g/C Ratio		0.63	0.63		0.29	0.31
v/c Ratio		0.26	0.77		0.22	0.84
Control Delay		12.5	18.2		37.4	59.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		12.5	18.2		37.4	59.0
LOS		B	B		D	E
Approach Delay		12.5	18.2		51.5	
Approach LOS		B	B		D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 22.4 — Intersection LOS: C
Intersection Capacity Utilization 78.9% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	914	2754	243	462
v/c Ratio	0.26	0.77	0.22	0.84
Control Delay	12.5	18.2	37.4	59.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.5	18.2	37.4	59.0
Queue Length 50th (m)	40.1	125.8	26.0	117.7
Queue Length 95th (m)	51.7	147.9	35.2	153.2
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3538	3573	1254	621
Starvation Cap Reductn	0	19	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.77	0.19	0.74

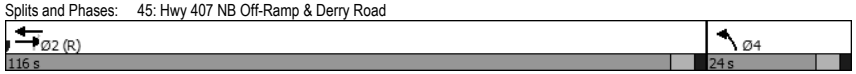
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1131	0	0	2571	104	130
Future Volume (vph)	1131	0	0	2571	104	130
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						0.99
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5655	3856	1743
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5655	3856	1722
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						137
Link Speed (k/h)	60			60	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	18.5			13.8	15.5	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	2%	1%	0%	2%
Adj. Flow (vph)	1191	0	0	2706	109	137
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1191	0	0	2706	109	137
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	116.0			116.0	24.0	116.0
Total Split (%)	82.9%			82.9%	17.1%	82.9%
Maximum Green (s)	110.0			110.0	18.0	110.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	118.5			118.5	9.5	118.5
Actuated g/C Ratio	0.85			0.85	0.07	0.85
v/c Ratio	0.25			0.57	0.42	0.09
Control Delay	2.0			0.9	67.1	0.4
Queue Delay	0.0			0.2	0.0	0.0
Total Delay	2.0			1.1	67.1	0.4
LOS	A			A	E	A
Approach Delay	2.0			1.1	30.0	
Approach LOS	A			A	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 3.1	Intersection LOS: A
Intersection Capacity Utilization 78.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1191	2706	109	137
v/c Ratio	0.25	0.57	0.42	0.09
Control Delay	2.0	0.9	67.1	0.4
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	2.0	1.1	67.1	0.4
Queue Length 50th (m)	12.6	9.4	15.2	0.0
Queue Length 95th (m)	17.5	12.9	24.5	3.0
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4785	4785	495	1478
Starvation Cap Reductn	0	870	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.25	0.69	0.22	0.09

Intersection Summary

Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1192	1104	3018	0	0	1778
Future Volume (vph)	1192	1104	3018	0	0	1778
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.963	0.850				
Flt Protected	0.964					
Satd. Flow (prot)	3740	1571	5491	0	0	5545
Flt Permitted	0.964					
Satd. Flow (perm)	3736	1571	5491	0	0	5545
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	4%	1%	0%	3%
Adj. Flow (vph)	1255	1162	3177	0	0	1872
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	1662	755	3177	0	0	1872
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				

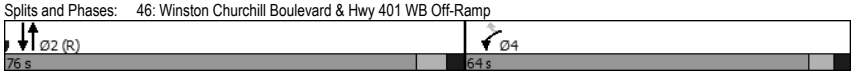
Lanes, Volumes, Timings
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	64.0	64.0	76.0			76.0
Total Split (%)	45.7%	45.7%	54.3%			54.3%
Maximum Green (s)	57.0	57.0	68.0			68.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	57.0	57.0	68.0			68.0
Actuated g/C Ratio	0.41	0.41	0.49			0.49
v/c Ratio	1.09	1.18	1.19			0.70
Control Delay	91.8	134.5	121.5			29.7
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	91.8	134.5	121.5			29.7
LOS	F	F	F			C
Approach Delay	105.1		121.5			29.7
Approach LOS	F		F			C

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 49 (35%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 93.2	Intersection LOS: F
Intersection Capacity Utilization 120.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1662	755	3177	1872
v/c Ratio	1.09	1.18	1.19	0.70
Control Delay	91.8	134.5	121.5	29.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	91.8	134.5	121.5	29.7
Queue Length 50th (m)	~266.7	~274.7	~388.1	144.2
Queue Length 95th (m)	#308.1	#357.3	#410.8	160.9
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1522	639	2667	2693
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.09	1.18	1.19	0.70

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

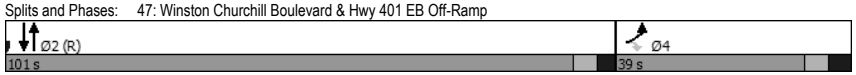
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	434	474	0	3264	2548	0
Future Volume (vph)	434	474	0	3264	2548	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.955	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3457	1586	0	5545	5599	0
Flt Permitted	0.966					
Satd. Flow (perm)	3457	1586	0	5545	5599	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	4	4				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	2%	0%	3%	2%	7%
Adj. Flow (vph)	467	510	0	3510	2740	0
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	666	311	0	3510	2740	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	39.0	39.0		101.0	101.0	
Total Split (%)	27.9%	27.9%		72.1%	72.1%	
Maximum Green (s)	31.0	31.0		94.0	94.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	30.0	30.0		95.0	95.0	
Actuated g/C Ratio	0.21	0.21		0.68	0.68	
v/c Ratio	0.90	0.91		0.93	0.72	
Control Delay	68.8	83.0		25.9	10.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	68.8	83.0		25.9	10.9	
LOS	E	F		C	B	
Approach Delay	73.3			25.9	10.9	
Approach LOS	E			C	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 32.2 (23%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 26.6		Intersection LOS: C	
Intersection Capacity Utilization 86.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	666	311	3510	2740
v/c Ratio	0.90	0.91	0.93	0.72
Control Delay	68.8	83.0	25.9	10.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	68.8	83.0	25.9	10.9
Queue Length 50th (m)	91.9	91.2	296.2	127.5
Queue Length 95th (m)	#120.6	#147.8	318.9	m130.0
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	768	354	3763	3800
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.87	0.88	0.93	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1108	1841	2192	0	0	2372
Future Volume (vph)	1108	1841	2192	0	0	2372
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.937	0.850				
Flt Protected	0.972					
Satd. Flow (prot)	3681	1602	5655	0	0	5655
Flt Permitted	0.972					
Satd. Flow (perm)	3681	1602	5655	0	0	5655
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Peak Hour Factor	0.89	0.96	0.93	0.93	0.89	0.89
Heavy Vehicles (%)	0%	1%	1%	0%	0%	1%
Adj. Flow (vph)	1245	1918	2357	0	0	2665
Shared Lane Traffic (%)		47%				
Lane Group Flow (vph)	2146	1017	2357	0	0	2665
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2

Lanes, Volumes, Timings
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

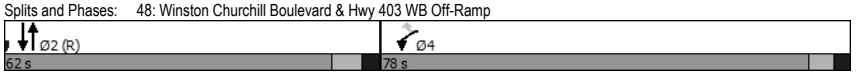
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	78.0	78.0	62.0			62.0
Total Split (%)	55.7%	55.7%	44.3%			44.3%
Maximum Green (s)	71.0	71.0	54.0			54.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	-2.9	-2.9			0.0
Total Lost Time (s)	7.0	4.1	5.1			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	71.0	73.9	56.9			54.0
Actuated g/C Ratio	0.51	0.53	0.41			0.39
v/c Ratio	1.15	1.20	1.03			1.22
Control Delay	107.1	134.0	67.4			141.9
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	107.1	134.0	67.4			141.9
LOS	F	F	E			F
Approach Delay	115.8		67.4			141.9
Approach LOS	F		E			F

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 2.8 (2%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.22
Intersection Signal Delay: 110.3 — Intersection LOS: F
Intersection Capacity Utilization 165.6% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	2146	1017	2357	2665
v/c Ratio	1.15	1.20	1.03	1.22
Control Delay	107.1	134.0	67.4	141.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	107.1	134.0	67.4	141.9
Queue Length 50th (m)	~359.0	~375.0	~256.9	~331.2
Queue Length 95th (m)	#390.7	#462.1	#284.4	#350.2
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1866	845	2298	2181
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.15	1.20	1.03	1.22

Intersection Summary

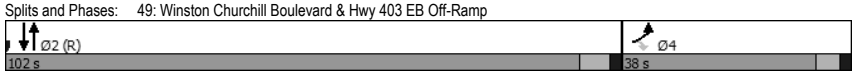
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	517	205	0	2131	2737	0
Future Volume (vph)	517	205	0	2131	2737	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3817	1726	0	5655	5655	0
Flt Permitted	0.950					
Satd. Flow (perm)	3817	1726	0	5655	5655	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		2				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	3%	0%	1%	1%	0%
Adj. Flow (vph)	568	225	0	2342	3008	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	568	225	0	2342	3008	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	38.0	38.0		102.0	102.0	
Total Split (%)	27.1%	27.1%		72.9%	72.9%	
Maximum Green (s)	32.0	32.0		95.0	95.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	26.4	26.4		100.6	100.6	
Actuated g/C Ratio	0.19	0.19		0.72	0.72	
v/c Ratio	0.79	0.69		0.58	0.74	
Control Delay	62.3	63.2		10.6	24.6	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	62.3	63.2		10.6	24.6	
LOS	E	E		B	C	
Approach Delay	62.5			10.6	24.6	
Approach LOS	E			B	C	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 81.2 (58%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 24.2	Intersection LOS: C
Intersection Capacity Utilization 165.6%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	568	225	2342	3008
v/c Ratio	0.79	0.69	0.58	0.74
Control Delay	62.3	63.2	10.6	24.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	62.3	63.2	10.6	24.6
Queue Length 50th (m)	77.7	58.0	104.9	229.4
Queue Length 95th (m)	93.5	82.4	132.5	m185.5
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	872	396	4061	4061
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.57	0.58	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1907	1861	0	520	1497
Future Volume (vph)	0	1907	1861	0	520	1497
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Ped Bike Factor						
Frt					0.912	0.850
Flt Protected					0.980	
Satd. Flow (prot)	0	5338	5599	0	3413	1571
Flt Permitted					0.980	
Satd. Flow (perm)	0	5338	5599	0	3413	1571
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					1	1
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	7%	2%	0%	11%	3%
Adj. Flow (vph)	0	1946	1899	0	531	1528
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	0	1946	1899	0	1295	764
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
50: Dundas Street & Hwy 403 SB Off-Ramp

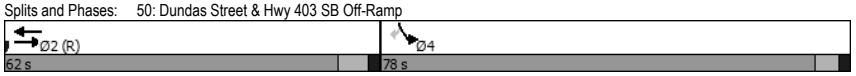
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		62.0	62.0		78.0	78.0
Total Split (%)		44.3%	44.3%		55.7%	55.7%
Maximum Green (s)		55.0	55.0		72.0	72.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		55.9	55.9		71.1	71.1
Actuated g/C Ratio		0.40	0.40		0.51	0.51
v/c Ratio		0.91	0.85		0.87dr	0.96
Control Delay		47.5	67.0		30.5	56.4
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		47.5	67.0		30.5	56.4
LOS		D	E		C	E
Approach Delay		47.5	67.0		40.1	
Approach LOS		D	E		D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 4.2 (3%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 51.2 Intersection LOS: D
Intersection Capacity Utilization 100.6% ICU Level of Service G
Analysis Period (min) 15
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1946	1899	1295	764
v/c Ratio	0.91	0.85	0.87dr	0.96
Control Delay	47.5	67.0	30.5	56.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.5	67.0	30.5	56.4
Queue Length 50th (m)	187.1	204.1	140.7	213.7
Queue Length 95th (m)	208.6	219.7	167.2	#311.0
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	2132	2236	1755	808
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.91	0.85	0.74	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1728	0	0	2386	126	853
Future Volume (vph)	1728	0	0	2386	126	853
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Frt					0.884	0.850
Flt Protected					0.989	
Satd. Flow (prot)	5491	0	0	5655	3479	1586
Flt Permitted					0.989	
Satd. Flow (perm)	5491	0	0	5655	3479	1586
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					11	11
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	4%	0%	0%	1%	2%	2%
Adj. Flow (vph)	1781	0	0	2460	130	879
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	1781	0	0	2460	570	439
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	82.0			82.0	58.0	58.0
Total Split (%)	58.6%			58.6%	41.4%	41.4%
Maximum Green (s)	75.0			75.0	52.0	52.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	83.4			83.4	43.6	43.6
Actuated g/C Ratio	0.60			0.60	0.31	0.31
v/c Ratio	0.54			0.73	0.52	0.88
Control Delay	10.4			23.0	39.8	62.7
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.4			23.0	39.8	62.7
LOS	B			C	D	E
Approach Delay	10.4			23.0	49.8	
Approach LOS	B			C	D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 43.4 (31%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 100.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street

Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1781	2460	570	439
v/c Ratio	0.54	0.73	0.52	0.88
Control Delay	10.4	23.0	39.8	62.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.4	23.0	39.8	62.7
Queue Length 50th (m)	90.8	173.7	64.9	122.5
Queue Length 95th (m)	181.4	217.7	75.8	158.0
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	3270	3368	1299	596
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.54	0.73	0.44	0.74

Intersection Summary

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	196	149	712	53	19	587
Future Volume (vph)	196	149	712	53	19	587
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.990			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3543	0	1789	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	3543	0	1789	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	289.7		780.0			514.0
Travel Time (s)	21.7		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	196	149	712	53	19	587
Shared Lane Traffic (%)						
Lane Group Flow (vph)	196	149	765	0	19	587
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 38.9% ICU Level of Service A
Analysis Period (min) 15

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1118	362	0	1820	0	0
Future Volume (vph)	1118	362	0	1820	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	120.9	
Travel Time (s)	15.5			6.8	9.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1118	362	0	1820	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1118	362	0	1820	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 120.1%		ICU Level of Service H	
Analysis Period (min) 15			

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	832	67	49	1424
Future Volume (vph)	46	47	832	67	49	1424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.98				
Frt		0.850	0.989			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3479	0	1825	3544
Flt Permitted	0.950				0.286	
Satd. Flow (perm)	1789	1560	3479	0	549	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	18			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	904	73	53	1548
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	977	0	53	1548
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

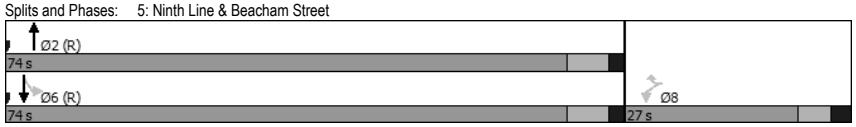
Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	27.0	27.0	74.0		74.0	74.0
Total Split (%)	26.7%	26.7%	73.3%		73.3%	73.3%
Maximum Green (s)	20.5	20.5	67.0		67.0	67.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	10.0	10.0	83.6		83.6	83.6
Actuated g/C Ratio	0.10	0.10	0.83		0.83	0.83
v/c Ratio	0.28	0.26	0.34		0.12	0.53
Control Delay	46.1	15.2	0.5		3.4	4.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.1	15.2	0.5		3.4	4.4
LOS	D	B	A		A	A
Approach Delay	30.5		0.5			4.4
Approach LOS	C		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 4.0		Intersection LOS: A	
Intersection Capacity Utilization 57.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	50	51	977	53	1548
v/c Ratio	0.28	0.26	0.34	0.12	0.53
Control Delay	46.1	15.2	0.5	3.4	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	15.2	0.5	3.4	4.4
Queue Length 50th (m)	9.3	0.0	1.1	1.8	45.0
Queue Length 95th (m)	19.9	10.5	1.1	5.3	67.4
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	380	372	2884	454	2934
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.14	0.34	0.12	0.53

Intersection Summary

APPENDIX S

2041 Scenario 4 Future Total Traffic Conditions – Argentia Extension

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	604	2	2	663
Future Volume (vph)	1	0	604	2	2	663
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1825	1921	1902	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1921	1902	0	0	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.2		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	3%
Adj. Flow (vph)	1	0	657	2	2	721
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	659	0	0	723
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	604	2	2	663
Future Volume (Veh/h)	1	0	604	2	2	663
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	657	2	2	721
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1383	658			659	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1383	658			659	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	160	468			939	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	659	723
Volume Left	1	0	2
Volume Right	0	2	0
cSH	120	1700	939
Volume to Capacity	0.01	0.39	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	35.3	0.0	0.1
Lane LOS	E		A
Approach Delay (s)	35.3	0.0	0.1
Approach LOS	E		

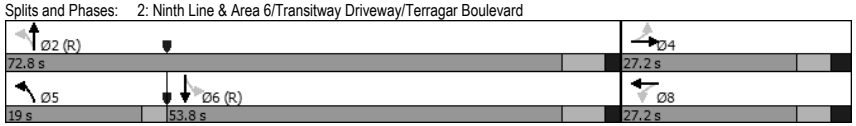
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	15	95	143	111	79	379	755	59	26	641	223
Future Volume (vph)	32	15	95	143	111	79	379	755	59	26	641	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.870			0.935			0.989			0.964	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1639	0	1755	1754	0	1789	3490	0	1825	3450	0
Flt Permitted	0.467			0.686			0.243			0.321		
Satd. Flow (perm)	880	1639	0	1267	1754	0	458	3490	0	617	3450	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95			36			17			59	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		138.3			287.6			434.9			780.0	
Travel Time (s)		10.4			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	3%	2%	3%	9%	0%	2%	2%
Adj. Flow (vph)	32	15	95	155	111	86	379	821	64	28	697	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	110	0	155	197	0	379	885	0	28	920	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	8.0		8.0	8.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		9.0	53.0		52.0	52.0	
Total Split (s)	27.2	27.2		27.2	27.2		19.0	72.8		53.8	53.8	
Total Split (%)	27.2%	27.2%		27.2%	27.2%		19.0%	72.8%		53.8%	53.8%	
Maximum Green (s)	20.7	20.7		20.7	20.7		16.0	65.8		46.8	46.8	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		2.0	6.0		6.0	6.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0			35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)	17.6	17.6		17.6	17.6		74.9	70.9		55.2	55.2	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.75	0.71		0.55	0.55	
v/c Ratio	0.21	0.30		0.70	0.58		0.72	0.36		0.08	0.48	
Control Delay	36.8	11.5		54.9	37.2		14.3	6.4		13.8	12.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	36.8	11.5		54.9	37.2		14.3	6.4		13.8	12.1	
LOS	D	B		D	D		B	A		B	B	
Approach Delay		17.2			45.0			8.8			12.1	
Approach LOS		B			D			A			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	32	110	155	197	379	885	28	920
v/c Ratio	0.21	0.30	0.70	0.58	0.72	0.36	0.08	0.48
Control Delay	36.8	11.5	54.9	37.2	14.3	6.4	13.8	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.8	11.5	54.9	37.2	14.3	6.4	13.8	12.1
Queue Length 50th (m)	5.3	2.4	28.2	28.5	20.2	30.7	1.9	33.0
Queue Length 95th (m)	13.3	15.9	47.5	48.5	44.3	45.1	m7.0	61.4
Internal Link Dist (m)		114.3		263.6		410.9		756.0
Turn Bay Length (m)					40.0		40.0	
Base Capacity (vph)	190	430	274	408	570	2480	340	1930
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.26	0.57	0.48	0.66	0.36	0.08	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	24	46	0	18	46	1194	63	11	822	5
Future Volume (vph)	8	0	24	46	0	18	46	1194	63	11	822	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.993			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3521	0	1674	3540	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3521	0	1674	3540	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		134.3			310.4			412.4			434.9	
Travel Time (s)		10.1			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	2%	9%	3%	2%
Adj. Flow (vph)	8	0	24	50	0	20	46	1298	68	12	893	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	24	0	50	20	0	46	1366	0	12	898	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 54.1% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	24	46	0	18	46	1194	63	11	822	5
Future Volume (Veh/h)	8	0	24	46	0	18	46	1194	63	11	822	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	8	0	24	50	0	20	46	1298	68	12	893	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1680	2378	449	1918	2346	683	898			1366		
vC1, stage 1 conf vol	920	920		1424	1424							
vC2, stage 2 conf vol	761	1458		494	922							
vCu, unblocked vol	1680	2378	449	1918	2346	683	898			1366		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	96	100	96	61	100	95	94			97		
cM capacity (veh/h)	211	148	557	129	156	396	752			464		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	8	24	50	20	46	865	501	12	595	303
Volume Left	8	0	50	0	46	0	0	12	0	0
Volume Right	0	24	0	20	0	0	68	0	0	5
cSH	211	557	129	396	752	1700	1700	464	1700	1700
Volume to Capacity	0.04	0.04	0.39	0.05	0.06	0.51	0.29	0.03	0.35	0.18
Queue Length 95th (m)	0.9	1.0	12.4	1.2	1.5	0.0	0.0	0.6	0.0	0.0
Control Delay (s)	22.7	11.8	49.7	14.6	10.1	0.0	0.0	13.0	0.0	0.0
Lane LOS	C	B	E	B	B			B		
Approach Delay (s)	14.5		39.6		0.3			0.2		
Approach LOS	B		E							

Intersection Summary				
Average Delay		1.6		
Intersection Capacity Utilization		54.1%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	269	2245	137	159	921	248	229	619	301	97	587	186
Future Volume (vph)	269	2245	137	159	921	248	229	619	301	97	587	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.991			0.968				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1733	5143	0	1716	4922	0	1785	3614	1566	1638	3614	1597
Flt Permitted	0.158			0.062			0.144			0.254		
Satd. Flow (perm)	288	5143	0	112	4922	0	271	3614	1566	438	3614	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			58				166			175
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	4%	4%	0%	0%	1%	2%	9%	1%	0%
Adj. Flow (vph)	269	2245	137	159	921	248	229	619	301	97	587	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	269	2382	0	159	1169	0	229	619	301	97	587	186
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

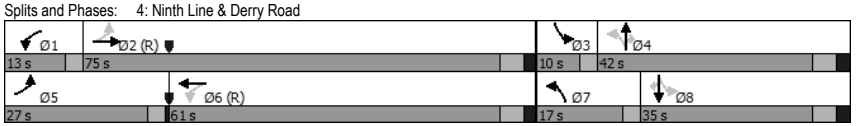
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	5.0	8.0	8.0
Minimum Split (s)	9.0	30.1		8.0	30.1		8.0	29.4	29.4	8.0	29.4	29.4
Total Split (s)	27.0	75.0		13.0	61.0		17.0	42.0	42.0	10.0	35.0	35.0
Total Split (%)	19.3%	53.6%		9.3%	43.6%		12.1%	30.0%	30.0%	7.1%	25.0%	25.0%
Maximum Green (s)	23.5	68.9		10.0	54.9		14.0	35.6	35.6	7.0	28.6	28.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.5	2.1		0.0	2.1		0.0	2.4	2.4	0.0	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.5	5.1		2.0	5.1		2.0	5.4	5.4	2.0	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	86.9	71.4		78.9	64.4		48.2	34.8	34.8	39.2	27.8	27.8
Actuated g/C Ratio	0.62	0.51		0.56	0.46		0.34	0.25	0.25	0.28	0.20	0.20
v/c Ratio	0.74	0.91		0.82	0.51		0.90	0.69	0.59	0.51	0.82	0.41
Control Delay	37.0	34.0		75.1	20.8		70.9	52.0	24.7	42.2	63.8	10.5
Queue Delay	0.0	0.2		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	34.2		75.1	20.8		70.9	52.0	24.7	42.2	63.8	10.5
LOS	D	C		E	C		E	D	C	D	E	B
Approach Delay		34.5			27.3			48.6			50.0	
Approach LOS		C			C			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 37.8 — Intersection LOS: D
Intersection Capacity Utilization 99.6% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	269	2382	159	1169	229	619	301	97	587	186
v/c Ratio	0.74	0.91	0.82	0.51	0.90	0.69	0.59	0.51	0.82	0.41
Control Delay	37.0	34.0	75.1	20.8	70.9	52.0	24.7	42.2	63.8	10.5
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	34.2	75.1	20.8	70.9	52.0	24.7	42.2	63.8	10.5
Queue Length 50th (m)	42.1	163.8	32.0	44.3	46.6	80.8	31.8	18.3	81.3	2.5
Queue Length 95th (m)	73.2	194.4	#72.8	78.0	#89.9	101.4	62.2	31.7	102.5	22.6
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	432	2627	194	2296	255	944	532	190	764	475
Starvation Cap Reductn	0	23	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.91	0.82	0.51	0.90	0.66	0.57	0.51	0.77	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1315	85	58	752
Future Volume (vph)	90	47	1315	85	58	752
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3546	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1807	1633	3546	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1429	92	63	817
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1521	0	63	817
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.9%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	90	47	1315	85	58	752
Future Volume (Veh/h)	90	47	1315	85	58	752
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	51	1429	92	63	817
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2010	762			1521	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2010	762			1521	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	85			86	
cM capacity (veh/h)	45	351			445	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	149	953	568	63	408	408
Volume Left	98	0	0	63	0	0
Volume Right	51	0	92	0	0	0
cSH	64	1700	1700	445	1700	1700
Volume to Capacity	2.33	0.56	0.33	0.14	0.24	0.24
Queue Length 95th (m)	110.1	0.0	0.0	3.7	0.0	0.0
Control Delay (s)	744.9	0.0	0.0	14.4	0.0	0.0
Lane LOS	F			B		
Approach Delay (s)	744.9	0.0		1.0		
Approach LOS	F					

Intersection Summary			
Average Delay	43.9		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	75	36	138	28	198	9	1082	97	80	668	8
Future Volume (vph)	33	75	36	138	28	198	9	1082	97	80	668	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		27.0	50.0		60.0	115.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.951			0.867			0.988			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1791	0	1772	1613	0	1789	3496	0	1825	3571	0
Flt Permitted	0.364			0.685			0.361			0.180		
Satd. Flow (perm)	686	1791	0	1278	1613	0	680	3496	0	346	3571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			85			17			2	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		99.7			255.0			850.0			603.1	
Travel Time (s)		7.5			18.4			43.7			31.0	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	3%	5%	0%	2%	2%
Adj. Flow (vph)	33	75	36	150	28	215	9	1176	105	87	726	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	111	0	150	243	0	9	1281	0	87	734	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

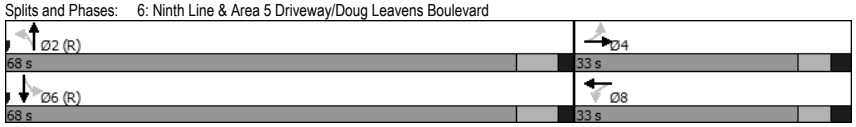
Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		45.0	45.0	
Minimum Split (s)	25.5	25.5		23.0	23.0		52.0	52.0		52.0	52.0	
Total Split (s)	33.0	33.0		33.0	33.0		68.0	68.0		68.0	68.0	
Total Split (%)	32.7%	32.7%		32.7%	32.7%		67.3%	67.3%		67.3%	67.3%	
Maximum Green (s)	26.5	26.5		26.5	26.5		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	18.4	18.4		18.4	18.4		71.1	71.1		71.1	71.1	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.70	0.70		0.70	0.70	
v/c Ratio	0.26	0.32		0.64	0.67		0.02	0.52		0.36	0.29	
Control Delay	38.4	28.6		50.0	33.0		10.3	14.9		12.8	6.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	38.4	28.6		50.0	33.0		10.3	14.9		12.8	6.6	
LOS	D	C		D	C		B	B		B	A	
Approach Delay		30.8			39.5			14.9			7.2	
Approach LOS		C			D			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 17.0		Intersection LOS: B	
Intersection Capacity Utilization 101.1%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard



Queues
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	111	150	243	9	1281	87	734
v/c Ratio	0.26	0.32	0.64	0.67	0.02	0.52	0.36	0.29
Control Delay	38.4	28.6	50.0	33.0	10.3	14.9	12.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	28.6	50.0	33.0	10.3	14.9	12.8	6.6
Queue Length 50th (m)	5.6	14.8	27.6	29.0	0.8	90.3	5.8	24.2
Queue Length 95th (m)	13.2	27.2	43.6	49.2	m2.3	134.2	20.2	42.1
Internal Link Dist (m)		75.7		231.0		826.0		579.1
Turn Bay Length (m)					50.0		115.0	
Base Capacity (vph)	186	505	347	501	478	2465	243	2513
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.22	0.43	0.49	0.02	0.52	0.36	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	27	36	200	13	88	9	1218	150	55	942	8
Future Volume (vph)	33	27	36	200	13	88	9	1218	150	55	942	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	13.0		0.0	35.0		25.0	270.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			13.0			60.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.914			0.868			0.984			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1721	0	1706	1615	0	1789	3443	0	1789	3541	0
Flt Permitted	0.685			0.716			0.221			0.098		
Satd. Flow (perm)	1290	1721	0	1286	1615	0	416	3443	0	185	3541	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			96			19			1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		142.8			160.0			383.2			301.0	
Travel Time (s)		10.7			11.5			19.7			15.5	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	7%	2%	3%	2%
Adj. Flow (vph)	33	27	36	217	13	96	9	1324	163	60	1024	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	63	0	217	109	0	9	1487	0	60	1032	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

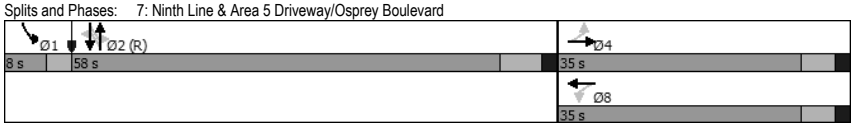
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.0	25.0		52.0	52.0		8.0	52.0	
Total Split (s)	35.0	35.0		35.0	35.0		58.0	58.0		8.0	58.0	
Total Split (%)	34.7%	34.7%		34.7%	34.7%		57.4%	57.4%		7.9%	57.4%	
Maximum Green (s)	29.0	29.0		29.0	29.0		51.0	51.0		5.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		37.0	37.0			37.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	22.8	22.8		22.8	22.8		59.8	59.8		69.6	59.8	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.59	0.59		0.69	0.59	
v/c Ratio	0.11	0.15		0.75	0.25		0.04	0.73		0.25	0.49	
Control Delay	29.2	15.6		51.7	9.0		12.3	19.0		11.2	17.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	29.2	15.6		51.7	9.0		12.3	19.0		11.2	17.8	
LOS	C	B		D	A		B	B		B	B	
Approach Delay		20.3			37.4			18.9			17.4	
Approach LOS		C			D			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 20.4 Intersection LOS: C
Intersection Capacity Utilization 72.6% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 7: Ninth Line & Area 5 Driveway/Osprey Boulevard



Queues
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	63	217	109	9	1487	60	1032
v/c Ratio	0.11	0.15	0.75	0.25	0.04	0.73	0.25	0.49
Control Delay	29.2	15.6	51.7	9.0	12.3	19.0	11.2	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	15.6	51.7	9.0	12.3	19.0	11.2	17.8
Queue Length 50th (m)	5.1	4.2	39.5	2.0	0.7	108.3	3.2	67.1
Queue Length 95th (m)	11.7	13.2	60.0	13.9	3.4	154.8	12.1	102.4
Internal Link Dist (m)		118.8		136.0		359.2		277.0
Turn Bay Length (m)			13.0		35.0		270.0	
Base Capacity (vph)	383	536	381	547	246	2047	238	2098
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.12	0.57	0.20	0.04	0.73	0.25	0.49

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	9	18	0	91	2	1112	6	27	969	2
Future Volume (vph)	7	0	9	18	0	91	2	1112	6	27	969	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			60.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.850			0.850			0.999				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3611	0	1825	3614	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3611	0	1825	3614	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		144.4			207.4			254.7			383.2	
Travel Time (s)		10.8			14.9			13.1			19.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	7	0	9	20	0	99	2	1209	7	29	1053	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	9	0	20	99	0	2	1216	0	29	1055	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	9	18	0	91	2	1112	6	27	969	2
Future Volume (Veh/h)	7	0	9	18	0	91	2	1112	6	27	969	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	7	0	9	20	0	99	2	1209	7	29	1053	2
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								255			383	
pX, platoon unblocked	0.78	0.78	0.87	0.78	0.78	0.72	0.87			0.72		
vC, conflicting volume	1820	2332	528	1810	2330	609	1055			1216		
vC1, stage 1 conf vol	1112	1112		1216	1216							
vC2, stage 2 conf vol	708	1220		594	1113							
vCu, unblocked vol	728	1381	147	714	1377	0	756			510		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	99	94	100	87	100			96		
cM capacity (veh/h)	270	253	757	352	260	781	737			763		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	7	9	20	99	2	806	410	29	702	353
Volume Left	7	0	20	0	2	0	0	29	0	0
Volume Right	0	9	0	99	0	0	7	0	0	2
cSH	270	757	352	781	737	1700	1700	763	1700	1700
Volume to Capacity	0.03	0.01	0.06	0.13	0.00	0.47	0.24	0.04	0.41	0.21
Queue Length 95th (m)	0.6	0.3	1.4	3.3	0.1	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	18.7	9.8	15.8	10.3	9.9	0.0	0.0	9.9	0.0	0.0
Lane LOS	C	A	C	B	A			A		
Approach Delay (s)	13.7		11.2		0.0			0.3		
Approach LOS	B		B							

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	2339	328	80	783	126	210	914	144	105	834	137
Future Volume (vph)	119	2339	328	80	783	126	210	914	144	105	834	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.982			0.979			0.980			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	5093	0	1767	4920	0	1785	3502	0	1653	3503	0
Flt Permitted	0.300			0.055			0.102			0.107		
Satd. Flow (perm)	558	5093	0	102	4920	0	192	3502	0	186	3503	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			36			13			13	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	2%	1%	2%	19%	0%	2%	3%	8%	2%	2%
Adj. Flow (vph)	119	2339	328	80	783	126	210	914	144	105	834	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	2667	0	80	909	0	210	1058	0	105	971	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	

Lanes, Volumes, Timings
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	24.6	24.6		8.0	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	76.0	76.0		8.0	84.0		13.0	48.0		8.0	43.0	
Total Split (%)	54.3%	54.3%		5.7%	60.0%		9.3%	34.3%		5.7%	30.7%	
Maximum Green (s)	69.4	69.4		5.0	77.4		10.0	41.4		5.0	36.4	
Yellow Time (s)	4.6	4.6		3.0	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	2.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-2.0	-1.0		-2.0	-1.0		-1.0	-3.0	
Total Lost Time (s)	5.6	5.6		1.0	5.6		1.0	5.6		2.0	3.6	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			12.0			12.0	
Flash Dont Walk (s)	11.0	11.0			11.0			18.0			18.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)	70.4	70.4		83.0	78.4		55.0	42.4		47.0	39.4	
Actuated g/C Ratio	0.50	0.50		0.59	0.56		0.39	0.30		0.34	0.28	
v/c Ratio	0.42	1.04		0.56	0.33		1.00	0.99		0.84	0.98	
Control Delay	16.1	51.8		49.5	13.6		95.5	72.9		79.4	72.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.1	51.8		49.5	13.6		95.5	72.9		79.4	72.2	
LOS	B	D		D	B		F	E		E	E	
Approach Delay		50.2			16.5			76.6			72.9	
Approach LOS		D			B			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.04			
Intersection Signal Delay: 54.2		Intersection LOS: D	
Intersection Capacity Utilization 110.7%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 9: Ninth Line & Britannia Road

Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	2667	80	909	210	1058	105	971
v/c Ratio	0.42	1.04	0.56	0.33	1.00	0.99	0.84	0.98
Control Delay	16.1	51.8	49.5	13.6	95.5	72.9	79.4	72.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	51.8	49.5	13.6	95.5	72.9	79.4	72.2
Queue Length 50th (m)	11.9	~275.7	8.8	32.1	41.6	152.3	19.0	139.1
Queue Length 95th (m)	13.7	#317.5	27.8	37.2	#93.6	#199.0	#45.9	#183.5
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	280	2573	143	2771	211	1069	125	995
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	1.04	0.56	0.33	1.00	0.99	0.84	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	22	40	28	20	1274	9	2	1273	38
Future Volume (vph)	0	0	0	22	40	28	20	1274	9	2	1273	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.936			0.999			0.996	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		111.0			491.2			170.0			206.5	
Travel Time (s)		8.3			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	0%	2%	2%	13%	50%	3%	2%
Adj. Flow (vph)	0	0	0	24	40	30	20	1385	10	2	1384	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	24	70	0	20	1395	0	2	1422	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.9% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	22	40	28	20	1274	9	2	1273	38
Future Volume (Veh/h)	0	0	0	22	40	28	20	1274	9	2	1273	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	0	0	0	24	40	30	20	1385	10	2	1384	38
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											206	
pX, platoon unblocked	0.74	0.74	0.74	0.74	0.74		0.74					
vC, conflicting volume	2190	2842	711	2126	2856	698	1422			1395		
vC1, stage 1 conf vol	1407	1407		1430	1430							
vC2, stage 2 conf vol	782	1435		696	1426							
vCu, unblocked vol	1903	2786	0	1817	2805	698	863			1395		
tC, single (s)	7.5	6.5	6.9	7.6	6.5	6.9	4.1			5.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.7		
p0 queue free %	100	100	100	81	72	92	97			99		
cM capacity (veh/h)	165	148	801	128	144	388	572			298		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	0	24	70	20	923	472	2	923	499
Volume Left	0	0	24	0	20	0	0	2	0	0
Volume Right	0	0	0	30	0	0	10	0	0	38
cSH	1700	1700	128	197	572	1700	1700	298	1700	1700
Volume to Capacity	0.00	0.00	0.19	0.35	0.03	0.54	0.28	0.01	0.54	0.29
Queue Length 95th (m)	0.0	0.0	5.0	11.4	0.8	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	0.0	0.0	39.6	32.9	11.5	0.0	0.0	17.2	0.0	0.0
Lane LOS	A	A	E	D	B			C		
Approach Delay (s)	0.0		34.6		0.2			0.0		
Approach LOS	A		D							

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization		46.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	4	3	24	1	41	14	1221	32	46	1238	27
Future Volume (vph)	9	4	3	24	1	41	14	1221	32	46	1238	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.936			0.853			0.996			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1763	0	1825	1591	0	1789	3554	0	1825	3568	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1763	0	1825	1591	0	1789	3554	0	1825	3568	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		61.6			511.9			217.0			170.0	
Travel Time (s)		4.6			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	3%	2%	2%	13%	0%	2%	2%
Adj. Flow (vph)	9	4	3	26	1	45	14	1327	35	50	1346	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	7	0	26	46	0	14	1362	0	50	1373	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	4	3	24	1	41	14	1221	32	46	1238	27
Future Volume (Veh/h)	9	4	3	24	1	41	14	1221	32	46	1238	27
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	9	4	3	26	1	45	14	1327	35	50	1346	27
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											376	
pX, platoon unblocked	0.76	0.76	0.76	0.76	0.76		0.76					
vC, conflicting volume	2198	2850	686	2150	2846	682	1373			1362		
vC1, stage 1 conf vol	1460	1460		1372	1372							
vC2, stage 2 conf vol	738	1390		778	1473							
vCu, unblocked vol	1941	2801	0	1879	2796	682	853			1362		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	97	100	82	99	88	98			90		
cM capacity (veh/h)	149	121	822	145	139	390	593			511		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	7	26	46	14	885	477	50	897	476
Volume Left	9	0	26	0	14	0	0	50	0	0
Volume Right	0	3	0	45	0	0	35	0	0	27
cSH	149	190	145	375	593	1700	1700	511	1700	1700
Volume to Capacity	0.06	0.04	0.18	0.12	0.02	0.52	0.28	0.10	0.53	0.28
Queue Length 95th (m)	1.4	0.9	4.8	3.2	0.6	0.0	0.0	2.5	0.0	0.0
Control Delay (s)	30.6	24.6	35.2	15.9	11.2	0.0	0.0	12.8	0.0	0.0
Lane LOS	D	C	E	C	B			B		
Approach Delay (s)	28.0		22.9		0.1			0.4		
Approach LOS	D		C							

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization		53.1%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	11	1358	8	4	1220
Future Volume (vph)	19	11	1358	8	4	1220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	30.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.951		0.999			
Flt Protected	0.969				0.950	
Satd. Flow (prot)	1714	0	3541	0	1825	3579
Flt Permitted	0.969				0.950	
Satd. Flow (perm)	1714	0	3541	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	0%	0%	2%
Adj. Flow (vph)	21	12	1476	9	4	1326
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	1485	0	4	1326
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	11	1358	8	4	1220
Future Volume (Veh/h)	19	11	1358	8	4	1220
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	12	1476	9	4	1326
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2152	742			1485	
vC1, stage 1 conf vol	1480					
vC2, stage 2 conf vol	671					
vCu, unblocked vol	2152	742			1485	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4			2.2	
p0 queue free %	87	96			99	
cM capacity (veh/h)	165	343			459	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	33	984	501	4	663	663
Volume Left	21	0	0	4	0	0
Volume Right	12	0	9	0	0	0
cSH	203	1700	1700	459	1700	1700
Volume to Capacity	0.16	0.58	0.29	0.01	0.39	0.39
Queue Length 95th (m)	4.3	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	26.1	0.0	0.0	12.9	0.0	0.0
Lane LOS	D			B		
Approach Delay (s)	26.1	0.0		0.0		
Approach LOS	D					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	11	1239	6	3	1261
Future Volume (vph)	6	11	1239	6	3	1261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1498	3535	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1498	3535	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	33%	0%	2%
Adj. Flow (vph)	7	12	1347	7	3	1371
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	12	1354	0	3	1371
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	11	1239	6	3	1261
Future Volume (Veh/h)	6	11	1239	6	3	1261
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	12	1347	7	3	1371
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.71	0.71			0.71	
vC, conflicting volume	2042	677			1354	
vC1, stage 1 conf vol	1350					
vC2, stage 2 conf vol	692					
vCu, unblocked vol	1657	0			693	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4			2.2	
p0 queue free %	97	98			100	
cM capacity (veh/h)	268	758			650	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	19	898	456	3	686	686
Volume Left	7	0	0	3	0	0
Volume Right	12	0	7	0	0	0
cSH	729	1700	1700	650	1700	1700
Volume to Capacity	0.03	0.53	0.27	0.00	0.40	0.40
Queue Length 95th (m)	0.6	0.0	0.0	0.1	0.0	0.0
Control Delay (s)	13.1	0.0	0.0	10.6	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	13.1	0.0		0.0		
Approach LOS	B					

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		44.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2	17	206	1	100	5	1151	183	89	1099	3
Future Volume (vph)	10	2	17	206	1	100	5	1151	183	89	1099	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		35.0	28.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			45.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.866			0.851			0.979				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1631	0	1789	1508	0	1789	3469	0	1690	3579	0
Flt Permitted	0.686			0.745			0.170			0.106		
Satd. Flow (perm)	1292	1631	0	1403	1508	0	320	3469	0	189	3579	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			109			26				
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		170.8			534.8			346.0			306.2	
Travel Time (s)		12.8			38.5			17.8			15.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	7%	2%	3%	3%	8%	2%	2%
Adj. Flow (vph)	10	2	17	224	1	109	5	1251	199	97	1195	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	19	0	224	110	0	5	1450	0	97	1198	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

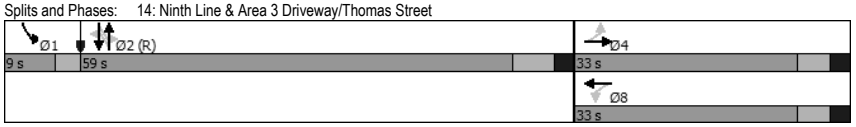
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		52.5	52.5		8.0	52.5	
Total Split (s)	33.0	33.0		33.0	33.0		59.0	59.0		9.0	59.0	
Total Split (%)	32.7%	32.7%		32.7%	32.7%		58.4%	58.4%		8.9%	58.4%	
Maximum Green (s)	26.5	26.5		26.5	26.5		51.5	51.5		6.0	51.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		0.0	2.5	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.5	6.5		2.0	6.5	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		33.0	33.0			33.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0			12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	21.7	21.7		21.7	21.7		59.3	59.3		70.2	59.3	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.59	0.59		0.70	0.59	
v/c Ratio	0.04	0.05		0.74	0.27		0.03	0.71		0.40	0.57	
Control Delay	28.6	13.8		53.4	10.0		13.4	23.8		10.3	15.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.6	13.8		53.4	10.0		13.4	23.8		10.3	15.7	
LOS	C	B		D	A		B	C		B	B	
Approach Delay		18.9			39.1			23.8			15.3	
Approach LOS		B			D			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 21.8 — Intersection LOS: C
Intersection Capacity Utilization 102.0% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 14: Ninth Line & Area 3 Driveway/Thomas Street



Queues
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	19	224	110	5	1450	97	1198
v/c Ratio	0.04	0.05	0.74	0.27	0.03	0.71	0.40	0.57
Control Delay	28.6	13.8	53.4	10.0	13.4	23.8	10.3	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.6	13.8	53.4	10.0	13.4	23.8	10.3	15.7
Queue Length 50th (m)	1.6	0.3	43.3	1.5	0.5	144.9	5.2	77.2
Queue Length 95th (m)	5.4	5.7	67.3	16.5	m1.7	174.7	12.0	106.6
Internal Link Dist (m)		146.8		510.8		322.0		282.2
Turn Bay Length (m)					30.0		28.0	
Base Capacity (vph)	351	456	382	489	187	2048	246	2102
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.04	0.59	0.22	0.03	0.71	0.39	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	46	1218	7	17	1305
Future Volume (vph)	18	46	1218	7	17	1305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.904		0.999			
Flt Protected	0.986				0.950	
Satd. Flow (prot)	1688	0	3541	0	1722	3579
Flt Permitted	0.986				0.950	
Satd. Flow (perm)	1688	0	3541	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	3%	0%	6%	2%
Adj. Flow (vph)	20	50	1324	8	18	1418
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	0	1332	0	18	1418
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	46	1218	7	17	1305
Future Volume (Veh/h)	18	46	1218	7	17	1305
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	50	1324	8	18	1418
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.78					
vC, conflicting volume	2073	666			1332	
vC1, stage 1 conf vol	1328					
vC2, stage 2 conf vol	745					
vCu, unblocked vol	1811	666			1332	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.3	
p0 queue free %	90	88			96	
cM capacity (veh/h)	203	402			493	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	70	883	449	18	709	709
Volume Left	20	0	0	18	0	0
Volume Right	50	0	8	0	0	0
cSH	314	1700	1700	493	1700	1700
Volume to Capacity	0.22	0.52	0.26	0.04	0.42	0.42
Queue Length 95th (m)	6.4	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	19.7	0.0	0.0	12.6	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	19.7	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	39	78	1201	49	46	1362
Future Volume (vph)	39	78	1201	49	46	1362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1617	3515	0	1722	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1617	3515	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Adj. Flow (vph)	42	85	1305	53	50	1480
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	85	1358	0	50	1480
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	39	78	1201	49	46	1362
Future Volume (Veh/h)	39	78	1201	49	46	1362
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	85	1305	53	50	1480
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2172	679			1358	
vC1, stage 1 conf vol	1332					
vC2, stage 2 conf vol	840					
vCu, unblocked vol	2172	679			1358	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.3	
p0 queue free %	77	79			90	
cM capacity (veh/h)	180	396			482	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	127	870	488	50	740	740
Volume Left	42	0	0	50	0	0
Volume Right	85	0	53	0	0	0
cSH	543	1700	1700	482	1700	1700
Volume to Capacity	0.23	0.51	0.29	0.10	0.44	0.44
Queue Length 95th (m)	6.8	0.0	0.0	2.6	0.0	0.0
Control Delay (s)	21.3	0.0	0.0	13.3	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	21.3	0.0		0.4		
Approach LOS	C					

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	14	9	0	18	5	1220	1	8	1397	3
Future Volume (vph)	12	0	14	9	0	18	5	1220	1	8	1397	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	70.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.927			0.910							
Flt Protected		0.977			0.984		0.950			0.950		
Satd. Flow (prot)	0	1706	0	0	1720	0	1789	3544	0	1825	3579	0
Flt Permitted		0.977			0.984		0.950			0.950		
Satd. Flow (perm)	0	1706	0	0	1720	0	1789	3544	0	1825	3579	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		92.8			113.3			424.8			250.0	
Travel Time (s)		7.0			8.2			21.8			12.9	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	0%	0%	2%	2%
Adj. Flow (vph)	12	0	14	10	0	20	5	1326	1	9	1518	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	0	30	0	5	1327	0	9	1521	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	14	9	0	18	5	1220	1	8	1397	3
Future Volume (Veh/h)	12	0	14	9	0	18	5	1220	1	8	1397	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	12	0	14	10	0	20	5	1326	1	9	1518	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2230	2874	760	2128	2876	664	1521			1327		
vC1, stage 1 conf vol	1538	1538		1336	1336							
vC2, stage 2 conf vol	693	1337		791	1539							
vCu, unblocked vol	2230	2874	760	2128	2876	664	1521			1327		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	100	96	93	100	95	99			98		
cM capacity (veh/h)	111	128	348	143	127	408	435			527		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	26	30	5	884	443	9	1012	509
Volume Left	12	10	5	0	0	9	0	0
Volume Right	14	20	0	0	1	0	0	3
cSH	175	252	435	1700	1700	527	1700	1700
Volume to Capacity	0.15	0.12	0.01	0.52	0.26	0.02	0.60	0.30
Queue Length 95th (m)	3.9	3.0	0.3	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	29.1	21.2	13.4	0.0	0.0	12.0	0.0	0.0
Lane LOS	D	C	B			B		
Approach Delay (s)	29.1	21.2	0.1			0.1		
Approach LOS	D	C						

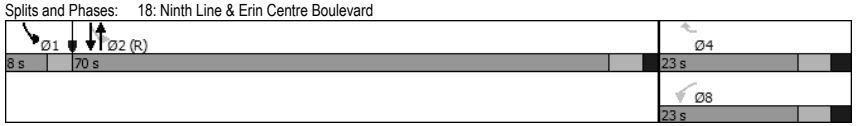
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	83	63	1109	58	55	1395
Future Volume (vph)	83	63	1109	58	55	1395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.993			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1706	1570	3497	0	1772	3579
Flt Permitted	0.950				0.183	
Satd. Flow (perm)	1706	1570	3497	0	341	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		68	10			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	4%	3%	16%	3%	2%
Adj. Flow (vph)	90	68	1205	63	60	1516
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	68	1268	0	60	1516
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	23.0	23.0	70.0		8.0	70.0
Total Split (%)	22.8%	22.8%	69.3%		7.9%	69.3%
Maximum Green (s)	16.5	16.5	64.0		5.0	64.0
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	5.0	8.0	50.0			50.0
Flash Dont Walk (s)	11.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	11.9	11.9	75.0		82.9	75.0
Actuated g/C Ratio	0.12	0.12	0.74		0.82	0.74
v/c Ratio	0.45	0.28	0.49		0.16	0.57
Control Delay	48.0	12.7	8.0		5.6	18.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	48.0	12.7	8.0		5.6	18.8
LOS	D	B	A		A	B
Approach Delay	32.8		8.0			18.3
Approach LOS	C		A			B

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	90	68	1268	60	1516
v/c Ratio	0.45	0.28	0.49	0.16	0.57
Control Delay	48.0	12.7	8.0	5.6	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	12.7	8.0	5.6	18.8
Queue Length 50th (m)	16.7	0.0	55.2	4.2	137.0
Queue Length 95th (m)	30.6	11.5	82.6	m7.9	167.4
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	295	328	2600	380	2659
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.31	0.21	0.49	0.16	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	0	0	17	0	41	0	1048	8	14	1484	5
Future Volume (vph)	16	0	0	17	0	41	0	1048	8	14	1484	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.850			0.999				
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1883	0	1825	1601	0	1883	3541	0	1825	3579	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1883	0	1825	1601	0	1883	3541	0	1825	3579	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		73.8			216.6			90.1			404.2	
Travel Time (s)		5.5			15.6			4.6			20.8	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	2%	3%	0%	0%	2%	2%
Adj. Flow (vph)	16	0	0	18	0	45	0	1139	9	15	1613	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	0	0	18	45	0	0	1148	0	15	1618	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 55.5% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	0	17	0	41	0	1048	8	14	1484	5
Future Volume (Veh/h)	16	0	0	17	0	41	0	1048	8	14	1484	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	16	0	0	18	0	45	0	1139	9	15	1613	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								373				
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	2260	2794	809	1980	2792	574	1618			1148		
vC1, stage 1 conf vol	1646	1646		1144	1144							
vC2, stage 2 conf vol	614	1148		836	1648							
vCu, unblocked vol	2128	2757	809	1798	2754	142	1618			818		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	100	100	92	100	94	100			98		
cM capacity (veh/h)	98	132	323	213	133	747	399			695		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	16	0	18	45	0	759	389	15	1075	543
Volume Left	16	0	18	0	0	0	0	15	0	0
Volume Right	0	0	0	45	0	0	9	0	0	5
cSH	98	1700	213	747	1700	1700	1700	695	1700	1700
Volume to Capacity	0.16	0.00	0.08	0.06	0.00	0.45	0.23	0.02	0.63	0.32
Queue Length 95th (m)	4.2	0.0	2.1	1.5	0.0	0.0	0.0	0.5	0.0	0.0
Control Delay (s)	48.9	0.0	23.4	10.1	0.0	0.0	0.0	10.3	0.0	0.0
Lane LOS	E	A	C	B				B		
Approach Delay (s)	48.9		13.9		0.0			0.1		
Approach LOS	E		B							

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		55.5%	ICU Level of Service	B
Analysis Period (min)		15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	17	1099	1	6	1459
Future Volume (vph)	5	17	1099	1	6	1459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.894					
Flt Protected	0.989				0.950	
Satd. Flow (prot)	1699	0	3544	0	1217	3614
Flt Permitted	0.989				0.950	
Satd. Flow (perm)	1699	0	3544	0	1217	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	50%	1%
Adj. Flow (vph)	5	18	1195	1	7	1586
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	1196	0	7	1586
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	17	1099	1	6	1459
Future Volume (Veh/h)	5	17	1099	1	6	1459
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	18	1195	1	7	1586
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.84	0.84			0.84	
vC, conflicting volume	2002	598			1196	
vC1, stage 1 conf vol	1196					
vC2, stage 2 conf vol	807					
vCu, unblocked vol	1808	130			844	
tC, single (s)	6.8	6.9			5.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.7	
p0 queue free %	98	98			98	
cM capacity (veh/h)	250	755			455	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	23	797	399	7	793	793
Volume Left	5	0	0	7	0	0
Volume Right	18	0	1	0	0	0
cSH	525	1700	1700	455	1700	1700
Volume to Capacity	0.04	0.47	0.23	0.02	0.47	0.47
Queue Length 95th (m)	1.0	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	12.2	0.0	0.0	13.0	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	12.2	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	0	43	2	0	25	11	974	6	0	1555	5
Future Volume (vph)	23	0	43	2	0	25	11	974	6	0	1555	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.912				0.865			0.850			
Flt Protected		0.983			0.950		0.950					
Satd. Flow (prot)	0	1688	0	0	0	1662	1789	3544	1396	0	3614	0
Flt Permitted		0.983			0.950		0.950					
Satd. Flow (perm)	0	1688	0	0	0	1662	1789	3544	1396	0	3614	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		70.1			245.5			191.7			91.0	
Travel Time (s)		5.3			17.7			9.9			4.7	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	17%	0%	1%	2%
Adj. Flow (vph)	23	0	43	2	0	27	11	1059	7	0	1690	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	66	0	0	2	27	11	1059	7	0	1695	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	0	43	2	0	25	11	974	6	0	1555	5
Future Volume (Veh/h)	23	0	43	2	0	25	11	974	6	0	1555	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	23	0	43	2	0	27	11	1059	7	0	1690	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								192				
pX, platoon unblocked	0.83	0.83		0.83	0.83	0.83				0.83		
vC, conflicting volume	2271	2774	848	1969	2776	530	1695			1059		
vC1, stage 1 conf vol	1692	1692		1081	1081							
vC2, stage 2 conf vol	578	1081		888	1695							
vCu, unblocked vol	2124	2728	848	1761	2731	32	1695			668		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	100	86	99	100	97	97			100		
cM capacity (veh/h)	94	132	305	197	123	867	372			775		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	66	29	11	530	530	7	1127	568
Volume Left	23	2	11	0	0	0	0	0
Volume Right	43	27	0	0	0	7	0	5
cSH	171	702	372	1700	1700	1700	1700	1700
Volume to Capacity	0.39	0.04	0.03	0.31	0.31	0.00	0.66	0.33
Queue Length 95th (m)	12.7	1.0	0.7	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	38.8	10.3	15.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	E	B	B					
Approach Delay (s)	38.8	10.3	0.2				0.0	
Approach LOS	E	B						

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		Err%	ICU Level of Service	H
Analysis Period (min)		15		

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	892	51	39	293	246	14	526	67	486	818	82
Future Volume (vph)	69	892	51	39	293	246	14	526	67	486	818	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.983			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3617	0	1825	1883	1526	1825	3526	0	1789	3596	0
Flt Permitted	0.519			0.097			0.293			0.131		
Satd. Flow (perm)	987	3617	0	186	1883	1526	563	3526	0	247	3596	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				267		9			11	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	2%	7%	0%	2%	0%	2%	0%	1%
Adj. Flow (vph)	75	970	55	42	318	267	15	572	73	528	889	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	1025	0	42	318	267	15	645	0	528	978	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

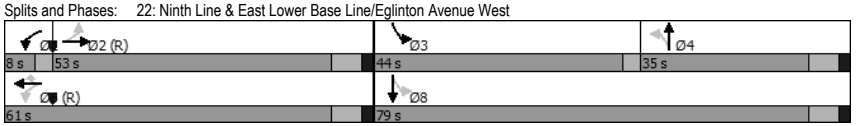
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		1	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		8.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	53.0	53.0		8.0	61.0	61.0	35.0	35.0		44.0	79.0	
Total Split (%)	37.9%	37.9%		5.7%	43.6%	43.6%	25.0%	25.0%		31.4%	56.4%	
Maximum Green (s)	46.0	46.0		5.0	54.0	54.0	28.0	28.0		41.0	72.0	
Yellow Time (s)	5.0	5.0		3.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		0.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min	Min	Min		None	Min	
Walk Time (s)	8.0	8.0			8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0			8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0			0	
Act Effct Green (s)	51.2	51.2		61.9	57.9	57.9	28.5	28.5		74.1	70.1	
Actuated g/C Ratio	0.37	0.37		0.44	0.41	0.41	0.20	0.20		0.53	0.50	
v/c Ratio	0.21	0.77		0.27	0.41	0.34	0.13	0.89		0.93	0.54	
Control Delay	34.9	45.2		28.3	31.9	4.3	48.7	68.6		61.3	24.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	34.9	45.2		28.3	31.9	4.3	48.7	68.6		61.3	24.6	
LOS	C	D		C	C	A	D	E		E	C	
Approach Delay		44.5			19.9			68.2			37.5	
Approach LOS		D			B			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 41.8 — Intersection LOS: D
Intersection Capacity Utilization 90.7% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	1025	42	318	267	15	645	528	978
v/c Ratio	0.21	0.77	0.27	0.41	0.34	0.13	0.89	0.93	0.54
Control Delay	34.9	45.2	28.3	31.9	4.3	48.7	68.6	61.3	24.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	45.2	28.3	31.9	4.3	48.7	68.6	61.3	24.6
Queue Length 50th (m)	14.9	137.7	6.8	63.8	0.0	3.4	90.7	119.6	89.9
Queue Length 95th (m)	28.0	165.2	14.3	90.2	17.1	10.1	#120.6	#182.5	108.3
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	360	1324	157	778	787	117	743	593	1880
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.77	0.27	0.41	0.34	0.13	0.87	0.89	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	145	22	159	235	14	33	25	249	21	37	13
Future Volume (vph)	7	145	22	159	235	14	33	25	249	21	37	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.995			0.890			0.975	
Flt Protected		0.998			0.981			0.995			0.985	
Satd. Flow (prot)	0	1794	0	0	1822	0	0	1663	0	0	1845	0
Flt Permitted		0.998			0.981			0.995			0.985	
Satd. Flow (perm)	0	1794	0	0	1822	0	0	1663	0	0	1845	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	9		16	16		9	10		27	27		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	4%	9%	3%	3%	0%	3%	4%	2%	0%	0%	0%
Adj. Flow (vph)	8	158	24	173	255	15	36	27	271	23	40	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	190	0	0	443	0	0	334	0	0	77	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 65.2%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	145	22	159	235	14	33	25	249	21	37	13
Future Volume (vph)	7	145	22	159	235	14	33	25	249	21	37	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	158	24	173	255	15	36	27	271	23	40	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	190	443	334	77
Volume Left (vph)	8	173	36	23
Volume Right (vph)	24	15	271	14
Hadj (s)	0.02	0.11	-0.43	-0.05
Departure Headway (s)	5.9	5.5	5.4	6.4
Degree Utilization, x	0.31	0.68	0.50	0.14
Capacity (veh/h)	550	623	609	464
Control Delay (s)	11.5	19.6	13.8	10.3
Approach Delay (s)	11.5	19.6	13.8	10.3
Approach LOS	B	C	B	B

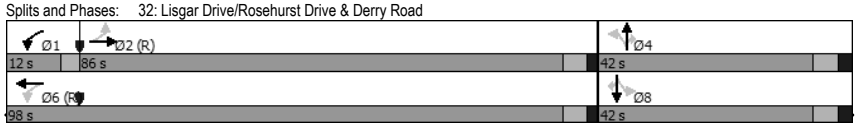
Intersection Summary			
Delay	15.6		
Level of Service	C		
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	2639	20	104	1160	132	95	43	361	224	92	92
Future Volume (vph)	22	2639	20	104	1160	132	95	43	361	224	92	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99		0.99		0.96	0.97		0.97
Frt		0.999			0.985				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5187	0	1684	4889	0	1750	1847	1617	1750	1795	1581
Flt Permitted	0.202			0.044			0.690			0.729		
Satd. Flow (perm)	377	5187	0	78	4889	0	1253	1847	1547	1303	1795	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			30				112			92
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	14		3	3		14	12		24	24		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	6%	5%	6%	2%	4%	1%	2%	7%	1%
Adj. Flow (vph)	22	2639	20	104	1160	132	95	43	361	224	92	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2659	0	104	1292	0	95	43	361	224	92	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		8.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	86.0	86.0		12.0	98.0		42.0	42.0	42.0	42.0	42.0	42.0
Total Split (%)	61.4%	61.4%		8.6%	70.0%		30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Maximum Green (s)	80.0	80.0		9.0	92.0		35.4	35.4	35.4	35.4	35.4	35.4
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		0.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		2.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0			12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0			18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	88.3	88.3		102.5	99.5		29.9	29.9	29.9	29.9	29.9	29.9
Actuated g/C Ratio	0.63	0.63		0.73	0.71		0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.09	0.81		0.64	0.37		0.35	0.11	0.86	0.81	0.24	0.23
Control Delay	4.8	5.8		43.1	8.7		49.0	42.1	56.0	73.0	45.3	9.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	5.8		43.1	8.7		49.0	42.1	56.0	73.0	45.3	9.0
LOS	A	A		D	A		D	D	E	E	D	A
Approach Delay		5.8			11.2			53.5			52.3	
Approach LOS		A			B			D			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 103.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	2659	104	1292	95	43	361	224	92	92
v/c Ratio	0.09	0.81	0.64	0.37	0.35	0.11	0.86	0.81	0.24	0.23
Control Delay	4.8	5.8	43.1	8.7	49.0	42.1	56.0	73.0	45.3	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	5.8	43.1	8.7	49.0	42.1	56.0	73.0	45.3	9.0
Queue Length 50th (m)	0.7	34.1	13.0	47.5	22.3	9.5	68.6	58.7	21.0	0.0
Queue Length 95th (m)	m1.0	39.5	#34.4	62.7	37.2	19.1	102.7	85.2	34.9	13.6
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	237	3271	173	3481	325	480	485	338	466	467
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.81	0.60	0.37	0.29	0.09	0.74	0.66	0.20	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	209	36	53	210	130	65	85	170	223	62	69
Future Volume (vph)	9	209	36	53	210	130	65	85	170	223	62	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.978			0.943			0.928			0.974	
Flt Protected	0.950			0.950				0.990			0.969	
Satd. Flow (prot)	1496	1839	0	1674	1787	0	0	1705	0	0	1776	0
Flt Permitted	0.950			0.950				0.990			0.969	
Satd. Flow (perm)	1496	1839	0	1674	1787	0	0	1705	0	0	1776	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	15		33	33		15	38		42	42		38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	2%	3%	9%	1%	2%	3%	7%	2%	1%	4%	4%
Adj. Flow (vph)	10	227	39	58	228	141	71	92	185	242	67	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	266	0	58	369	0	0	348	0	0	384	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 77.0% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	209	36	53	210	130	65	85	170	223	62	69
Future Volume (vph)	9	209	36	53	210	130	65	85	170	223	62	69
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	227	39	58	228	141	71	92	185	242	67	75

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	10	266	58	369	348	384
Volume Left (vph)	10	0	58	0	71	242
Volume Right (vph)	0	39	0	141	185	75
Hadj (s)	0.87	-0.07	0.65	-0.24	-0.22	0.04
Departure Headway (s)	9.7	8.7	9.0	8.1	7.8	7.8
Degree Utilization, x	0.03	0.64	0.15	0.83	0.75	0.84
Capacity (veh/h)	327	379	379	429	435	441
Control Delay (s)	11.7	24.8	12.4	38.8	30.5	39.8
Approach Delay (s)	24.3		35.3		30.5	39.8
Approach LOS	C		E		D	E

Intersection Summary			
Delay		33.2	
Level of Service		D	
Intersection Capacity Utilization		77.0%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	84	3	9	61	122	5	16	12	210	11	104
Future Volume (vph)	89	84	3	9	61	122	5	16	12	210	11	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.914			0.950			0.957	
Flt Protected		0.975			0.998			0.993			0.969	
Satd. Flow (prot)	0	1851	0	0	1752	0	0	1812	0	0	1748	0
Flt Permitted		0.975			0.998			0.993			0.969	
Satd. Flow (perm)	0	1851	0	0	1752	0	0	1812	0	0	1748	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	8		6	6		8	2		12	12		2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%
Adj. Flow (vph)	97	91	3	10	66	133	5	17	13	228	12	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	191	0	0	209	0	0	35	0	0	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 57.6%		ICU Level of Service B
Analysis Period (min) 15		

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	84	3	9	61	122	5	16	12	210	11	104
Future Volume (vph)	89	84	3	9	61	122	5	16	12	210	11	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	91	3	10	66	133	5	17	13	228	12	113

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	191	209	35	353
Volume Left (vph)	97	10	5	228
Volume Right (vph)	3	133	13	113
Hadj (s)	0.11	-0.37	-0.19	-0.03
Departure Headway (s)	5.3	4.9	5.3	5.0
Degree Utilization, x	0.28	0.28	0.05	0.49
Capacity (veh/h)	624	683	587	687
Control Delay (s)	10.4	9.7	8.6	12.6
Approach Delay (s)	10.4	9.7	8.6	12.6
Approach LOS	B	A	A	B

Intersection Summary				
Delay			11.1	
Level of Service			B	
Intersection Capacity Utilization			57.6%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2508	131	60	1003	17	31	3	209	74	16	17
Future Volume (vph)	1	2508	131	60	1003	17	31	3	209	74	16	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		0.99	0.97		0.99	0.99	
Frt		0.993			0.997			0.852			0.923	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5151	0	1552	5009	0	1733	1575	0	1785	1712	0
Flt Permitted	0.269			0.039			0.736			0.295		
Satd. Flow (perm)	503	5151	0	64	5009	0	1330	1575	0	549	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			5			72			17	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			101.9			114.1			106.4	
Travel Time (s)		28.2			6.1			8.2			7.7	
Confl. Peds. (#/hr)	8		4	4		8	6		10	10		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	4%	23%	3%	0%	1%	0%	5%	0%
Adj. Flow (vph)	1	2508	131	60	1003	17	31	3	209	74	16	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2639	0	60	1020	0	31	212	0	74	33	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

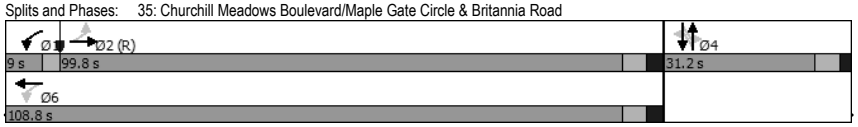
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			4	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		1	6		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		9.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	99.8	99.8		9.0	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	71.3%	71.3%		6.4%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	92.8	92.8		6.0	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		0.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-2.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0		5.2	5.2		4.2	5.2	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	11.0	11.0			11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0			18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	101.6	101.6		113.2	109.2		19.6	19.6		20.6	19.6	
Actuated g/C Ratio	0.73	0.73		0.81	0.78		0.14	0.14		0.15	0.14	
v/c Ratio	0.00	0.71		0.47	0.26		0.17	0.75		0.93	0.13	
Control Delay	4.0	4.3		27.9	4.8		52.2	53.8		139.0	30.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.0	4.3		27.9	4.8		52.2	53.8		139.0	30.2	
LOS	A	A		C	A		D	D		F	C	
Approach Delay		4.3			6.1			53.6			105.4	
Approach LOS		A			A			D			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 10.4 Intersection LOS: B
Intersection Capacity Utilization 86.9% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	2639	60	1020	31	212	74	33
v/c Ratio	0.00	0.71	0.47	0.26	0.17	0.75	0.93	0.13
Control Delay	4.0	4.3	27.9	4.8	52.2	53.8	139.0	30.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	4.3	27.9	4.8	52.2	53.8	139.0	30.2
Queue Length 50th (m)	0.0	39.0	2.9	25.2	7.6	37.7	20.3	3.9
Queue Length 95th (m)	m0.0	m39.8	18.2	36.1	16.6	63.1	#44.9	13.2
Internal Link Dist (m)		445.7		77.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	365	3742	130	3909	247	351	105	331
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.71	0.46	0.26	0.13	0.60	0.70	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	17	21	42	67	20	11	187	34	16	202	7
Future Volume (vph)	12	17	21	42	67	20	11	187	34	16	202	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.942			0.979			0.980			0.996	
Flt Protected		0.988			0.984			0.998			0.997	
Satd. Flow (prot)	0	1753	0	0	1771	0	0	1835	0	0	1795	0
Flt Permitted		0.988			0.984			0.998			0.997	
Satd. Flow (perm)	0	1753	0	0	1771	0	0	1835	0	0	1795	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)			13	13			16		13	13		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	0%	5%	4%	5%	0%	3%	0%	0%	7%	0%
Adj. Flow (vph)	13	18	23	46	73	22	12	203	37	17	220	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	141	0	0	252	0	0	245	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	17	21	42	67	20	11	187	34	16	202	7
Future Volume (Veh/h)	12	17	21	42	67	20	11	187	34	16	202	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	18	23	46	73	22	12	203	37	17	220	8
Pedestrians		16			13			13				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			1			1				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	578	551	253	562	536	234	244			253		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	578	551	253	562	536	234	244			253		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	96	97	88	83	97	99			99		
cM capacity (veh/h)	346	417	771	384	427	788	1316			1309		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	54	141	252	245
Volume Left	13	46	12	17
Volume Right	23	22	37	8
cSH	488	442	1316	1309
Volume to Capacity	0.11	0.32	0.01	0.01
Queue Length 95th (m)	2.8	10.3	0.2	0.3
Control Delay (s)	13.3	16.9	0.4	0.6
Lane LOS	B	C	A	A
Approach Delay (s)	13.3	16.9	0.4	0.6
Approach LOS	B	C		

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	199	31	90	72	29	13	212	161	61	242	11
Future Volume (vph)	23	199	31	90	72	29	13	212	161	61	242	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.979			0.944			0.995	
Flt Protected		0.995			0.977			0.998			0.990	
Satd. Flow (prot)	0	1749	0	0	1779	0	0	1769	0	0	1864	0
Flt Permitted		0.995			0.977			0.998			0.990	
Satd. Flow (perm)	0	1749	0	0	1779	0	0	1769	0	0	1864	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	19		71	71		19	20		20	20		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	9%	0%	2%	5%	3%	15%	1%	3%	0%	2%	0%
Adj. Flow (vph)	25	216	34	98	78	32	14	230	175	66	263	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	275	0	0	208	0	0	419	0	0	341	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 78.4%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	199	31	90	72	29	13	212	161	61	242	11
Future Volume (vph)	23	199	31	90	72	29	13	212	161	61	242	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	216	34	98	78	32	14	230	175	66	263	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	275	208	419	341
Volume Left (vph)	25	98	14	66
Volume Right (vph)	34	32	175	12
Hadj (s)	0.07	0.06	-0.20	0.04
Departure Headway (s)	7.1	7.3	6.3	6.7
Degree Utilization, x	0.54	0.42	0.74	0.64
Capacity (veh/h)	453	420	542	494
Control Delay (s)	18.2	15.6	25.1	20.9
Approach Delay (s)	18.2	15.6	25.1	20.9
Approach LOS	C	C	D	C

Intersection Summary			
Delay	20.8		
Level of Service	C		
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	519	14	104	245	181	20	257	68	181	303	63
Future Volume (vph)	131	519	14	104	245	181	20	257	68	181	303	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	1.00		0.99	0.97		1.00	0.99		0.98	1.00	
Frt		0.996			0.936			0.969			0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3590	0	1772	3145	0	1825	1799	0	1807	1819	0
Flt Permitted	0.456			0.384			0.389			0.434		
Satd. Flow (perm)	844	3590	0	711	3145	0	744	1799	0	808	1819	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			197			18			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	7%	3%	3%	8%	0%	2%	4%	1%	2%	5%
Adj. Flow (vph)	142	564	15	113	266	197	22	279	74	197	329	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	142	579	0	113	463	0	22	353	0	197	397	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	47.0	47.0		47.0	47.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.5%	46.5%		46.5%	46.5%		53.5%	53.5%		53.5%	53.5%	
Maximum Green (s)	40.5	40.5		40.5	40.5		48.0	48.0		48.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	47.3	47.3		47.3	47.3		43.2	43.2		43.2	43.2	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.43	0.43		0.43	0.43	
v/c Ratio	0.36	0.34		0.34	0.29		0.07	0.45		0.57	0.51	
Control Delay	24.6	21.1		21.4	10.0		17.1	21.3		29.2	22.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.6	21.1		21.4	10.0		17.1	21.3		29.2	22.7	
LOS	C	C		C	A		B	C		C	C	
Approach Delay		21.7			12.2			21.1			24.9	
Approach LOS		C			B			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 20.0	Intersection LOS: C
Intersection Capacity Utilization 113.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	579	113	463	22	353	197	397
v/c Ratio	0.36	0.34	0.34	0.29	0.07	0.45	0.57	0.51
Control Delay	24.6	21.1	21.4	10.0	17.1	21.3	29.2	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	21.1	21.4	10.0	17.1	21.3	29.2	22.7
Queue Length 50th (m)	17.6	37.3	13.2	15.0	2.5	46.4	29.2	54.6
Queue Length 95th (m)	m33.4	55.5	29.8	28.0	6.6	63.1	48.0	72.9
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	395	1683	333	1578	360	882	392	889
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.34	0.34	0.29	0.06	0.40	0.50	0.45

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	98	20	26	70	39	17	122	26	78	259	19
Future Volume (vph)	21	98	20	26	70	39	17	122	26	78	259	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.980			0.961			0.979			0.993	
Flt Protected		0.992			0.991			0.995			0.989	
Satd. Flow (prot)	0	1767	0	0	1788	0	0	1783	0	0	1787	0
Flt Permitted		0.992			0.991			0.995			0.989	
Satd. Flow (perm)	0	1767	0	0	1788	0	0	1783	0	0	1787	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	21		17	17		21	16		16	16		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	4%	3%	0%	6%	5%	4%	1%	7%	5%
Adj. Flow (vph)	23	107	22	28	76	42	18	133	28	85	282	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	152	0	0	146	0	0	179	0	0	388	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	98	20	26	70	39	17	122	26	78	259	19
Future Volume (vph)	21	98	20	26	70	39	17	122	26	78	259	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	107	22	28	76	42	18	133	28	85	282	21

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	152	146	179	388
Volume Left (vph)	23	28	18	85
Volume Right (vph)	22	42	28	21
Hadj (s)	0.04	-0.09	0.01	0.11
Departure Headway (s)	5.7	5.6	5.4	5.2
Degree Utilization, x	0.24	0.23	0.27	0.56
Capacity (veh/h)	561	570	618	669
Control Delay (s)	10.6	10.3	10.3	14.4
Approach Delay (s)	10.6	10.3	10.3	14.4
Approach LOS	B	B	B	B

Intersection Summary			
Delay		12.2	
Level of Service		B	
Intersection Capacity Utilization		52.5%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	214	15	29	124	14	22	129	121	67	260	36
Future Volume (vph)	22	214	15	29	124	14	22	129	121	67	260	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.989			0.940			0.987	
Flt Protected		0.996			0.991			0.996			0.991	
Satd. Flow (prot)	0	1750	0	0	1772	0	0	1720	0	0	1793	0
Flt Permitted		0.996			0.991			0.996			0.991	
Satd. Flow (perm)	0	1750	0	0	1772	0	0	1720	0	0	1793	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	8%	7%	7%	6%	7%	5%	6%	3%	1%	6%	3%
Adj. Flow (vph)	24	233	16	32	135	15	24	140	132	73	283	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	273	0	0	182	0	0	296	0	0	395	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	214	15	29	124	14	22	129	121	67	260	36
Future Volume (vph)	22	214	15	29	124	14	22	129	121	67	260	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	233	16	32	135	15	24	140	132	73	283	39

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	273	182	296	395
Volume Left (vph)	24	32	24	73
Volume Right (vph)	16	15	132	39
Hadj (s)	0.13	0.09	-0.17	0.06
Departure Headway (s)	6.7	6.9	6.2	6.2
Degree Utilization, x	0.51	0.35	0.51	0.68
Capacity (veh/h)	487	446	531	546
Control Delay (s)	16.3	13.5	15.4	21.2
Approach Delay (s)	16.3	13.5	15.4	21.2
Approach LOS	C	B	C	C

Intersection Summary				
Delay			17.3	
Level of Service			C	
Intersection Capacity Utilization			57.4%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	2163	1289	65	215	125
Future Volume (vph)	3	2163	1289	65	215	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt			0.993			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	3579	3443	0	1755	1183
Flt Permitted	0.164				0.950	
Satd. Flow (perm)	315	3579	3443	0	1755	1183
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			12			61
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	5%	8%	4%	38%
Adj. Flow (vph)	3	2163	1289	65	215	125
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	2163	1354	0	215	125
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

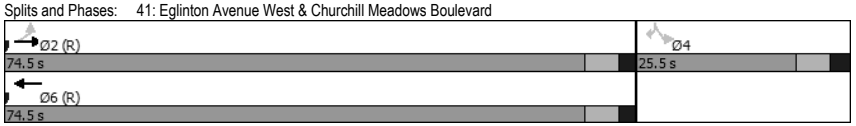
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				4	4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	24.0	24.0	24.0		25.5	25.5
Total Split (s)	74.5	74.5	74.5		25.5	25.5
Total Split (%)	74.5%	74.5%	74.5%		25.5%	25.5%
Maximum Green (s)	68.5	68.5	68.5		19.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	72.2	72.2	72.2		17.3	17.3
Actuated g/C Ratio	0.72	0.72	0.72		0.17	0.17
v/c Ratio	0.01	0.84	0.54		0.71	0.49
Control Delay	5.0	14.3	7.6		52.0	26.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	5.0	14.3	7.6		52.0	26.4
LOS	A	B	A		D	C
Approach Delay		14.3	7.6		42.6	
Approach LOS		B	A		D	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 14.5 — Intersection LOS: B
Intersection Capacity Utilization 80.5% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3	2163	1354	215	125
v/c Ratio	0.01	0.84	0.54	0.71	0.49
Control Delay	5.0	14.3	7.6	52.0	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	14.3	7.6	52.0	26.4
Queue Length 50th (m)	0.2	139.5	56.2	39.1	10.8
Queue Length 95th (m)	1.0	188.9	75.7	62.2	27.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	227	2585	2490	351	285
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.84	0.54	0.61	0.44

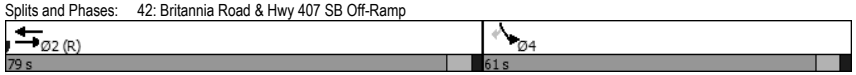
Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2022	657	0	433	6
Future Volume (vph)	0	2022	657	0	433	6
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5678	5622	0	1847	1524
Flt Permitted					0.950	
Satd. Flow (perm)	0	5678	5622	0	1847	1524
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						3
Link Speed (k/h)		80	80		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		9.3	13.4		15.0	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	0%	1%	2%	7%	16%
Adj. Flow (vph)	0	2042	664	0	437	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2042	664	0	437	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		79.0	79.0		61.0	61.0
Total Split (%)		56.4%	56.4%		43.6%	43.6%
Maximum Green (s)		73.0	73.0		55.0	55.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		88.7	88.7		39.3	39.3
Actuated g/C Ratio		0.63	0.63		0.28	0.28
v/c Ratio		0.57	0.19		0.84	0.01
Control Delay		16.4	4.6		62.0	24.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		16.4	4.6		62.0	24.5
LOS		B	A		E	C
Approach Delay		16.4	4.6		61.5	
Approach LOS		B	A		E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 20.2	Intersection LOS: C
Intersection Capacity Utilization 69.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2042	664	437	6
v/c Ratio	0.57	0.19	0.84	0.01
Control Delay	16.4	4.6	62.0	24.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.4	4.6	62.0	24.5
Queue Length 50th (m)	112.3	7.9	114.3	0.6
Queue Length 95th (m)	151.2	9.3	140.0	3.6
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3595	3560	725	600
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.57	0.19	0.60	0.01

Intersection Summary

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2349	0	0	812	11	309
Future Volume (vph)	2349	0	0	812	11	309
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5678	0	0	5622	1847	1768
Flt Permitted					0.950	
Satd. Flow (perm)	5678	0	0	5622	1847	1768
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	80			80	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	13.4			9.8	11.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	1%	7%	0%
Adj. Flow (vph)	2447	0	0	846	11	322
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2447	0	0	846	11	322
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

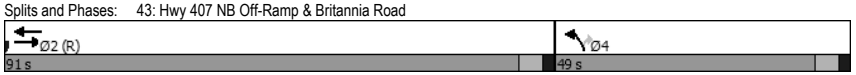
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	91.0			91.0	49.0	49.0
Total Split (%)	65.0%			65.0%	35.0%	35.0%
Maximum Green (s)	85.0			85.0	43.0	43.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	97.1			97.1	30.9	30.9
Actuated g/C Ratio	0.69			0.69	0.22	0.22
v/c Ratio	0.62			0.22	0.03	0.83
Control Delay	5.9			8.4	38.9	69.0
Queue Delay	0.2			0.0	0.0	0.0
Total Delay	6.1			8.4	38.9	69.0
LOS	A			A	D	E
Approach Delay	6.1			8.4	68.1	
Approach LOS	A			A	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 12.3 Intersection LOS: B
Intersection Capacity Utilization 69.6% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2447	846	11	322
v/c Ratio	0.62	0.22	0.03	0.83
Control Delay	5.9	8.4	38.9	69.0
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	6.1	8.4	38.9	69.0
Queue Length 50th (m)	48.9	24.6	2.4	85.6
Queue Length 95th (m)	51.4	m31.8	7.1	111.1
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3938	3899	567	543
Starvation Cap Reductn	15	0	0	0
Spillback Cap Reductn	583	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.22	0.02	0.59

Intersection Summary

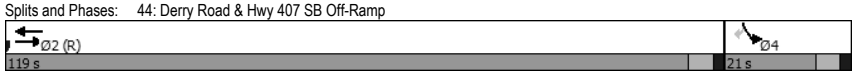
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3237	767	0	27	36
Future Volume (vph)	0	3237	767	0	27	36
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5622	5408	0	3686	1414
Flt Permitted					0.950	
Satd. Flow (perm)	0	5622	5408	0	3686	1414
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						38
Link Speed (k/h)		80	80		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		15.0	13.9		13.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	1%	5%	2%	4%	25%
Adj. Flow (vph)	0	3372	799	0	28	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	3372	799	0	28	38
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		119.0	119.0		21.0	21.0
Total Split (%)		85.0%	85.0%		15.0%	15.0%
Maximum Green (s)		113.0	113.0		15.0	15.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		123.7	123.7		8.3	8.3
Actuated g/C Ratio		0.88	0.88		0.06	0.06
v/c Ratio		0.68	0.17		0.13	0.32
Control Delay		4.0	0.5		63.6	25.3
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		4.0	0.5		63.6	25.3
LOS		A	A		E	C
Approach Delay		4.0	0.5		41.5	
Approach LOS		A	A		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 3.9	Intersection LOS: A
Intersection Capacity Utilization 74.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3372	799	28	38
v/c Ratio	0.68	0.17	0.13	0.32
Control Delay	4.0	0.5	63.6	25.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.0	0.5	63.6	25.3
Queue Length 50th (m)	91.6	3.1	3.8	0.0
Queue Length 95th (m)	108.2	3.1	8.9	11.4
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4968	4779	394	185
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.17	0.07	0.21

Intersection Summary

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2505	0	0	941	14	148
Future Volume (vph)	2505	0	0	941	14	148
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5622	0	0	5408	3582	1716
Flt Permitted					0.950	
Satd. Flow (perm)	5622	0	0	5408	3582	1716
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						151
Link Speed (k/h)	80			80	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	13.9			10.3	15.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	2%	2%	5%	7%	3%
Adj. Flow (vph)	2556	0	0	960	14	151
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2556	0	0	960	14	151
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

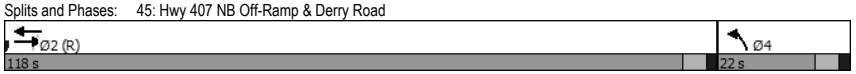
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	118.0			118.0	22.0	118.0
Total Split (%)	84.3%			84.3%	15.7%	84.3%
Maximum Green (s)	112.0			112.0	16.0	112.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	132.0			132.0	8.0	132.0
Actuated g/C Ratio	0.94			0.94	0.06	0.94
v/c Ratio	0.48			0.19	0.07	0.09
Control Delay	1.0			0.3	63.4	0.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	1.0			0.3	63.4	0.3
LOS	A			A	E	A
Approach Delay	1.0			0.3	5.7	
Approach LOS	A			A	A	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:WBEB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 1.0 Intersection LOS: A
Intersection Capacity Utilization 74.4% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2556	960	14	151
v/c Ratio	0.48	0.19	0.07	0.09
Control Delay	1.0	0.3	63.4	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.0	0.3	63.4	0.3
Queue Length 50th (m)	0.0	0.0	1.9	0.0
Queue Length 95th (m)	30.9	m3.1	5.6	2.4
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	5300	5099	409	1626
Starvation Cap Reductn	152	0	0	0
Spillback Cap Reductn	136	0	0	41
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.19	0.03	0.10

Intersection Summary

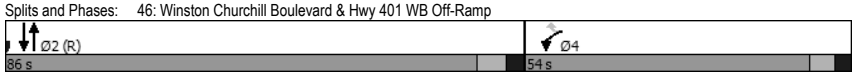
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	468	495	1649	0	0	2347
Future Volume (vph)	468	495	1649	0	0	2347
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.956	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3404	1424	5513	0	0	5408
Flt Permitted	0.966					
Satd. Flow (perm)	3404	1424	5513	0	0	5408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	11	11				
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	8%	13%	3%	2%	0%	5%
Adj. Flow (vph)	532	563	1874	0	0	2667
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	752	343	1874	0	0	2667
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	54.0	54.0	86.0			86.0
Total Split (%)	38.6%	38.6%	61.4%			61.4%
Maximum Green (s)	47.0	47.0	78.0			78.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	39.1	39.1	85.9			85.9
Actuated g/C Ratio	0.28	0.28	0.61			0.61
v/c Ratio	0.78	0.85	0.55			0.80
Control Delay	51.7	64.7	15.7			24.2
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	51.7	64.7	15.7			24.2
LOS	D	E	B			C
Approach Delay	55.8		15.7			24.2
Approach LOS	E		B			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 102.2 (73%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 27.5		Intersection LOS: C	
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	752	343	1874	2667
v/c Ratio	0.78	0.85	0.55	0.80
Control Delay	51.7	64.7	15.7	24.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	51.7	64.7	15.7	24.2
Queue Length 50th (m)	97.2	95.2	99.3	199.1
Queue Length 95th (m)	107.9	123.9	117.2	238.3
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1150	485	3383	3319
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.71	0.55	0.80

Intersection Summary

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	698	367	0	1400	2309	0
Future Volume (vph)	698	367	0	1400	2309	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.992	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3681	1593	0	5567	5408	0
Flt Permitted	0.955					
Satd. Flow (perm)	3681	1593	0	5567	5408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1	1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	4%	1%	0%	2%	5%	8%
Adj. Flow (vph)	793	417	0	1591	2624	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	835	375	0	1591	2624	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

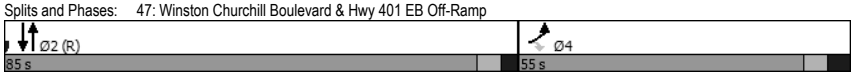
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	55.0	55.0		85.0	85.0	
Total Split (%)	39.3%	39.3%		60.7%	60.7%	
Maximum Green (s)	47.0	47.0		78.0	78.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	39.7	39.7		85.3	85.3	
Actuated g/C Ratio	0.28	0.28		0.61	0.61	
v/c Ratio	0.80	0.83		0.47	0.80	
Control Delay	52.3	62.3		16.2	21.0	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	52.3	62.3		16.2	21.0	
LOS	D	E		B	C	
Approach Delay	55.4			16.2	21.0	
Approach LOS	E			B	C	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 92.4 (66%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 27.3 Intersection LOS: C
Intersection Capacity Utilization 75.6% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	835	375	1591	2624
v/c Ratio	0.80	0.83	0.47	0.80
Control Delay	52.3	62.3	16.2	21.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.3	62.3	16.2	21.0
Queue Length 50th (m)	110.5	106.8	84.2	137.5
Queue Length 95th (m)	120.5	135.4	105.3	197.0
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	1236	535	3390	3293
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.70	0.47	0.80

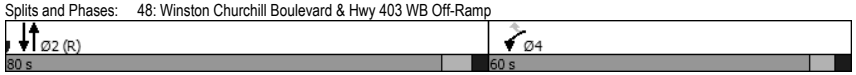
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	983	919	2552	0	0	2934
Future Volume (vph)	983	919	2552	0	0	2934
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.963	0.850				
Flt Protected	0.964					
Satd. Flow (prot)	3550	1547	5513	0	0	5513
Flt Permitted	0.964					
Satd. Flow (perm)	3548	1547	5513	0	0	5513
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	1	1				
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	4%	3%	0%	0%	3%
Adj. Flow (vph)	1046	978	2715	0	0	3121
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	1388	636	2715	0	0	3121
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	60.0	60.0	80.0			80.0
Total Split (%)	42.9%	42.9%	57.1%			57.1%
Maximum Green (s)	53.0	53.0	72.0			72.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	53.0	53.0	72.0			72.0
Actuated g/C Ratio	0.38	0.38	0.51			0.51
v/c Ratio	1.03	1.09	0.96			1.10
Control Delay	75.8	103.5	40.7			84.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	75.8	103.5	40.7			84.5
LOS	E	F	D			F
Approach Delay	84.5		40.7			84.5
Approach LOS	F		D			F

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 117.6 (84%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 69.4		Intersection LOS: E	
Intersection Capacity Utilization 133.5%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1388	636	2715	3121
v/c Ratio	1.03	1.09	0.96	1.10
Control Delay	75.8	103.5	40.7	84.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	75.8	103.5	40.7	84.5
Queue Length 50th (m)	~212.0	~216.7	222.9	~358.4
Queue Length 95th (m)	#254.3	#296.7	#271.9	#380.9
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1344	586	2835	2835
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	1.09	0.96	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1211	435	0	1553	2554	0
Future Volume (vph)	1211	435	0	1553	2554	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor	1.00					
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3795	1733	0	5460	5513	0
Flt Permitted	0.950					
Satd. Flow (perm)	3789	1733	0	5460	5513	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	0%	4%	3%	0%
Adj. Flow (vph)	1261	453	0	1618	2660	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1261	453	0	1618	2660	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

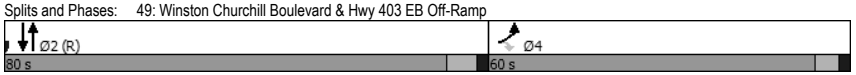
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	60.0	60.0		80.0	80.0	
Total Split (%)	42.9%	42.9%		57.1%	57.1%	
Maximum Green (s)	54.0	54.0		73.0	73.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	51.9	51.9		75.1	75.1	
Actuated g/C Ratio	0.37	0.37		0.54	0.54	
v/c Ratio	0.90	0.70		0.55	0.90	
Control Delay	50.8	44.0		22.6	35.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	50.8	44.0		22.6	35.3	
LOS	D	D		C	D	
Approach Delay	49.0			22.6	35.3	
Approach LOS	D			C	D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 50.4 (36%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 35.8 Intersection LOS: D
Intersection Capacity Utilization 133.5% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1261	453	1618	2660
v/c Ratio	0.90	0.70	0.55	0.90
Control Delay	50.8	44.0	22.6	35.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	50.8	44.0	22.6	35.3
Queue Length 50th (m)	164.4	103.4	108.5	265.0
Queue Length 95th (m)	193.4	142.5	122.4	m236.3
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	1463	669	2928	2956
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.86	0.68	0.55	0.90

Intersection Summary

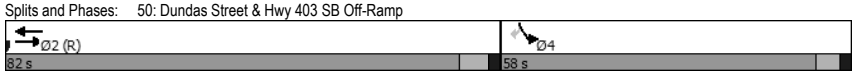
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3054	638	0	1372	560
Future Volume (vph)	0	3054	638	0	1372	560
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.994	0.850
Flt Protected					0.954	
Satd. Flow (prot)	0	5567	5307	0	3636	1449
Flt Permitted					0.954	
Satd. Flow (perm)	0	5567	5307	0	3636	1449
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					3	219
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	7%	0%	5%	11%
Adj. Flow (vph)	0	3148	658	0	1414	577
Shared Lane Traffic (%)						10%
Lane Group Flow (vph)	0	3148	658	0	1472	519
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		82.0	82.0		58.0	58.0
Total Split (%)		58.6%	58.6%		41.4%	41.4%
Maximum Green (s)		75.0	75.0		52.0	52.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		75.0	75.0		52.0	52.0
Actuated g/C Ratio		0.54	0.54		0.37	0.37
v/c Ratio		1.06	0.23		1.09	0.77
Control Delay		65.7	7.7		93.8	30.4
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		65.7	7.7		93.8	30.4
LOS		E	A		F	C
Approach Delay		65.7	7.7		77.3	
Approach LOS		E	A		E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 22.4 (16%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 63.1	Intersection LOS: E
Intersection Capacity Utilization 106.9%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3148	658	1472	519
v/c Ratio	1.06	0.23	1.09	0.77
Control Delay	65.7	7.7	93.8	30.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	65.7	7.7	93.8	30.4
Queue Length 50th (m)	~348.6	12.3	~235.8	84.1
Queue Length 95th (m)	#370.9	14.7	#278.1	137.0
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	2982	2843	1352	675
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	0.23	1.09	0.77

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2880	0	0	1062	139	1105
Future Volume (vph)	2880	0	0	1062	139	1105
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Ped Bike Factor					1.00	
Frt					0.880	0.850
Flt Protected					0.990	
Satd. Flow (prot)	5513	0	0	5357	3453	1577
Flt Permitted					0.990	
Satd. Flow (perm)	5513	0	0	5357	3452	1577
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	0%	6%	1%	2%
Adj. Flow (vph)	3200	0	0	1180	154	1228
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	3200	0	0	1180	768	614
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	83.0			83.0	57.0	57.0
Total Split (%)	59.3%			59.3%	40.7%	40.7%
Maximum Green (s)	76.0			76.0	51.0	51.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	76.0			76.0	51.0	51.0
Actuated g/C Ratio	0.54			0.54	0.36	0.36
v/c Ratio	1.07			0.41	0.97dr	1.07
Control Delay	62.9			19.3	38.9	99.9
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	62.9			19.3	38.9	99.9
LOS	E			B	D	F
Approach Delay	62.9			19.3	66.0	
Approach LOS	E			B	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8.4 (6%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 54.7 Intersection LOS: D
Intersection Capacity Utilization 106.9% ICU Level of Service G
Analysis Period (min) 15
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street

Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	3200	1180	768	614
v/c Ratio	1.07	0.41	0.97dr	1.07
Control Delay	62.9	19.3	38.9	99.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	62.9	19.3	38.9	99.9
Queue Length 50th (m)	~356.4	67.8	89.2	~206.2
Queue Length 95th (m)	m#272.3	78.6	109.8	#285.1
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	2992	2908	1257	574
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.07	0.41	0.61	1.07

Intersection Summary

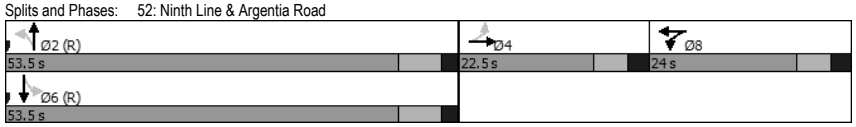
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	48	59	182	12	40	71	374	202	104	518	72
Future Volume (vph)	10	48	59	182	12	40	71	374	202	104	518	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	20.0		45.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.917			0.885			0.947			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1727	0	1789	1667	0	1789	3389	0	1789	3514	0
Flt Permitted	0.374			0.950			0.405			0.413		
Satd. Flow (perm)	704	1727	0	1789	1667	0	763	3389	0	778	3514	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		53			40			137			21	
Link Speed (k/h)		48			48			70			70	
Link Distance (m)		157.8			273.4			780.0			514.0	
Travel Time (s)		11.8			20.5			40.1			26.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	48	59	182	12	40	71	374	202	104	518	72
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	107	0	182	52	0	71	576	0	104	590	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases		4		8	8			2			6	
Permitted Phases	4						2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		52.0	52.0		52.0	52.0	
Total Split (s)	22.5	22.5		24.0	24.0		53.5	53.5		53.5	53.5	
Total Split (%)	22.5%	22.5%		24.0%	24.0%		53.5%	53.5%		53.5%	53.5%	
Maximum Green (s)	16.0	16.0		17.5	17.5		46.5	46.5		46.5	46.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	10.7	10.7		16.2	16.2		56.1	56.1		56.1	56.1	
Actuated g/C Ratio	0.11	0.11		0.16	0.16		0.56	0.56		0.56	0.56	
v/c Ratio	0.14	0.46		0.63	0.17		0.17	0.29		0.24	0.30	
Control Delay	43.3	29.2		48.4	15.6		11.8	7.9		14.8	12.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	43.3	29.2		48.4	15.6		11.8	7.9		14.8	12.5	
LOS	D	C		D	B		B	A		B	B	
Approach Delay		30.4			41.1			8.3			12.9	
Approach LOS		C			D			A			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 16.2	Intersection LOS: B
Intersection Capacity Utilization 54.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 52: Ninth Line & Argentia Road



Queues
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	107	182	52	71	576	104	590
v/c Ratio	0.14	0.46	0.63	0.17	0.17	0.29	0.24	0.30
Control Delay	43.3	29.2	48.4	15.6	11.8	7.9	14.8	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	29.2	48.4	15.6	11.8	7.9	14.8	12.5
Queue Length 50th (m)	1.8	9.9	33.2	2.0	5.4	16.2	9.4	27.8
Queue Length 95th (m)	6.6	24.8	51.8	11.4	12.9	26.8	23.8	47.4
Internal Link Dist (m)		133.8		249.4		756.0		490.0
Turn Bay Length (m)					20.0		20.0	
Base Capacity (vph)	119	337	341	350	428	1962	436	1982
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.32	0.53	0.15	0.17	0.29	0.24	0.30

Intersection Summary

Lanes, Volumes, Timings
97: Ninth Line & Foxwood Ave

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	772	0	0	661
Future Volume (vph)	0	0	772	0	0	661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				15.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	3579	0	1883	3579
Flt Permitted						
Satd. Flow (perm)	1883	0	3579	0	1883	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	226.1		301.0			850.0
Travel Time (s)	17.0		15.5			43.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	772	0	0	661
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	772	0	0	661
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 24.7% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
97: Ninth Line & Foxwood Ave

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	772	0	0	661
Future Volume (Veh/h)	0	0	772	0	0	661
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	772	0	0	661
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			301			
pX, platoon unblocked						
vC, conflicting volume	1102	386			772	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1102	386			772	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	206	612			839	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	386	386	0	330	330
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.23	0.23	0.00	0.19	0.19
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
136: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1165	275	0	1169	0	0
Future Volume (vph)	1165	275	0	1169	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	125.7	
Travel Time (s)	15.5			6.8	9.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1165	275	0	1169	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1165	275	0	1169	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1315	85	58	752
Future Volume (vph)	90	47	1315	85	58	752
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.98				
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3546	0	1825	3544
Flt Permitted	0.950				0.145	
Satd. Flow (perm)	1807	1607	3546	0	279	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	15			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1429	92	63	817
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1521	0	63	817
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

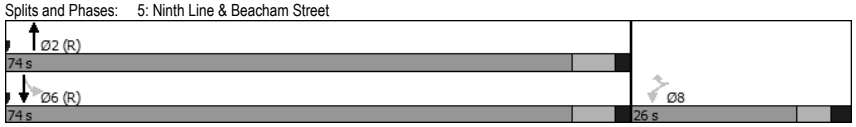
16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	26.0	26.0	74.0		74.0	74.0
Total Split (%)	26.0%	26.0%	74.0%		74.0%	74.0%
Maximum Green (s)	19.5	19.5	67.0		67.0	67.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	12.0	12.0	80.6		80.6	80.6
Actuated g/C Ratio	0.12	0.12	0.81		0.81	0.81
v/c Ratio	0.45	0.22	0.53		0.28	0.29
Control Delay	47.1	13.1	5.4		8.0	3.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.1	13.1	5.4		8.0	3.7
LOS	D	B	A		A	A
Approach Delay	35.5		5.4			4.0
Approach LOS	D		A			A

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 6.7 — Intersection LOS: A
Intersection Capacity Utilization 64.9% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	98	51	1521	63	817
v/c Ratio	0.45	0.22	0.53	0.28	0.29
Control Delay	47.1	13.1	5.4	8.0	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	13.1	5.4	8.0	3.7
Queue Length 50th (m)	18.0	0.0	50.4	3.0	20.3
Queue Length 95th (m)	32.2	9.9	77.7	10.5	32.4
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	370	369	2861	224	2856
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.14	0.53	0.28	0.29

Intersection Summary

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	3	599	7	3	702
Future Volume (vph)	11	3	599	7	3	702
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950					
Satd. Flow (prot)	1825	1633	1880	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1633	1880	0	0	1865
Link Speed (k/h)	48		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.3		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	3%
Adj. Flow (vph)	12	3	651	8	3	763
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	3	659	0	0	766
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	3	599	7	3	702
Future Volume (Veh/h)	11	3	599	7	3	702
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	3	651	8	3	763
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1424	655			659	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1424	655			659	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	99			100	
cM capacity (veh/h)	151	470			939	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	15	659	766
Volume Left	12	0	3
Volume Right	3	8	0
cSH	188	1700	939
Volume to Capacity	0.08	0.39	0.00
Queue Length 95th (m)	2.0	0.0	0.1
Control Delay (s)	27.3	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	27.3	0.0	0.1
Approach LOS	D		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	104	480	46	18	32	67	763	86	103	825	51
Future Volume (vph)	86	104	480	46	18	32	67	763	86	103	825	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.877			0.901			0.985			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1652	0	1825	1644	0	1789	3553	0	1722	3517	0
Flt Permitted	0.722			0.147			0.228			0.238		
Satd. Flow (perm)	1360	1652	0	282	1644	0	429	3553	0	431	3517	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		86			35			16			8	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		131.8			287.6			434.9			780.0	
Travel Time (s)		9.9			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	7%	2%	1%	3%	6%	3%	2%
Adj. Flow (vph)	86	104	480	50	18	35	67	829	93	112	897	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	86	584	0	50	53	0	67	922	0	112	948	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

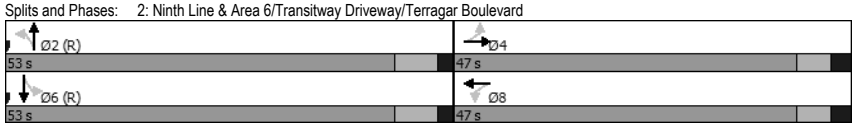
Lanes, Volumes, Timings
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		53.0	53.0		52.0	52.0	
Total Split (s)	47.0	47.0		47.0	47.0		53.0	53.0		53.0	53.0	
Total Split (%)	47.0%	47.0%		47.0%	47.0%		53.0%	53.0%		53.0%	53.0%	
Maximum Green (s)	40.5	40.5		40.5	40.5		46.0	46.0		46.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.0	37.0		37.0	37.0		51.5	51.5		51.5	51.5	
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.52	0.52		0.52	0.52	
v/c Ratio	0.17	0.88		0.48	0.08		0.30	0.50		0.50	0.52	
Control Delay	20.5	40.1		39.7	9.1		21.0	17.6		28.0	17.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.5	40.1		39.7	9.1		21.0	17.6		28.0	17.7	
LOS	C	D		D	A		C	B		C	B	
Approach Delay		37.6			24.0			17.9			18.8	
Approach LOS		D			C			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 83.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	86	584	50	53	67	922	112	948
v/c Ratio	0.17	0.88	0.48	0.08	0.30	0.50	0.50	0.52
Control Delay	20.5	40.1	39.7	9.1	21.0	17.6	28.0	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	40.1	39.7	9.1	21.0	17.6	28.0	17.7
Queue Length 50th (m)	10.5	86.6	7.0	2.1	7.6	61.3	14.4	64.3
Queue Length 95th (m)	20.1	#131.8	19.4	9.1	19.1	81.8	33.8	89.3
Internal Link Dist (m)		107.8		263.6		410.9		756.0
Turn Bay Length (m)					40.0		40.0	
Base Capacity (vph)	564	735	117	702	220	1838	222	1815
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.79	0.43	0.08	0.30	0.50	0.50	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	58	28	0	17	25	758	45	35	1288	9
Future Volume (vph)	5	0	58	28	0	17	25	758	45	35	1288	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.992			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1541	0	1789	3517	0	1825	3575	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1541	0	1789	3517	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		124.9			310.4			412.4			434.9	
Travel Time (s)		9.4			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	6%	2%	3%	2%	0%	2%	2%
Adj. Flow (vph)	5	0	58	30	0	18	25	824	49	38	1400	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	58	0	30	18	0	25	873	0	38	1409	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 50.8% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	58	28	0	17	25	758	45	35	1288	9
Future Volume (Veh/h)	5	0	58	28	0	17	25	758	45	35	1288	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	5	0	58	30	0	18	25	824	49	38	1400	9
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1960	2404	704	1732	2384	436	1409			873		
vC1, stage 1 conf vol	1480	1480		898	898							
vC2, stage 2 conf vol	480	923		834	1485							
vCu, unblocked vol	1960	2404	704	1732	2384	436	1409			873		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	96	100	85	84	100	97	95			95		
cM capacity (veh/h)	119	149	379	186	137	557	480			781		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	5	58	30	18	25	549	324	38	933	476
Volume Left	5	0	30	0	25	0	0	38	0	0
Volume Right	0	58	0	18	0	0	49	0	0	9
cSH	119	379	186	557	480	1700	1700	781	1700	1700
Volume to Capacity	0.04	0.15	0.16	0.03	0.05	0.32	0.19	0.05	0.55	0.28
Queue Length 95th (m)	1.0	4.1	4.3	0.8	1.2	0.0	0.0	1.2	0.0	0.0
Control Delay (s)	36.6	16.2	28.1	11.7	12.9	0.0	0.0	9.8	0.0	0.0
Lane LOS	E	C	D	B	B			A		
Approach Delay (s)	17.8		21.9		0.4			0.3		
Approach LOS	C		C							

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		50.8%	ICU Level of Service
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	707	242	230	1689	97	142	600	217	207	826	209
Future Volume (vph)	163	707	242	230	1689	97	142	600	217	207	826	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00							
Frt		0.962			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	4923	0	1785	5139	0	1767	3650	1597	1733	3650	1597
Flt Permitted	0.070			0.208			0.156			0.382		
Satd. Flow (perm)	132	4923	0	391	5139	0	290	3650	1597	697	3650	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66			7				217			176
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	4%	1%	0%	0%	3%	0%	0%
Adj. Flow (vph)	163	707	242	230	1689	97	142	600	217	207	826	209
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	949	0	230	1786	0	142	600	217	207	826	209
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

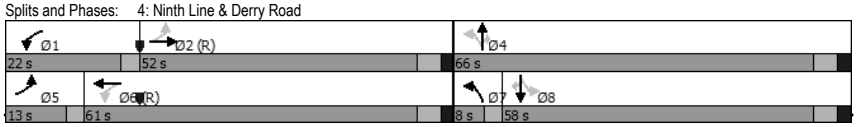
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	30.1		8.0	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	13.0	52.0		22.0	61.0		8.0	66.0	66.0	58.0	58.0	58.0
Total Split (%)	9.3%	37.1%		15.7%	43.6%		5.7%	47.1%	47.1%	41.4%	41.4%	41.4%
Maximum Green (s)	10.0	45.9		19.0	54.9		5.0	59.6	59.6	51.6	51.6	51.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.1		0.0	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.1		2.0	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0	0	0	0
Act Effct Green (s)	71.7	57.2		77.5	61.5		58.0	54.6	54.6	46.6	46.6	46.6
Actuated g/C Ratio	0.51	0.41		0.55	0.44		0.41	0.39	0.39	0.33	0.33	0.33
v/c Ratio	0.81	0.46		0.62	0.79		0.78	0.42	0.29	0.90	0.68	0.32
Control Delay	70.8	24.0		21.2	33.7		55.1	31.5	3.9	80.8	42.8	7.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	24.0		21.2	33.7		55.1	31.5	3.9	80.8	42.8	7.8
LOS	E	C		C	C		E	C	A	F	D	A
Approach Delay		30.8			32.3			28.7			43.3	
Approach LOS		C			C			C			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 33.9 Intersection LOS: C
Intersection Capacity Utilization 89.9% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	163	949	230	1786	142	600	217	207	826	209
v/c Ratio	0.81	0.46	0.62	0.79	0.78	0.42	0.29	0.90	0.68	0.32
Control Delay	70.8	24.0	21.2	33.7	55.1	31.5	3.9	80.8	42.8	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	24.0	21.2	33.7	55.1	31.5	3.9	80.8	42.8	7.8
Queue Length 50th (m)	30.6	52.5	22.5	166.1	23.4	59.8	0.0	51.7	98.5	5.9
Queue Length 95th (m)	#70.8	51.9	28.4	186.8	#43.1	73.6	14.6	#93.7	117.6	22.9
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	205	2049	416	2260	183	1579	814	261	1371	709
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.46	0.55	0.79	0.78	0.38	0.27	0.79	0.60	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	997	67	49	1479
Future Volume (vph)	46	47	997	67	49	1479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3484	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1585	3484	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	1084	73	53	1608
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	1157	0	53	1608
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	47	997	67	49	1479
Future Volume (Veh/h)	46	47	997	67	49	1479
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	51	1084	73	53	1608
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2030	580			1157	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2030	580			1157	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	89			91	
cM capacity (veh/h)	45	454			611	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	101	723	434	53	804	804
Volume Left	50	0	0	53	0	0
Volume Right	51	0	73	0	0	0
cSH	87	1700	1700	611	1700	1700
Volume to Capacity	1.17	0.43	0.26	0.09	0.47	0.47
Queue Length 95th (m)	54.1	0.0	0.0	2.2	0.0	0.0
Control Delay (s)	236.5	0.0	0.0	11.4	0.0	0.0
Lane LOS	F			B		
Approach Delay (s)	236.5	0.0		0.4		
Approach LOS	F					

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	53	32	66	71	62	55	1011	108	100	1211	50
Future Volume (vph)	31	53	32	66	71	62	55	1011	108	100	1211	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		27.0	50.0		60.0	115.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.944			0.927			0.986			0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1778	0	1789	1734	0	1789	3535	0	1825	3561	0
Flt Permitted	0.569			0.702			0.173			0.209		
Satd. Flow (perm)	1072	1778	0	1322	1734	0	326	3535	0	402	3561	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			44			23			8	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		104.1			255.0			1151.0			603.1	
Travel Time (s)		7.8			18.4			59.2			31.0	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	31	53	32	72	71	67	55	1099	117	109	1316	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	85	0	72	138	0	55	1216	0	109	1366	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

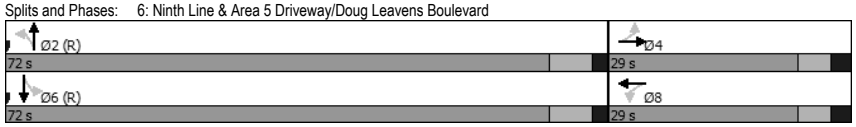
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		45.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		53.0	53.0		53.0	53.0	
Total Split (s)	29.0	29.0		29.0	29.0		72.0	72.0		72.0	72.0	
Total Split (%)	28.7%	28.7%		28.7%	28.7%		71.3%	71.3%		71.3%	71.3%	
Maximum Green (s)	22.5	22.5		22.5	22.5		65.0	65.0		65.0	65.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	12.4	12.4		12.4	12.4		77.1	77.1		77.1	77.1	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.76	0.76		0.76	0.76	
v/c Ratio	0.24	0.35		0.44	0.55		0.22	0.45		0.36	0.50	
Control Delay	43.0	31.4		48.9	35.9		13.8	12.3		8.4	5.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	43.0	31.4		48.9	35.9		13.8	12.3		8.4	5.6	
LOS	D	C		D	D		B	B		A	A	
Approach Delay		34.5			40.4			12.3			5.9	
Approach LOS		C			D			B			A	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 12.0 — Intersection LOS: B
Intersection Capacity Utilization 108.6% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard



Queues
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	31	85	72	138	55	1216	109	1366
v/c Ratio	0.24	0.35	0.44	0.55	0.22	0.45	0.36	0.50
Control Delay	43.0	31.4	48.9	35.9	13.8	12.3	8.4	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	31.4	48.9	35.9	13.8	12.3	8.4	5.6
Queue Length 50th (m)	5.6	10.3	13.4	17.4	5.7	81.8	5.5	42.5
Queue Length 95th (m)	13.6	23.1	25.7	34.2	m13.5	128.1	17.5	69.3
Internal Link Dist (m)		80.1		231.0		1127.0		579.1
Turn Bay Length (m)					50.0		115.0	
Base Capacity (vph)	249	435	307	437	248	2704	306	2720
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.20	0.23	0.32	0.22	0.45	0.36	0.50

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	17	23	134	17	44	39	1148	148	71	1445	35
Future Volume (vph)	21	17	23	134	17	44	39	1148	148	71	1445	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	13.0		0.0	35.0		25.0	270.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			13.0			2.5			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.914			0.889			0.983			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1721	0	1738	1599	0	1789	3480	0	1825	3501	0
Flt Permitted	0.715			0.731			0.097			0.137		
Satd. Flow (perm)	1347	1721	0	1337	1599	0	183	3480	0	263	3501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			48			26			4	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		142.6			160.0			383.2			1151.0	
Travel Time (s)		10.7			11.5			19.7			59.2	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	7%	2%	3%	4%	0%	4%	2%
Adj. Flow (vph)	21	17	23	146	17	48	39	1248	161	77	1571	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	40	0	146	65	0	39	1409	0	77	1606	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

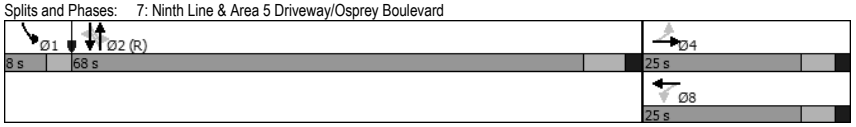
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		52.0	52.0		8.0	52.0	
Total Split (s)	25.0	25.0		25.0	25.0		68.0	68.0		8.0	68.0	
Total Split (%)	24.8%	24.8%		24.8%	24.8%		67.3%	67.3%		7.9%	67.3%	
Maximum Green (s)	19.0	19.0		19.0	19.0		61.0	61.0		5.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		37.0	37.0			37.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	16.4	16.4		16.4	16.4		66.7	66.7		76.0	66.7	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.66	0.66		0.75	0.66	
v/c Ratio	0.10	0.13		0.68	0.22		0.33	0.61		0.26	0.69	
Control Delay	35.0	20.2		54.9	16.1		18.6	12.0		6.3	15.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.0	20.2		54.9	16.1		18.6	12.0		6.3	15.8	
LOS	D	C		D	B		B	B		A	B	
Approach Delay		25.3			42.9			12.2			15.4	
Approach LOS		C			D			B			B	

Intersection Summary

Area Type:	Other
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 82.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: Ninth Line & Area 5 Driveway/Osprey Boulevard



Queues
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	21	40	146	65	39	1409	77	1606
v/c Ratio	0.10	0.13	0.68	0.22	0.33	0.61	0.26	0.69
Control Delay	35.0	20.2	54.9	16.1	18.6	12.0	6.3	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	20.2	54.9	16.1	18.6	12.0	6.3	15.8
Queue Length 50th (m)	3.5	2.8	26.9	2.8	3.3	81.6	2.9	95.5
Queue Length 95th (m)	9.8	11.4	46.1	13.7	12.4	106.5	10.5	154.3
Internal Link Dist (m)		118.6		136.0		359.2		1127.0
Turn Bay Length (m)			13.0		35.0		270.0	
Base Capacity (vph)	266	359	264	355	120	2307	300	2313
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.11	0.55	0.18	0.33	0.61	0.26	0.69

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	10	14	0	19	17	1113	20	32	1131	15
Future Volume (vph)	8	0	10	14	0	19	17	1113	20	32	1131	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			60.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.850			0.850			0.997			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3604	0	1825	3571	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3604	0	1825	3571	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		101.3			207.4			254.7			383.2	
Travel Time (s)		7.6			14.9			13.1			19.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	2%	2%
Adj. Flow (vph)	8	0	10	15	0	21	17	1210	22	35	1229	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	10	0	15	21	0	17	1232	0	35	1244	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	10	14	0	19	17	1113	20	32	1131	15
Future Volume (Veh/h)	8	0	10	14	0	19	17	1113	20	32	1131	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	8	0	10	15	0	21	17	1210	22	35	1229	15
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								255			383	
pX, platoon unblocked	0.79	0.79	0.78	0.79	0.79	0.68	0.78			0.68		
vC, conflicting volume	1968	2572	622	1950	2569	617	1244			1232		
vC1, stage 1 conf vol	1306	1306		1255	1255							
vC2, stage 2 conf vol	661	1266		694	1314							
vCu, unblocked vol	432	1198	0	409	1193	0	745			396		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	99	96	100	97	97			96		
cM capacity (veh/h)	278	245	844	374	241	740	669			797		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	8	10	15	21	17	807	425	35	819	425
Volume Left	8	0	15	0	17	0	0	35	0	0
Volume Right	0	10	0	21	0	0	22	0	0	15
cSH	278	844	374	740	669	1700	1700	797	1700	1700
Volume to Capacity	0.03	0.01	0.04	0.03	0.03	0.47	0.25	0.04	0.48	0.25
Queue Length 95th (m)	0.7	0.3	0.9	0.7	0.6	0.0	0.0	1.0	0.0	0.0
Control Delay (s)	18.3	9.3	15.0	10.0	10.5	0.0	0.0	9.7	0.0	0.0
Lane LOS	C	A	C	B	B			A		
Approach Delay (s)	13.3		12.1		0.1			0.3		
Approach LOS	B		B							

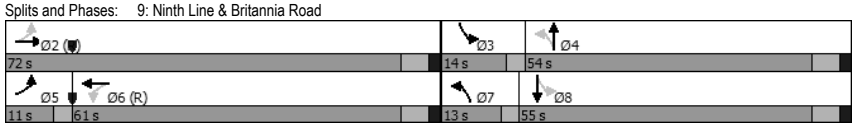
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	930	255	125	1585	143	190	1151	112	184	1099	162
Future Volume (vph)	161	930	255	125	1585	143	190	1151	112	184	1099	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.968			0.988			0.987			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	4998	0	1767	5173	0	1767	3593	0	1684	3545	0
Flt Permitted	0.070			0.198			0.083			0.081		
Satd. Flow (perm)	130	4998	0	368	5173	0	154	3593	0	144	3545	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		67			12			8			13	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	1%	0%	2%	1%	0%	3%	6%	1%	1%
Adj. Flow (vph)	161	930	255	125	1585	143	190	1151	112	184	1099	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	1185	0	125	1728	0	190	1263	0	184	1261	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	8.0	24.6		24.6	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	11.0	72.0		61.0	61.0		13.0	54.0		14.0	55.0	
Total Split (%)	7.9%	51.4%		43.6%	43.6%		9.3%	38.6%		10.0%	39.3%	
Maximum Green (s)	8.0	65.4		54.4	54.4		10.0	47.4		11.0	48.4	
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	0.0	2.0		2.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	2.0	5.6		5.6	5.6		2.0	5.6		2.0	5.6	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0			12.0			12.0	
Flash Dont Walk (s)		11.0		11.0	11.0			18.0			18.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	70.0	66.4		55.4	55.4		63.0	48.4		65.0	49.4	
Actuated g/C Ratio	0.50	0.47		0.40	0.40		0.45	0.35		0.46	0.35	
v/c Ratio	0.95	0.49		0.86	0.84		0.97	1.01		0.93	1.00	
Control Delay	91.6	36.7		80.8	39.8		90.5	73.6		81.3	70.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	91.6	36.7		80.8	39.8		90.5	73.6		81.3	70.3	
LOS	F	D		F	D		F	E		F	E	
Approach Delay		43.3			42.5			75.8			71.7	
Approach LOS		D			D			E			E	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 32.2 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 57.5	Intersection LOS: E
Intersection Capacity Utilization 104.8%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	161	1185	125	1728	190	1263	184	1261
v/c Ratio	0.95	0.49	0.86	0.84	0.97	1.01	0.93	1.00
Control Delay	91.6	36.7	80.8	39.8	90.5	73.6	81.3	70.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.6	36.7	80.8	39.8	90.5	73.6	81.3	70.3
Queue Length 50th (m)	35.8	102.2	31.6	157.5	36.3	~187.8	35.2	~182.4
Queue Length 95th (m)	#73.5	117.1	#71.5	177.4	#85.4	#235.4	#80.7	#232.5
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	170	2405	145	2054	196	1247	198	1259
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.49	0.86	0.84	0.97	1.01	0.93	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	12	13	0	13	3	1290	22	26	1459	10
Future Volume (vph)	55	0	12	13	0	13	3	1290	22	26	1459	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.997			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		103.7			491.2			170.0			206.5	
Travel Time (s)		7.8			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	55	0	12	14	0	14	3	1402	24	28	1586	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	12	0	14	14	0	3	1426	0	28	1596	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 57.0% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	0	12	13	0	13	3	1290	22	26	1459	10
Future Volume (Veh/h)	55	0	12	13	0	13	3	1290	22	26	1459	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	55	0	12	14	0	14	3	1402	24	28	1586	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											206	
pX, platoon unblocked	0.66	0.66	0.66	0.66	0.66		0.66					
vC, conflicting volume	2368	3079	798	2281	3072	713	1596			1426		
vC1, stage 1 conf vol	1647	1647		1420	1420							
vC2, stage 2 conf vol	721	1432		861	1652							
vCu, unblocked vol	2045	3119	0	1913	3109	713	878			1426		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	63	100	98	90	100	96	99			94		
cM capacity (veh/h)	149	123	718	138	134	379	506			483		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	55	12	14	14	3	935	491	28	1057	539
Volume Left	55	0	14	0	3	0	0	28	0	0
Volume Right	0	12	0	14	0	0	24	0	0	10
cSH	149	718	138	379	506	1700	1700	483	1700	1700
Volume to Capacity	0.37	0.02	0.10	0.04	0.01	0.55	0.29	0.06	0.62	0.32
Queue Length 95th (m)	11.8	0.4	2.5	0.9	0.1	0.0	0.0	1.4	0.0	0.0
Control Delay (s)	42.7	10.1	34.0	14.9	12.2	0.0	0.0	12.9	0.0	0.0
Lane LOS	E	B	D	B	B			B		
Approach Delay (s)	36.9		24.4		0.0			0.2		
Approach LOS	E		C							

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		57.0%	ICU Level of Service	B
Analysis Period (min)		15		

Lanes, Volumes, Timings
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	3	19	8	3	42	5	1259	35	37	1363	17
Future Volume (vph)	45	3	19	8	3	42	5	1259	35	37	1363	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.870			0.859			0.996			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1639	0	1825	1648	0	1789	3592	0	1825	3606	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1639	0	1825	1648	0	1789	3592	0	1825	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		90.3			511.9			217.0			170.0	
Travel Time (s)		6.8			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	9%	0%	1%	2%
Adj. Flow (vph)	45	3	19	9	3	46	5	1368	38	40	1482	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	22	0	9	49	0	5	1406	0	40	1499	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	3	19	8	3	42	5	1259	35	37	1363	17
Future Volume (Veh/h)	45	3	19	8	3	42	5	1259	35	37	1363	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	45	3	19	9	3	46	5	1368	38	40	1482	17
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											376	
pX, platoon unblocked	0.68	0.68	0.68	0.68	0.68		0.68					
vC, conflicting volume	2313	2986	750	2238	2976	704	1499			1406		
vC1, stage 1 conf vol	1570	1570		1397	1397							
vC2, stage 2 conf vol	742	1416		842	1579							
vCu, unblocked vol	1992	2980	0	1883	2965	704	798			1406		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	70	98	97	94	98	88	99			92		
cM capacity (veh/h)	150	122	739	142	139	384	559			492		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	45	22	9	49	5	912	494	40	988	511
Volume Left	45	0	9	0	5	0	0	40	0	0
Volume Right	0	19	0	46	0	0	38	0	0	17
cSH	150	438	142	346	559	1700	1700	492	1700	1700
Volume to Capacity	0.30	0.05	0.06	0.14	0.01	0.54	0.29	0.08	0.58	0.30
Queue Length 95th (m)	9.0	1.2	1.5	3.7	0.2	0.0	0.0	2.0	0.0	0.0
Control Delay (s)	39.0	13.6	32.1	17.1	11.5	0.0	0.0	13.0	0.0	0.0
Lane LOS	E	B	D	C	B			B		
Approach Delay (s)	30.7		19.4		0.0			0.3		
Approach LOS	D		C							

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization		54.0%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	5	1270	20	12	1405
Future Volume (vph)	9	5	1270	20	12	1405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		35.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3572	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3572	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	1%
Adj. Flow (vph)	10	5	1380	22	13	1527
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	5	1402	0	13	1527
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	5	1270	20	12	1405
Future Volume (Veh/h)	9	5	1270	20	12	1405
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	5	1380	22	13	1527
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2180	701			1402	
vC1, stage 1 conf vol	1391					
vC2, stage 2 conf vol	790					
vCu, unblocked vol	2180	701			1402	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	99			97	
cM capacity (veh/h)	176	386			493	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	15	920	482	13	764	764
Volume Left	10	0	0	13	0	0
Volume Right	5	0	22	0	0	0
cSH	264	1700	1700	493	1700	1700
Volume to Capacity	0.06	0.54	0.28	0.03	0.45	0.45
Queue Length 95th (m)	1.4	0.0	0.0	0.6	0.0	0.0
Control Delay (s)	22.6	0.0	0.0	12.5	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	22.6	0.0		0.1		
Approach LOS	C					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	9	1269	13	6	1339
Future Volume (vph)	3	9	1269	13	6	1339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3607	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3607	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	3	10	1379	14	7	1455
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	10	1393	0	7	1455
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	9	1269	13	6	1339
Future Volume (Veh/h)	3	9	1269	13	6	1339
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	10	1379	14	7	1455
Pedestrians	1					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.74	0.74			0.74	
vC, conflicting volume	2128	698			1394	
vC1, stage 1 conf vol	1387					
vC2, stage 2 conf vol	742					
vCu, unblocked vol	1829	0			842	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	239	811			597	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	13	919	474	7	728	728
Volume Left	3	0	0	7	0	0
Volume Right	10	0	14	0	0	0
cSH	1034	1700	1700	597	1700	1700
Volume to Capacity	0.01	0.54	0.28	0.01	0.43	0.43
Queue Length 95th (m)	0.3	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	12.0	0.0	0.0	11.1	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	12.0	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1	10	113	1	101	17	1276	148	93	1243	10
Future Volume (vph)	7	1	10	113	1	101	17	1276	148	93	1243	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		35.0	28.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			45.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor								1.00		1.00		
Frt		0.864			0.851			0.984			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1627	0	1807	1557	0	1789	3554	0	1807	3575	0
Flt Permitted	0.679			0.750			0.149			0.108		
Satd. Flow (perm)	1279	1627	0	1427	1557	0	281	3554	0	205	3575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			110			21			1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		170.8			534.8			346.0			306.2	
Travel Time (s)		12.8			38.5			17.8			15.7	
Confl. Peds. (#/hr)									6	6		
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	1%	2%	5%	2%	1%	0%	1%	2%	2%
Adj. Flow (vph)	7	1	10	123	1	110	17	1387	161	101	1351	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	11	0	123	111	0	17	1548	0	101	1361	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

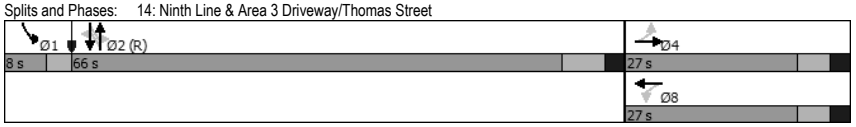
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		52.5	52.5		8.0	52.5	
Total Split (s)	27.0	27.0		27.0	27.0		66.0	66.0		8.0	66.0	
Total Split (%)	26.7%	26.7%		26.7%	26.7%		65.3%	65.3%		7.9%	65.3%	
Maximum Green (s)	20.5	20.5		20.5	20.5		58.5	58.5		5.0	58.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		0.0	2.5	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.5	6.5		2.0	6.5	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		33.0	33.0			33.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0			12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	15.0	15.0		15.0	15.0		66.4	66.4		76.9	66.4	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.66	0.66		0.76	0.66	
v/c Ratio	0.04	0.04		0.58	0.34		0.09	0.66		0.37	0.58	
Control Delay	34.3	18.6		48.9	11.9		15.0	22.9		7.2	12.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.3	18.6		48.9	11.9		15.0	22.9		7.2	12.0	
LOS	C	B		D	B		B	C		A	B	
Approach Delay		24.7			31.3			22.8			11.7	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 18.5 — Intersection LOS: B
Intersection Capacity Utilization 100.2% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 14: Ninth Line & Area 3 Driveway/Thomas Street



Queues
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	11	123	111	17	1548	101	1361
v/c Ratio	0.04	0.04	0.58	0.34	0.09	0.66	0.37	0.58
Control Delay	34.3	18.6	48.9	11.9	15.0	22.9	7.2	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	18.6	48.9	11.9	15.0	22.9	7.2	12.0
Queue Length 50th (m)	1.2	0.2	23.5	0.0	2.0	157.3	3.7	75.3
Queue Length 95th (m)	4.8	4.8	39.8	16.1	m4.6	187.4	9.5	108.1
Internal Link Dist (m)		146.8		510.8		322.0		282.2
Turn Bay Length (m)					30.0		28.0	
Base Capacity (vph)	272	354	303	418	184	2343	273	2350
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.41	0.27	0.09	0.66	0.37	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	6	1343	27	19	1299
Future Volume (vph)	9	6	1343	27	19	1299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.944		0.997			
Flt Protected	0.971				0.950	
Satd. Flow (prot)	1761	0	3604	0	1825	3614
Flt Permitted	0.971				0.950	
Satd. Flow (perm)	1761	0	3604	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	10	7	1460	29	21	1412
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	1489	0	21	1412
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	6	1343	27	19	1299
Future Volume (Veh/h)	9	6	1343	27	19	1299
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	7	1460	29	21	1412
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.78					
vC, conflicting volume	2222	744			1489	
vC1, stage 1 conf vol	1474					
vC2, stage 2 conf vol	748					
vCu, unblocked vol	2001	744			1489	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	98			95	
cM capacity (veh/h)	170	361			457	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	17	973	516	21	706	706
Volume Left	10	0	0	21	0	0
Volume Right	7	0	29	0	0	0
cSH	218	1700	1700	457	1700	1700
Volume to Capacity	0.08	0.57	0.30	0.05	0.42	0.42
Queue Length 95th (m)	1.9	0.0	0.0	1.1	0.0	0.0
Control Delay (s)	22.9	0.0	0.0	13.3	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	22.9	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	34	37	1398	74	56	1377
Future Volume (vph)	34	37	1398	74	56	1377
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.992			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3553	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3553	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	37	40	1520	80	61	1497
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	40	1600	0	61	1497
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.5%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	37	1398	74	56	1377
Future Volume (Veh/h)	34	37	1398	74	56	1377
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	40	1520	80	61	1497
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2430	800			1600	
vC1, stage 1 conf vol	1560					
vC2, stage 2 conf vol	870					
vCu, unblocked vol	2430	800			1600	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	88			85	
cM capacity (veh/h)	140	332			415	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	77	1013	587	61	748	748
Volume Left	37	0	0	61	0	0
Volume Right	40	0	80	0	0	0
cSH	292	1700	1700	415	1700	1700
Volume to Capacity	0.26	0.60	0.35	0.15	0.44	0.44
Queue Length 95th (m)	7.9	0.0	0.0	3.9	0.0	0.0
Control Delay (s)	28.0	0.0	0.0	15.2	0.0	0.0
Lane LOS	D			C		
Approach Delay (s)	28.0	0.0		0.6		
Approach LOS	D					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	9	0	0	6	14	1423	5	10	1349	13
Future Volume (vph)	8	0	9	0	0	6	14	1423	5	10	1349	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	70.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.929			0.865						0.999	
Flt Protected		0.977					0.950			0.950		
Satd. Flow (prot)	0	1709	0	0	1662	0	1789	3614	0	1825	3575	0
Flt Permitted		0.977					0.950			0.950		
Satd. Flow (perm)	0	1709	0	0	1662	0	1789	3614	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		89.2			113.3			424.8			250.0	
Travel Time (s)		6.7			8.2			21.8			12.9	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	2%	2%
Adj. Flow (vph)	8	0	9	0	0	7	14	1547	5	11	1466	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	17	0	0	7	0	14	1552	0	11	1479	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	9	0	0	6	14	1423	5	10	1349	13
Future Volume (Veh/h)	8	0	9	0	0	6	14	1423	5	10	1349	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	8	0	9	0	0	7	14	1547	5	11	1466	13
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2303	3074	740	2342	3078	776	1479			1552		
vC1, stage 1 conf vol	1494	1494		1578	1578							
vC2, stage 2 conf vol	808	1580		764	1501							
vCu, unblocked vol	2303	3074	740	2342	3078	776	1479			1552		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	97	100	100	98	97			97		
cM capacity (veh/h)	113	110	360	104	110	345	451			433		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	17	7	14	1031	521	11	977	502
Volume Left	8	0	14	0	0	11	0	0
Volume Right	9	7	0	0	5	0	0	13
cSH	178	345	451	1700	1700	433	1700	1700
Volume to Capacity	0.10	0.02	0.03	0.61	0.31	0.03	0.57	0.30
Queue Length 95th (m)	2.4	0.5	0.7	0.0	0.0	0.6	0.0	0.0
Control Delay (s)	27.4	15.7	13.2	0.0	0.0	13.5	0.0	0.0
Lane LOS	D	C	B			B		
Approach Delay (s)	27.4	15.7	0.1			0.1		
Approach LOS	D	C						

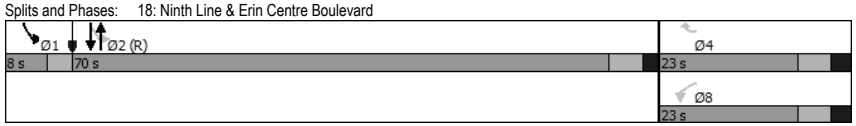
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	56	76	1336	61	54	1193
Future Volume (vph)	56	76	1336	61	54	1193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.993			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3563	0	1825	3579
Flt Permitted	0.950				0.131	
Satd. Flow (perm)	1789	1585	3563	0	252	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		83	9			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	1%	18%	0%	2%
Adj. Flow (vph)	61	83	1452	66	59	1297
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	83	1518	0	59	1297
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	23.0	23.0	70.0		8.0	70.0
Total Split (%)	22.8%	22.8%	69.3%		7.9%	69.3%
Maximum Green (s)	16.5	16.5	64.0		5.0	64.0
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	8.0	8.0	50.0			50.0
Flash Dont Walk (s)	8.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	10.4	10.4	76.6		84.4	76.6
Actuated g/C Ratio	0.10	0.10	0.76		0.84	0.76
v/c Ratio	0.33	0.35	0.56		0.18	0.48
Control Delay	46.6	13.6	8.1		5.0	15.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.6	13.6	8.1		5.0	15.7
LOS	D	B	A		A	B
Approach Delay	27.6		8.1			15.3
Approach LOS	C		A			B

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	61	83	1518	59	1297
v/c Ratio	0.33	0.35	0.56	0.18	0.48
Control Delay	46.6	13.6	8.1	5.0	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	13.6	8.1	5.0	15.7
Queue Length 50th (m)	11.4	0.0	68.1	3.4	109.5
Queue Length 95th (m)	23.1	13.1	99.9	m6.3	147.0
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	309	343	2704	321	2714
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.20	0.24	0.56	0.18	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	0	5	0	11	0	1265	15	23	1153	16
Future Volume (vph)	9	0	0	5	0	11	0	1265	15	23	1153	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.850			0.998			0.998	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1883	0	1825	1633	0	1883	3607	0	1825	3606	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1883	0	1825	1633	0	1883	3607	0	1825	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		98.8			216.6			90.1			404.2	
Travel Time (s)		7.4			15.6			4.6			20.8	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	9	0	0	5	0	12	0	1375	16	25	1253	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	0	0	5	12	0	0	1391	0	25	1269	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.3% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	0	5	0	11	0	1265	15	23	1153	16
Future Volume (Veh/h)	9	0	0	5	0	11	0	1265	15	23	1153	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	9	0	0	5	0	12	0	1375	16	25	1253	16
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								373				
pX, platoon unblocked	0.80	0.80		0.80	0.80	0.80				0.80		
vC, conflicting volume	2010	2702	634	2060	2702	696	1269			1391		
vC1, stage 1 conf vol	1311	1311		1383	1383							
vC2, stage 2 conf vol	700	1391		676	1319							
vCu, unblocked vol	1769	2629	634	1830	2629	132	1269			998		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	100	97	100	98	100			96		
cM capacity (veh/h)	153	152	422	186	158	722	543			564		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	0	5	12	0	917	474	25	835	434
Volume Left	9	0	5	0	0	0	0	25	0	0
Volume Right	0	0	0	12	0	0	16	0	0	16
cSH	153	1700	186	722	1700	1700	1700	564	1700	1700
Volume to Capacity	0.06	0.00	0.03	0.02	0.00	0.54	0.28	0.04	0.49	0.26
Queue Length 95th (m)	1.4	0.0	0.6	0.4	0.0	0.0	0.0	1.1	0.0	0.0
Control Delay (s)	30.0	0.0	24.9	10.1	0.0	0.0	0.0	11.7	0.0	0.0
Lane LOS	D	A	C	B				B		
Approach Delay (s)	30.0		14.4		0.0			0.2		
Approach LOS	D		B							

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		49.3%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	1302	2	16	1183
Future Volume (vph)	1	1	1302	2	16	1183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.932					
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1748	0	3614	0	1825	3614
Flt Permitted	0.976				0.950	
Satd. Flow (perm)	1748	0	3614	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	1	1	1415	2	17	1286
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1417	0	17	1286
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	1	1302	2	16	1183
Future Volume (Veh/h)	1	1	1302	2	16	1183
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	1415	2	17	1286
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.80	0.80			0.80	
vC, conflicting volume	2093	708			1417	
vC1, stage 1 conf vol	1416					
vC2, stage 2 conf vol	677					
vCu, unblocked vol	1860	120			1011	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			97	
cM capacity (veh/h)	219	728			552	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	2	943	474	17	643	643
Volume Left	1	0	0	17	0	0
Volume Right	1	0	2	0	0	0
cSH	337	1700	1700	552	1700	1700
Volume to Capacity	0.01	0.55	0.28	0.03	0.38	0.38
Queue Length 95th (m)	0.1	0.0	0.0	0.7	0.0	0.0
Control Delay (s)	15.8	0.0	0.0	11.7	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	15.8	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	0	27	0	0	2	48	1372	5	3	1175	22
Future Volume (vph)	14	0	27	0	0	2	48	1372	5	3	1175	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	0.95
Ped Bike Factor												
Frt		0.911				0.865			0.850		0.997	
Flt Protected		0.983					0.950					
Satd. Flow (prot)	0	1687	0	0	0	1662	1789	3614	1633	0	3603	0
Flt Permitted		0.983					0.950					
Satd. Flow (perm)	0	1687	0	0	0	1662	1789	3614	1633	0	3603	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		116.8			245.5			191.7			91.0	
Travel Time (s)		8.8			17.7			9.9			4.7	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	14	0	27	0	0	2	48	1491	5	3	1277	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	0	0	0	2	48	1491	5	0	1302	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	0	27	0	0	2	48	1372	5	3	1175	22
Future Volume (Veh/h)	14	0	27	0	0	2	48	1372	5	3	1175	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	14	0	27	0	0	2	48	1491	5	3	1277	22
Pedestrians					1							
Lane Width (m)					3.7							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								192				
pX, platoon unblocked	0.79	0.79		0.79	0.79	0.79				0.79		
vC, conflicting volume	2138	2882	650	2260	2893	746	1299			1492		
vC1, stage 1 conf vol	1294	1294		1588	1588							
vC2, stage 2 conf vol	844	1588		672	1305							
vCu, unblocked vol	1903	2850	650	2058	2864	134	1299			1082		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	100	93	100	100	100	91			99		
cM capacity (veh/h)	158	134	412	127	121	704	529			512		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	41	2	48	746	746	5	642	660
Volume Left	14	0	48	0	0	0	3	0
Volume Right	27	2	0	0	0	5	0	22
cSH	266	704	529	1700	1700	1700	512	1700
Volume to Capacity	0.15	0.00	0.09	0.44	0.44	0.00	0.01	0.39
Queue Length 95th (m)	4.1	0.1	2.3	0.0	0.0	0.0	0.1	0.0
Control Delay (s)	21.0	10.1	12.5	0.0	0.0	0.0	0.2	0.0
Lane LOS	C	B	B				A	
Approach Delay (s)	21.0	10.1	0.4				0.1	
Approach LOS	C	B						

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)		15	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	358	19	40	788	452	181	692	38	291	633	73
Future Volume (vph)	63	358	19	40	788	452	181	692	38	291	633	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.992			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3543	0	1789	1812	1458	1825	3552	0	1807	3535	0
Flt Permitted	0.079			0.494			0.201			0.116		
Satd. Flow (perm)	152	3543	0	930	1812	1458	386	3552	0	221	3535	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				334		4			9	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	6%	2%	6%	12%	0%	2%	1%	1%	1%	8%
Adj. Flow (vph)	68	389	21	43	857	491	197	752	41	316	688	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	410	0	43	857	491	197	793	0	316	767	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		7	4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

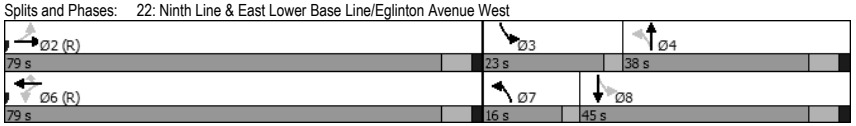
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	5.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	8.0	24.0		8.0	24.0	
Total Split (s)	79.0	79.0		79.0	79.0	79.0	16.0	38.0		23.0	45.0	
Total Split (%)	56.4%	56.4%		56.4%	56.4%	56.4%	11.4%	27.1%		16.4%	32.1%	
Maximum Green (s)	72.0	72.0		72.0	72.0	72.0	13.0	31.0		20.0	38.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	0.0		0.0	-1.0	0.0	-1.0	-1.0		-1.0	0.0	
Total Lost Time (s)	6.0	7.0		7.0	6.0	7.0	2.0	6.0		2.0	7.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	Min		None	Min	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0		8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0		9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)	72.2	71.2		71.2	72.2	71.2	50.1	32.5		59.8	39.2	
Actuated g/C Ratio	0.52	0.51		0.51	0.52	0.51	0.36	0.23		0.43	0.28	
v/c Ratio	0.87	0.23		0.09	0.92	0.54	0.71	0.96		0.94	0.77	
Control Delay	104.8	19.1		18.1	46.8	8.9	41.9	75.5		74.5	52.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	104.8	19.1		18.1	46.8	8.9	41.9	75.5		74.5	52.2	
LOS	F	B		B	D	A	D	E		E	D	
Approach Delay		31.3			32.6			68.8			58.7	
Approach LOS		C			C			E			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 48.7 Intersection LOS: D
Intersection Capacity Utilization 102.9% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	68	410	43	857	491	197	793	316	767
v/c Ratio	0.87	0.23	0.09	0.92	0.54	0.71	0.96	0.94	0.77
Control Delay	104.8	19.1	18.1	46.8	8.9	41.9	75.5	74.5	52.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.8	19.1	18.1	46.8	8.9	41.9	75.5	74.5	52.2
Queue Length 50th (m)	15.9	31.4	5.9	209.6	24.7	35.0	115.1	69.9	103.2
Queue Length 95th (m)	#47.9	41.5	12.7	#297.9	54.3	#53.5	#156.4	#128.0	127.0
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	79	1825	478	944	912	284	827	335	995
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.22	0.09	0.91	0.54	0.69	0.96	0.94	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	240	27	135	386	14	16	23	72	10	10	9
Future Volume (vph)	9	240	27	135	386	14	16	23	72	10	10	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.997			0.912			0.958	
Flt Protected		0.998			0.988			0.993			0.983	
Satd. Flow (prot)	0	1892	0	0	1888	0	0	1696	0	0	1809	0
Flt Permitted		0.998			0.988			0.993			0.983	
Satd. Flow (perm)	0	1892	0	0	1888	0	0	1696	0	0	1809	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	2		10	10		2	5		3	3		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	10	261	29	147	420	15	17	25	78	11	11	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	300	0	0	582	0	0	120	0	0	32	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 61.4%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	240	27	135	386	14	16	23	72	10	10	9
Future Volume (vph)	9	240	27	135	386	14	16	23	72	10	10	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	261	29	147	420	15	17	25	78	11	11	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	300	582	120	32
Volume Left (vph)	10	147	17	11
Volume Right (vph)	29	15	78	10
Hadj (s)	-0.05	0.04	-0.32	-0.12
Departure Headway (s)	5.0	4.8	5.8	6.2
Degree Utilization, x	0.42	0.78	0.19	0.06
Capacity (veh/h)	675	736	566	508
Control Delay (s)	11.7	22.4	10.1	9.6
Approach Delay (s)	11.7	22.4	10.1	9.6
Approach LOS	B	C	B	A

Intersection Summary			
Delay	17.5		
Level of Service	C		
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1133	52	335	1979	185	47	33	160	99	25	45
Future Volume (vph)	57	1133	52	335	1979	185	47	33	160	99	25	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		0.99		0.99	1.00		0.98
Frt		0.993			0.987				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5053	0	1785	5112	0	1785	1921	1617	1785	1830	1566
Flt Permitted	0.068			0.219			0.741			0.736		
Satd. Flow (perm)	128	5053	0	411	5112	0	1376	1921	1593	1379	1830	1529
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			25				121			23
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	4		6	6		4	9		2	2		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	1%	0%	0%	1%	0%	5%	2%
Adj. Flow (vph)	57	1133	52	335	1979	185	47	33	160	99	25	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1185	0	335	2164	0	47	33	160	99	25	45
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

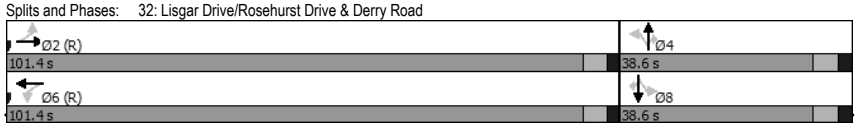
Lanes, Volumes, Timings
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	101.4	101.4		101.4	101.4		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (%)	72.4%	72.4%		72.4%	72.4%		27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Maximum Green (s)	95.4	95.4		95.4	95.4		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	113.0	113.0		113.0	113.0		16.4	16.4	16.4	16.4	16.4	16.4
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.12	0.12	0.12	0.12	0.12	0.12
v/c Ratio	0.55	0.29		1.01	0.52		0.29	0.15	0.55	0.61	0.12	0.23
Control Delay	34.2	2.0		69.6	5.3		59.3	54.6	23.3	74.2	54.0	33.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	2.0		69.6	5.3		59.3	54.6	23.3	74.2	54.0	33.6
LOS	C	A		E	A		E	D	C	E	D	C
Approach Delay		3.5			13.9			34.7			60.4	
Approach LOS		A			B			C			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 113.4 (81%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 81.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	1185	335	2164	47	33	160	99	25	45
v/c Ratio	0.55	0.29	1.01	0.52	0.29	0.15	0.55	0.61	0.12	0.23
Control Delay	34.2	2.0	69.6	5.3	59.3	54.6	23.3	74.2	54.0	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	2.0	69.6	5.3	59.3	54.6	23.3	74.2	54.0	33.6
Queue Length 50th (m)	2.9	12.2	~84.9	60.1	12.1	8.4	9.9	26.5	6.3	5.6
Queue Length 95th (m)	m#19.1	23.2	#74.5	87.7	23.7	17.8	30.8	43.7	14.6	16.7
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	103	4081	331	4131	324	452	467	325	431	377
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.29	1.01	0.52	0.15	0.07	0.34	0.30	0.06	0.12

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	200	56	92	191	133	43	83	86	142	101	46
Future Volume (vph)	43	200	56	92	191	133	43	83	86	142	101	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.967			0.938			0.945			0.979	
Flt Protected	0.950			0.950				0.990			0.976	
Satd. Flow (prot)	1738	1645	0	1772	1672	0	0	1592	0	0	1670	0
Flt Permitted	0.950			0.950				0.990			0.976	
Satd. Flow (perm)	1738	1645	0	1772	1672	0	0	1592	0	0	1670	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	12		31	31		12	39		40	40		39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	14%	9%	3%	9%	6%	9%	22%	6%	6%	15%	11%
Adj. Flow (vph)	47	217	61	100	208	145	47	90	93	154	110	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	278	0	100	353	0	0	230	0	0	314	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 65.2% ICU Level of Service C
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	43	200	56	92	191	133	43	83	86	142	101	46
Future Volume (vph)	43	200	56	92	191	133	43	83	86	142	101	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	217	61	100	208	145	47	90	93	154	110	50

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	47	278	100	353	230	314
Volume Left (vph)	47	0	100	0	47	154
Volume Right (vph)	0	61	0	145	93	50
Hadj (s)	0.58	0.07	0.55	-0.16	0.02	0.17
Departure Headway (s)	8.2	7.6	7.9	7.2	7.3	7.2
Degree Utilization, x	0.11	0.59	0.22	0.70	0.47	0.63
Capacity (veh/h)	409	439	432	477	438	459
Control Delay (s)	10.9	19.7	11.9	24.2	16.6	21.6
Approach Delay (s)	18.4		21.5		16.6	21.6
Approach LOS	C		C		C	C

Intersection Summary			
Delay		19.9	
Level of Service		C	
Intersection Capacity Utilization		65.2%	ICU Level of Service C
Analysis Period (min)		15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	67	5	11	49	94	5	5	7	108	11	64
Future Volume (vph)	42	67	5	11	49	94	5	5	7	108	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.918			0.940			0.953	
Flt Protected		0.982			0.996			0.986			0.971	
Satd. Flow (prot)	0	1830	0	0	1757	0	0	1781	0	0	1683	0
Flt Permitted		0.982			0.996			0.986			0.971	
Satd. Flow (perm)	0	1830	0	0	1757	0	0	1781	0	0	1683	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	10		4	4		10	1		46	46		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	6%
Adj. Flow (vph)	46	73	5	12	53	102	5	5	8	117	12	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	124	0	0	167	0	0	18	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 42.4%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	42	67	5	11	49	94	5	5	7	108	11	64
Future Volume (vph)	42	67	5	11	49	94	5	5	7	108	11	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	73	5	12	53	102	5	5	8	117	12	70

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	124	167	18	199
Volume Left (vph)	46	12	5	117
Volume Right (vph)	5	102	8	70
Hadj (s)	0.09	-0.35	-0.21	0.00
Departure Headway (s)	4.7	4.2	4.6	4.6
Degree Utilization, x	0.16	0.20	0.02	0.25
Capacity (veh/h)	716	799	714	736
Control Delay (s)	8.6	8.3	7.7	9.2
Approach Delay (s)	8.6	8.3	7.7	9.2
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.7	
Level of Service			A	
Intersection Capacity Utilization			42.4%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1159	94	219	1963	78	35	16	102	30	11	7
Future Volume (vph)	16	1159	94	219	1963	78	35	16	102	30	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00		1.00	0.99		1.00	0.99	
Frt		0.989			0.994			0.870			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5139	0	1552	5205	0	1733	1647	0	1785	1746	0
Flt Permitted	0.083			0.208			0.746			0.440		
Satd. Flow (perm)	156	5139	0	340	5205	0	1356	1647	0	823	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			11			102			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			97.9			114.1			106.4	
Travel Time (s)		28.2			5.9			8.2			7.7	
Confl. Peds. (#/hr)	4					4	2		3	3		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	0%	1%	3%	0%	0%	0%	5%	0%
Adj. Flow (vph)	16	1159	94	219	1963	78	35	16	102	30	11	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1253	0	219	2041	0	35	118	0	30	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

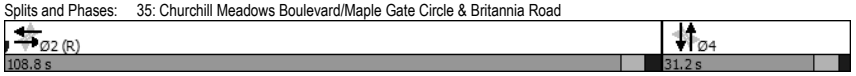
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Detector Phase	2	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		36.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	108.8	108.8		108.8	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	77.7%	77.7%		77.7%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	101.8	101.8		101.8	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.2	5.2		5.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	11.0	11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	117.9	117.9		117.9	117.9		10.9	10.9		10.9	10.9	
Actuated g/C Ratio	0.84	0.84		0.84	0.84		0.08	0.08		0.08	0.08	
v/c Ratio	0.12	0.29		0.77	0.47		0.33	0.53		0.48	0.13	
Control Delay	2.4	0.9		26.5	3.3		69.0	23.9		85.2	44.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.4	0.9		26.5	3.3		69.0	23.9		85.2	44.1	
LOS	A	A		C	A		E	C		F	D	
Approach Delay		0.9			5.6			34.2			69.8	
Approach LOS		A			A			C			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 6.0 Intersection LOS: A
Intersection Capacity Utilization 73.8% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	1253	219	2041	35	118	30	18
v/c Ratio	0.12	0.29	0.77	0.47	0.33	0.53	0.48	0.13
Control Delay	2.4	0.9	26.5	3.3	69.0	23.9	85.2	44.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.4	0.9	26.5	3.3	69.0	23.9	85.2	44.1
Queue Length 50th (m)	0.1	3.0	20.0	39.5	9.4	4.2	8.2	2.9
Queue Length 95th (m)	m0.6	m10.2	#97.1	56.2	20.3	23.1	18.7	10.6
Internal Link Dist (m)		445.7		73.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	131	4332	286	4385	251	388	152	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.29	0.77	0.47	0.14	0.30	0.20	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	9	8	9	7	12	12	145	15	18	236	15
Future Volume (vph)	12	9	8	9	7	12	12	145	15	18	236	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.962			0.943			0.988			0.993	
Flt Protected		0.980			0.984			0.997			0.997	
Satd. Flow (prot)	0	1747	0	0	1720	0	0	1856	0	0	1878	0
Flt Permitted		0.980			0.984			0.997			0.997	
Satd. Flow (perm)	0	1747	0	0	1720	0	0	1856	0	0	1878	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)	6		3	3		6	11		10	10		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	13%	0%	14%	0%	0%	1%	13%	0%	1%	7%
Adj. Flow (vph)	13	10	9	10	8	13	13	158	16	20	257	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	31	0	0	187	0	0	293	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	9	8	9	7	12	12	145	15	18	236	15
Future Volume (Veh/h)	12	9	8	9	7	12	12	145	15	18	236	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	10	9	10	8	13	13	158	16	20	257	16
Pedestrians		11			10			3			6	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	531	526	279	524	526	182	284			184		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	531	526	279	524	526	182	284			184		
tC, single (s)	7.1	6.5	6.3	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	97	98	99	98	98	98	99			99		
cM capacity (veh/h)	428	441	725	434	422	854	1278			1391		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	32	31	187	293
Volume Left	13	10	13	20
Volume Right	9	13	16	16
cSH	489	542	1278	1391
Volume to Capacity	0.07	0.06	0.01	0.01
Queue Length 95th (m)	1.6	1.4	0.2	0.3
Control Delay (s)	12.9	12.0	0.6	0.6
Lane LOS	B	B	A	A
Approach Delay (s)	12.9	12.0	0.6	0.6
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	85	23	69	121	24	16	127	62	17	142	22
Future Volume (vph)	10	85	23	69	121	24	16	127	62	17	142	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.974			0.985			0.959			0.983	
Flt Protected		0.996			0.984			0.996			0.995	
Satd. Flow (prot)	0	1603	0	0	1731	0	0	1726	0	0	1781	0
Flt Permitted		0.996			0.984			0.996			0.995	
Satd. Flow (perm)	0	1603	0	0	1731	0	0	1726	0	0	1781	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	20		92	92		20	33		36	36		33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	19%	9%	6%	10%	0%	6%	7%	5%	0%	7%	0%
Adj. Flow (vph)	11	92	25	75	132	26	17	138	67	18	154	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	128	0	0	233	0	0	222	0	0	196	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	40.4%	ICU Level of Service A	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	85	23	69	121	24	16	127	62	17	142	22
Future Volume (vph)	10	85	23	69	121	24	16	127	62	17	142	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	92	25	75	132	26	17	138	67	18	154	24

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	128	233	222	196
Volume Left (vph)	11	75	17	18
Volume Right (vph)	25	26	67	24
Hadj (s)	0.18	0.13	-0.06	0.04
Departure Headway (s)	5.6	5.4	5.2	5.3
Degree Utilization, x	0.20	0.35	0.32	0.29
Capacity (veh/h)	581	621	647	626
Control Delay (s)	10.0	11.2	10.6	10.5
Approach Delay (s)	10.0	11.2	10.6	10.5
Approach LOS	A	B	B	B

Intersection Summary			
Delay	10.6		
Level of Service	B		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	142	17	114	215	204	7	77	27	109	129	26
Future Volume (vph)	26	142	17	114	215	204	7	77	27	109	129	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	1.00		0.99	0.96		0.99	0.99		0.97	1.00	
Frt		0.984			0.927			0.962			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3450	0	1789	3195	0	1601	1644	0	1789	1737	0
Flt Permitted	0.463			0.643			0.634			0.684		
Satd. Flow (perm)	832	3450	0	1193	3195	0	1062	1644	0	1247	1737	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			222			24			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	2%	18%	2%	2%	2%	14%	11%	11%	2%	6%	15%
Adj. Flow (vph)	28	154	18	124	234	222	8	84	29	118	140	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	172	0	124	456	0	8	113	0	118	168	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	46.0	46.0		46.0	46.0		55.0	55.0		55.0	55.0	
Total Split (%)	45.5%	45.5%		45.5%	45.5%		54.5%	54.5%		54.5%	54.5%	
Maximum Green (s)	39.5	39.5		39.5	39.5		49.0	49.0		49.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.5	48.5		48.5	48.5		42.0	42.0		42.0	42.0	
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.42	0.42		0.42	0.42	
v/c Ratio	0.07	0.10		0.22	0.28		0.02	0.16		0.23	0.23	
Control Delay	23.3	20.5		16.5	8.2		17.7	15.2		20.6	18.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.3	20.5		16.5	8.2		17.7	15.2		20.6	18.4	
LOS	C	C		B	A		B	B		C	B	
Approach Delay		20.9			10.0			15.4			19.3	
Approach LOS		C			A			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.28	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 74.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	172	124	456	8	113	118	168
v/c Ratio	0.07	0.10	0.22	0.28	0.02	0.16	0.23	0.23
Control Delay	23.3	20.5	16.5	8.2	17.7	15.2	20.6	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	20.5	16.5	8.2	17.7	15.2	20.6	18.4
Queue Length 50th (m)	3.6	11.1	13.6	13.0	0.9	10.5	14.6	18.9
Queue Length 95th (m)	m8.2	m20.3	25.0	22.1	3.7	21.4	27.1	33.1
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	399	1664	572	1649	525	825	617	866
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.10	0.22	0.28	0.02	0.14	0.19	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	43	7	29	70	35	17	96	26	22	172	13
Future Volume (vph)	8	43	7	29	70	35	17	96	26	22	172	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.965			0.975			0.992	
Flt Protected		0.993			0.989			0.994			0.995	
Satd. Flow (prot)	0	1765	0	0	1728	0	0	1707	0	0	1721	0
Flt Permitted		0.993			0.989			0.994			0.995	
Satd. Flow (perm)	0	1765	0	0	1728	0	0	1707	0	0	1721	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	14		19	19		14	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	6%	0%	3%	5%	11%	6%	11%	4%	5%	11%	8%
Adj. Flow (vph)	9	47	8	32	76	38	18	104	28	24	187	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	64	0	0	146	0	0	150	0	0	225	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	43	7	29	70	35	17	96	26	22	172	13
Future Volume (vph)	8	43	7	29	70	35	17	96	26	22	172	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	47	8	32	76	38	18	104	28	24	187	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	64	146	150	225
Volume Left (vph)	9	32	18	24
Volume Right (vph)	8	38	28	14
Hadj (s)	0.06	-0.01	0.07	0.16
Departure Headway (s)	5.1	4.9	4.8	4.8
Degree Utilization, x	0.09	0.20	0.20	0.30
Capacity (veh/h)	639	676	708	712
Control Delay (s)	8.6	9.1	9.0	9.8
Approach Delay (s)	8.6	9.1	9.0	9.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay		9.3	
Level of Service		A	
Intersection Capacity Utilization		33.5%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	93	15	40	114	26	35	155	54	24	166	35
Future Volume (vph)	18	93	15	40	114	26	35	155	54	24	166	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.984			0.981			0.970			0.979	
Flt Protected		0.993			0.989			0.993			0.995	
Satd. Flow (prot)	0	1675	0	0	1787	0	0	1775	0	0	1779	0
Flt Permitted		0.993			0.989			0.993			0.995	
Satd. Flow (perm)	0	1675	0	0	1787	0	0	1775	0	0	1779	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	12%	0%	0%	5%	8%	9%	4%	2%	8%	4%	9%
Adj. Flow (vph)	20	101	16	43	124	28	38	168	59	26	180	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	137	0	0	195	0	0	265	0	0	244	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 42.9%		ICU Level of Service A
Analysis Period (min) 15		

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	93	15	40	114	26	35	155	54	24	166	35
Future Volume (vph)	18	93	15	40	114	26	35	155	54	24	166	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	101	16	43	124	28	38	168	59	26	180	38

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	137	195	265	244
Volume Left (vph)	20	43	38	26
Volume Right (vph)	16	28	59	38
Hadj (s)	0.16	0.03	-0.03	0.02
Departure Headway (s)	5.8	5.6	5.2	5.3
Degree Utilization, x	0.22	0.30	0.38	0.36
Capacity (veh/h)	554	589	636	631
Control Delay (s)	10.4	10.9	11.5	11.3
Approach Delay (s)	10.4	10.9	11.5	11.3
Approach LOS	B	B	B	B

Intersection Summary				
Delay			11.1	
Level of Service			B	
Intersection Capacity Utilization			42.9%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	1385	2476	191	123	70
Future Volume (vph)	13	1385	2476	191	123	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			1.00			
Frt			0.989			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1690	3579	3566	0	1789	1089
Flt Permitted	0.052				0.950	
Satd. Flow (perm)	92	3579	3566	0	1789	1089
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			18			8
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	4			4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	2%	1%	1%	2%	50%
Adj. Flow (vph)	13	1385	2476	191	123	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	1385	2667	0	123	70
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

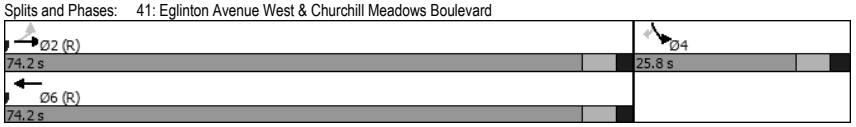
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.5	25.5
Total Split (s)	74.2	74.2	74.2		25.8	25.8
Total Split (%)	74.2%	74.2%	74.2%		25.8%	25.8%
Maximum Green (s)	68.2	68.2	68.2		19.3	19.3
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	76.2	76.2	76.2		13.3	13.3
Actuated g/C Ratio	0.76	0.76	0.76		0.13	0.13
v/c Ratio	0.19	0.51	0.98		0.52	0.46
Control Delay	11.5	5.7	25.9		47.6	44.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	11.5	5.7	25.9		47.6	44.8
LOS	B	A	C		D	D
Approach Delay		5.8	25.9		46.6	
Approach LOS		A	C		D	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 20.2 Intersection LOS: C
Intersection Capacity Utilization 90.1% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	13	1385	2667	123	70
v/c Ratio	0.19	0.51	0.98	0.52	0.46
Control Delay	11.5	5.7	25.9	47.6	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	5.7	25.9	47.6	44.8
Queue Length 50th (m)	0.6	44.5	206.5	22.6	11.2
Queue Length 95th (m)	4.0	70.0	#337.5	38.1	23.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	70	2728	2723	363	227
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.51	0.98	0.34	0.31

Intersection Summary

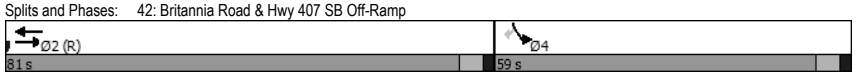
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	635	1767	0	367	27
Future Volume (vph)	0	635	1767	0	367	27
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	1987	1726
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	1987	1726
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (k/h)		60	60		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		12.4	17.9		15.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	0%	2%	0%	3%
Adj. Flow (vph)	0	706	1963	0	408	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	706	1963	0	408	30
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		81.0	81.0		59.0	59.0
Total Split (%)		57.9%	57.9%		42.1%	42.1%
Maximum Green (s)		75.0	75.0		53.0	53.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		93.2	93.2		34.8	34.8
Actuated g/C Ratio		0.67	0.67		0.25	0.25
v/c Ratio		0.19	0.52		0.83	0.07
Control Delay		9.7	20.7		63.7	37.4
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		9.7	20.7		63.7	37.4
LOS		A	C		E	D
Approach Delay		9.7	20.7		61.9	
Approach LOS		A	C		E	

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green		
Natural Cycle: 50		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.83		
Intersection Signal Delay: 24.0		Intersection LOS: C
Intersection Capacity Utilization 60.0%		ICU Level of Service B
Analysis Period (min) 15		

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	706	1963	408	30
v/c Ratio	0.19	0.52	0.83	0.07
Control Delay	9.7	20.7	63.7	37.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.7	20.7	63.7	37.4
Queue Length 50th (m)	25.5	115.5	107.5	6.4
Queue Length 95th (m)	37.9	141.7	133.1	13.5
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3765	3802	752	653
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.52	0.54	0.05

Intersection Summary

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1054	0	0	1844	74	120
Future Volume (vph)	1054	0	0	1844	74	120
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5711	1987	1778
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5711	1987	1778
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	17.9			13.0	11.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	0%	0%	0%
Adj. Flow (vph)	1171	0	0	2049	82	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1171	0	0	2049	82	133
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

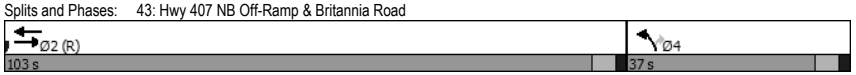
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	103.0			103.0	37.0	37.0
Total Split (%)	73.6%			73.6%	26.4%	26.4%
Maximum Green (s)	97.0			97.0	31.0	31.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	112.2			112.2	15.8	15.8
Actuated g/C Ratio	0.80			0.80	0.11	0.11
v/c Ratio	0.26			0.45	0.37	0.67
Control Delay	6.2			8.0	60.8	74.8
Queue Delay	0.0			0.2	0.0	0.0
Total Delay	6.2			8.3	60.8	74.8
LOS	A			A	E	E
Approach Delay	6.2			8.3	69.5	
Approach LOS	A			A	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 11.4 Intersection LOS: B
Intersection Capacity Utilization 60.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1171	2049	82	133
v/c Ratio	0.26	0.45	0.37	0.67
Control Delay	6.2	8.0	60.8	74.8
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	6.2	8.3	60.8	74.8
Queue Length 50th (m)	44.0	72.4	21.3	35.9
Queue Length 95th (m)	48.9	m101.2	36.3	55.3
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4532	4576	439	393
Starvation Cap Reductn	0	1401	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.65	0.19	0.34

Intersection Summary

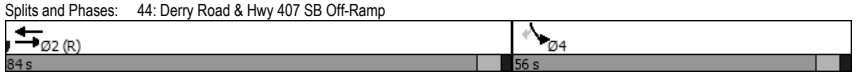
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	810	2307	0	231	435
Future Volume (vph)	0	810	2307	0	231	435
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	3817	1778
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	3817	1778
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						2
Link Speed (k/h)		60	60		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		20.0	18.5		13.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%
Adj. Flow (vph)	0	862	2454	0	246	463
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	862	2454	0	246	463
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		84.0	84.0		56.0	56.0
Total Split (%)		60.0%	60.0%		40.0%	40.0%
Maximum Green (s)		78.0	78.0		50.0	50.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	-2.9
Total Lost Time (s)		6.0	6.0		6.0	3.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		86.4	86.4		41.6	44.5
Actuated g/C Ratio		0.62	0.62		0.30	0.32
v/c Ratio		0.25	0.70		0.22	0.82
Control Delay		13.0	17.5		36.3	55.7
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		13.0	17.5		36.3	55.7
LOS		B	B		D	E
Approach Delay		13.0	17.5		48.9	
Approach LOS		B	B		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 74.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	862	2454	246	463
v/c Ratio	0.25	0.70	0.22	0.82
Control Delay	13.0	17.5	36.3	55.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.0	17.5	36.3	55.7
Queue Length 50th (m)	37.8	102.1	26.2	117.1
Queue Length 95th (m)	52.3	146.0	33.9	146.1
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3490	3525	1363	673
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.25	0.70	0.18	0.69

Intersection Summary

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1103	0	0	2178	121	150
Future Volume (vph)	1103	0	0	2178	121	150
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						0.99
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5655	3856	1743
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5655	3856	1722
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						158
Link Speed (k/h)	60			60	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	18.5			13.8	15.5	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	2%	1%	0%	2%
Adj. Flow (vph)	1161	0	0	2293	127	158
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1161	0	0	2293	127	158
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

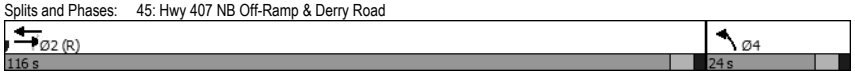
Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	116.0			116.0	24.0	116.0
Total Split (%)	82.9%			82.9%	17.1%	82.9%
Maximum Green (s)	110.0			110.0	18.0	110.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	117.9			117.9	10.1	117.9
Actuated g/C Ratio	0.84			0.84	0.07	0.84
v/c Ratio	0.24			0.48	0.46	0.11
Control Delay	0.8			0.8	67.3	0.5
Queue Delay	0.0			0.1	0.0	0.0
Total Delay	0.8			0.9	67.3	0.5
LOS	A			A	E	A
Approach Delay	0.8			0.9	30.3	
Approach LOS	A			A	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 3.1	Intersection LOS: A
Intersection Capacity Utilization 74.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1161	2293	127	158
v/c Ratio	0.24	0.48	0.46	0.11
Control Delay	0.8	0.8	67.3	0.5
Queue Delay	0.0	0.1	0.0	0.0
Total Delay	0.8	0.9	67.3	0.5
Queue Length 50th (m)	3.9	8.4	17.7	0.0
Queue Length 95th (m)	8.5	11.8	27.7	3.3
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4762	4762	495	1475
Starvation Cap Reductn	0	1003	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	0.61	0.26	0.11

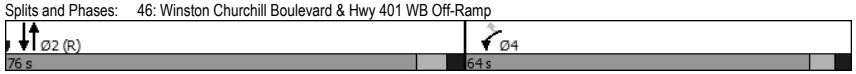
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1202	1110	3148	0	0	1771
Future Volume (vph)	1202	1110	3148	0	0	1771
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.964	0.850				
Flt Protected	0.963					
Satd. Flow (prot)	3741	1571	5491	0	0	5545
Flt Permitted	0.963					
Satd. Flow (perm)	3737	1571	5491	0	0	5545
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	4%	1%	0%	3%
Adj. Flow (vph)	1265	1168	3314	0	0	1864
Shared Lane Traffic (%)		34%				
Lane Group Flow (vph)	1662	771	3314	0	0	1864
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	64.0	64.0	76.0			76.0
Total Split (%)	45.7%	45.7%	54.3%			54.3%
Maximum Green (s)	57.0	57.0	68.0			68.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	57.0	57.0	68.0			68.0
Actuated g/C Ratio	0.41	0.41	0.49			0.49
v/c Ratio	1.09	1.21	1.24			0.69
Control Delay	91.5	144.2	143.5			29.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	91.5	144.2	143.5			29.6
LOS	F	F	F			C
Approach Delay	108.2		143.5			29.6
Approach LOS	F		F			C

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 49 (35%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 104.3	Intersection LOS: F
Intersection Capacity Utilization 120.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1662	771	3314	1864
v/c Ratio	1.09	1.21	1.24	0.69
Control Delay	91.5	144.2	143.5	29.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	91.5	144.2	143.5	29.6
Queue Length 50th (m)	~266.5	~284.8	~417.5	143.3
Queue Length 95th (m)	#308.0	#368.1	#439.3	160.0
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1523	639	2667	2693
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.09	1.21	1.24	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	422	461	0	3277	2582	0
Future Volume (vph)	422	461	0	3277	2582	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.955	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3457	1586	0	5545	5599	0
Flt Permitted	0.966					
Satd. Flow (perm)	3457	1586	0	5545	5599	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	3	3				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	2%	0%	3%	2%	7%
Adj. Flow (vph)	454	496	0	3524	2776	0
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	647	303	0	3524	2776	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

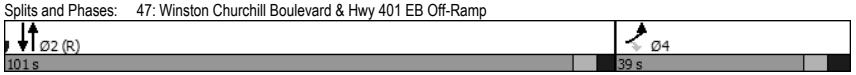
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	39.0	39.0		101.0	101.0	
Total Split (%)	27.9%	27.9%		72.1%	72.1%	
Maximum Green (s)	31.0	31.0		94.0	94.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	29.6	29.6		95.4	95.4	
Actuated g/C Ratio	0.21	0.21		0.68	0.68	
v/c Ratio	0.88	0.90		0.93	0.73	
Control Delay	67.6	81.8		25.8	11.0	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	67.6	81.8		25.8	11.0	
LOS	E	F		C	B	
Approach Delay	72.1			25.8	11.0	
Approach LOS	E			C	B	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 32.2 (23%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 26.2 — Intersection LOS: C
Intersection Capacity Utilization 86.1% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	647	303	3524	2776
v/c Ratio	0.88	0.90	0.93	0.73
Control Delay	67.6	81.8	25.8	11.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	67.6	81.8	25.8	11.0
Queue Length 50th (m)	88.7	88.5	299.3	132.5
Queue Length 95th (m)	#112.2	#142.5	322.0	m135.0
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	767	353	3777	3813
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.86	0.93	0.73

Intersection Summary

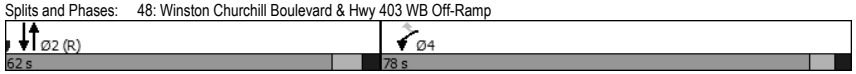
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1191	1967	2218	0	0	2405
Future Volume (vph)	1191	1967	2218	0	0	2405
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.937	0.850				
Flt Protected	0.972					
Satd. Flow (prot)	3681	1602	5655	0	0	5655
Flt Permitted	0.972					
Satd. Flow (perm)	3681	1602	5655	0	0	5655
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Peak Hour Factor	0.89	0.96	0.93	0.93	0.89	0.89
Heavy Vehicles (%)	0%	1%	1%	0%	0%	1%
Adj. Flow (vph)	1338	2049	2385	0	0	2702
Shared Lane Traffic (%)		47%				
Lane Group Flow (vph)	2301	1086	2385	0	0	2702
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	78.0	78.0	62.0			62.0
Total Split (%)	55.7%	55.7%	44.3%			44.3%
Maximum Green (s)	71.0	71.0	54.0			54.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	-2.9	-2.9			0.0
Total Lost Time (s)	7.0	4.1	5.1			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	71.0	73.9	56.9			54.0
Actuated g/C Ratio	0.51	0.53	0.41			0.39
v/c Ratio	1.23	1.29	1.04			1.24
Control Delay	141.7	167.7	70.7			149.0
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	141.7	167.7	70.7			149.0
LOS	F	F	E			F
Approach Delay	150.0		70.7			149.0
Approach LOS	F		E			F

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 2.8 (2%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.29	
Intersection Signal Delay: 127.3	Intersection LOS: F
Intersection Capacity Utilization 171.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	2301	1086	2385	2702
v/c Ratio	1.23	1.29	1.04	1.24
Control Delay	141.7	167.7	70.7	149.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	141.7	167.7	70.7	149.0
Queue Length 50th (m)	~404.9	~418.6	~262.9	~339.0
Queue Length 95th (m)	#435.4	#506.3	#290.4	#357.8
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1866	845	2298	2181
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.23	1.29	1.04	1.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	514	204	0	2171	2873	0
Future Volume (vph)	514	204	0	2171	2873	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3817	1726	0	5655	5655	0
Flt Permitted	0.950					
Satd. Flow (perm)	3817	1726	0	5655	5655	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		2				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	3%	0%	1%	1%	0%
Adj. Flow (vph)	565	224	0	2386	3157	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	565	224	0	2386	3157	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

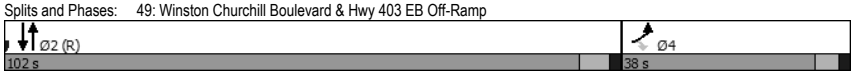
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	38.0	38.0		102.0	102.0	
Total Split (%)	27.1%	27.1%		72.9%	72.9%	
Maximum Green (s)	32.0	32.0		95.0	95.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	26.4	26.4		100.6	100.6	
Actuated g/C Ratio	0.19	0.19		0.72	0.72	
v/c Ratio	0.79	0.69		0.59	0.78	
Control Delay	62.2	63.2		10.7	25.2	
Queue Delay	0.0	0.0		0.0	0.1	
Total Delay	62.2	63.2		10.7	25.3	
LOS	E	E		B	C	
Approach Delay	62.5			10.7	25.3	
Approach LOS	E			B	C	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 81.2 (58%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 24.4 Intersection LOS: C
Intersection Capacity Utilization 171.7% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	565	224	2386	3157
v/c Ratio	0.79	0.69	0.59	0.78
Control Delay	62.2	63.2	10.7	25.2
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	62.2	63.2	10.7	25.3
Queue Length 50th (m)	77.3	57.7	108.0	245.0
Queue Length 95th (m)	93.0	82.1	136.7	m187.9
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	872	396	4065	4065
Starvation Cap Reductn	0	0	0	129
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.57	0.59	0.80

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

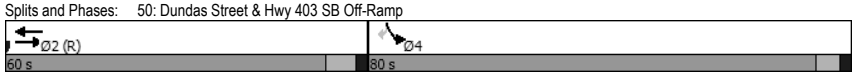
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1857	1810	0	537	1548
Future Volume (vph)	0	1857	1810	0	537	1548
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Ped Bike Factor						
Frt					0.911	0.850
Flt Protected					0.980	
Satd. Flow (prot)	0	5338	5599	0	3409	1571
Flt Permitted					0.980	
Satd. Flow (perm)	0	5338	5599	0	3409	1571
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					1	1
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	7%	2%	0%	11%	3%
Adj. Flow (vph)	0	1895	1847	0	548	1580
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	0	1895	1847	0	1338	790
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		60.0	60.0		80.0	80.0
Total Split (%)		42.9%	42.9%		57.1%	57.1%
Maximum Green (s)		53.0	53.0		74.0	74.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		53.8	53.8		73.2	73.2
Actuated g/C Ratio		0.38	0.38		0.52	0.52
v/c Ratio		0.92	0.86		0.88dr	0.96
Control Delay		50.0	68.5		29.4	55.7
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		50.0	68.5		29.4	55.7
LOS		D	E		C	E
Approach Delay		50.0	68.5		39.1	
Approach LOS		D	E		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 4.2 (3%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 51.9		Intersection LOS: D	
Intersection Capacity Utilization 101.6%		ICU Level of Service G	
Analysis Period (min) 15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1895	1847	1338	790
v/c Ratio	0.92	0.86	0.88dr	0.96
Control Delay	50.0	68.5	29.4	55.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	50.0	68.5	29.4	55.7
Queue Length 50th (m)	183.9	199.4	143.8	220.9
Queue Length 95th (m)	#207.5	214.2	170.4	#320.4
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	2050	2150	1802	830
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.92	0.86	0.74	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1690	0	0	2344	125	835
Future Volume (vph)	1690	0	0	2344	125	835
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Frt					0.885	0.850
Flt Protected					0.989	
Satd. Flow (prot)	5491	0	0	5655	3483	1586
Flt Permitted					0.989	
Satd. Flow (perm)	5491	0	0	5655	3483	1586
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					12	12
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	4%	0%	0%	1%	2%	2%
Adj. Flow (vph)	1742	0	0	2416	129	861
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	1742	0	0	2416	560	430
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

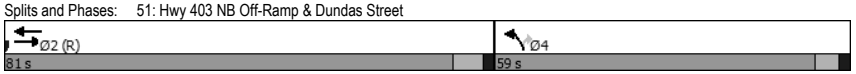
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	81.0			81.0	59.0	59.0
Total Split (%)	57.9%			57.9%	42.1%	42.1%
Maximum Green (s)	74.0			74.0	53.0	53.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	83.7			83.7	43.3	43.3
Actuated g/C Ratio	0.60			0.60	0.31	0.31
v/c Ratio	0.53			0.71	0.52	0.86
Control Delay	9.9			22.5	39.8	61.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	9.9			22.5	39.8	61.3
LOS	A			C	D	E
Approach Delay	9.9			22.5	49.1	
Approach LOS	A			C	D	

Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 43.4 (31%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 23.3		Intersection LOS: C	
Intersection Capacity Utilization 101.6%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street



Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1742	2416	560	430
v/c Ratio	0.53	0.71	0.52	0.86
Control Delay	9.9	22.5	39.8	61.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.9	22.5	39.8	61.3
Queue Length 50th (m)	74.2	166.0	63.9	119.6
Queue Length 95th (m)	182.3	214.6	73.2	151.4
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	3284	3382	1326	607
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	0.71	0.42	0.71

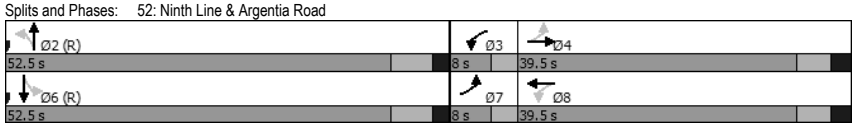
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	150	156	126	471	69	238	620	116	45	459	326
Future Volume (vph)	122	150	156	126	471	69	238	620	116	45	459	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	20.0		45.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.924			0.981			0.976			0.938	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1740	0	1789	1848	0	1789	3493	0	1789	3357	0
Flt Permitted	0.124			0.424			0.286			0.309		
Satd. Flow (perm)	234	1740	0	799	1848	0	539	3493	0	582	3357	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57			8			29			241	
Link Speed (k/h)		48			48			70			70	
Link Distance (m)		157.8			289.7			780.0			514.0	
Travel Time (s)		11.8			21.7			40.1			26.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	122	150	156	126	471	69	238	620	116	45	459	326
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	306	0	126	540	0	238	736	0	45	785	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	8.0		4.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	8.0	22.5		8.0	22.5		52.0	52.0		52.0	52.0	
Total Split (s)	8.0	39.5		8.0	39.5		52.5	52.5		52.5	52.5	
Total Split (%)	8.0%	39.5%		8.0%	39.5%		52.5%	52.5%		52.5%	52.5%	
Maximum Green (s)	5.0	33.0		5.0	33.0		45.5	45.5		45.5	45.5	
Yellow Time (s)	3.0	4.0		3.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	2.5		0.0	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	2.0	5.5		2.0	5.5		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)		8.0			8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)		8.0			8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	41.7	32.2		41.7	32.2		48.3	48.3		48.3	48.3	
Actuated g/C Ratio	0.42	0.32		0.42	0.32		0.48	0.48		0.48	0.48	
v/c Ratio	0.64	0.51		0.32	0.90		0.92	0.43		0.16	0.45	
Control Delay	33.3	25.1		19.0	51.6		75.7	26.4		17.4	12.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	33.3	25.1		19.0	51.6		75.7	26.4		17.4	12.6	
LOS	C	C		B	D		E	C		B	B	
Approach Delay		27.4			45.4			38.4			12.9	
Approach LOS		C			D			D			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 31.1	Intersection LOS: C
Intersection Capacity Utilization 90.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 52: Ninth Line & Argentia Road



Queues
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	122	306	126	540	238	736	45	785
v/c Ratio	0.64	0.51	0.32	0.90	0.92	0.43	0.16	0.45
Control Delay	33.3	25.1	19.0	51.6	75.7	26.4	17.4	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	25.1	19.0	51.6	75.7	26.4	17.4	12.6
Queue Length 50th (m)	13.4	37.4	13.9	95.1	40.6	54.1	4.9	35.4
Queue Length 95th (m)	#26.3	62.1	24.8	#151.5	#88.2	78.1	12.1	50.6
Internal Link Dist (m)		133.8		265.7		756.0		490.0
Turn Bay Length (m)					20.0		20.0	
Base Capacity (vph)	191	629	391	633	260	1703	281	1747
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.49	0.32	0.85	0.92	0.43	0.16	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
97: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1118	362	0	1820	0	0
Future Volume (vph)	1118	362	0	1820	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	120.9	
Travel Time (s)	15.5			6.8	9.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1118	362	0	1820	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1118	362	0	1820	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 120.3% ICU Level of Service H
Analysis Period (min) 15

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	997	67	49	1479
Future Volume (vph)	46	47	997	67	49	1479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.98				
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3484	0	1825	3544
Flt Permitted	0.950				0.232	
Satd. Flow (perm)	1789	1560	3484	0	446	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	15			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	1084	73	53	1608
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	1157	0	53	1608
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

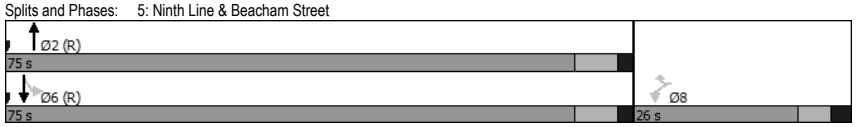
Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	26.0	26.0	75.0		75.0	75.0
Total Split (%)	25.7%	25.7%	74.3%		74.3%	74.3%
Maximum Green (s)	19.5	19.5	68.0		68.0	68.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	10.0	10.0	83.6		83.6	83.6
Actuated g/C Ratio	0.10	0.10	0.83		0.83	0.83
v/c Ratio	0.28	0.26	0.40		0.14	0.55
Control Delay	46.1	15.2	0.7		3.8	4.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.1	15.2	0.7		3.8	4.6
LOS	D	B	A		A	A
Approach Delay	30.5		0.7			4.6
Approach LOS	C		A			A

Intersection Summary		
Area Type:	Other	
Cycle Length: 101		
Actuated Cycle Length: 101		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green		
Natural Cycle: 80		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.55		
Intersection Signal Delay: 3.9		Intersection LOS: A
Intersection Capacity Utilization 57.6%		ICU Level of Service B
Analysis Period (min) 15		

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	50	51	1157	53	1608
v/c Ratio	0.28	0.26	0.40	0.14	0.55
Control Delay	46.1	15.2	0.7	3.8	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	15.2	0.7	3.8	4.6
Queue Length 50th (m)	9.3	0.0	1.0	1.9	48.0
Queue Length 95th (m)	19.9	10.5	1.1	5.6	72.3
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	363	357	2887	369	2934
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.14	0.40	0.14	0.55

Intersection Summary

APPENDIX T

2041 Scenario 5 Future Total Traffic Conditions – GTA West

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	0	610	2	2	632
Future Volume (vph)	1	0	610	2	2	632
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1825	1921	1902	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1921	1902	0	0	1865
Link Speed (k/h)	50		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.2		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	3%
Adj. Flow (vph)	1	0	663	2	2	687
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	665	0	0	689
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	610	2	2	632
Future Volume (Veh/h)	1	0	610	2	2	632
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	663	2	2	687
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1355	664			665	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1355	664			665	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	166	464			934	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	665	689
Volume Left	1	0	2
Volume Right	0	2	0
cSH	125	1700	934
Volume to Capacity	0.01	0.39	0.00
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	34.1	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	34.1	0.0	0.1
Approach LOS	D		

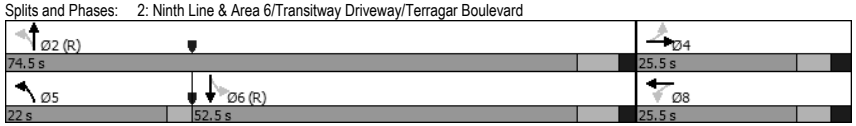
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	20	106	143	115	84	506	775	62	27	655	80
Future Volume (vph)	14	20	106	143	115	84	506	775	62	27	655	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.874			0.934			0.989			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1646	0	1755	1752	0	1789	3490	0	1825	3525	0
Flt Permitted	0.439			0.647			0.285			0.314		
Satd. Flow (perm)	827	1646	0	1195	1752	0	537	3490	0	603	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		106			36			19			16	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		138.3			287.6			434.9			780.0	
Travel Time (s)		10.4			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	4%	2%	3%	2%	3%	9%	0%	2%	2%
Adj. Flow (vph)	14	20	106	155	115	91	506	842	67	29	712	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	126	0	155	206	0	506	909	0	29	792	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	8.0		8.0	8.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		9.0	53.0		52.0	52.0	
Total Split (s)	25.5	25.5		25.5	25.5		22.0	74.5		52.5	52.5	
Total Split (%)	25.5%	25.5%		25.5%	25.5%		22.0%	74.5%		52.5%	52.5%	
Maximum Green (s)	19.0	19.0		19.0	19.0		19.0	67.5		45.5	45.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		2.0	6.0		6.0	6.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0			35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)	17.2	17.2		17.2	17.2		75.3	71.3		52.2	52.2	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.75	0.71		0.52	0.52	
v/c Ratio	0.10	0.34		0.75	0.62		0.82	0.36		0.09	0.43	
Control Delay	34.9	12.2		61.5	39.5		19.2	6.3		15.6	16.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.9	12.2		61.5	39.5		19.2	6.3		15.6	16.4	
LOS	C	B		E	D		B	A		B	B	
Approach Delay		14.5			49.0			10.9			16.4	
Approach LOS		B			D			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 84.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	14	126	155	206	506	909	29	792
v/c Ratio	0.10	0.34	0.75	0.62	0.82	0.36	0.09	0.43
Control Delay	34.9	12.2	61.5	39.5	19.2	6.3	15.6	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	12.2	61.5	39.5	19.2	6.3	15.6	16.4
Queue Length 50th (m)	2.3	3.2	28.2	30.0	30.6	32.6	2.9	49.9
Queue Length 95th (m)	7.6	17.9	#52.9	52.1	#76.5	43.6	8.5	68.6
Internal Link Dist (m)		114.3		263.6		410.9		756.0
Turn Bay Length (m)					40.0		40.0	
Base Capacity (vph)	165	414	239	379	654	2492	314	1846
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.30	0.65	0.54	0.77	0.36	0.09	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	27	46	0	18	59	1312	63	11	851	4
Future Volume (vph)	7	0	27	46	0	18	59	1312	63	11	851	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.993			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3521	0	1674	3540	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3521	0	1674	3540	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		134.3			310.4			412.4			434.9	
Travel Time (s)		10.1			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	2%	9%	3%	2%
Adj. Flow (vph)	7	0	27	50	0	20	59	1426	68	12	925	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	27	0	50	20	0	59	1494	0	12	929	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 60.8% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	27	46	0	18	59	1312	63	11	851	4
Future Volume (Veh/h)	7	0	27	46	0	18	59	1312	63	11	851	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	7	0	27	50	0	20	59	1426	68	12	925	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1802	2563	464	2092	2531	747	929			1494		
vC1, stage 1 conf vol	951	951		1578	1578							
vC2, stage 2 conf vol	851	1612		514	953							
vCu, unblocked vol	1802	2563	464	2092	2531	747	929			1494		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	96	100	95	51	100	94	92			97		
cM capacity (veh/h)	189	123	544	102	131	360	732			412		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	7	27	50	20	59	951	543	12	617	312
Volume Left	7	0	50	0	59	0	0	12	0	0
Volume Right	0	27	0	20	0	0	68	0	0	4
cSH	189	544	102	360	732	1700	1700	412	1700	1700
Volume to Capacity	0.04	0.05	0.49	0.06	0.08	0.56	0.32	0.03	0.36	0.18
Queue Length 95th (m)	0.9	1.2	16.5	1.3	2.0	0.0	0.0	0.7	0.0	0.0
Control Delay (s)	24.8	12.0	70.4	15.6	10.3	0.0	0.0	14.0	0.0	0.0
Lane LOS	C	B	F	C	B			B		
Approach Delay (s)	14.6		54.8		0.4			0.2		
Approach LOS	B		F							

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization		60.8%	ICU Level of Service
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	291	2166	137	159	882	344	229	664	301	114	601	186
Future Volume (vph)	291	2166	137	159	882	344	229	664	301	114	601	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.991			0.958				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1733	5143	0	1716	4884	0	1785	3614	1566	1638	3614	1597
Flt Permitted	0.135			0.066			0.137			0.243		
Satd. Flow (perm)	246	5143	0	119	4884	0	257	3614	1566	419	3614	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			80				181			168
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	4%	4%	0%	0%	1%	2%	9%	1%	0%
Adj. Flow (vph)	291	2166	137	159	882	344	229	664	301	114	601	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	291	2303	0	159	1226	0	229	664	301	114	601	186
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

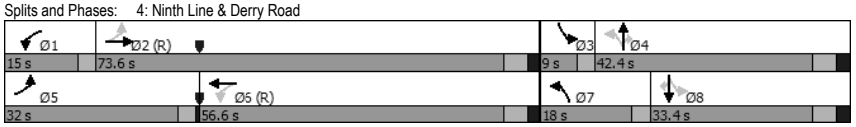
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	5.0	8.0	8.0
Minimum Split (s)	9.0	30.1		8.0	30.1		8.0	29.4	29.4	8.0	29.4	29.4
Total Split (s)	32.0	73.6		15.0	56.6		18.0	42.4	42.4	9.0	33.4	33.4
Total Split (%)	22.9%	52.6%		10.7%	40.4%		12.9%	30.3%	30.3%	6.4%	23.9%	23.9%
Maximum Green (s)	28.5	67.5		12.0	50.5		15.0	36.0	36.0	6.0	27.0	27.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.5	2.1		0.0	2.1		0.0	2.4	2.4	0.0	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.5	5.1		2.0	5.1		2.0	5.4	5.4	2.0	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	87.0	70.2		75.8	60.5		48.5	36.1	36.1	37.5	27.1	27.1
Actuated g/C Ratio	0.62	0.50		0.54	0.43		0.35	0.26	0.26	0.27	0.19	0.19
v/c Ratio	0.77	0.89		0.79	0.57		0.87	0.71	0.56	0.66	0.86	0.42
Control Delay	42.7	34.1		67.1	23.3		66.0	51.9	21.4	53.9	67.6	12.0
Queue Delay	0.0	0.2		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	34.4		67.1	23.3		66.0	51.9	21.4	53.9	67.6	12.0
LOS	D	C		E	C		E	D	C	D	E	B
Approach Delay		35.3			28.3			46.9			54.4	
Approach LOS		D			C			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 38.8 — Intersection LOS: D
Intersection Capacity Utilization 98.4% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	291	2303	159	1226	229	664	301	114	601	186
v/c Ratio	0.77	0.89	0.79	0.57	0.87	0.71	0.56	0.66	0.86	0.42
Control Delay	42.7	34.1	67.1	23.3	66.0	51.9	21.4	53.9	67.6	12.0
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	34.4	67.1	23.3	66.0	51.9	21.4	53.9	67.6	12.0
Queue Length 50th (m)	53.3	154.2	31.4	48.6	46.9	87.6	27.6	21.9	84.8	4.1
Queue Length 95th (m)	88.9	181.7	#65.8	95.2	#90.0	109.1	57.5	#39.0	#107.2	24.9
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	466	2583	213	2156	263	955	547	173	722	453
Starvation Cap Reductn	0	30	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.90	0.75	0.57	0.87	0.70	0.55	0.66	0.83	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1338	85	58	780
Future Volume (vph)	90	47	1338	85	58	780
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3546	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1807	1633	3546	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1454	92	63	848
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1546	0	63	848
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.5%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	90	47	1338	85	58	780
Future Volume (Veh/h)	90	47	1338	85	58	780
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	51	1454	92	63	848
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2050	775			1546	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2050	775			1546	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	85			86	
cM capacity (veh/h)	42	344			435	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	149	969	577	63	424	424
Volume Left	98	0	0	63	0	0
Volume Right	51	0	92	0	0	0
cSH	60	1700	1700	435	1700	1700
Volume to Capacity	2.48	0.57	0.34	0.14	0.25	0.25
Queue Length 95th (m)	113.1	0.0	0.0	3.8	0.0	0.0
Control Delay (s)	821.1	0.0	0.0	14.7	0.0	0.0
Lane LOS	F			B		
Approach Delay (s)	821.1	0.0		1.0		
Approach LOS	F					

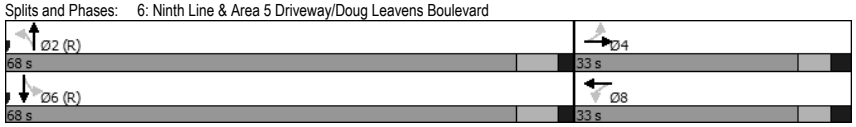
Intersection Summary			
Average Delay	47.3		
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	75	36	138	28	207	9	1081	97	80	680	8
Future Volume (vph)	33	75	36	138	28	207	9	1081	97	80	680	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		27.0	50.0		60.0	115.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.951			0.867			0.988			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1791	0	1772	1613	0	1789	3496	0	1825	3571	0
Flt Permitted	0.340			0.685			0.356			0.180		
Satd. Flow (perm)	640	1791	0	1278	1613	0	671	3496	0	346	3571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			86			17			2	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		99.7			255.0			850.0			603.1	
Travel Time (s)		7.5			18.4			43.7			31.0	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	3%	5%	0%	2%	2%
Adj. Flow (vph)	33	75	36	150	28	225	9	1175	105	87	739	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	111	0	150	253	0	9	1280	0	87	747	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		45.0	45.0	
Minimum Split (s)	25.5	25.5		23.0	23.0		52.0	52.0		52.0	52.0	
Total Split (s)	33.0	33.0		33.0	33.0		68.0	68.0		68.0	68.0	
Total Split (%)	32.7%	32.7%		32.7%	32.7%		67.3%	67.3%		67.3%	67.3%	
Maximum Green (s)	26.5	26.5		26.5	26.5		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	18.4	18.4		18.4	18.4		71.1	71.1		71.1	71.1	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.70	0.70		0.70	0.70	
v/c Ratio	0.28	0.32		0.64	0.70		0.02	0.52		0.36	0.30	
Control Delay	39.5	28.6		50.0	34.7		10.2	14.7		12.8	6.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.5	28.6		50.0	34.7		10.2	14.7		12.8	6.6	
LOS	D	C		D	C		B	B		B	A	
Approach Delay		31.1			40.4			14.7			7.3	
Approach LOS		C			D			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 17.1		Intersection LOS: B	
Intersection Capacity Utilization 101.7%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard



Queues
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	111	150	253	9	1280	87	747
v/c Ratio	0.28	0.32	0.64	0.70	0.02	0.52	0.36	0.30
Control Delay	39.5	28.6	50.0	34.7	10.2	14.7	12.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	28.6	50.0	34.7	10.2	14.7	12.8	6.6
Queue Length 50th (m)	5.7	14.8	27.6	30.9	0.8	89.2	5.8	24.7
Queue Length 95th (m)	13.3	27.2	43.6	51.7	m2.4	133.3	20.2	43.1
Internal Link Dist (m)		75.7		231.0		826.0		579.1
Turn Bay Length (m)					50.0		115.0	
Base Capacity (vph)	174	505	347	501	472	2465	243	2513
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.22	0.43	0.50	0.02	0.52	0.36	0.30

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	27	36	200	13	122	9	1229	150	55	953	8
Future Volume (vph)	33	27	36	200	13	122	9	1229	150	55	953	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	13.0		0.0	35.0		25.0	270.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			13.0			60.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.914			0.863			0.984			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1721	0	1706	1605	0	1789	3443	0	1789	3541	0
Flt Permitted	0.609			0.716			0.217			0.096		
Satd. Flow (perm)	1147	1721	0	1286	1605	0	409	3443	0	181	3541	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			127			19			1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		142.8			160.0			383.2			301.0	
Travel Time (s)		10.7			11.5			19.7			15.5	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	7%	2%	2%	2%	4%	7%	2%	3%	2%
Adj. Flow (vph)	33	27	36	217	13	133	9	1336	163	60	1036	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	63	0	217	146	0	9	1499	0	60	1044	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

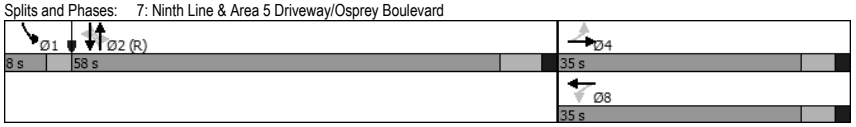
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.0	25.0		52.0	52.0		8.0	52.0	
Total Split (s)	35.0	35.0		35.0	35.0		58.0	58.0		8.0	58.0	
Total Split (%)	34.7%	34.7%		34.7%	34.7%		57.4%	57.4%		7.9%	57.4%	
Maximum Green (s)	29.0	29.0		29.0	29.0		51.0	51.0		5.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		37.0	37.0			37.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	22.8	22.8		22.8	22.8		59.8	59.8		69.6	59.8	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.59	0.59		0.69	0.59	
v/c Ratio	0.13	0.15		0.75	0.32		0.04	0.73		0.25	0.50	
Control Delay	29.6	15.6		51.7	8.9		12.3	19.2		11.2	17.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	29.6	15.6		51.7	8.9		12.3	19.2		11.2	17.9	
LOS	C	B		D	A		B	B		B	B	
Approach Delay		20.4			34.5			19.1			17.5	
Approach LOS		C			C			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 20.4 Intersection LOS: C
Intersection Capacity Utilization 76.8% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 7: Ninth Line & Area 5 Driveway/Osprey Boulevard



Queues
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	63	217	146	9	1499	60	1044
v/c Ratio	0.13	0.15	0.75	0.32	0.04	0.73	0.25	0.50
Control Delay	29.6	15.6	51.7	8.9	12.3	19.2	11.2	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	15.6	51.7	8.9	12.3	19.2	11.2	17.9
Queue Length 50th (m)	5.1	4.2	39.5	2.9	0.7	109.9	3.2	68.3
Queue Length 95th (m)	11.8	13.2	60.0	16.5	3.4	156.8	12.1	104.0
Internal Link Dist (m)		118.8		136.0		359.2		277.0
Turn Bay Length (m)			13.0		35.0		270.0	
Base Capacity (vph)	340	536	381	566	242	2047	236	2098
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.12	0.57	0.26	0.04	0.73	0.25	0.50

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	9	18	0	91	2	1122	6	27	980	2
Future Volume (vph)	7	0	9	18	0	91	2	1122	6	27	980	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			60.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.850			0.850			0.999				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3611	0	1825	3614	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3611	0	1825	3614	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		144.4			207.4			254.7			383.2	
Travel Time (s)		10.8			14.9			13.1			19.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	7	0	9	20	0	99	2	1220	7	29	1065	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	9	0	20	99	0	2	1227	0	29	1067	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	9	18	0	91	2	1122	6	27	980	2
Future Volume (Veh/h)	7	0	9	18	0	91	2	1122	6	27	980	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	7	0	9	20	0	99	2	1220	7	29	1065	2
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								255			383	
pX, platoon unblocked	0.78	0.78	0.86	0.78	0.78	0.71	0.86			0.71		
vC, conflicting volume	1838	2355	534	1827	2352	614	1067			1227		
vC1, stage 1 conf vol	1124	1124		1228	1228							
vC2, stage 2 conf vol	714	1231		600	1125							
vCu, unblocked vol	729	1389	142	714	1386	0	760			518		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	99	94	100	87	100			96		
cM capacity (veh/h)	268	251	759	348	257	779	731			756		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	7	9	20	99	2	813	414	29	710	357
Volume Left	7	0	20	0	2	0	0	29	0	0
Volume Right	0	9	0	99	0	0	7	0	0	2
cSH	268	759	348	779	731	1700	1700	756	1700	1700
Volume to Capacity	0.03	0.01	0.06	0.13	0.00	0.48	0.24	0.04	0.42	0.21
Queue Length 95th (m)	0.6	0.3	1.4	3.3	0.1	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	18.8	9.8	16.0	10.3	9.9	0.0	0.0	10.0	0.0	0.0
Lane LOS	C	A	C	B	A			A		
Approach Delay (s)	13.7		11.2		0.0			0.3		
Approach LOS	B		B							

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	2291	328	80	763	125	210	931	144	104	848	137
Future Volume (vph)	120	2291	328	80	763	125	210	931	144	104	848	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.981			0.979			0.980			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	5088	0	1767	4918	0	1785	3502	0	1653	3503	0
Flt Permitted	0.308			0.055			0.102			0.107		
Satd. Flow (perm)	573	5088	0	102	4918	0	192	3502	0	186	3503	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			37			13			13	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	2%	1%	2%	19%	0%	2%	3%	8%	2%	2%
Adj. Flow (vph)	120	2291	328	80	763	125	210	931	144	104	848	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	2619	0	80	888	0	210	1075	0	104	985	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	24.6	24.6		8.0	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	76.0	76.0		8.0	84.0		13.0	48.0		8.0	43.0	
Total Split (%)	54.3%	54.3%		5.7%	60.0%		9.3%	34.3%		5.7%	30.7%	
Maximum Green (s)	69.4	69.4		5.0	77.4		10.0	41.4		5.0	36.4	
Yellow Time (s)	4.6	4.6		3.0	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	2.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-2.0	-1.0		-2.0	-1.0		-1.0	-3.0	
Total Lost Time (s)	5.6	5.6		1.0	5.6		1.0	5.6		2.0	3.6	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			12.0			12.0	
Flash Dont Walk (s)	11.0	11.0			11.0			18.0			18.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)	70.4	70.4		83.0	78.4		55.0	42.4		47.0	39.4	
Actuated g/C Ratio	0.50	0.50		0.59	0.56		0.39	0.30		0.34	0.28	
v/c Ratio	0.42	1.02		0.56	0.32		1.00	1.01		0.83	0.99	
Control Delay	16.2	44.2		48.7	14.5		95.5	76.6		78.0	75.4	
Queue Delay	0.0	0.3		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.2	44.4		48.7	14.5		95.5	76.6		78.0	75.4	
LOS	B	D		D	B		F	E		E	E	
Approach Delay		43.2			17.3			79.7			75.6	
Approach LOS		D			B			E			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green, Master Intersection			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 52.6		Intersection LOS: D	
Intersection Capacity Utilization 110.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 9: Ninth Line & Britannia Road

Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	2619	80	888	210	1075	104	985
v/c Ratio	0.42	1.02	0.56	0.32	1.00	1.01	0.83	0.99
Control Delay	16.2	44.2	48.7	14.5	95.5	76.6	78.0	75.4
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	44.4	48.7	14.5	95.5	76.6	78.0	75.4
Queue Length 50th (m)	10.1	~281.5	9.6	33.3	41.6	~157.1	18.7	142.1
Queue Length 95th (m)	15.9	#300.8	28.9	38.3	#93.6	#204.5	#45.3	#187.8
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	288	2571	143	2770	211	1069	125	995
Starvation Cap Reductn	0	2	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	1.02	0.56	0.32	1.00	1.01	0.83	0.99

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	22	40	28	20	1299	9	2	1287	38
Future Volume (vph)	0	0	0	22	40	28	20	1299	9	2	1287	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.936			0.999			0.996	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	1883	0	1738	1778	0	1789	3572	0	1217	3531	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		111.0			491.2			170.0			206.5	
Travel Time (s)		8.3			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	0%	2%	2%	13%	50%	3%	2%
Adj. Flow (vph)	0	0	0	24	40	30	20	1412	10	2	1399	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	24	70	0	20	1422	0	2	1437	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.3% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	22	40	28	20	1299	9	2	1287	38
Future Volume (Veh/h)	0	0	0	22	40	28	20	1299	9	2	1287	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	0	0	0	24	40	30	20	1412	10	2	1399	38
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											206	
pX, platoon unblocked	0.73	0.73	0.73	0.73	0.73		0.73					
vC, conflicting volume	2218	2884	718	2160	2898	711	1437			1422		
vC1, stage 1 conf vol	1422	1422		1457	1457							
vC2, stage 2 conf vol	796	1462		704	1441							
vCu, unblocked vol	1935	2842	0	1857	2861	711	872			1422		
tC, single (s)	7.5	6.5	6.9	7.6	6.5	6.9	4.1			5.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.7		
p0 queue free %	100	100	100	80	72	92	96			99		
cM capacity (veh/h)	161	144	796	123	140	380	565			289		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	0	0	24	70	20	941	481	2	933	504
Volume Left	0	0	24	0	20	0	0	2	0	0
Volume Right	0	0	0	30	0	0	10	0	0	38
cSH	1700	1700	123	192	565	1700	1700	289	1700	1700
Volume to Capacity	0.00	0.00	0.20	0.36	0.04	0.55	0.28	0.01	0.55	0.30
Queue Length 95th (m)	0.0	0.0	5.2	11.8	0.8	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	0.0	0.0	41.3	34.0	11.6	0.0	0.0	17.5	0.0	0.0
Lane LOS	A	A	E	D	B			C		
Approach Delay (s)	0.0		35.9		0.2			0.0		
Approach LOS	A		E							

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization		47.3%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	4	3	24	1	41	14	1244	32	46	1252	27
Future Volume (vph)	9	4	3	24	1	41	14	1244	32	46	1252	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.936			0.853			0.996			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1763	0	1825	1591	0	1789	3555	0	1825	3568	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1763	0	1825	1591	0	1789	3555	0	1825	3568	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		61.6			511.9			217.0			170.0	
Travel Time (s)		4.6			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	3%	2%	2%	13%	0%	2%	2%
Adj. Flow (vph)	9	4	3	26	1	45	14	1352	35	50	1361	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	7	0	26	46	0	14	1387	0	50	1388	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	4	3	24	1	41	14	1244	32	46	1252	27
Future Volume (Veh/h)	9	4	3	24	1	41	14	1244	32	46	1252	27
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	9	4	3	26	1	45	14	1352	35	50	1361	27
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											376	
pX, platoon unblocked	0.75	0.75	0.75	0.75	0.75		0.75					
vC, conflicting volume	2225	2890	694	2183	2886	694	1388			1387		
vC1, stage 1 conf vol	1474	1474		1398	1398							
vC2, stage 2 conf vol	750	1415		786	1488							
vCu, unblocked vol	1971	2853	0	1915	2848	694	860			1387		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	97	100	81	99	88	98			90		
cM capacity (veh/h)	146	117	817	140	135	382	585			500		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	7	26	46	14	901	486	50	907	481
Volume Left	9	0	26	0	14	0	0	50	0	0
Volume Right	0	3	0	45	0	0	35	0	0	27
cSH	146	185	140	368	585	1700	1700	500	1700	1700
Volume to Capacity	0.06	0.04	0.19	0.13	0.02	0.53	0.29	0.10	0.53	0.28
Queue Length 95th (m)	1.5	0.9	5.0	3.2	0.6	0.0	0.0	2.5	0.0	0.0
Control Delay (s)	31.3	25.3	36.5	16.2	11.3	0.0	0.0	13.0	0.0	0.0
Lane LOS	D	D	E	C	B			B		
Approach Delay (s)	28.6		23.5		0.1			0.5		
Approach LOS	D		C							

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization		53.1%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	11	1385	8	4	1234
Future Volume (vph)	19	11	1385	8	4	1234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		35.0	30.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.951		0.999			
Flt Protected	0.969				0.950	
Satd. Flow (prot)	1714	0	3541	0	1825	3579
Flt Permitted	0.969				0.950	
Satd. Flow (perm)	1714	0	3541	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	0%	0%	2%
Adj. Flow (vph)	21	12	1505	9	4	1341
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	1514	0	4	1341
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	11	1385	8	4	1234
Future Volume (Veh/h)	19	11	1385	8	4	1234
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	12	1505	9	4	1341
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2188	757			1514	
vC1, stage 1 conf vol	1510					
vC2, stage 2 conf vol	678					
vCu, unblocked vol	2188	757			1514	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4			2.2	
p0 queue free %	87	96			99	
cM capacity (veh/h)	159	335			447	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	33	1003	511	4	670	670
Volume Left	21	0	0	4	0	0
Volume Right	12	0	9	0	0	0
cSH	197	1700	1700	447	1700	1700
Volume to Capacity	0.17	0.59	0.30	0.01	0.39	0.39
Queue Length 95th (m)	4.5	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	26.9	0.0	0.0	13.1	0.0	0.0
Lane LOS	D			B		
Approach Delay (s)	26.9	0.0		0.0		
Approach LOS	D					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	11	1263	6	3	1276
Future Volume (vph)	6	11	1263	6	3	1276
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1498	3535	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1498	3535	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	9%	3%	33%	0%	2%
Adj. Flow (vph)	7	12	1373	7	3	1387
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	12	1380	0	3	1387
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	11	1263	6	3	1276
Future Volume (Veh/h)	6	11	1263	6	3	1276
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	12	1373	7	3	1387
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.72	0.72			0.72	
vC, conflicting volume	2076	690			1380	
vC1, stage 1 conf vol	1376					
vC2, stage 2 conf vol	700					
vCu, unblocked vol	1708	0			734	
tC, single (s)	6.8	7.1			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.4			2.2	
p0 queue free %	97	98			100	
cM capacity (veh/h)	258	759			629	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	19	915	465	3	694	694
Volume Left	7	0	0	3	0	0
Volume Right	12	0	7	0	0	0
cSH	702	1700	1700	629	1700	1700
Volume to Capacity	0.03	0.54	0.27	0.00	0.41	0.41
Queue Length 95th (m)	0.6	0.0	0.0	0.1	0.0	0.0
Control Delay (s)	13.3	0.0	0.0	10.7	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	13.3	0.0		0.0		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2	17	206	1	100	5	1155	183	89	1139	3
Future Volume (vph)	10	2	17	206	1	100	5	1155	183	89	1139	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		35.0	28.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			45.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.866			0.851			0.979				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1631	0	1789	1508	0	1789	3469	0	1690	3579	0
Flt Permitted	0.686			0.745			0.160			0.108		
Satd. Flow (perm)	1292	1631	0	1403	1508	0	301	3469	0	192	3579	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			109			27				
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		170.8			534.8			346.0			306.2	
Travel Time (s)		12.8			38.5			17.8			15.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	7%	2%	3%	3%	8%	2%	2%
Adj. Flow (vph)	10	2	17	224	1	109	5	1255	199	97	1238	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	19	0	224	110	0	5	1454	0	97	1241	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

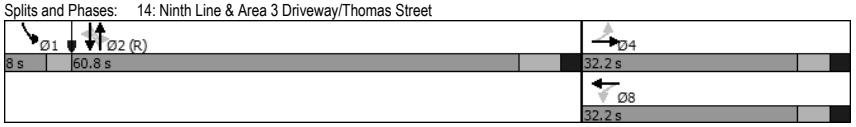
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		52.5	52.5		8.0	52.5	
Total Split (s)	32.2	32.2		32.2	32.2		60.8	60.8		8.0	60.8	
Total Split (%)	31.9%	31.9%		31.9%	31.9%		60.2%	60.2%		7.9%	60.2%	
Maximum Green (s)	25.7	25.7		25.7	25.7		53.3	53.3		5.0	53.3	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		0.0	2.5	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.5	6.5		2.0	6.5	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		33.0	33.0			33.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0			12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	21.5	21.5		21.5	21.5		60.1	60.1		70.4	60.1	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.60	0.60		0.70	0.60	
v/c Ratio	0.04	0.05		0.75	0.27		0.03	0.70		0.41	0.58	
Control Delay	28.9	14.0		50.2	9.3		13.6	24.1		10.5	15.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.9	14.0		50.2	9.3		13.6	24.1		10.5	15.4	
LOS	C	B		D	A		B	C		B	B	
Approach Delay		19.1			36.8			24.1			15.0	
Approach LOS		B			D			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 21.5 Intersection LOS: C
Intersection Capacity Utilization 102.0% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 14: Ninth Line & Area 3 Driveway/Thomas Street



Queues
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	19	224	110	5	1454	97	1241
v/c Ratio	0.04	0.05	0.75	0.27	0.03	0.70	0.41	0.58
Control Delay	28.9	14.0	50.2	9.3	13.6	24.1	10.5	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	14.0	50.2	9.3	13.6	24.1	10.5	15.4
Queue Length 50th (m)	1.6	0.3	43.6	2.3	0.6	149.4	5.2	81.5
Queue Length 95th (m)	5.5	5.8	67.5	17.4	m1.7	174.2	11.6	107.5
Internal Link Dist (m)		146.8		510.8		322.0		282.2
Turn Bay Length (m)					30.0		28.0	
Base Capacity (vph)	341	443	370	478	178	2073	239	2128
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.04	0.61	0.23	0.03	0.70	0.41	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	46	1222	7	17	1353
Future Volume (vph)	18	46	1222	7	17	1353
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.904		0.999			
Flt Protected	0.986				0.950	
Satd. Flow (prot)	1688	0	3541	0	1722	3579
Flt Permitted	0.986				0.950	
Satd. Flow (perm)	1688	0	3541	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	3%	0%	6%	2%
Adj. Flow (vph)	20	50	1328	8	18	1471
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	0	1336	0	18	1471
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	46	1222	7	17	1353
Future Volume (Veh/h)	18	46	1222	7	17	1353
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	50	1328	8	18	1471
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.77					
vC, conflicting volume	2104	668			1336	
vC1, stage 1 conf vol	1332					
vC2, stage 2 conf vol	772					
vCu, unblocked vol	1836	668			1336	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.3	
p0 queue free %	90	88			96	
cM capacity (veh/h)	201	401			491	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	70	885	451	18	736	736
Volume Left	20	0	0	18	0	0
Volume Right	50	0	8	0	0	0
cSH	312	1700	1700	491	1700	1700
Volume to Capacity	0.22	0.52	0.27	0.04	0.43	0.43
Queue Length 95th (m)	6.4	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	19.8	0.0	0.0	12.6	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	19.8	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	39	78	1201	49	46	1357
Future Volume (vph)	39	78	1201	49	46	1357
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.994			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1617	3515	0	1722	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1617	3515	0	1722	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	3%	9%	6%	2%
Adj. Flow (vph)	42	85	1305	53	50	1475
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	85	1358	0	50	1475
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	39	78	1201	49	46	1357
Future Volume (Veh/h)	39	78	1201	49	46	1357
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	85	1305	53	50	1475
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2169	679			1358	
vC1, stage 1 conf vol	1332					
vC2, stage 2 conf vol	838					
vCu, unblocked vol	2169	679			1358	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.3	
p0 queue free %	77	79			90	
cM capacity (veh/h)	180	396			482	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	127	870	488	50	738	738
Volume Left	42	0	0	50	0	0
Volume Right	85	0	53	0	0	0
cSH	544	1700	1700	482	1700	1700
Volume to Capacity	0.23	0.51	0.29	0.10	0.43	0.43
Queue Length 95th (m)	6.8	0.0	0.0	2.6	0.0	0.0
Control Delay (s)	21.3	0.0	0.0	13.3	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	21.3	0.0		0.4		
Approach LOS	C					

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	14	9	0	18	5	1218	1	8	1394	3
Future Volume (vph)	12	0	14	9	0	18	5	1218	1	8	1394	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	70.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.927			0.910							
Flt Protected		0.977			0.984		0.950			0.950		
Satd. Flow (prot)	0	1706	0	0	1720	0	1789	3544	0	1825	3579	0
Flt Permitted		0.977			0.984		0.950			0.950		
Satd. Flow (perm)	0	1706	0	0	1720	0	1789	3544	0	1825	3579	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		92.8			113.3			424.8			250.0	
Travel Time (s)		7.0			8.2			21.8			12.9	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	0%	0%	2%	2%
Adj. Flow (vph)	12	0	14	10	0	20	5	1324	1	9	1515	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	0	30	0	5	1325	0	9	1518	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	14	9	0	18	5	1218	1	8	1394	3
Future Volume (Veh/h)	12	0	14	9	0	18	5	1218	1	8	1394	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	12	0	14	10	0	20	5	1324	1	9	1515	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2226	2870	759	2124	2870	662	1518			1325		
vC1, stage 1 conf vol	1534	1534		1334	1334							
vC2, stage 2 conf vol	692	1335		790	1536							
vCu, unblocked vol	2226	2870	759	2124	2870	662	1518			1325		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	100	96	93	100	95	99			98		
cM capacity (veh/h)	111	128	349	143	128	409	436			528		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	26	30	5	883	442	9	1010	508
Volume Left	12	10	5	0	0	9	0	0
Volume Right	14	20	0	0	1	0	0	3
cSH	176	252	436	1700	1700	528	1700	1700
Volume to Capacity	0.15	0.12	0.01	0.52	0.26	0.02	0.59	0.30
Queue Length 95th (m)	3.9	3.0	0.3	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	29.0	21.2	13.4	0.0	0.0	11.9	0.0	0.0
Lane LOS	D	C	B			B		
Approach Delay (s)	29.0	21.2	0.1			0.1		
Approach LOS	D	C						

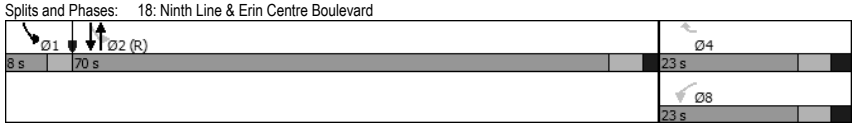
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	83	63	1117	58	55	1403
Future Volume (vph)	83	63	1117	58	55	1403
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.993			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1706	1570	3497	0	1772	3579
Flt Permitted	0.950				0.181	
Satd. Flow (perm)	1706	1570	3497	0	338	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		68	10			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	4%	3%	16%	3%	2%
Adj. Flow (vph)	90	68	1214	63	60	1525
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	68	1277	0	60	1525
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	23.0	23.0	70.0		8.0	70.0
Total Split (%)	22.8%	22.8%	69.3%		7.9%	69.3%
Maximum Green (s)	16.5	16.5	64.0		5.0	64.0
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	5.0	8.0	50.0			50.0
Flash Dont Walk (s)	11.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	11.9	11.9	75.0		82.9	75.0
Actuated g/C Ratio	0.12	0.12	0.74		0.82	0.74
v/c Ratio	0.45	0.28	0.49		0.16	0.57
Control Delay	48.0	12.7	8.1		5.5	18.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	48.0	12.7	8.1		5.5	18.8
LOS	D	B	A		A	B
Approach Delay	32.8		8.1			18.3
Approach LOS	C		A			B

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	90	68	1277	60	1525
v/c Ratio	0.45	0.28	0.49	0.16	0.57
Control Delay	48.0	12.7	8.1	5.5	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	12.7	8.1	5.5	18.8
Queue Length 50th (m)	16.7	0.0	55.9	4.1	139.6
Queue Length 95th (m)	30.6	11.5	83.3	m7.5	167.9
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	295	328	2600	378	2659
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.31	0.21	0.49	0.16	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	0	0	17	0	41	0	1056	8	14	1493	5
Future Volume (vph)	16	0	0	17	0	41	0	1056	8	14	1493	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.850			0.999				
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1883	0	1825	1601	0	1883	3541	0	1825	3579	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1883	0	1825	1601	0	1883	3541	0	1825	3579	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		73.8			216.6			90.1			404.2	
Travel Time (s)		5.5			15.6			4.6			20.8	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	2%	3%	0%	0%	2%	2%
Adj. Flow (vph)	16	0	0	18	0	45	0	1148	9	15	1623	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	0	0	18	45	0	0	1157	0	15	1628	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 55.7% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	0	17	0	41	0	1056	8	14	1493	5
Future Volume (Veh/h)	16	0	0	17	0	41	0	1056	8	14	1493	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	16	0	0	18	0	45	0	1148	9	15	1623	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								373				
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	2274	2812	814	1994	2810	578	1628			1157		
vC1, stage 1 conf vol	1656	1656		1152	1152							
vC2, stage 2 conf vol	619	1157		842	1658							
vCu, unblocked vol	2145	2779	814	1815	2777	148	1628			829		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	100	100	91	100	94	100			98		
cM capacity (veh/h)	96	130	321	211	131	741	395			689		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	16	0	18	45	0	765	392	15	1082	546
Volume Left	16	0	18	0	0	0	0	15	0	0
Volume Right	0	0	0	45	0	0	9	0	0	5
cSH	96	1700	211	741	1700	1700	1700	689	1700	1700
Volume to Capacity	0.17	0.00	0.09	0.06	0.00	0.45	0.23	0.02	0.64	0.32
Queue Length 95th (m)	4.3	0.0	2.1	1.5	0.0	0.0	0.0	0.5	0.0	0.0
Control Delay (s)	49.7	0.0	23.7	10.2	0.0	0.0	0.0	10.3	0.0	0.0
Lane LOS	E	A	C	B				B		
Approach Delay (s)	49.7		14.0		0.0			0.1		
Approach LOS	E		B							

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		55.7%	ICU Level of Service	B
Analysis Period (min)		15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	17	1108	1	6	1468
Future Volume (vph)	5	17	1108	1	6	1468
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.894					
Flt Protected	0.989				0.950	
Satd. Flow (prot)	1699	0	3544	0	1217	3614
Flt Permitted	0.989				0.950	
Satd. Flow (perm)	1699	0	3544	0	1217	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	50%	1%
Adj. Flow (vph)	5	18	1204	1	7	1596
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	1205	0	7	1596
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	17	1108	1	6	1468
Future Volume (Veh/h)	5	17	1108	1	6	1468
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	18	1204	1	7	1596
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.84	0.84			0.84	
vC, conflicting volume	2016	602			1205	
vC1, stage 1 conf vol	1204					
vC2, stage 2 conf vol	812					
vCu, unblocked vol	1825	136			855	
tC, single (s)	6.8	6.9			5.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.7	
p0 queue free %	98	98			98	
cM capacity (veh/h)	247	749			450	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	23	803	402	7	798	798
Volume Left	5	0	0	7	0	0
Volume Right	18	0	1	0	0	0
cSH	520	1700	1700	450	1700	1700
Volume to Capacity	0.04	0.47	0.24	0.02	0.47	0.47
Queue Length 95th (m)	1.1	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	12.2	0.0	0.0	13.1	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	12.2	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	0	43	2	0	25	11	982	6	0	1564	5
Future Volume (vph)	23	0	43	2	0	25	11	982	6	0	1564	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		20.0	0.0		0.0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.912				0.865			0.850			
Flt Protected		0.983			0.950		0.950					
Satd. Flow (prot)	0	1688	0	0	0	1662	1789	3544	1396	0	3614	0
Flt Permitted		0.983			0.950		0.950					
Satd. Flow (perm)	0	1688	0	0	0	1662	1789	3544	1396	0	3614	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		70.1			245.5			191.7			91.0	
Travel Time (s)		5.3			17.7			9.9			4.7	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	17%	0%	1%	2%
Adj. Flow (vph)	23	0	43	2	0	27	11	1067	7	0	1700	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	66	0	0	2	27	11	1067	7	0	1705	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization Err%		ICU Level of Service H	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	0	43	2	0	25	11	982	6	0	1564	5
Future Volume (Veh/h)	23	0	43	2	0	25	11	982	6	0	1564	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	23	0	43	2	0	27	11	1067	7	0	1700	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								192				
pX, platoon unblocked	0.83	0.83		0.83	0.83	0.83				0.83		
vC, conflicting volume	2285	2792	852	1982	2794	534	1705			1067		
vC1, stage 1 conf vol	1702	1702		1089	1089							
vC2, stage 2 conf vol	582	1089		893	1705							
vCu, unblocked vol	2141	2750	852	1777	2753	37	1705			678		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	100	86	99	100	97	97			100		
cM capacity (veh/h)	92	130	303	195	121	860	369			769		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	66	29	11	534	534	7	1133	572
Volume Left	23	2	11	0	0	0	0	0
Volume Right	43	27	0	0	0	7	0	5
cSH	169	696	369	1700	1700	1700	1700	1700
Volume to Capacity	0.39	0.04	0.03	0.31	0.31	0.00	0.67	0.34
Queue Length 95th (m)	12.9	1.0	0.7	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	39.4	10.4	15.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	E	B	C					
Approach Delay (s)	39.4	10.4	0.2				0.0	
Approach LOS	E	B						

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		Err%	ICU Level of Service	H
Analysis Period (min)		15		

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	908	51	39	314	245	14	526	67	486	826	82
Future Volume (vph)	69	908	51	39	314	245	14	526	67	486	826	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.983			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3617	0	1825	1883	1526	1825	3526	0	1789	3596	0
Flt Permitted	0.491			0.091			0.290			0.131		
Satd. Flow (perm)	934	3617	0	175	1883	1526	557	3526	0	247	3596	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				266		9			11	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	0%	2%	7%	0%	2%	0%	2%	0%	1%
Adj. Flow (vph)	75	987	55	42	341	266	15	572	73	528	898	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	1042	0	42	341	266	15	645	0	528	987	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

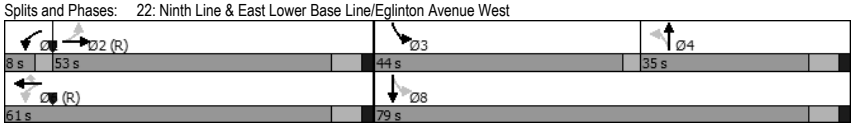
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		1	6	6	4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0	8.0	8.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		8.0	23.0	23.0	24.0	24.0		8.0	24.0	
Total Split (s)	53.0	53.0		8.0	61.0	61.0	35.0	35.0		44.0	79.0	
Total Split (%)	37.9%	37.9%		5.7%	43.6%	43.6%	25.0%	25.0%		31.4%	56.4%	
Maximum Green (s)	46.0	46.0		5.0	54.0	54.0	28.0	28.0		41.0	72.0	
Yellow Time (s)	5.0	5.0		3.0	5.0	5.0	5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		0.0	2.0	2.0	2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0	6.0	6.0	6.0		2.0	6.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min	Min	Min		None	Min	
Walk Time (s)	8.0	8.0			8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)	8.0	8.0			8.0	8.0	9.0	9.0			9.0	
Pedestrian Calls (#/hr)	0	0			0	0	0	0			0	
Act Effct Green (s)	51.2	51.2		61.9	57.9	57.9	28.5	28.5		74.1	70.1	
Actuated g/C Ratio	0.37	0.37		0.44	0.41	0.41	0.20	0.20		0.53	0.50	
v/c Ratio	0.22	0.79		0.28	0.44	0.34	0.13	0.89		0.93	0.55	
Control Delay	35.2	45.7		28.6	32.5	4.3	48.8	68.6		61.5	24.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	35.2	45.7		28.6	32.5	4.3	48.8	68.6		61.5	24.8	
LOS	D	D		C	C	A	D	E		E	C	
Approach Delay		45.0			20.7			68.2			37.6	
Approach LOS		D			C			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 42.0 Intersection LOS: D
Intersection Capacity Utilization 91.2% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	1042	42	341	266	15	645	528	987
v/c Ratio	0.22	0.79	0.28	0.44	0.34	0.13	0.89	0.93	0.55
Control Delay	35.2	45.7	28.6	32.5	4.3	48.8	68.6	61.5	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	45.7	28.6	32.5	4.3	48.8	68.6	61.5	24.8
Queue Length 50th (m)	15.0	140.8	6.8	69.4	0.0	3.4	90.7	119.6	91.1
Queue Length 95th (m)	28.3	168.6	14.3	97.4	17.1	10.1	#120.6	#182.5	109.6
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	341	1326	152	779	787	116	743	593	1880
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.79	0.28	0.44	0.34	0.13	0.87	0.89	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	109	22	159	237	14	33	24	249	21	35	13
Future Volume (vph)	7	109	22	159	237	14	33	24	249	21	35	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.978			0.995			0.890			0.975	
Flt Protected		0.997			0.981			0.995			0.985	
Satd. Flow (prot)	0	1778	0	0	1822	0	0	1664	0	0	1845	0
Flt Permitted		0.997			0.981			0.995			0.985	
Satd. Flow (perm)	0	1778	0	0	1822	0	0	1664	0	0	1845	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	9		16	16		9	10		27	27		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	4%	9%	3%	3%	0%	3%	4%	2%	0%	0%	0%
Adj. Flow (vph)	8	118	24	173	258	15	36	26	271	23	38	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	0	446	0	0	333	0	0	75	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 64.1%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	109	22	159	237	14	33	24	249	21	35	13
Future Volume (vph)	7	109	22	159	237	14	33	24	249	21	35	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	118	24	173	258	15	36	26	271	23	38	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	150	446	333	75
Volume Left (vph)	8	173	36	23
Volume Right (vph)	24	15	271	14
Hadj (s)	0.01	0.11	-0.43	-0.05
Departure Headway (s)	5.8	5.4	5.3	6.2
Degree Utilization, x	0.24	0.67	0.49	0.13
Capacity (veh/h)	552	637	628	485
Control Delay (s)	10.7	18.9	13.3	10.1
Approach Delay (s)	10.7	18.9	13.3	10.1
Approach LOS	B	C	B	B

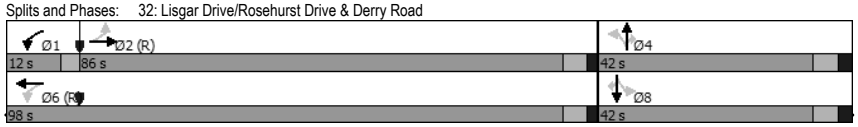
Intersection Summary			
Delay	15.1		
Level of Service	C		
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	2718	20	104	1215	132	95	52	361	224	98	92
Future Volume (vph)	22	2718	20	104	1215	132	95	52	361	224	98	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			0.99		0.99		0.96	0.97		0.97
Frt		0.999			0.985				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5187	0	1684	4890	0	1750	1847	1617	1750	1795	1581
Flt Permitted	0.191			0.044			0.677			0.723		
Satd. Flow (perm)	357	5187	0	78	4890	0	1230	1847	1547	1293	1795	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			28				112			91
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	14		3	3		14	12		24	24		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	6%	5%	6%	2%	4%	1%	2%	7%	1%
Adj. Flow (vph)	22	2718	20	104	1215	132	95	52	361	224	98	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2738	0	104	1347	0	95	52	361	224	98	92
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		1	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		8.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	86.0	86.0		12.0	98.0		42.0	42.0	42.0	42.0	42.0	42.0
Total Split (%)	61.4%	61.4%		8.6%	70.0%		30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Maximum Green (s)	80.0	80.0		9.0	92.0		35.4	35.4	35.4	35.4	35.4	35.4
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		0.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		2.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0			12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0			18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	0
Act Effct Green (s)	88.3	88.3		102.4	99.4		30.0	30.0	30.0	30.0	30.0	30.0
Actuated g/C Ratio	0.63	0.63		0.73	0.71		0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.10	0.84		0.64	0.39		0.36	0.13	0.86	0.81	0.26	0.23
Control Delay	5.6	8.8		43.1	8.8		49.2	42.7	55.9	73.7	45.7	9.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	8.8		43.1	8.8		49.2	42.7	55.9	73.7	45.7	9.2
LOS	A	A		D	A		D	D	E	E	D	A
Approach Delay		8.8			11.3			53.3			52.7	
Approach LOS		A			B			D			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 17.4	Intersection LOS: B
Intersection Capacity Utilization 104.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	2738	104	1347	95	52	361	224	98	92
v/c Ratio	0.10	0.84	0.64	0.39	0.36	0.13	0.86	0.81	0.26	0.23
Control Delay	5.6	8.8	43.1	8.8	49.2	42.7	55.9	73.7	45.7	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	8.8	43.1	8.8	49.2	42.7	55.9	73.7	45.7	9.2
Queue Length 50th (m)	0.7	39.7	13.0	50.4	22.3	11.6	68.6	58.8	22.5	0.2
Queue Length 95th (m)	m1.2	47.2	#34.4	66.3	37.3	22.0	102.7	85.5	37.0	13.8
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	225	3270	173	3480	319	480	485	336	466	467
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.84	0.60	0.39	0.30	0.11	0.74	0.67	0.21	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	217	36	53	224	130	65	79	170	223	0	69
Future Volume (vph)	9	217	36	53	224	130	65	79	170	223	0	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.979			0.945			0.927			0.968	
Flt Protected	0.950			0.950				0.990			0.963	
Satd. Flow (prot)	1496	1841	0	1674	1791	0	0	1704	0	0	1761	0
Flt Permitted	0.950			0.950				0.990			0.963	
Satd. Flow (perm)	1496	1841	0	1674	1791	0	0	1704	0	0	1761	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	15		33	33		15	38		42	42		38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	2%	3%	9%	1%	2%	3%	7%	2%	1%	4%	4%
Adj. Flow (vph)	10	236	39	58	243	141	71	86	185	242	0	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	275	0	58	384	0	0	342	0	0	317	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 74.3% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	217	36	53	224	130	65	79	170	223	0	69
Future Volume (vph)	9	217	36	53	224	130	65	79	170	223	0	69
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	236	39	58	243	141	71	86	185	242	0	75

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	10	275	58	384	342	317
Volume Left (vph)	10	0	58	0	71	242
Volume Right (vph)	0	39	0	141	185	75
Hadj (s)	0.87	-0.06	0.65	-0.23	-0.22	0.04
Departure Headway (s)	9.2	8.2	8.6	7.6	7.3	7.7
Degree Utilization, x	0.03	0.62	0.14	0.82	0.70	0.67
Capacity (veh/h)	357	401	399	452	453	434
Control Delay (s)	11.2	22.7	11.7	35.2	25.6	25.1
Approach Delay (s)	22.2		32.1		25.6	25.1
Approach LOS	C		D		D	D

Intersection Summary			
Delay		26.9	
Level of Service		D	
Intersection Capacity Utilization		74.3%	ICU Level of Service D
Analysis Period (min)		15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	112	3	9	95	122	5	16	12	210	11	104
Future Volume (vph)	89	112	3	9	95	122	5	16	12	210	11	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.927			0.950			0.957	
Flt Protected		0.979			0.998			0.993			0.969	
Satd. Flow (prot)	0	1861	0	0	1777	0	0	1812	0	0	1748	0
Flt Permitted		0.979			0.998			0.993			0.969	
Satd. Flow (perm)	0	1861	0	0	1777	0	0	1812	0	0	1748	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	8		6	6		8	2		12	12		2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%
Adj. Flow (vph)	97	122	3	10	103	133	5	17	13	228	12	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	222	0	0	246	0	0	35	0	0	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 60.2%	ICU Level of Service B
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	112	3	9	95	122	5	16	12	210	11	104
Future Volume (vph)	89	112	3	9	95	122	5	16	12	210	11	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	122	3	10	103	133	5	17	13	228	12	113

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	222	246	35	353
Volume Left (vph)	97	10	5	228
Volume Right (vph)	3	133	13	113
Hadj (s)	0.09	-0.32	-0.19	-0.03
Departure Headway (s)	5.4	5.0	5.6	5.2
Degree Utilization, x	0.34	0.34	0.05	0.51
Capacity (veh/h)	615	666	548	657
Control Delay (s)	11.1	10.6	8.9	13.3
Approach Delay (s)	11.1	10.6	8.9	13.3
Approach LOS	B	B	A	B

Intersection Summary				
Delay			11.8	
Level of Service			B	
Intersection Capacity Utilization			60.2%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2455	131	60	978	17	31	3	209	74	15	17
Future Volume (vph)	1	2455	131	60	978	17	31	3	209	74	15	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		0.99	0.97		0.99	0.99	
Frt		0.992			0.997			0.852			0.920	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5146	0	1552	5009	0	1733	1575	0	1785	1707	0
Flt Permitted	0.276			0.039			0.736			0.293		
Satd. Flow (perm)	516	5146	0	64	5009	0	1330	1575	0	545	1707	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			5			73			17	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			101.9			114.1			106.4	
Travel Time (s)		28.2			6.1			8.2			7.7	
Confl. Peds. (#/hr)	8		4	4		8	6		10	10		6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	4%	23%	3%	0%	1%	0%	5%	0%
Adj. Flow (vph)	1	2455	131	60	978	17	31	3	209	74	15	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2586	0	60	995	0	31	212	0	74	32	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

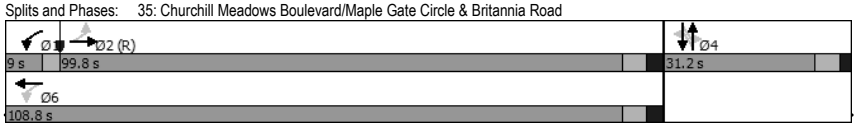
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			4	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		1	6		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		9.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	99.8	99.8		9.0	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	71.3%	71.3%		6.4%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	92.8	92.8		6.0	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		0.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-2.0	-1.0	
Total Lost Time (s)	6.0	6.0		2.0	6.0		5.2	5.2		4.2	5.2	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	11.0	11.0			11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0			18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	101.7	101.7		113.3	109.3		19.5	19.5		20.5	19.5	
Actuated g/C Ratio	0.73	0.73		0.81	0.78		0.14	0.14		0.15	0.14	
v/c Ratio	0.00	0.69		0.47	0.25		0.17	0.75		0.93	0.13	
Control Delay	2.0	2.3		27.9	4.8		52.2	53.5		140.4	29.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.0	2.3		27.9	4.8		52.2	53.5		140.4	29.6	
LOS	A	A		C	A		D	D		F	C	
Approach Delay		2.3			6.1			53.3			107.0	
Approach LOS		A			A			D			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 9.2 — Intersection LOS: A
Intersection Capacity Utilization 85.9% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1	2586	60	995	31	212	74	32
v/c Ratio	0.00	0.69	0.47	0.25	0.17	0.75	0.93	0.13
Control Delay	2.0	2.3	27.9	4.8	52.2	53.5	140.4	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	2.3	27.9	4.8	52.2	53.5	140.4	29.6
Queue Length 50th (m)	0.0	23.1	2.9	24.3	7.6	37.4	20.4	3.6
Queue Length 95th (m)	m0.0	m25.0	18.2	35.2	16.6	62.8	#45.1	12.7
Internal Link Dist (m)		445.7		77.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	374	3740	130	3910	247	351	105	330
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.69	0.46	0.25	0.13	0.60	0.70	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	17	21	42	67	20	11	177	34	16	201	7
Future Volume (vph)	12	17	21	42	67	20	11	177	34	16	201	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.942			0.979			0.979			0.996	
Flt Protected		0.988			0.984			0.998			0.997	
Satd. Flow (prot)	0	1753	0	0	1771	0	0	1833	0	0	1795	0
Flt Permitted		0.988			0.984			0.998			0.997	
Satd. Flow (perm)	0	1753	0	0	1771	0	0	1833	0	0	1795	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)			13	13			16		13	13		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	0%	5%	4%	5%	0%	3%	0%	0%	7%	0%
Adj. Flow (vph)	13	18	23	46	73	22	12	192	37	17	218	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	141	0	0	241	0	0	243	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	17	21	42	67	20	11	177	34	16	201	7
Future Volume (Veh/h)	12	17	21	42	67	20	11	177	34	16	201	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	18	23	46	73	22	12	192	37	17	218	8
Pedestrians		16			13			13				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			1			1				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	565	538	251	548	524	224	242			242		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	565	538	251	548	524	224	242			242		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	96	97	88	83	97	99			99		
cM capacity (veh/h)	354	424	773	392	435	800	1318			1321		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	54	141	241	243
Volume Left	13	46	12	17
Volume Right	23	22	37	8
cSH	496	451	1318	1321
Volume to Capacity	0.11	0.31	0.01	0.01
Queue Length 95th (m)	2.8	10.0	0.2	0.3
Control Delay (s)	13.1	16.6	0.5	0.6
Lane LOS	B	C	A	A
Approach Delay (s)	13.1	16.6	0.5	0.6
Approach LOS	B	C		

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	197	31	90	65	29	13	200	161	61	240	11
Future Volume (vph)	23	197	31	90	65	29	13	200	161	61	240	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.979			0.942			0.995	
Flt Protected		0.995			0.976			0.998			0.990	
Satd. Flow (prot)	0	1749	0	0	1778	0	0	1765	0	0	1864	0
Flt Permitted		0.995			0.976			0.998			0.990	
Satd. Flow (perm)	0	1749	0	0	1778	0	0	1765	0	0	1864	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	19		71	71		19	20		20	20		20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	9%	0%	2%	5%	3%	15%	1%	3%	0%	2%	0%
Adj. Flow (vph)	25	214	34	98	71	32	14	217	175	66	261	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	273	0	0	201	0	0	406	0	0	339	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 77.6%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	197	31	90	65	29	13	200	161	61	240	11
Future Volume (vph)	23	197	31	90	65	29	13	200	161	61	240	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	214	34	98	71	32	14	217	175	66	261	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	273	201	406	339
Volume Left (vph)	25	98	14	66
Volume Right (vph)	34	32	175	12
Hadj (s)	0.07	0.06	-0.21	0.04
Departure Headway (s)	6.9	7.1	6.2	6.6
Degree Utilization, x	0.53	0.40	0.70	0.62
Capacity (veh/h)	462	429	549	505
Control Delay (s)	17.4	14.8	22.3	19.6
Approach Delay (s)	17.4	14.8	22.3	19.6
Approach LOS	C	B	C	C

Intersection Summary			
Delay	19.2		
Level of Service	C		
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	349	14	104	315	181	20	271	68	181	305	63
Future Volume (vph)	131	349	14	104	315	181	20	271	68	181	305	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		0.99	0.97		1.00	0.99		0.98	1.00	
Frt		0.994			0.945			0.970			0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	3579	0	1772	3199	0	1825	1802	0	1807	1819	0
Flt Permitted	0.408			0.503			0.387			0.418		
Satd. Flow (perm)	758	3579	0	928	3199	0	740	1802	0	779	1819	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			137			17			14	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	7%	3%	3%	8%	0%	2%	4%	1%	2%	5%
Adj. Flow (vph)	142	379	15	113	342	197	22	295	74	197	332	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	142	394	0	113	539	0	22	369	0	197	400	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	47.0	47.0		47.0	47.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.5%	46.5%		46.5%	46.5%		53.5%	53.5%		53.5%	53.5%	
Maximum Green (s)	40.5	40.5		40.5	40.5		48.0	48.0		48.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	47.2	47.2		47.2	47.2		43.3	43.3		43.3	43.3	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.43	0.43		0.43	0.43	
v/c Ratio	0.40	0.24		0.26	0.34		0.07	0.47		0.59	0.51	
Control Delay	27.5	21.3		19.2	13.5		16.9	21.7		30.2	22.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	27.5	21.3		19.2	13.5		16.9	21.7		30.2	22.6	
LOS	C	C		B	B		B	C		C	C	
Approach Delay		22.9			14.5			21.4			25.1	
Approach LOS		C			B			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 20.7	Intersection LOS: C
Intersection Capacity Utilization 113.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	394	113	539	22	369	197	400
v/c Ratio	0.40	0.24	0.26	0.34	0.07	0.47	0.59	0.51
Control Delay	27.5	21.3	19.2	13.5	16.9	21.7	30.2	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	21.3	19.2	13.5	16.9	21.7	30.2	22.6
Queue Length 50th (m)	18.7	25.8	12.6	23.8	2.5	49.3	29.5	55.1
Queue Length 95th (m)	m34.0	39.5	27.7	40.5	6.5	65.6	48.4	72.3
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	353	1674	433	1567	359	882	377	889
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.24	0.26	0.34	0.06	0.42	0.52	0.45

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	101	20	26	66	39	17	121	26	78	257	19
Future Volume (vph)	21	101	20	26	66	39	17	121	26	78	257	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.960			0.979			0.993	
Flt Protected		0.993			0.990			0.995			0.989	
Satd. Flow (prot)	0	1770	0	0	1785	0	0	1783	0	0	1787	0
Flt Permitted		0.993			0.990			0.995			0.989	
Satd. Flow (perm)	0	1770	0	0	1785	0	0	1783	0	0	1787	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	21		17	17		21	16		16	16		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	10%	4%	3%	0%	6%	5%	4%	1%	7%	5%
Adj. Flow (vph)	23	110	22	28	72	42	18	132	28	85	279	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	155	0	0	142	0	0	178	0	0	385	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	101	20	26	66	39	17	121	26	78	257	19
Future Volume (vph)	21	101	20	26	66	39	17	121	26	78	257	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	110	22	28	72	42	18	132	28	85	279	21

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	155	142	178	385
Volume Left (vph)	23	28	18	85
Volume Right (vph)	22	42	28	21
Hadj (s)	0.04	-0.10	0.01	0.11
Departure Headway (s)	5.7	5.6	5.4	5.2
Degree Utilization, x	0.25	0.22	0.27	0.55
Capacity (veh/h)	565	570	619	669
Control Delay (s)	10.6	10.2	10.3	14.3
Approach Delay (s)	10.6	10.2	10.3	14.3
Approach LOS	B	B	B	B

Intersection Summary				
Delay			12.1	
Level of Service			B	
Intersection Capacity Utilization			52.3%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	208	15	29	122	14	22	137	121	67	261	36
Future Volume (vph)	22	208	15	29	122	14	22	137	121	67	261	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.989			0.942			0.987	
Flt Protected		0.996			0.991			0.996			0.991	
Satd. Flow (prot)	0	1750	0	0	1772	0	0	1723	0	0	1793	0
Flt Permitted		0.996			0.991			0.996			0.991	
Satd. Flow (perm)	0	1750	0	0	1772	0	0	1723	0	0	1793	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	8%	7%	7%	6%	7%	5%	6%	3%	1%	6%	3%
Adj. Flow (vph)	24	226	16	32	133	15	24	149	132	73	284	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	266	0	0	180	0	0	305	0	0	396	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.5%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	208	15	29	122	14	22	137	121	67	261	36
Future Volume (vph)	22	208	15	29	122	14	22	137	121	67	261	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	226	16	32	133	15	24	149	132	73	284	39

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	266	180	305	396
Volume Left (vph)	24	32	24	73
Volume Right (vph)	16	15	132	39
Hadj (s)	0.13	0.09	-0.17	0.06
Departure Headway (s)	6.7	6.9	6.1	6.2
Degree Utilization, x	0.49	0.34	0.52	0.68
Capacity (veh/h)	484	444	537	548
Control Delay (s)	16.0	13.5	15.6	21.1
Approach Delay (s)	16.0	13.5	15.6	21.1
Approach LOS	C	B	C	C

Intersection Summary				
Delay			17.3	
Level of Service			C	
Intersection Capacity Utilization			57.5%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	2197	1345	65	215	125
Future Volume (vph)	3	2197	1345	65	215	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt			0.993			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	3579	3443	0	1755	1183
Flt Permitted	0.152				0.950	
Satd. Flow (perm)	292	3579	3443	0	1755	1183
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			11			61
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	5%	8%	4%	38%
Adj. Flow (vph)	3	2197	1345	65	215	125
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	2197	1410	0	215	125
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

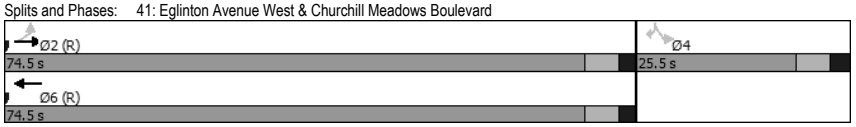
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Perm	Perm
Protected Phases		2	6			
Permitted Phases	2				4	4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	24.0	24.0	24.0		25.5	25.5
Total Split (s)	74.5	74.5	74.5		25.5	25.5
Total Split (%)	74.5%	74.5%	74.5%		25.5%	25.5%
Maximum Green (s)	68.5	68.5	68.5		19.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	72.2	72.2	72.2		17.3	17.3
Actuated g/C Ratio	0.72	0.72	0.72		0.17	0.17
v/c Ratio	0.01	0.85	0.57		0.71	0.49
Control Delay	5.0	15.0	7.9		52.0	26.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	5.0	15.0	7.9		52.0	26.4
LOS	A	B	A		D	C
Approach Delay		15.0	7.9		42.6	
Approach LOS		B	A		D	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 14.8 — Intersection LOS: B
Intersection Capacity Utilization 81.4% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3	2197	1410	215	125
v/c Ratio	0.01	0.85	0.57	0.71	0.49
Control Delay	5.0	15.0	7.9	52.0	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	15.0	7.9	52.0	26.4
Queue Length 50th (m)	0.2	145.1	60.2	39.1	10.8
Queue Length 95th (m)	1.0	197.2	80.9	62.2	27.8
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	210	2585	2490	351	285
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.85	0.57	0.61	0.44

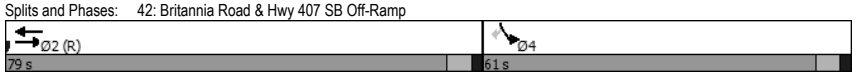
Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2070	657	0	425	5
Future Volume (vph)	0	2070	657	0	425	5
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5678	5622	0	1847	1524
Flt Permitted					0.950	
Satd. Flow (perm)	0	5678	5622	0	1847	1524
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						3
Link Speed (k/h)		80	80		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		9.3	13.4		15.0	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	0%	1%	2%	7%	16%
Adj. Flow (vph)	0	2091	664	0	429	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2091	664	0	429	5
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		79.0	79.0		61.0	61.0
Total Split (%)		56.4%	56.4%		43.6%	43.6%
Maximum Green (s)		73.0	73.0		55.0	55.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		89.3	89.3		38.7	38.7
Actuated g/C Ratio		0.64	0.64		0.28	0.28
v/c Ratio		0.58	0.19		0.84	0.01
Control Delay		16.3	6.3		62.2	23.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		16.3	6.3		62.2	23.8
LOS		B	A		E	C
Approach Delay		16.3	6.3		61.8	
Approach LOS		B	A		E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 20.4		Intersection LOS: C	
Intersection Capacity Utilization 69.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2091	664	429	5
v/c Ratio	0.58	0.19	0.84	0.01
Control Delay	16.3	6.3	62.2	23.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.3	6.3	62.2	23.8
Queue Length 50th (m)	115.0	11.7	112.2	0.4
Queue Length 95th (m)	155.1	14.1	138.0	3.5
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3620	3584	725	600
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.19	0.59	0.01

Intersection Summary

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2409	0	0	815	10	289
Future Volume (vph)	2409	0	0	815	10	289
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5678	0	0	5622	1847	1768
Flt Permitted					0.950	
Satd. Flow (perm)	5678	0	0	5622	1847	1768
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	80			80	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	13.4			9.8	11.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	2%	1%	7%	0%
Adj. Flow (vph)	2509	0	0	849	10	301
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2509	0	0	849	10	301
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

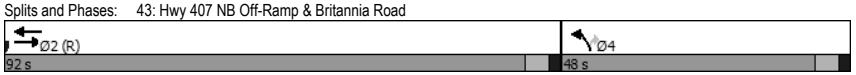
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	92.0			92.0	48.0	48.0
Total Split (%)	65.7%			65.7%	34.3%	34.3%
Maximum Green (s)	86.0			86.0	42.0	42.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	98.8			98.8	29.2	29.2
Actuated g/C Ratio	0.71			0.71	0.21	0.21
v/c Ratio	0.63			0.21	0.03	0.82
Control Delay	5.1			5.8	40.3	69.8
Queue Delay	0.2			0.0	0.0	0.0
Total Delay	5.3			5.8	40.3	69.8
LOS	A			A	D	E
Approach Delay	5.3			5.8	68.9	
Approach LOS	A			A	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 10.8 Intersection LOS: B
Intersection Capacity Utilization 69.5% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2509	849	10	301
v/c Ratio	0.63	0.21	0.03	0.82
Control Delay	5.1	5.8	40.3	69.8
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	5.3	5.8	40.3	69.8
Queue Length 50th (m)	46.8	18.6	2.2	80.2
Queue Length 95th (m)	49.2	m30.6	6.6	105.1
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4005	3965	554	530
Starvation Cap Reductn	7	0	0	0
Spillback Cap Reductn	552	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.21	0.02	0.57

Intersection Summary

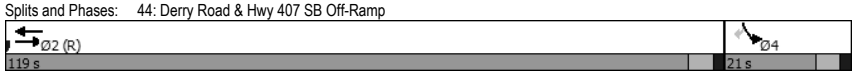
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3165	763	0	27	36
Future Volume (vph)	0	3165	763	0	27	36
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5622	5408	0	3686	1414
Flt Permitted					0.950	
Satd. Flow (perm)	0	5622	5408	0	3686	1414
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						38
Link Speed (k/h)		80	80		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		15.0	13.9		13.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	1%	5%	2%	4%	25%
Adj. Flow (vph)	0	3297	795	0	28	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	3297	795	0	28	38
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		119.0	119.0		21.0	21.0
Total Split (%)		85.0%	85.0%		15.0%	15.0%
Maximum Green (s)		113.0	113.0		15.0	15.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		123.7	123.7		8.3	8.3
Actuated g/C Ratio		0.88	0.88		0.06	0.06
v/c Ratio		0.66	0.17		0.13	0.32
Control Delay		3.8	0.5		63.6	25.3
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		3.8	0.5		63.6	25.3
LOS		A	A		E	C
Approach Delay		3.8	0.5		41.5	
Approach LOS		A	A		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 8 (6%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 3.8	Intersection LOS: A
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3297	795	28	38
v/c Ratio	0.66	0.17	0.13	0.32
Control Delay	3.8	0.5	63.6	25.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.8	0.5	63.6	25.3
Queue Length 50th (m)	86.5	3.2	3.8	0.0
Queue Length 95th (m)	102.6	3.6	8.9	11.4
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4968	4779	394	185
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.17	0.07	0.21

Intersection Summary

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2412	0	0	904	13	144
Future Volume (vph)	2412	0	0	904	13	144
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5622	0	0	5408	3582	1716
Flt Permitted					0.950	
Satd. Flow (perm)	5622	0	0	5408	3582	1716
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						147
Link Speed (k/h)	80			80	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	13.9			10.3	15.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	2%	2%	5%	7%	3%
Adj. Flow (vph)	2461	0	0	922	13	147
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2461	0	0	922	13	147
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

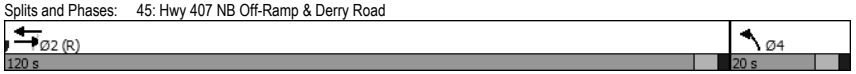
Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	120.0			120.0	20.0	120.0
Total Split (%)	85.7%			85.7%	14.3%	85.7%
Maximum Green (s)	114.0			114.0	14.0	114.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	132.0			132.0	8.0	132.0
Actuated g/C Ratio	0.94			0.94	0.06	0.94
v/c Ratio	0.46			0.18	0.06	0.09
Control Delay	0.9			0.2	63.2	0.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	0.9			0.2	63.2	0.3
LOS	A			A	E	A
Approach Delay	0.9			0.2	5.4	
Approach LOS	A			A	A	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 8 (6%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 0.9	Intersection LOS: A
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2461	922	13	147
v/c Ratio	0.46	0.18	0.06	0.09
Control Delay	0.9	0.2	63.2	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	0.9	0.2	63.2	0.3
Queue Length 50th (m)	0.0	0.0	1.8	0.0
Queue Length 95th (m)	25.9	1.7	5.4	2.4
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	5300	5099	358	1626
Starvation Cap Reductn	159	0	0	0
Spillback Cap Reductn	93	0	0	28
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.48	0.18	0.04	0.09

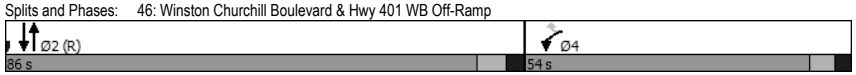
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	499	529	1624	0	0	2175
Future Volume (vph)	499	529	1624	0	0	2175
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.956	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3404	1424	5513	0	0	5408
Flt Permitted	0.966					
Satd. Flow (perm)	3404	1424	5513	0	0	5408
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	12	12				
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	8%	13%	3%	2%	0%	5%
Adj. Flow (vph)	567	601	1845	0	0	2472
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	801	367	1845	0	0	2472
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	54.0	54.0	86.0			86.0
Total Split (%)	38.6%	38.6%	61.4%			61.4%
Maximum Green (s)	47.0	47.0	78.0			78.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	41.0	41.0	84.0			84.0
Actuated g/C Ratio	0.29	0.29	0.60			0.60
v/c Ratio	0.80	0.86	0.56			0.76
Control Delay	51.0	64.8	17.4			23.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	51.0	64.8	17.4			23.6
LOS	D	E	B			C
Approach Delay	55.3		17.4			23.6
Approach LOS	E		B			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 110.2 (79%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 28.2		Intersection LOS: C	
Intersection Capacity Utilization 69.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	801	367	1845	2472
v/c Ratio	0.80	0.86	0.56	0.76
Control Delay	51.0	64.8	17.4	23.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	51.0	64.8	17.4	23.6
Queue Length 50th (m)	103.0	101.6	132.5	180.3
Queue Length 95th (m)	116.4	135.0	114.1	207.8
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1150	486	3306	3243
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.70	0.76	0.56	0.76

Intersection Summary

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	579	305	0	1417	2202	0
Future Volume (vph)	579	305	0	1417	2202	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.992	0.850				
Flt Protected	0.955					
Satd. Flow (prot)	3681	1593	0	5567	5408	0
Flt Permitted	0.955					
Satd. Flow (perm)	3681	1593	0	5567	5408	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	2	2				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	4%	1%	0%	2%	5%	8%
Adj. Flow (vph)	658	347	0	1610	2502	0
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	693	312	0	1610	2502	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

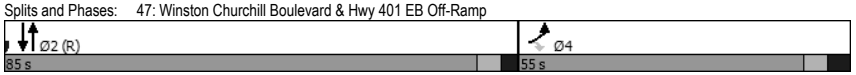
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	55.0	55.0		85.0	85.0	
Total Split (%)	39.3%	39.3%		60.7%	60.7%	
Maximum Green (s)	47.0	47.0		78.0	78.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	34.5	34.5		90.5	90.5	
Actuated g/C Ratio	0.25	0.25		0.65	0.65	
v/c Ratio	0.76	0.79		0.45	0.72	
Control Delay	54.2	63.3		13.5	16.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	54.2	63.3		13.5	16.2	
LOS	D	E		B	B	
Approach Delay	57.0			13.5	16.2	
Approach LOS	E			B	B	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 100.4 (72%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 23.4 Intersection LOS: C
Intersection Capacity Utilization 70.0% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	693	312	1610	2502
v/c Ratio	0.76	0.79	0.45	0.72
Control Delay	54.2	63.3	13.5	16.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	54.2	63.3	13.5	16.2
Queue Length 50th (m)	92.7	89.6	75.0	118.5
Queue Length 95th (m)	99.6	111.6	102.4	160.1
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	1237	536	3599	3496
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.56	0.58	0.45	0.72

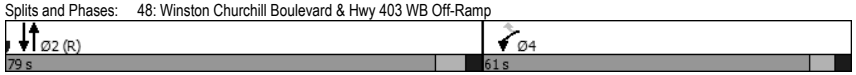
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	992	925	2646	0	0	2845
Future Volume (vph)	992	925	2646	0	0	2845
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.963	0.850				
Flt Protected	0.964					
Satd. Flow (prot)	3550	1547	5513	0	0	5513
Flt Permitted	0.964					
Satd. Flow (perm)	3548	1547	5513	0	0	5513
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	6%	4%	3%	0%	0%	3%
Adj. Flow (vph)	1055	984	2815	0	0	3027
Shared Lane Traffic (%)		35%				
Lane Group Flow (vph)	1399	640	2815	0	0	3027
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	61.0	61.0	79.0			79.0
Total Split (%)	43.6%	43.6%	56.4%			56.4%
Maximum Green (s)	54.0	54.0	71.0			71.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	54.0	54.0	71.0			71.0
Actuated g/C Ratio	0.39	0.39	0.51			0.51
v/c Ratio	1.02	1.07	1.01			1.08
Control Delay	72.2	99.2	51.0			78.0
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	72.2	99.2	51.0			78.0
LOS	E	F	D			E
Approach Delay	80.7		51.0			78.0
Approach LOS	F		D			E

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 125.6 (90%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.08			
Intersection Signal Delay: 69.1		Intersection LOS: E	
Intersection Capacity Utilization 132.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1399	640	2815	3027
v/c Ratio	1.02	1.07	1.01	1.08
Control Delay	72.2	99.2	51.0	78.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	72.2	99.2	51.0	78.0
Queue Length 50th (m)	~211.5	~215.7	~264.7	~342.7
Queue Length 95th (m)	#253.2	#295.1	#322.1	#365.9
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1369	596	2795	2795
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.02	1.07	1.01	1.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1237	444	0	1555	2494	0
Future Volume (vph)	1237	444	0	1555	2494	0
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor	1.00					
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3795	1733	0	5460	5513	0
Flt Permitted	0.950					
Satd. Flow (perm)	3789	1733	0	5460	5513	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	0%	4%	3%	0%
Adj. Flow (vph)	1289	463	0	1620	2598	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1289	463	0	1620	2598	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

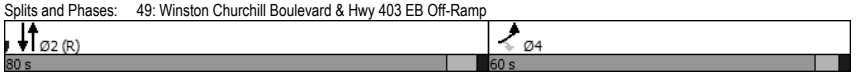
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	60.0	60.0		80.0	80.0	
Total Split (%)	42.9%	42.9%		57.1%	57.1%	
Maximum Green (s)	54.0	54.0		73.0	73.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	52.3	52.3		74.7	74.7	
Actuated g/C Ratio	0.37	0.37		0.53	0.53	
v/c Ratio	0.91	0.71		0.56	0.88	
Control Delay	51.8	44.3		22.8	34.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	51.8	44.3		22.8	34.9	
LOS	D	D		C	C	
Approach Delay	49.8			22.8	34.9	
Approach LOS	D			C	C	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 58.4 (42%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 36.0 — Intersection LOS: D
Intersection Capacity Utilization 132.1% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1289	463	1620	2598
v/c Ratio	0.91	0.71	0.56	0.88
Control Delay	51.8	44.3	22.8	34.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	51.8	44.3	22.8	34.9
Queue Length 50th (m)	169.9	106.4	108.6	255.6
Queue Length 95th (m)	199.5	146.2	122.5	m233.2
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	1463	669	2912	2939
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.88	0.69	0.56	0.88

Intersection Summary

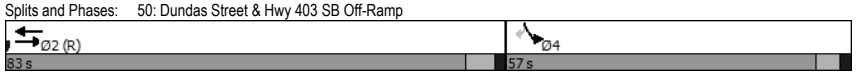
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	3141	648	0	1359	608
Future Volume (vph)	0	3141	648	0	1359	608
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Frt					0.994	0.850
Flt Protected					0.954	
Satd. Flow (prot)	0	5567	5307	0	3635	1449
Flt Permitted					0.954	
Satd. Flow (perm)	0	5567	5307	0	3635	1449
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					4	218
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	2%	7%	0%	5%	11%
Adj. Flow (vph)	0	3238	668	0	1401	627
Shared Lane Traffic (%)						10%
Lane Group Flow (vph)	0	3238	668	0	1464	564
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		83.0	83.0		57.0	57.0
Total Split (%)		59.3%	59.3%		40.7%	40.7%
Maximum Green (s)		76.0	76.0		51.0	51.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		76.0	76.0		51.0	51.0
Actuated g/C Ratio		0.54	0.54		0.36	0.36
v/c Ratio		1.07	0.23		1.10	0.85
Control Delay		71.0	7.8		99.8	37.7
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		71.0	7.8		99.8	37.7
LOS		E	A		F	D
Approach Delay		71.0	7.8		82.5	
Approach LOS		E	A		F	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 30.4 (22%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.10	
Intersection Signal Delay: 67.8	Intersection LOS: E
Intersection Capacity Utilization 108.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	3238	668	1464	564
v/c Ratio	1.07	0.23	1.10	0.85
Control Delay	71.0	7.8	99.8	37.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	71.0	7.8	99.8	37.7
Queue Length 50th (m)	~363.3	12.8	~237.2	104.0
Queue Length 95th (m)	#385.2	15.3	#279.6	#177.9
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	3022	2880	1326	666
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.07	0.23	1.10	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2996	0	0	1068	136	1086
Future Volume (vph)	2996	0	0	1068	136	1086
Ideal Flow (vphpl)	2057	2057	2057	2057	2057	2057
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Ped Bike Factor					1.00	
Frt					0.880	0.850
Flt Protected					0.990	
Satd. Flow (prot)	5513	0	0	5357	3453	1577
Flt Permitted					0.990	
Satd. Flow (perm)	5513	0	0	5357	3452	1577
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	0%	6%	1%	2%
Adj. Flow (vph)	3329	0	0	1187	151	1207
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	3329	0	0	1187	755	603
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.89	0.89	0.89	0.89	0.89	0.89
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	85.0			85.0	55.0	55.0
Total Split (%)	60.7%			60.7%	39.3%	39.3%
Maximum Green (s)	78.0			78.0	49.0	49.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	78.0			78.0	49.0	49.0
Actuated g/C Ratio	0.56			0.56	0.35	0.35
v/c Ratio	1.08			0.40	1.00dr	1.09
Control Delay	68.1			18.1	40.6	109.1
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	68.1			18.1	40.6	109.1
LOS	E			B	D	F
Approach Delay	68.1			18.1	71.1	
Approach LOS	E			B	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 16.4 (12%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 58.7 Intersection LOS: E
Intersection Capacity Utilization 108.6% ICU Level of Service G
Analysis Period (min) 15
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street

Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	3329	1187	755	603
v/c Ratio	1.08	0.40	1.00dr	1.09
Control Delay	68.1	18.1	40.6	109.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	68.1	18.1	40.6	109.1
Queue Length 50th (m)	~375.3	66.0	89.3	~206.4
Queue Length 95th (m)	m#274.9	76.5	110.3	#284.7
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	3071	2984	1208	551
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.40	0.63	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	24	38	492	176	99	623
Future Volume (vph)	24	38	492	176	99	623
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.960			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3435	0	1789	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	3435	0	1789	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	273.4		780.0			514.0
Travel Time (s)	20.5		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	38	492	176	99	623
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	38	668	0	99	623
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
52: Ninth Line & Argentia Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	24	38	492	176	99	623
Future Volume (Veh/h)	24	38	492	176	99	623
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	24	38	492	176	99	623
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1090	334			668	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1090	334			668	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	94			89	
cM capacity (veh/h)	187	662			918	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	24	38	328	340	99	312	312
Volume Left	24	0	0	0	99	0	0
Volume Right	0	38	0	176	0	0	0
cSH	187	662	1700	1700	918	1700	1700
Volume to Capacity	0.13	0.06	0.19	0.20	0.11	0.18	0.18
Queue Length 95th (m)	3.3	1.4	0.0	0.0	2.7	0.0	0.0
Control Delay (s)	27.0	10.8	0.0	0.0	9.4	0.0	0.0
Lane LOS	D	B			A		
Approach Delay (s)	17.1		0.0		1.3		
Approach LOS	C						

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
97: Ninth Line & Foxwood Ave

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	772	0	0	661
Future Volume (vph)	0	0	772	0	0	661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				15.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	3579	0	1883	3579
Flt Permitted						
Satd. Flow (perm)	1883	0	3579	0	1883	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	226.1		301.0			850.0
Travel Time (s)	17.0		15.5			43.7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	772	0	0	661
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	772	0	0	661
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
97: Ninth Line & Foxwood Ave

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	772	0	0	661
Future Volume (Veh/h)	0	0	772	0	0	661
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	772	0	0	661
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			301			
pX, platoon unblocked						
vC, conflicting volume	1102	386			772	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1102	386			772	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	206	612			839	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	0	386	386	0	330	330
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.23	0.23	0.00	0.19	0.19
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
136: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1165	275	0	1169	0	0
Future Volume (vph)	1165	275	0	1169	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	125.7	
Travel Time (s)	15.5			6.8	9.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1165	275	0	1169	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1165	275	0	1169	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 69.6%			ICU Level of Service C
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
136: Winston Churchill Boulevard

16/06/2017

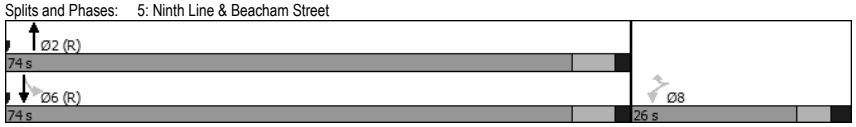
Intersection Sign configuration not allowed in HCM analysis.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	47	1338	85	58	780
Future Volume (vph)	90	47	1338	85	58	780
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.98				
Frt		0.850	0.991			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1807	1633	3546	0	1825	3544
Flt Permitted	0.950				0.140	
Satd. Flow (perm)	1807	1607	3546	0	269	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	14			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	2%	2%	0%	3%
Adj. Flow (vph)	98	51	1454	92	63	848
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	51	1546	0	63	848
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	26.0	26.0	74.0		74.0	74.0
Total Split (%)	26.0%	26.0%	74.0%		74.0%	74.0%
Maximum Green (s)	19.5	19.5	67.0		67.0	67.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	12.0	12.0	80.6		80.6	80.6
Actuated g/C Ratio	0.12	0.12	0.81		0.81	0.81
v/c Ratio	0.45	0.22	0.54		0.29	0.30
Control Delay	47.1	13.1	5.5		8.4	3.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.1	13.1	5.5		8.4	3.8
LOS	D	B	A		A	A
Approach Delay	35.5		5.5			4.1
Approach LOS	D		A			A

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 64.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	98	51	1546	63	848
v/c Ratio	0.45	0.22	0.54	0.29	0.30
Control Delay	47.1	13.1	5.5	8.4	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	13.1	5.5	8.4	3.8
Queue Length 50th (m)	18.0	0.0	51.7	3.0	21.3
Queue Length 95th (m)	32.2	9.9	80.1	10.9	34.0
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	370	369	2860	216	2856
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.14	0.54	0.29	0.30

Intersection Summary

Lanes, Volumes, Timings
1: Ninth Line & Golf Club Access

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	3	631	7	3	692
Future Volume (vph)	11	3	631	7	3	692
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	10.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950					
Satd. Flow (prot)	1825	1633	1880	0	0	1865
Flt Permitted	0.950					
Satd. Flow (perm)	1825	1633	1880	0	0	1865
Link Speed (k/h)	48		70			70
Link Distance (m)	31.2		514.0			553.5
Travel Time (s)	2.3		26.4			28.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	3%
Adj. Flow (vph)	12	3	686	8	3	752
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	3	694	0	0	755
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Ninth Line & Golf Club Access

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	3	631	7	3	692
Future Volume (Veh/h)	11	3	631	7	3	692
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	3	686	8	3	752
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		1				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1448	690			694	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1448	690			694	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	99			100	
cM capacity (veh/h)	146	449			911	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	15	694	755
Volume Left	12	0	3
Volume Right	3	8	0
cSH	182	1700	911
Volume to Capacity	0.08	0.41	0.00
Queue Length 95th (m)	2.0	0.0	0.1
Control Delay (s)	28.2	0.0	0.1
Lane LOS	D		A
Approach Delay (s)	28.2	0.0	0.1
Approach LOS	D		

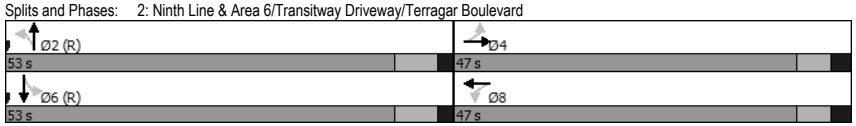
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	110	508	48	29	32	175	758	86	66	905	24
Future Volume (vph)	73	110	508	48	29	32	175	758	86	66	905	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	40.0		15.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.877			0.918			0.985			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1652	0	1825	1684	0	1789	3553	0	1722	3530	0
Flt Permitted	0.715			0.135			0.199			0.234		
Satd. Flow (perm)	1347	1652	0	259	1684	0	375	3553	0	424	3530	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		67			35			16			3	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		131.8			287.6			434.9			780.0	
Travel Time (s)		9.9			20.7			22.4			40.1	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	7%	2%	1%	3%	6%	3%	2%
Adj. Flow (vph)	73	110	508	52	29	35	175	824	93	72	984	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	618	0	52	64	0	175	917	0	72	1008	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		53.0	53.0		52.0	52.0	
Total Split (s)	47.0	47.0		47.0	47.0		53.0	53.0		53.0	53.0	
Total Split (%)	47.0%	47.0%		47.0%	47.0%		53.0%	53.0%		53.0%	53.0%	
Maximum Green (s)	40.5	40.5		40.5	40.5		46.0	46.0		46.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	38.7	38.7		38.7	38.7		49.8	49.8		49.8	49.8	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.50	0.50		0.50	0.50	
v/c Ratio	0.14	0.91		0.52	0.10		0.94	0.52		0.34	0.57	
Control Delay	19.5	44.4		43.5	10.2		81.1	18.5		22.6	19.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.5	44.4		43.5	10.2		81.1	18.5		22.6	19.8	
LOS	B	D		D	B		F	B		C	B	
Approach Delay		41.7			25.2			28.6			20.0	
Approach LOS		D			C			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 28.4	Intersection LOS: C
Intersection Capacity Utilization 89.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard



Queues
2: Ninth Line & Area 6/Transitway Driveway/Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	618	52	64	175	917	72	1008
v/c Ratio	0.14	0.91	0.52	0.10	0.94	0.52	0.34	0.57
Control Delay	19.5	44.4	43.5	10.2	81.1	18.5	22.6	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	44.4	43.5	10.2	81.1	18.5	22.6	19.8
Queue Length 50th (m)	8.6	96.3	7.2	3.3	32.6	63.3	8.6	73.4
Queue Length 95th (m)	17.5	#160.3	#23.2	11.1	#75.8	81.3	20.8	93.4
Internal Link Dist (m)		107.8		263.6		410.9		756.0
Turn Bay Length (m)					40.0		40.0	
Base Capacity (vph)	559	724	107	719	186	1777	211	1759
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.85	0.49	0.09	0.94	0.52	0.34	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	61	28	0	17	28	812	45	35	1473	8
Future Volume (vph)	8	0	61	28	0	17	28	812	45	35	1473	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	50.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.992			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1541	0	1789	3517	0	1825	3575	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1541	0	1789	3517	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		124.9			310.4			412.4			434.9	
Travel Time (s)		9.4			22.3			21.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	6%	2%	3%	2%	0%	2%	2%
Adj. Flow (vph)	8	0	61	30	0	18	28	883	49	38	1601	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	61	0	30	18	0	28	932	0	38	1609	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane											Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 55.9% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Ninth Line & Area 6/Transitway Driveway/Hazelridge Road

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	61	28	0	17	28	812	45	35	1473	8
Future Volume (Veh/h)	8	0	61	28	0	17	28	812	45	35	1473	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	8	0	61	30	0	18	28	883	49	38	1601	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2196	2669	804	1901	2648	466	1609			932		
vC1, stage 1 conf vol	1681	1681		964	964							
vC2, stage 2 conf vol	516	988		938	1685							
vCu, unblocked vol	2196	2669	804	1901	2648	466	1609			932		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	91	100	81	80	100	97	93			95		
cM capacity (veh/h)	89	121	326	153	104	533	402			743		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	8	61	30	18	28	589	343	38	1067	542
Volume Left	8	0	30	0	28	0	0	38	0	0
Volume Right	0	61	0	18	0	0	49	0	0	8
cSH	89	326	153	533	402	1700	1700	743	1700	1700
Volume to Capacity	0.09	0.19	0.20	0.03	0.07	0.35	0.20	0.05	0.63	0.32
Queue Length 95th (m)	2.2	5.1	5.3	0.8	1.7	0.0	0.0	1.2	0.0	0.0
Control Delay (s)	49.3	18.6	34.1	12.0	14.6	0.0	0.0	10.1	0.0	0.0
Lane LOS	E	C	D	B	B			B		
Approach Delay (s)	22.1		25.8		0.4			0.2		
Approach LOS	C		D							

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		55.9%	ICU Level of Service
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	732	242	230	1835	115	142	548	217	253	826	210
Future Volume (vph)	167	732	242	230	1835	115	142	548	217	253	826	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	78.0		0.0	86.0		0.0	90.0		110.0	58.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	75.0			70.0			100.0			53.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00							
Frt		0.963			0.991				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	4927	0	1785	5133	0	1767	3650	1597	1733	3650	1597
Flt Permitted	0.074			0.190			0.172			0.426		
Satd. Flow (perm)	139	4927	0	357	5133	0	320	3650	1597	777	3650	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		63			8				217			165
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		229.8			382.7			716.6			412.4	
Travel Time (s)		10.3			17.2			36.9			21.2	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	4%	1%	0%	0%	3%	0%	0%
Adj. Flow (vph)	167	732	242	230	1835	115	142	548	217	253	826	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	974	0	230	1950	0	142	548	217	253	826	210
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
4: Ninth Line & Derry Road

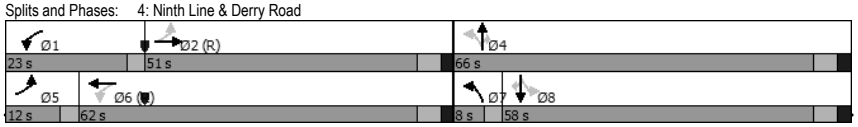
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		7	4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	5	2		1	6		7	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	30.1		8.0	30.1		8.0	29.4	29.4	29.4	29.4	29.4
Total Split (s)	12.0	51.0		23.0	62.0		8.0	66.0	66.0	58.0	58.0	58.0
Total Split (%)	8.6%	36.4%		16.4%	44.3%		5.7%	47.1%	47.1%	41.4%	41.4%	41.4%
Maximum Green (s)	9.0	44.9		20.0	55.9		5.0	59.6	59.6	51.6	51.6	51.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.1		0.0	2.1		0.0	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	5.1		2.0	5.1		2.0	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		9.0			9.0			9.0	9.0	9.0	9.0	9.0
Flash Dont Walk (s)		15.0			15.0			14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		0			0			0	0	0	0	0
Act Effct Green (s)	67.9	53.9		74.5	59.2		60.8	57.4	57.4	49.4	49.4	49.4
Actuated g/C Ratio	0.48	0.38		0.53	0.42		0.43	0.41	0.41	0.35	0.35	0.35
v/c Ratio	0.86	0.50		0.65	0.90		0.71	0.37	0.28	0.92	0.64	0.31
Control Delay	79.5	27.8		24.8	39.4		45.4	29.0	3.9	81.4	40.1	8.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	27.8		24.8	39.4		45.4	29.0	3.9	81.4	40.1	8.9
LOS	E	C		C	D		D	C	A	F	D	A
Approach Delay		35.4			37.9			25.6			43.1	
Approach LOS		D			D			C			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 36.5 Intersection LOS: D
Intersection Capacity Utilization 93.4% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Ninth Line & Derry Road



Queues
4: Ninth Line & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	167	974	230	1950	142	548	217	253	826	210
v/c Ratio	0.86	0.50	0.65	0.90	0.71	0.37	0.28	0.92	0.64	0.31
Control Delay	79.5	27.8	24.8	39.4	45.4	29.0	3.9	81.4	40.1	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	27.8	24.8	39.4	45.4	29.0	3.9	81.4	40.1	8.9
Queue Length 50th (m)	30.3	77.1	23.7	188.0	22.8	52.5	0.0	64.5	96.5	8.0
Queue Length 95th (m)	#73.4	95.4	34.6	209.8	#39.3	66.8	14.6	#115.5	117.6	25.5
Internal Link Dist (m)		205.8		358.7		692.6			388.4	
Turn Bay Length (m)	78.0		86.0		90.0		110.0	58.0		60.0
Base Capacity (vph)	195	1934	405	2174	201	1579	814	291	1371	703
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.50	0.57	0.90	0.71	0.35	0.27	0.87	0.60	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	921	67	49	1465
Future Volume (vph)	46	47	921	67	49	1465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.990			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3481	0	1825	3544
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1585	3481	0	1825	3544
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	1001	73	53	1592
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	1074	0	53	1592
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Ninth Line & Beacham Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	47	921	67	49	1465
Future Volume (Veh/h)	46	47	921	67	49	1465
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	51	1001	73	53	1592
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.2
Percent Blockage						0
Right turn flare (veh)		2				
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1940	539			1074	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1940	539			1074	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	5	89			92	
cM capacity (veh/h)	53	483			657	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	101	667	407	53	796	796
Volume Left	50	0	0	53	0	0
Volume Right	51	0	73	0	0	0
cSH	101	1700	1700	657	1700	1700
Volume to Capacity	1.00	0.39	0.24	0.08	0.47	0.47
Queue Length 95th (m)	46.8	0.0	0.0	2.0	0.0	0.0
Control Delay (s)	167.2	0.0	0.0	11.0	0.0	0.0
Lane LOS	F			B		
Approach Delay (s)	167.2	0.0		0.4		
Approach LOS	F					

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	53	32	66	71	62	55	919	108	100	1244	50
Future Volume (vph)	31	53	32	66	71	62	55	919	108	100	1244	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		27.0	50.0		60.0	115.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.944			0.927			0.984			0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1778	0	1789	1734	0	1789	3529	0	1825	3561	0
Flt Permitted	0.570			0.702			0.165			0.237		
Satd. Flow (perm)	1074	1778	0	1322	1734	0	311	3529	0	455	3561	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			42			28			8	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		104.1			255.0			1151.0			603.1	
Travel Time (s)		7.8			18.4			59.2			31.0	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	31	53	32	72	71	67	55	999	117	109	1352	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	85	0	72	138	0	55	1116	0	109	1402	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

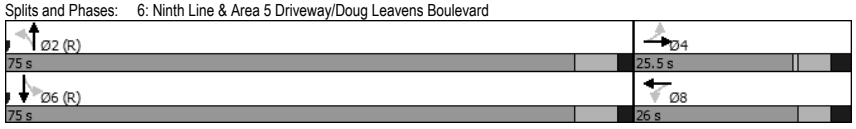
Lanes, Volumes, Timings
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		45.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		53.0	53.0		53.0	53.0	
Total Split (s)	25.5	25.5		26.0	26.0		75.0	75.0		75.0	75.0	
Total Split (%)	25.2%	25.2%		25.7%	25.7%		74.3%	74.3%		74.3%	74.3%	
Maximum Green (s)	19.0	19.0		19.5	19.5		68.0	68.0		68.0	68.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		35.0	35.0		35.0	35.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	12.5	12.5		12.5	12.5		77.0	77.0		77.0	77.0	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.76	0.76		0.76	0.76	
v/c Ratio	0.23	0.35		0.44	0.55		0.23	0.41		0.31	0.52	
Control Delay	42.8	31.7		48.7	36.6		13.3	10.4		7.2	5.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	42.8	31.7		48.7	36.6		13.3	10.4		7.2	5.8	
LOS	D	C		D	D		B	B		A	A	
Approach Delay		34.7			40.7			10.5			5.9	
Approach LOS		C			D			B			A	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 11.2	Intersection LOS: B
Intersection Capacity Utilization 108.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard



Queues
6: Ninth Line & Area 5 Driveway/Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	31	85	72	138	55	1116	109	1402
v/c Ratio	0.23	0.35	0.44	0.55	0.23	0.41	0.31	0.52
Control Delay	42.8	31.7	48.7	36.6	13.3	10.4	7.2	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	31.7	48.7	36.6	13.3	10.4	7.2	5.8
Queue Length 50th (m)	5.6	10.5	13.4	17.8	5.1	63.8	5.3	44.5
Queue Length 95th (m)	13.6	23.2	25.7	34.5	m13.5	101.8	15.9	72.5
Internal Link Dist (m)		80.1		231.0		1127.0		579.1
Turn Bay Length (m)					50.0		115.0	
Base Capacity (vph)	217	382	268	385	237	2697	347	2717
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.22	0.27	0.36	0.23	0.41	0.31	0.52

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	17	23	134	17	44	39	1069	148	71	1477	35
Future Volume (vph)	21	17	23	134	17	44	39	1069	148	71	1477	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	13.0		0.0	35.0		25.0	270.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			13.0			2.5			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99							
Frt		0.914			0.889			0.982			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1721	0	1738	1599	0	1789	3476	0	1825	3501	0
Flt Permitted	0.715			0.731			0.092			0.158		
Satd. Flow (perm)	1347	1721	0	1337	1599	0	173	3476	0	304	3501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			48			29			4	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		142.6			160.0			383.2			1151.0	
Travel Time (s)		10.7			11.5			19.7			59.2	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	5%	2%	7%	2%	3%	4%	0%	4%	2%
Adj. Flow (vph)	21	17	23	146	17	48	39	1162	161	77	1605	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	40	0	146	65	0	39	1323	0	77	1640	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

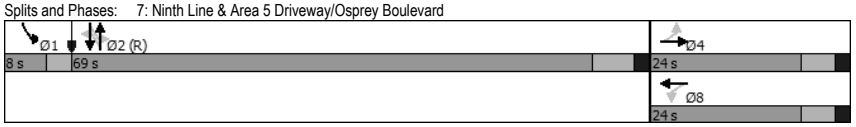
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		52.0	52.0		8.0	52.0	
Total Split (s)	24.0	24.0		24.0	24.0		69.0	69.0		8.0	69.0	
Total Split (%)	23.8%	23.8%		23.8%	23.8%		68.3%	68.3%		7.9%	68.3%	
Maximum Green (s)	18.0	18.0		18.0	18.0		62.0	62.0		5.0	62.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		2.0	6.0	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		37.0	37.0			37.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	16.0	16.0		16.0	16.0		67.1	67.1		76.4	67.1	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.66	0.66		0.76	0.66	
v/c Ratio	0.10	0.14		0.69	0.22		0.34	0.57		0.23	0.70	
Control Delay	35.7	20.7		56.8	16.5		19.5	11.0		6.0	17.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.7	20.7		56.8	16.5		19.5	11.0		6.0	17.1	
LOS	D	C		E	B		B	B		A	B	
Approach Delay		25.9			44.4			11.2			16.6	
Approach LOS		C			D			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 16.3 Intersection LOS: B
Intersection Capacity Utilization 82.3% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 7: Ninth Line & Area 5 Driveway/Osprey Boulevard



Queues
7: Ninth Line & Area 5 Driveway/Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	21	40	146	65	39	1323	77	1640
v/c Ratio	0.10	0.14	0.69	0.22	0.34	0.57	0.23	0.70
Control Delay	35.7	20.7	56.8	16.5	19.5	11.0	6.0	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	20.7	56.8	16.5	19.5	11.0	6.0	17.1
Queue Length 50th (m)	3.5	2.8	26.9	2.8	3.4	73.3	3.0	110.0
Queue Length 95th (m)	9.9	11.5	46.7	13.9	12.7	92.9	10.6	166.2
Internal Link Dist (m)		118.6		136.0		359.2		1127.0
Turn Bay Length (m)			13.0		35.0		270.0	
Base Capacity (vph)	253	342	251	339	114	2319	329	2327
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.12	0.58	0.19	0.34	0.57	0.23	0.70

Intersection Summary

Lanes, Volumes, Timings
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	10	14	0	19	17	1040	20	32	1152	15
Future Volume (vph)	8	0	10	14	0	19	17	1040	20	32	1152	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	35.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			60.0			60.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.850			0.850			0.997			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3604	0	1825	3571	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3604	0	1825	3571	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		101.3			207.4			254.7			383.2	
Travel Time (s)		7.6			14.9			13.1			19.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	2%	2%
Adj. Flow (vph)	8	0	10	15	0	21	17	1130	22	35	1252	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	10	0	15	21	0	17	1152	0	35	1267	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
8: Ninth Line & Area 5 Driveway/Parkgate Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	10	14	0	19	17	1040	20	32	1152	15
Future Volume (Veh/h)	8	0	10	14	0	19	17	1040	20	32	1152	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	8	0	10	15	0	21	17	1130	22	35	1252	15
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								255			383	
pX, platoon unblocked	0.80	0.80	0.77	0.80	0.80	0.69	0.77			0.69		
vC, conflicting volume	1950	2516	634	1881	2512	577	1267			1152		
vC1, stage 1 conf vol	1330	1330		1175	1175							
vC2, stage 2 conf vol	621	1186		706	1337							
vCu, unblocked vol	400	1105	0	313	1101	0	750			308		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	99	96	100	97	97			96		
cM capacity (veh/h)	318	256	835	427	246	748	658			868		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	8	10	15	21	17	753	399	35	835	432
Volume Left	8	0	15	0	17	0	0	35	0	0
Volume Right	0	10	0	21	0	0	22	0	0	15
cSH	318	835	427	748	658	1700	1700	868	1700	1700
Volume to Capacity	0.03	0.01	0.04	0.03	0.03	0.44	0.23	0.04	0.49	0.25
Queue Length 95th (m)	0.6	0.3	0.8	0.7	0.6	0.0	0.0	1.0	0.0	0.0
Control Delay (s)	16.6	9.4	13.7	10.0	10.6	0.0	0.0	9.3	0.0	0.0
Lane LOS	C	A	B	A	B			A		
Approach Delay (s)	12.6		11.5		0.2			0.3		
Approach LOS	B		B							

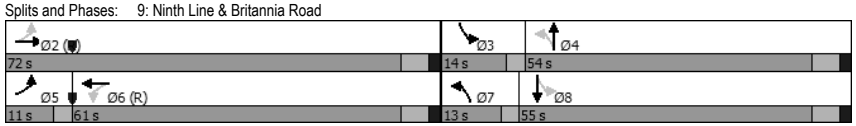
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	934	255	125	1631	143	190	1130	112	184	1091	162
Future Volume (vph)	161	934	255	125	1631	143	190	1130	112	184	1091	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	63.0		0.0	32.0		58.0	52.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	97.0			100.0			30.0			60.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.968			0.988			0.986			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	4998	0	1767	5173	0	1767	3589	0	1684	3545	0
Flt Permitted	0.070			0.197			0.083			0.081		
Satd. Flow (perm)	130	4998	0	366	5173	0	154	3589	0	144	3545	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		67			12			8			13	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		216.7			469.7			206.5			254.7	
Travel Time (s)		9.8			21.1			10.6			13.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	1%	0%	2%	1%	0%	3%	6%	1%	1%
Adj. Flow (vph)	161	934	255	125	1631	143	190	1130	112	184	1091	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	1189	0	125	1774	0	190	1242	0	184	1253	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	8.0	24.6		24.6	24.6		8.0	36.6		8.0	36.6	
Total Split (s)	11.0	72.0		61.0	61.0		13.0	54.0		14.0	55.0	
Total Split (%)	7.9%	51.4%		43.6%	43.6%		9.3%	38.6%		10.0%	39.3%	
Maximum Green (s)	8.0	65.4		54.4	54.4		10.0	47.4		11.0	48.4	
Yellow Time (s)	3.0	4.6		4.6	4.6		3.0	4.6		3.0	4.6	
All-Red Time (s)	0.0	2.0		2.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	2.0	5.6		5.6	5.6		2.0	5.6		2.0	5.6	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0			12.0			12.0	
Flash Dont Walk (s)		11.0		11.0	11.0			18.0			18.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	70.0	66.4		55.4	55.4		63.0	48.4		65.0	49.4	
Actuated g/C Ratio	0.50	0.47		0.40	0.40		0.45	0.35		0.46	0.35	
v/c Ratio	0.95	0.49		0.87	0.86		0.97	1.00		0.93	1.00	
Control Delay	91.6	36.7		81.8	40.9		90.5	69.9		81.3	68.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	91.6	36.7		81.8	40.9		90.5	69.9		81.3	68.7	
LOS	F	D		F	D		F	E		F	E	
Approach Delay		43.3			43.6			72.7			70.3	
Approach LOS		D			D			E			E	

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 32.2 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.00		
Intersection Signal Delay: 56.6		Intersection LOS: E
Intersection Capacity Utilization 105.5%		ICU Level of Service G
Analysis Period (min) 15		

Splits and Phases: 9: Ninth Line & Britannia Road



Queues
9: Ninth Line & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	161	1189	125	1774	190	1242	184	1253
v/c Ratio	0.95	0.49	0.87	0.86	0.97	1.00	0.93	1.00
Control Delay	91.6	36.7	81.8	40.9	90.5	69.9	81.3	68.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.6	36.7	81.8	40.9	90.5	69.9	81.3	68.7
Queue Length 50th (m)	35.8	102.6	31.7	163.7	36.3	179.4	35.2	180.3
Queue Length 95th (m)	#73.7	117.6	#71.2	184.3	#85.4	#229.2	#80.7	#230.0
Internal Link Dist (m)		192.7		445.7		182.5		230.7
Turn Bay Length (m)	63.0		32.0		52.0		50.0	
Base Capacity (vph)	170	2405	144	2054	196	1246	198	1259
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.49	0.87	0.86	0.97	1.00	0.93	1.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	12	13	0	13	3	1265	22	26	1448	10
Future Volume (vph)	55	0	12	13	0	13	3	1265	22	26	1448	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	30.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.850			0.997			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1601	0	1825	1633	0	1789	3569	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		103.7			491.2			170.0			206.5	
Travel Time (s)		7.8			35.4			8.7			10.6	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	2%	0%	0%	2%	2%
Adj. Flow (vph)	55	0	12	14	0	14	3	1375	24	28	1574	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	12	0	14	14	0	3	1399	0	28	1584	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 56.7% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
10: Ninth Line & Area 4/Transitway Driveway/Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	0	12	13	0	13	3	1265	22	26	1448	10
Future Volume (Veh/h)	55	0	12	13	0	13	3	1265	22	26	1448	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	55	0	12	14	0	14	3	1375	24	28	1574	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											206	
pX, platoon unblocked	0.66	0.66	0.66	0.66	0.66		0.66					
vC, conflicting volume	2342	3040	792	2248	3033	700	1584			1399		
vC1, stage 1 conf vol	1635	1635		1393	1393							
vC2, stage 2 conf vol	708	1405		855	1640							
vCu, unblocked vol	2007	3060	0	1864	3050	700	862			1399		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	64	100	98	90	100	96	99			94		
cM capacity (veh/h)	153	127	718	143	137	387	514			495		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	55	12	14	14	3	917	482	28	1049	535
Volume Left	55	0	14	0	3	0	0	28	0	0
Volume Right	0	12	0	14	0	0	24	0	0	10
cSH	153	718	143	387	514	1700	1700	495	1700	1700
Volume to Capacity	0.36	0.02	0.10	0.04	0.01	0.54	0.28	0.06	0.62	0.31
Queue Length 95th (m)	11.4	0.4	2.4	0.9	0.1	0.0	0.0	1.4	0.0	0.0
Control Delay (s)	41.3	10.1	32.8	14.7	12.0	0.0	0.0	12.7	0.0	0.0
Lane LOS	E	B	D	B	B			B		
Approach Delay (s)	35.7		23.7		0.0			0.2		
Approach LOS	E		C							

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		56.7%	ICU Level of Service	B
Analysis Period (min)		15		

Lanes, Volumes, Timings
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	3	19	8	3	42	5	1244	35	37	1320	17
Future Volume (vph)	45	3	19	8	3	42	5	1244	35	37	1320	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		30.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.870			0.859			0.996			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1639	0	1825	1648	0	1789	3592	0	1825	3606	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	1639	0	1825	1648	0	1789	3592	0	1825	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		90.3			511.9			217.0			170.0	
Travel Time (s)		6.8			36.9			11.2			8.7	
Confl. Peds. (#/hr)						1						
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	9%	0%	1%	2%
Adj. Flow (vph)	45	3	19	9	3	46	5	1352	38	40	1435	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	22	0	9	49	0	5	1390	0	40	1452	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
11: Ninth Line & Area 4/Transitway Driveway/McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	3	19	8	3	42	5	1244	35	37	1320	17
Future Volume (Veh/h)	45	3	19	8	3	42	5	1244	35	37	1320	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	45	3	19	9	3	46	5	1352	38	40	1435	17
Pedestrians											1	
Lane Width (m)											3.7	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)											376	
pX, platoon unblocked	0.69	0.69	0.69	0.69	0.69		0.69					
vC, conflicting volume	2258	2924	726	2199	2913	696	1452			1390		
vC1, stage 1 conf vol	1524	1524		1381	1381							
vC2, stage 2 conf vol	734	1400		818	1532							
vCu, unblocked vol	1919	2889	0	1833	2873	696	744			1390		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	72	98	97	94	98	88	99			92		
cM capacity (veh/h)	160	128	744	145	145	388	590			499		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	45	22	9	49	5	901	489	40	957	495
Volume Left	45	0	9	0	5	0	0	40	0	0
Volume Right	0	19	0	46	0	0	38	0	0	17
cSH	160	448	145	352	590	1700	1700	499	1700	1700
Volume to Capacity	0.28	0.05	0.06	0.14	0.01	0.53	0.29	0.08	0.56	0.29
Queue Length 95th (m)	8.3	1.2	1.5	3.6	0.2	0.0	0.0	2.0	0.0	0.0
Control Delay (s)	36.1	13.4	31.4	16.9	11.2	0.0	0.0	12.8	0.0	0.0
Lane LOS	E	B	D	C	B			B		
Approach Delay (s)	28.7		19.1		0.0			0.3		
Approach LOS	D		C							

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization		52.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
12: Ninth Line & Lacman Trail

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	5	1255	20	12	1361
Future Volume (vph)	9	5	1255	20	12	1361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		35.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3572	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3572	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	282.3		102.8			217.0
Travel Time (s)	20.3		5.3			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	1%
Adj. Flow (vph)	10	5	1364	22	13	1479
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	5	1386	0	13	1479
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
12: Ninth Line & Lacman Trail

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	5	1255	20	12	1361
Future Volume (Veh/h)	9	5	1255	20	12	1361
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	5	1364	22	13	1479
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2140	693			1386	
vC1, stage 1 conf vol	1375					
vC2, stage 2 conf vol	766					
vCu, unblocked vol	2140	693			1386	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	99			97	
cM capacity (veh/h)	180	390			500	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	15	909	477	13	740	740
Volume Left	10	0	0	13	0	0
Volume Right	5	0	22	0	0	0
cSH	270	1700	1700	500	1700	1700
Volume to Capacity	0.06	0.53	0.28	0.03	0.43	0.43
Queue Length 95th (m)	1.3	0.0	0.0	0.6	0.0	0.0
Control Delay (s)	22.2	0.0	0.0	12.4	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	22.2	0.0		0.1		
Approach LOS	C					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
13: Ninth Line & Brinwood Gate

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	9	1254	13	6	1298
Future Volume (vph)	3	9	1254	13	6	1298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	30.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3607	0	1825	3614
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3607	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	278.4		306.2			102.8
Travel Time (s)	20.0		15.7			5.3
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	3	10	1363	14	7	1411
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	10	1377	0	7	1411
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
13: Ninth Line & Brinwood Gate

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	9	1254	13	6	1298
Future Volume (Veh/h)	3	9	1254	13	6	1298
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	10	1363	14	7	1411
Pedestrians	1					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			306			
pX, platoon unblocked	0.75	0.75			0.75	
vC, conflicting volume	2090	690			1378	
vC1, stage 1 conf vol	1371					
vC2, stage 2 conf vol	720					
vCu, unblocked vol	1793	0			847	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	242	821			601	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	13	909	468	7	706	706
Volume Left	3	0	0	7	0	0
Volume Right	10	0	14	0	0	0
cSH	1050	1700	1700	601	1700	1700
Volume to Capacity	0.01	0.53	0.28	0.01	0.41	0.41
Queue Length 95th (m)	0.3	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	11.9	0.0	0.0	11.1	0.0	0.0
Lane LOS	B			B		
Approach Delay (s)	11.9	0.0		0.1		
Approach LOS	B					

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		45.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1	10	113	1	101	17	1247	148	93	1234	10
Future Volume (vph)	7	1	10	113	1	101	17	1247	148	93	1234	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		35.0	28.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			7.5			45.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor								1.00		1.00		
Frt		0.864			0.851			0.984			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1627	0	1807	1557	0	1789	3554	0	1807	3575	0
Flt Permitted	0.679			0.750			0.151			0.115		
Satd. Flow (perm)	1279	1627	0	1427	1557	0	284	3554	0	219	3575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			110			22			1	
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		170.8			534.8			346.0			306.2	
Travel Time (s)		12.8			38.5			17.8			15.7	
Confl. Peds. (#/hr)									6	6		
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	1%	2%	5%	2%	1%	0%	1%	2%	2%
Adj. Flow (vph)	7	1	10	123	1	110	17	1355	161	101	1341	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	11	0	123	111	0	17	1516	0	101	1351	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
14: Ninth Line & Area 3 Driveway/Thomas Street

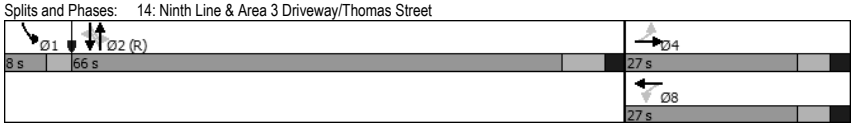
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	2	
Permitted Phases	4			8			2			2		
Detector Phase	4	4		8	8		2	2		1	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		45.0	45.0		5.0	45.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		52.5	52.5		8.0	52.5	
Total Split (s)	27.0	27.0		27.0	27.0		66.0	66.0		8.0	66.0	
Total Split (%)	26.7%	26.7%		26.7%	26.7%		65.3%	65.3%		7.9%	65.3%	
Maximum Green (s)	20.5	20.5		20.5	20.5		58.5	58.5		5.0	58.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		5.0	5.0		3.0	5.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		0.0	2.5	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		6.5	6.5		2.0	6.5	
Lead/Lag							Lag	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		33.0	33.0			33.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		12.0	12.0			12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	15.0	15.0		15.0	15.0		66.4	66.4		76.9	66.4	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.66	0.66		0.76	0.66	
v/c Ratio	0.04	0.04		0.58	0.34		0.09	0.65		0.36	0.57	
Control Delay	34.3	18.6		47.5	12.4		15.1	22.4		6.9	11.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.3	18.6		47.5	12.4		15.1	22.4		6.9	11.9	
LOS	C	B		D	B		B	C		A	B	
Approach Delay		24.7			30.9			22.3			11.6	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 101
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 18.1 — Intersection LOS: B
Intersection Capacity Utilization 100.2% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 14: Ninth Line & Area 3 Driveway/Thomas Street



Queues
14: Ninth Line & Area 3 Driveway/Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	11	123	111	17	1516	101	1351
v/c Ratio	0.04	0.04	0.58	0.34	0.09	0.65	0.36	0.57
Control Delay	34.3	18.6	47.5	12.4	15.1	22.4	6.9	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	18.6	47.5	12.4	15.1	22.4	6.9	11.9
Queue Length 50th (m)	1.2	0.2	23.6	0.1	2.0	151.3	3.7	74.3
Queue Length 95th (m)	4.8	4.8	39.9	17.4	m4.6	182.2	9.5	106.8
Internal Link Dist (m)		146.8		510.8		322.0		282.2
Turn Bay Length (m)					30.0		28.0	
Base Capacity (vph)	272	354	303	418	186	2344	282	2350
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.41	0.27	0.09	0.65	0.36	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
15: Ninth Line & Deepwood Heights

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	6	1313	27	19	1289
Future Volume (vph)	9	6	1313	27	19	1289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		40.0	25.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.944		0.997			
Flt Protected	0.971				0.950	
Satd. Flow (prot)	1761	0	3604	0	1825	3614
Flt Permitted	0.971				0.950	
Satd. Flow (perm)	1761	0	3604	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	533.3		324.0			346.0
Travel Time (s)	38.4		16.7			17.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	10	7	1427	29	21	1401
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	1456	0	21	1401
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
15: Ninth Line & Deepwood Heights

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	6	1313	27	19	1289
Future Volume (Veh/h)	9	6	1313	27	19	1289
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	7	1427	29	21	1401
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						346
pX, platoon unblocked	0.78					
vC, conflicting volume	2184	728			1456	
vC1, stage 1 conf vol	1442					
vC2, stage 2 conf vol	742					
vCu, unblocked vol	1956	728			1456	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	98			96	
cM capacity (veh/h)	177	370			471	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	17	951	505	21	700	700
Volume Left	10	0	0	21	0	0
Volume Right	7	0	29	0	0	0
cSH	226	1700	1700	471	1700	1700
Volume to Capacity	0.08	0.56	0.30	0.04	0.41	0.41
Queue Length 95th (m)	1.8	0.0	0.0	1.1	0.0	0.0
Control Delay (s)	22.2	0.0	0.0	13.0	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	22.2	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: Ninth Line & Tacc Drive

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	34	37	1401	74	56	1384
Future Volume (vph)	34	37	1401	74	56	1384
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		45.0	65.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.993			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1825	1633	3557	0	1825	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1825	1633	3557	0	1825	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	531.4		250.0			324.0
Travel Time (s)	38.3		12.9			16.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	37	40	1523	80	61	1504
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	40	1603	0	61	1504
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.5%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
16: Ninth Line & Tacc Drive

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	37	1401	74	56	1384
Future Volume (Veh/h)	34	37	1401	74	56	1384
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	40	1523	80	61	1504
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2437	802			1603	
vC1, stage 1 conf vol	1563					
vC2, stage 2 conf vol	874					
vCu, unblocked vol	2437	802			1603	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	88			85	
cM capacity (veh/h)	140	331			414	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	77	1015	588	61	752	752
Volume Left	37	0	0	61	0	0
Volume Right	40	0	80	0	0	0
cSH	291	1700	1700	414	1700	1700
Volume to Capacity	0.26	0.60	0.35	0.15	0.44	0.44
Queue Length 95th (m)	7.9	0.0	0.0	3.9	0.0	0.0
Control Delay (s)	28.1	0.0	0.0	15.2	0.0	0.0
Lane LOS	D			C		
Approach Delay (s)	28.1	0.0		0.6		
Approach LOS	D					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	9	0	0	6	14	1421	5	10	1349	13
Future Volume (vph)	8	0	9	0	0	6	14	1421	5	10	1349	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	70.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.929			0.865						0.999	
Flt Protected		0.977					0.950			0.950		
Satd. Flow (prot)	0	1709	0	0	1662	0	1789	3614	0	1825	3575	0
Flt Permitted		0.977					0.950			0.950		
Satd. Flow (perm)	0	1709	0	0	1662	0	1789	3614	0	1825	3575	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		89.2			113.3			424.8			250.0	
Travel Time (s)		6.7			8.2			21.8			12.9	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	2%	2%
Adj. Flow (vph)	8	0	9	0	0	7	14	1545	5	11	1466	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	17	0	0	7	0	14	1550	0	11	1479	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
17: Ninth Line & Area 2 Driveway/Janice Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	9	0	0	6	14	1421	5	10	1349	13
Future Volume (Veh/h)	8	0	9	0	0	6	14	1421	5	10	1349	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	8	0	9	0	0	7	14	1545	5	11	1466	13
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2302	3072	740	2340	3076	775	1479			1550		
vC1, stage 1 conf vol	1494	1494		1576	1576							
vC2, stage 2 conf vol	808	1578		764	1501							
vCu, unblocked vol	2302	3072	740	2340	3076	775	1479			1550		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	97	100	100	98	97			97		
cM capacity (veh/h)	113	111	360	105	110	345	451			433		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	17	7	14	1030	520	11	977	502
Volume Left	8	0	14	0	0	11	0	0
Volume Right	9	7	0	0	5	0	0	13
cSH	178	345	451	1700	1700	433	1700	1700
Volume to Capacity	0.10	0.02	0.03	0.61	0.31	0.03	0.57	0.30
Queue Length 95th (m)	2.4	0.5	0.7	0.0	0.0	0.6	0.0	0.0
Control Delay (s)	27.4	15.6	13.2	0.0	0.0	13.5	0.0	0.0
Lane LOS	D	C	B			B		
Approach Delay (s)	27.4	15.6	0.1			0.1		
Approach LOS	D	C						

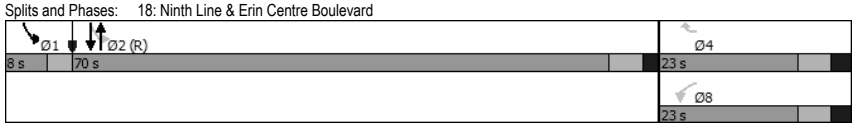
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	56	76	1337	61	54	1211
Future Volume (vph)	56	76	1337	61	54	1211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0	0.0		0.0	18.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	75.0				16.0	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.993			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3563	0	1825	3579
Flt Permitted	0.950				0.131	
Satd. Flow (perm)	1789	1585	3563	0	252	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		83	9			
Link Speed (k/h)	60		70			70
Link Distance (m)	497.0		404.2			424.8
Travel Time (s)	29.8		20.8			21.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	1%	18%	0%	2%
Adj. Flow (vph)	61	83	1453	66	59	1316
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	83	1519	0	59	1316
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm	Perm	NA		pm+pt	NA
Protected Phases			2		1	2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8	4			2	
Detector Phase	8	4	2		1	2
Switch Phase						
Minimum Initial (s)	8.0	8.0	58.0		5.0	58.0
Minimum Split (s)	22.5	22.5	64.0		8.0	64.0
Total Split (s)	23.0	23.0	70.0		8.0	70.0
Total Split (%)	22.8%	22.8%	69.3%		7.9%	69.3%
Maximum Green (s)	16.5	16.5	64.0		5.0	64.0
Yellow Time (s)	4.0	4.0	4.0		3.0	4.0
All-Red Time (s)	2.5	2.5	2.0		0.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	5.0		2.0	5.0
Lead/Lag			Lag		Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	8.0	8.0	50.0			50.0
Flash Dont Walk (s)	8.0	8.0	8.0			8.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	10.4	10.4	76.6		84.4	76.6
Actuated g/C Ratio	0.10	0.10	0.76		0.84	0.76
v/c Ratio	0.33	0.35	0.56		0.18	0.48
Control Delay	46.6	13.6	8.1		5.0	15.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.6	13.6	8.1		5.0	15.8
LOS	D	B	A		A	B
Approach Delay	27.6		8.1			15.3
Approach LOS	C		A			B

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 18: Ninth Line & Erin Centre Boulevard



Queues
18: Ninth Line & Erin Centre Boulevard

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	61	83	1519	59	1316
v/c Ratio	0.33	0.35	0.56	0.18	0.48
Control Delay	46.6	13.6	8.1	5.0	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	13.6	8.1	5.0	15.8
Queue Length 50th (m)	11.4	0.0	68.1	3.4	111.0
Queue Length 95th (m)	23.1	13.1	100.2	m6.4	148.3
Internal Link Dist (m)	473.0		380.2		400.8
Turn Bay Length (m)	25.0			18.0	
Base Capacity (vph)	309	343	2704	321	2714
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.20	0.24	0.56	0.18	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	0	0	5	0	11	0	1265	15	23	1171	16
Future Volume (vph)	9	0	0	5	0	11	0	1265	15	23	1171	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		15.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt					0.850			0.998			0.998	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1789	1883	0	1825	1633	0	1883	3607	0	1825	3606	0
Flt Permitted	0.950			0.950						0.950		
Satd. Flow (perm)	1789	1883	0	1825	1633	0	1883	3607	0	1825	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		98.8			216.6			90.1			404.2	
Travel Time (s)		7.4			15.6			4.6			20.8	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	9	0	0	5	0	12	0	1375	16	25	1273	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	0	0	5	12	0	0	1391	0	25	1289	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.3% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
19: Ninth Line & Area 1 Driveway/Candlelight Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	0	5	0	11	0	1265	15	23	1171	16
Future Volume (Veh/h)	9	0	0	5	0	11	0	1265	15	23	1171	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	9	0	0	5	0	12	0	1375	16	25	1273	16
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								373				
pX, platoon unblocked	0.80	0.80		0.80	0.80	0.80				0.80		
vC, conflicting volume	2030	2722	644	2070	2722	696	1289			1391		
vC1, stage 1 conf vol	1331	1331		1383	1383							
vC2, stage 2 conf vol	700	1391		686	1339							
vCu, unblocked vol	1791	2653	644	1840	2653	127	1289			994		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	100	97	100	98	100			96		
cM capacity (veh/h)	149	150	415	186	156	727	534			565		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	0	5	12	0	917	474	25	849	440
Volume Left	9	0	5	0	0	0	0	25	0	0
Volume Right	0	0	0	12	0	0	16	0	0	16
cSH	149	1700	186	727	1700	1700	1700	565	1700	1700
Volume to Capacity	0.06	0.00	0.03	0.02	0.00	0.54	0.28	0.04	0.50	0.26
Queue Length 95th (m)	1.5	0.0	0.6	0.4	0.0	0.0	0.0	1.1	0.0	0.0
Control Delay (s)	30.8	0.0	24.9	10.0	0.0	0.0	0.0	11.7	0.0	0.0
Lane LOS	D	A	C	B				B		
Approach Delay (s)	30.8		14.4		0.0			0.2		
Approach LOS	D		B							

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		49.3%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
20: Ninth Line & Skyview Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	1302	2	16	1202
Future Volume (vph)	1	1	1302	2	16	1202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.932					
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1748	0	3614	0	1825	3614
Flt Permitted	0.976				0.950	
Satd. Flow (perm)	1748	0	3614	0	1825	3614
Link Speed (k/h)	50		70			70
Link Distance (m)	233.9		91.0			90.1
Travel Time (s)	16.8		4.7			4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	1	1	1415	2	17	1307
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1417	0	17	1307
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane			Yes			Yes
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
20: Ninth Line & Skyview Street

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	1	1302	2	16	1202
Future Volume (Veh/h)	1	1	1302	2	16	1202
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	1415	2	17	1307
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			283			
pX, platoon unblocked	0.79	0.79			0.79	
vC, conflicting volume	2104	708			1417	
vC1, stage 1 conf vol	1416					
vC2, stage 2 conf vol	688					
vCu, unblocked vol	1871	115			1007	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			97	
cM capacity (veh/h)	218	732			553	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	2	943	474	17	654	654
Volume Left	1	0	0	17	0	0
Volume Right	1	0	2	0	0	0
cSH	337	1700	1700	553	1700	1700
Volume to Capacity	0.01	0.55	0.28	0.03	0.38	0.38
Queue Length 95th (m)	0.1	0.0	0.0	0.7	0.0	0.0
Control Delay (s)	15.8	0.0	0.0	11.7	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	15.8	0.0		0.2		
Approach LOS	C					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	0	27	0	0	2	48	1372	5	3	1194	22
Future Volume (vph)	14	0	27	0	0	2	48	1372	5	3	1194	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		20.0	0.0		0.0
Storage Lanes	0		0	0		1	1		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	0.95
Ped Bike Factor												
Frt		0.911				0.865			0.850		0.998	
Flt Protected		0.983					0.950					
Satd. Flow (prot)	0	1687	0	0	0	1662	1789	3614	1633	0	3606	0
Flt Permitted		0.983					0.950					
Satd. Flow (perm)	0	1687	0	0	0	1662	1789	3614	1633	0	3606	0
Link Speed (k/h)		48			50			70			70	
Link Distance (m)		116.8			245.5			191.7			91.0	
Travel Time (s)		8.8			17.7			9.9			4.7	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	1%	0%	0%	1%	2%
Adj. Flow (vph)	14	0	27	0	0	2	48	1491	5	3	1298	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	0	0	0	2	48	1491	5	0	1323	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
21: Ninth Line & Area 1 Driveway/Stardust Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	0	27	0	0	2	48	1372	5	3	1194	22
Future Volume (Veh/h)	14	0	27	0	0	2	48	1372	5	3	1194	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.92	0.92	0.92	0.92	1.00
Hourly flow rate (vph)	14	0	27	0	0	2	48	1491	5	3	1298	22
Pedestrians					1							
Lane Width (m)					3.7							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								192				
pX, platoon unblocked	0.78	0.78		0.78	0.78	0.78				0.78		
vC, conflicting volume	2158	2903	660	2270	2914	746	1320			1492		
vC1, stage 1 conf vol	1315	1315		1588	1588							
vC2, stage 2 conf vol	844	1588		682	1326							
vCu, unblocked vol	1928	2876	660	2070	2890	129	1320			1079		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	100	93	100	100	100	91			99		
cM capacity (veh/h)	154	133	406	127	119	708	519			513		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	41	2	48	746	746	5	652	671
Volume Left	14	0	48	0	0	0	3	0
Volume Right	27	2	0	0	0	5	0	22
cSH	260	708	519	1700	1700	1700	513	1700
Volume to Capacity	0.16	0.00	0.09	0.44	0.44	0.00	0.01	0.39
Queue Length 95th (m)	4.2	0.1	2.3	0.0	0.0	0.0	0.1	0.0
Control Delay (s)	21.4	10.1	12.6	0.0	0.0	0.0	0.2	0.0
Lane LOS	C	B	B				A	
Approach Delay (s)	21.4	10.1	0.4				0.1	
Approach LOS	C	B						

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		54.6%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	365	19	40	795	451	181	696	38	291	635	73
Future Volume (vph)	63	365	19	40	795	451	181	696	38	291	635	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	16.0		0.0	28.0		0.0	30.0		0.0	36.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	27.0			52.0			51.0			46.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.992				0.850		0.992			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3543	0	1789	1812	1458	1825	3552	0	1807	3535	0
Flt Permitted	0.073			0.489			0.199			0.115		
Satd. Flow (perm)	140	3543	0	921	1812	1458	382	3552	0	219	3535	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				330		4			9	
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		668.2			502.9			376.5			191.7	
Travel Time (s)		40.1			30.2			19.4			9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	6%	2%	6%	12%	0%	2%	1%	1%	1%	8%
Adj. Flow (vph)	68	397	21	43	864	490	197	757	41	316	690	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	418	0	43	864	490	197	798	0	316	769	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		7	4		3	8	

Lanes, Volumes, Timings
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

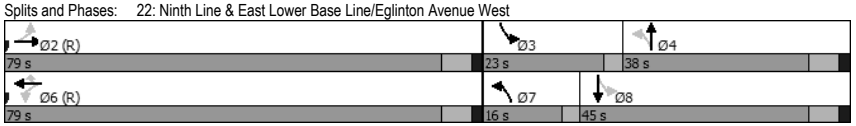
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	4			8		
Detector Phase	2	2		6	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	5.0	8.0		5.0	8.0	
Minimum Split (s)	23.0	23.0		23.0	23.0	23.0	8.0	24.0		8.0	24.0	
Total Split (s)	79.0	79.0		79.0	79.0	79.0	16.0	38.0		23.0	45.0	
Total Split (%)	56.4%	56.4%		56.4%	56.4%	56.4%	11.4%	27.1%		16.4%	32.1%	
Maximum Green (s)	72.0	72.0		72.0	72.0	72.0	13.0	31.0		20.0	38.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	5.0		3.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	-1.0	0.0		0.0	-1.0	0.0	-1.0	-1.0		-1.0	0.0	
Total Lost Time (s)	6.0	7.0		7.0	6.0	7.0	2.0	6.0		2.0	7.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min	C-Min	None	Min		None	Min	
Walk Time (s)	8.0	8.0		8.0	8.0	8.0		8.0			8.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0		9.0			9.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effct Green (s)	72.1	71.1		71.1	72.1	71.1	50.3	32.7		59.9	39.3	
Actuated g/C Ratio	0.52	0.51		0.51	0.52	0.51	0.36	0.23		0.43	0.28	
v/c Ratio	0.94	0.23		0.09	0.93	0.54	0.71	0.96		0.95	0.77	
Control Delay	127.7	19.2		18.1	48.1	9.1	42.1	75.5		75.6	52.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	127.7	19.2		18.1	48.1	9.1	42.1	75.5		75.6	52.1	
LOS	F	B		B	D	A	D	E		E	D	
Approach Delay		34.3			33.5			68.9			59.0	
Approach LOS		C			C			E			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 49.5 — Intersection LOS: D
Intersection Capacity Utilization 103.1% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 22: Ninth Line & East Lower Base Line/Eglinton Avenue West



Queues
22: Ninth Line & East Lower Base Line/Eglinton Avenue West

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	68	418	43	864	490	197	798	316	769
v/c Ratio	0.94	0.23	0.09	0.93	0.54	0.71	0.96	0.95	0.77
Control Delay	127.7	19.2	18.1	48.1	9.1	42.1	75.5	75.6	52.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.7	19.2	18.1	48.1	9.1	42.1	75.5	75.6	52.1
Queue Length 50th (m)	17.0	32.1	5.9	212.8	25.3	35.0	116.0	70.1	103.5
Queue Length 95th (m)	#49.7	42.4	12.7	#301.9	55.4	#53.8	#158.3	#128.4	127.4
Internal Link Dist (m)		644.2		478.9			352.5		167.7
Turn Bay Length (m)	16.0		28.0			30.0		36.0	
Base Capacity (vph)	73	1825	473	944	910	283	831	333	998
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.23	0.09	0.92	0.54	0.70	0.96	0.95	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	255	27	135	216	14	16	17	72	10	16	9
Future Volume (vph)	9	255	27	135	216	14	16	17	72	10	16	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988			0.995			0.907			0.964	
Flt Protected		0.998			0.982			0.993			0.986	
Satd. Flow (prot)	0	1894	0	0	1870	0	0	1684	0	0	1826	0
Flt Permitted		0.998			0.982			0.993			0.986	
Satd. Flow (perm)	0	1894	0	0	1870	0	0	1684	0	0	1826	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		287.6			92.3			174.8			239.2	
Travel Time (s)		20.7			6.6			12.6			17.2	
Confl. Peds. (#/hr)	2		10	10		2	5		3	3		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	10	277	29	147	235	15	17	18	78	11	17	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	316	0	0	397	0	0	113	0	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
31: Rosehurst Drive & Terragar Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	255	27	135	216	14	16	17	72	10	16	9
Future Volume (vph)	9	255	27	135	216	14	16	17	72	10	16	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	277	29	147	235	15	17	18	78	11	17	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	316	397	113	38
Volume Left (vph)	10	147	17	11
Volume Right (vph)	29	15	78	10
Hadj (s)	-0.05	0.06	-0.34	-0.10
Departure Headway (s)	4.8	4.8	5.3	5.7
Degree Utilization, x	0.42	0.53	0.17	0.06
Capacity (veh/h)	717	729	588	534
Control Delay (s)	11.2	13.0	9.4	9.1
Approach Delay (s)	11.2	13.0	9.4	9.1
Approach LOS	B	B	A	A

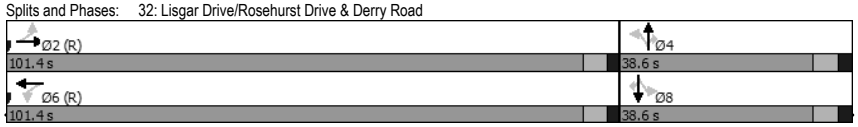
Intersection Summary			
Delay	11.7		
Level of Service	B		
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1092	52	335	2150	185	47	34	160	99	40	45
Future Volume (vph)	57	1092	52	335	2150	185	47	34	160	99	40	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.7	3.5	3.7	3.5
Storage Length (m)	66.0		0.0	90.0		0.0	14.0		28.0	25.0		16.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	40.0			100.0			20.0			25.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00		0.99		0.99	1.00		0.98
Frt		0.993			0.988				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5053	0	1785	5119	0	1785	1921	1617	1785	1830	1566
Flt Permitted	0.054			0.229			0.731			0.735		
Satd. Flow (perm)	101	5053	0	429	5119	0	1358	1921	1593	1378	1830	1529
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			23				131			23
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		382.7			259.7			280.6			160.4	
Travel Time (s)		23.0			15.6			20.2			11.5	
Confl. Peds. (#/hr)	4		6	6		4	9		2	2		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	1%	0%	1%	1%	0%	0%	1%	0%	5%	2%
Adj. Flow (vph)	57	1092	52	335	2150	185	47	34	160	99	40	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1144	0	335	2335	0	47	34	160	99	40	45
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane								Yes				
Headway Factor	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	0.99	1.01	0.99	1.01
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Detector Phase	2	2		6	6		4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	36.0	36.0		36.0	36.0		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (s)	101.4	101.4		101.4	101.4		38.6	38.6	38.6	38.6	38.6	38.6
Total Split (%)	72.4%	72.4%		72.4%	72.4%		27.6%	27.6%	27.6%	27.6%	27.6%	27.6%
Maximum Green (s)	95.4	95.4		95.4	95.4		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.6	5.6	5.6	5.6	5.6	5.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	113.0	113.0		113.0	113.0		16.4	16.4	16.4	16.4	16.4	16.4
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.12	0.12	0.12	0.12	0.12	0.12
v/c Ratio	0.70	0.28		0.97	0.56		0.30	0.15	0.53	0.61	0.19	0.23
Control Delay	59.1	1.9		57.3	5.7		59.4	54.7	20.2	74.2	55.5	33.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	1.9		57.3	5.7		59.4	54.7	20.2	74.2	55.5	33.6
LOS	E	A		E	A		E	D	C	E	E	C
Approach Delay		4.6			12.2			32.7			60.2	
Approach LOS		A			B			C			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 113.4 (81%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 84.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 32: Lisgar Drive/Rosehurst Drive & Derry Road



Queues
32: Lisgar Drive/Rosehurst Drive & Derry Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	1144	335	2335	47	34	160	99	40	45
v/c Ratio	0.70	0.28	0.97	0.56	0.30	0.15	0.53	0.61	0.19	0.23
Control Delay	59.1	1.9	57.3	5.7	59.4	54.7	20.2	74.2	55.5	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	1.9	57.3	5.7	59.4	54.7	20.2	74.2	55.5	33.6
Queue Length 50th (m)	5.6	11.0	68.0	68.9	12.1	8.6	7.4	26.5	10.2	5.6
Queue Length 95th (m)	m#35.3	22.6	#66.5	99.9	23.7	18.3	27.9	43.7	20.7	16.7
Internal Link Dist (m)		358.7		235.7		256.6			136.4	
Turn Bay Length (m)	66.0		90.0		14.0		28.0	25.0		16.0
Base Capacity (vph)	81	4081	346	4136	320	452	475	324	431	377
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.28	0.97	0.56	0.15	0.08	0.34	0.31	0.09	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	194	56	92	193	133	43	98	86	142	100	46
Future Volume (vph)	43	194	56	92	193	133	43	98	86	142	100	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.966			0.939			0.949			0.978	
Flt Protected	0.950			0.950				0.991			0.976	
Satd. Flow (prot)	1738	1644	0	1772	1674	0	0	1592	0	0	1668	0
Flt Permitted	0.950			0.950				0.991			0.976	
Satd. Flow (perm)	1738	1644	0	1772	1674	0	0	1592	0	0	1668	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		255.0			168.5			106.8			109.7	
Travel Time (s)		18.4			12.1			7.7			7.9	
Confl. Peds. (#/hr)	12		31	31		12	39		40	40		39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	14%	9%	3%	9%	6%	9%	22%	6%	6%	15%	11%
Adj. Flow (vph)	47	211	61	100	210	145	47	107	93	154	109	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	272	0	100	355	0	0	247	0	0	313	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 66.0% ICU Level of Service C
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
33: Lisgar Drive & Doug Leavens Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	43	194	56	92	193	133	43	98	86	142	100	46
Future Volume (vph)	43	194	56	92	193	133	43	98	86	142	100	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	211	61	100	210	145	47	107	93	154	109	50

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	47	272	100	355	247	313
Volume Left (vph)	47	0	100	0	47	154
Volume Right (vph)	0	61	0	145	93	50
Hadj (s)	0.58	0.06	0.55	-0.15	0.04	0.17
Departure Headway (s)	8.3	7.8	8.0	7.3	7.4	7.3
Degree Utilization, x	0.11	0.59	0.22	0.72	0.51	0.64
Capacity (veh/h)	403	432	427	472	439	455
Control Delay (s)	11.1	20.0	12.1	25.6	17.9	22.3
Approach Delay (s)	18.7		22.6		17.9	22.3
Approach LOS	C		C		C	C

Intersection Summary			
Delay		20.7	
Level of Service		C	
Intersection Capacity Utilization		66.0%	ICU Level of Service C
Analysis Period (min)		15	

Lanes, Volumes, Timings
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	64	5	11	47	94	5	5	7	108	11	64
Future Volume (vph)	42	64	5	11	47	94	5	5	7	108	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.917			0.940			0.953	
Flt Protected		0.981			0.996			0.986			0.971	
Satd. Flow (prot)	0	1825	0	0	1755	0	0	1781	0	0	1683	0
Flt Permitted		0.981			0.996			0.986			0.971	
Satd. Flow (perm)	0	1825	0	0	1755	0	0	1781	0	0	1683	0
Link Speed (k/h)		50			50			50			40	
Link Distance (m)		212.0			50.7			73.1			137.1	
Travel Time (s)		15.3			3.7			5.3			12.3	
Confl. Peds. (#/hr)	10		4	4		10	1		46	46		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	6%
Adj. Flow (vph)	46	70	5	12	51	102	5	5	8	117	12	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	121	0	0	165	0	0	18	0	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 42.2%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
34: Lisgar Drive & Osprey Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	42	64	5	11	47	94	5	5	7	108	11	64
Future Volume (vph)	42	64	5	11	47	94	5	5	7	108	11	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	70	5	12	51	102	5	5	8	117	12	70

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	121	165	18	199
Volume Left (vph)	46	12	5	117
Volume Right (vph)	5	102	8	70
Hadj (s)	0.10	-0.36	-0.21	0.00
Departure Headway (s)	4.7	4.2	4.6	4.6
Degree Utilization, x	0.16	0.19	0.02	0.25
Capacity (veh/h)	716	801	717	738
Control Delay (s)	8.6	8.2	7.7	9.1
Approach Delay (s)	8.6	8.2	7.7	9.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.7	
Level of Service			A	
Intersection Capacity Utilization			42.2%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1163	94	219	2017	78	35	17	102	30	11	7
Future Volume (vph)	16	1163	94	219	2017	78	35	17	102	30	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.5	3.7	3.7
Storage Length (m)	33.0		22.0	35.0		22.0	21.0		0.0	19.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	92.0			60.0			20.0			19.0		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00		1.00	0.99		1.00	0.99	
Frt		0.989			0.994			0.871			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1785	5139	0	1552	5206	0	1733	1649	0	1785	1746	0
Flt Permitted	0.078			0.207			0.746			0.435		
Satd. Flow (perm)	147	5139	0	338	5206	0	1356	1649	0	814	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			11			102			7	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		469.7			97.9			114.1			106.4	
Travel Time (s)		28.2			5.9			8.2			7.7	
Confl. Peds. (#/hr)	4					4	2		3	3		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	0%	15%	0%	1%	3%	0%	0%	0%	5%	0%
Adj. Flow (vph)	16	1163	94	219	2017	78	35	17	102	30	11	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1257	0	219	2095	0	35	119	0	30	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	0.99	1.01	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

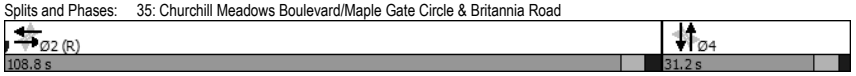
16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		
Detector Phase	2	2		2	2		4	4		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	36.0	36.0		36.0	36.0		31.2	31.2		31.2	31.2	
Total Split (s)	108.8	108.8		108.8	108.8		31.2	31.2		31.2	31.2	
Total Split (%)	77.7%	77.7%		77.7%	77.7%		22.3%	22.3%		22.3%	22.3%	
Maximum Green (s)	101.8	101.8		101.8	101.8		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.2	4.2		4.2	4.2	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.2	5.2		5.2	5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	11.0	11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	117.9	117.9		117.9	117.9		10.9	10.9		10.9	10.9	
Actuated g/C Ratio	0.84	0.84		0.84	0.84		0.08	0.08		0.08	0.08	
v/c Ratio	0.13	0.29		0.77	0.48		0.33	0.54		0.48	0.13	
Control Delay	2.7	0.9		27.1	3.4		68.9	24.2		85.4	44.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.7	0.9		27.1	3.4		68.9	24.2		85.4	44.0	
LOS	A	A		C	A		E	C		F	D	
Approach Delay		0.9			5.7			34.4			69.9	
Approach LOS		A			A			C			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 1.4 (1%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 6.0 Intersection LOS: A
Intersection Capacity Utilization 74.8% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road



Queues
35: Churchill Meadows Boulevard/Maple Gate Circle & Britannia Road

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	1257	219	2095	35	119	30	18
v/c Ratio	0.13	0.29	0.77	0.48	0.33	0.54	0.48	0.13
Control Delay	2.7	0.9	27.1	3.4	68.9	24.2	85.4	44.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.7	0.9	27.1	3.4	68.9	24.2	85.4	44.0
Queue Length 50th (m)	0.1	3.1	20.2	41.2	9.4	4.5	8.2	2.9
Queue Length 95th (m)	m0.6	m10.5	#97.7	58.9	20.3	23.3	18.7	10.6
Internal Link Dist (m)		445.7		73.9		90.1		82.4
Turn Bay Length (m)	33.0		35.0		21.0		19.0	
Base Capacity (vph)	123	4331	284	4385	251	389	151	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.29	0.77	0.48	0.14	0.31	0.20	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	9	8	9	7	12	12	150	15	18	246	15
Future Volume (vph)	12	9	8	9	7	12	12	150	15	18	246	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.962			0.943			0.989			0.993	
Flt Protected		0.980			0.984			0.997			0.997	
Satd. Flow (prot)	0	1747	0	0	1720	0	0	1858	0	0	1878	0
Flt Permitted		0.980			0.984			0.997			0.997	
Satd. Flow (perm)	0	1747	0	0	1720	0	0	1858	0	0	1878	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		491.2			26.5			86.4			75.9	
Travel Time (s)		35.4			1.9			6.2			5.5	
Confl. Peds. (#/hr)	6		3	3		6	11		10	10		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	13%	0%	14%	0%	0%	1%	13%	0%	1%	7%
Adj. Flow (vph)	13	10	9	10	8	13	13	163	16	20	267	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	31	0	0	192	0	0	303	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
36: Churchill Meadows Boulevard & Freeman Terrace

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	9	8	9	7	12	12	150	15	18	246	15
Future Volume (Veh/h)	12	9	8	9	7	12	12	150	15	18	246	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	10	9	10	8	13	13	163	16	20	267	16
Pedestrians		11			10			3			6	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											190	
pX, platoon unblocked												
vC, conflicting volume	546	541	289	539	541	187	294			189		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	546	541	289	539	541	187	294			189		
tC, single (s)	7.1	6.5	6.3	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	97	98	99	98	98	98	99			99		
cM capacity (veh/h)	418	432	716	424	414	848	1267			1385		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	32	31	192	303
Volume Left	13	10	13	20
Volume Right	9	13	16	16
cSH	479	532	1267	1385
Volume to Capacity	0.07	0.06	0.01	0.01
Queue Length 95th (m)	1.6	1.4	0.2	0.3
Control Delay (s)	13.1	12.2	0.6	0.6
Lane LOS	B	B	A	A
Approach Delay (s)	13.1	12.2	0.6	0.6
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	87	23	69	108	24	16	131	62	17	147	22
Future Volume (vph)	10	87	23	69	108	24	16	131	62	17	147	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.974			0.984			0.960			0.984	
Flt Protected		0.996			0.983			0.996			0.996	
Satd. Flow (prot)	0	1602	0	0	1730	0	0	1728	0	0	1784	0
Flt Permitted		0.996			0.983			0.996			0.996	
Satd. Flow (perm)	0	1602	0	0	1730	0	0	1728	0	0	1784	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		511.9			78.8			199.2			82.1	
Travel Time (s)		36.9			5.7			14.3			5.9	
Confl. Peds. (#/hr)	20		92	92		20	33		36	36		33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	19%	9%	6%	10%	0%	6%	7%	5%	0%	7%	0%
Adj. Flow (vph)	11	95	25	75	117	26	17	142	67	18	160	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	131	0	0	218	0	0	226	0	0	202	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	40.0%	ICU Level of Service A	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
37: Churchill Meadows Boulevard & McDowell Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	87	23	69	108	24	16	131	62	17	147	22
Future Volume (vph)	10	87	23	69	108	24	16	131	62	17	147	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	95	25	75	117	26	17	142	67	18	160	24

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	131	218	226	202
Volume Left (vph)	11	75	17	18
Volume Right (vph)	25	26	67	24
Hadj (s)	0.18	0.12	-0.06	0.04
Departure Headway (s)	5.6	5.4	5.2	5.3
Degree Utilization, x	0.20	0.33	0.32	0.30
Capacity (veh/h)	581	616	650	630
Control Delay (s)	10.0	11.0	10.6	10.5
Approach Delay (s)	10.0	11.0	10.6	10.5
Approach LOS	B	B	B	B

Intersection Summary			
Delay	10.6		
Level of Service	B		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	140	17	114	260	204	7	75	27	109	136	26
Future Volume (vph)	26	140	17	114	260	204	7	75	27	109	136	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	23.0		0.0	25.0		0.0	24.0		0.0	25.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	30.0			47.0			22.0			22.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	1.00		0.99	0.97		0.99	0.99		0.97	1.00	
Frt		0.984			0.934			0.961			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3450	0	1789	3231	0	1601	1642	0	1789	1740	0
Flt Permitted	0.432			0.644			0.625			0.685		
Satd. Flow (perm)	778	3450	0	1195	3231	0	1047	1642	0	1248	1740	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			222			25			13	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		534.8			155.2			215.3			173.7	
Travel Time (s)		32.1			9.3			15.5			12.5	
Confl. Peds. (#/hr)	27		9	9		27	11		51	51		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	2%	18%	2%	2%	2%	14%	11%	11%	2%	6%	15%
Adj. Flow (vph)	28	152	18	124	283	222	8	82	29	118	148	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	170	0	124	505	0	8	111	0	118	176	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		41.0	41.0		41.0	41.0	
Minimum Split (s)	30.5	30.5		30.5	30.5		47.0	47.0		47.0	47.0	
Total Split (s)	46.0	46.0		46.0	46.0		55.0	55.0		55.0	55.0	
Total Split (%)	45.5%	45.5%		45.5%	45.5%		54.5%	54.5%		54.5%	54.5%	
Maximum Green (s)	39.5	39.5		39.5	39.5		49.0	49.0		49.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.5	48.5		48.5	48.5		42.0	42.0		42.0	42.0	
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.42	0.42		0.42	0.42	
v/c Ratio	0.08	0.10		0.22	0.30		0.02	0.16		0.23	0.24	
Control Delay	23.4	20.5		16.5	9.1		17.7	14.9		20.6	18.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.4	20.5		16.5	9.1		17.7	14.9		20.6	18.8	
LOS	C	C		B	A		B	B		C	B	
Approach Delay		20.9			10.5			15.1			19.5	
Approach LOS		C			B			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 101	
Actuated Cycle Length: 101	
Offset: 0 (0%), Referenced to phase 4:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 74.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 38: Churchill Meadows Boulevard & Thomas Street

Queues
38: Churchill Meadows Boulevard & Thomas Street

16/06/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	170	124	505	8	111	118	176
v/c Ratio	0.08	0.10	0.22	0.30	0.02	0.16	0.23	0.24
Control Delay	23.4	20.5	16.5	9.1	17.7	14.9	20.6	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	20.5	16.5	9.1	17.7	14.9	20.6	18.8
Queue Length 50th (m)	3.6	10.8	13.6	16.0	0.9	10.2	14.6	20.1
Queue Length 95th (m)	m8.3	m20.3	25.0	26.0	3.7	21.0	27.1	34.7
Internal Link Dist (m)		510.8		131.2		191.3		149.7
Turn Bay Length (m)	23.0		25.0		24.0		25.0	
Base Capacity (vph)	373	1664	573	1666	518	825	617	867
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.10	0.22	0.30	0.02	0.13	0.19	0.20

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	43	7	29	69	35	17	95	26	22	180	13
Future Volume (vph)	8	43	7	29	69	35	17	95	26	22	180	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.965			0.975			0.992	
Flt Protected		0.993			0.989			0.994			0.995	
Satd. Flow (prot)	0	1765	0	0	1728	0	0	1707	0	0	1721	0
Flt Permitted		0.993			0.989			0.994			0.995	
Satd. Flow (perm)	0	1765	0	0	1728	0	0	1707	0	0	1721	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		531.4			133.0			144.4			144.6	
Travel Time (s)		38.3			9.6			10.4			10.4	
Confl. Peds. (#/hr)	14		19	19		14	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	6%	0%	3%	5%	11%	6%	11%	4%	5%	11%	8%
Adj. Flow (vph)	9	47	8	32	75	38	18	103	28	24	196	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	64	0	0	145	0	0	149	0	0	234	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
39: Churchill Meadows Boulevard & Tacc Drive

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	43	7	29	69	35	17	95	26	22	180	13
Future Volume (vph)	8	43	7	29	69	35	17	95	26	22	180	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	47	8	32	75	38	18	103	28	24	196	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	64	145	149	234
Volume Left (vph)	9	32	18	24
Volume Right (vph)	8	38	28	14
Hadj (s)	0.06	-0.01	0.07	0.16
Departure Headway (s)	5.1	4.9	4.8	4.8
Degree Utilization, x	0.09	0.20	0.20	0.31
Capacity (veh/h)	636	673	706	713
Control Delay (s)	8.6	9.1	9.0	9.9
Approach Delay (s)	8.6	9.1	9.0	9.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay		9.4	
Level of Service		A	
Intersection Capacity Utilization		33.8%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	84	15	40	108	26	35	148	54	24	175	35
Future Volume (vph)	18	84	15	40	108	26	35	148	54	24	175	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.980			0.969			0.980	
Flt Protected		0.992			0.989			0.993			0.995	
Satd. Flow (prot)	0	1672	0	0	1785	0	0	1773	0	0	1781	0
Flt Permitted		0.992			0.989			0.993			0.995	
Satd. Flow (perm)	0	1672	0	0	1785	0	0	1773	0	0	1781	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		497.0			165.0			190.2			301.3	
Travel Time (s)		35.8			11.9			13.7			21.7	
Confl. Peds. (#/hr)	8		7	7		8	26		76	76		26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	12%	0%	0%	5%	8%	9%	4%	2%	8%	4%	9%
Adj. Flow (vph)	20	91	16	43	117	28	38	161	59	26	190	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	127	0	0	188	0	0	258	0	0	254	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 42.2%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
40: Churchill Meadows Boulevard & Erin Centre Boulevard

16/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	84	15	40	108	26	35	148	54	24	175	35
Future Volume (vph)	18	84	15	40	108	26	35	148	54	24	175	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	91	16	43	117	28	38	161	59	26	190	38

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	127	188	258	254
Volume Left (vph)	20	43	38	26
Volume Right (vph)	16	28	59	38
Hadj (s)	0.16	0.03	-0.04	0.02
Departure Headway (s)	5.8	5.5	5.2	5.2
Degree Utilization, x	0.20	0.29	0.37	0.37
Capacity (veh/h)	556	592	642	643
Control Delay (s)	10.2	10.8	11.2	11.3
Approach Delay (s)	10.2	10.8	11.2	11.3
Approach LOS	B	B	B	B

Intersection Summary				
Delay			11.0	
Level of Service			B	
Intersection Capacity Utilization			42.2%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	1406	2497	191	123	70
Future Volume (vph)	13	1406	2497	191	123	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	10.0
Storage Lanes	1			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			1.00			
Frt			0.989			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1690	3579	3566	0	1789	1089
Flt Permitted	0.052				0.950	
Satd. Flow (perm)	92	3579	3566	0	1789	1089
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			18			7
Link Speed (k/h)		60	60		50	
Link Distance (m)		502.9	166.4		193.1	
Travel Time (s)		30.2	10.0		13.9	
Confl. Peds. (#/hr)	4			4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	2%	1%	1%	2%	50%
Adj. Flow (vph)	13	1406	2497	191	123	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	1406	2688	0	123	70
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	6.1	30.5	30.5		6.1	6.1
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	1.8	1.8		6.1	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
41: Eglinton Avenue West & Churchill Meadows Boulevard

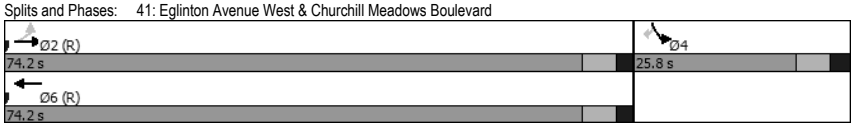
16/06/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.5	25.5
Total Split (s)	74.2	74.2	74.2		25.8	25.8
Total Split (%)	74.2%	74.2%	74.2%		25.8%	25.8%
Maximum Green (s)	68.2	68.2	68.2		19.3	19.3
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.5	2.5
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0		5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	76.2	76.2	76.2		13.3	13.3
Actuated g/C Ratio	0.76	0.76	0.76		0.13	0.13
v/c Ratio	0.19	0.52	0.99		0.52	0.47
Control Delay	11.5	5.8	27.6		47.5	45.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	11.5	5.8	27.6		47.5	45.4
LOS	B	A	C		D	D
Approach Delay		5.9	27.6		46.8	
Approach LOS		A	C		D	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 21.3 Intersection LOS: C
Intersection Capacity Utilization 90.7% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 41: Eglinton Avenue West & Churchill Meadows Boulevard



Queues
41: Eglinton Avenue West & Churchill Meadows Boulevard

16/06/2017

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	13	1406	2688	123	70
v/c Ratio	0.19	0.52	0.99	0.52	0.47
Control Delay	11.5	5.8	27.6	47.5	45.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	5.8	27.6	47.5	45.4
Queue Length 50th (m)	0.6	45.5	213.2	22.6	11.4
Queue Length 95th (m)	4.0	72.0	#342.5	38.0	24.0
Internal Link Dist (m)		478.9	142.4	169.1	
Turn Bay Length (m)	45.0				10.0
Base Capacity (vph)	70	2727	2722	363	226
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.52	0.99	0.34	0.31

Intersection Summary

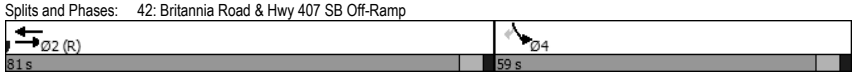
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	634	1877	0	376	29
Future Volume (vph)	0	634	1877	0	376	29
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	36.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	1987	1726
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	1987	1726
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (k/h)		60	60		60	
Link Distance (m)		205.9	298.5		249.3	
Travel Time (s)		12.4	17.9		15.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	1%	0%	2%	0%	3%
Adj. Flow (vph)	0	704	2086	0	418	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	704	2086	0	418	32
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		23.0	23.0		22.0	22.0
Total Split (s)		81.0	81.0		59.0	59.0
Total Split (%)		57.9%	57.9%		42.1%	42.1%
Maximum Green (s)		75.0	75.0		53.0	53.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		92.5	92.5		35.5	35.5
Actuated g/C Ratio		0.66	0.66		0.25	0.25
v/c Ratio		0.19	0.55		0.83	0.07
Control Delay		10.0	22.0		63.3	37.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		10.0	22.0		63.3	37.0
LOS		B	C		E	D
Approach Delay		10.0	22.0		61.4	
Approach LOS		B	C		E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 24.9		Intersection LOS: C	
Intersection Capacity Utilization 62.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 42: Britannia Road & Hwy 407 SB Off-Ramp



Queues
42: Britannia Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	704	2086	418	32
v/c Ratio	0.19	0.55	0.83	0.07
Control Delay	10.0	22.0	63.3	37.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.0	22.0	63.3	37.0
Queue Length 50th (m)	25.8	199.4	110.0	6.8
Queue Length 95th (m)	38.4	220.6	135.9	13.9
Internal Link Dist (m)	181.9	274.5	225.3	
Turn Bay Length (m)				36.0
Base Capacity (vph)	3735	3772	752	653
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.55	0.56	0.05

Intersection Summary

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1045	0	0	1902	71	115
Future Volume (vph)	1045	0	0	1902	71	115
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	36.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5711	1987	1778
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5711	1987	1778
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (k/h)	60			60	60	
Link Distance (m)	298.5			216.7	183.4	
Travel Time (s)	17.9			13.0	11.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	0%	0%	0%
Adj. Flow (vph)	1161	0	0	2113	79	128
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1161	0	0	2113	79	128
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
43: Hwy 407 NB Off-Ramp & Britannia Road

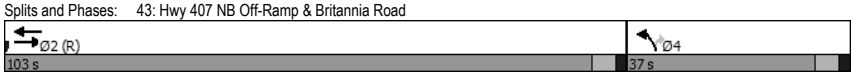
16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	103.0			103.0	37.0	37.0
Total Split (%)	73.6%			73.6%	26.4%	26.4%
Maximum Green (s)	97.0			97.0	31.0	31.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Act Effct Green (s)	112.6			112.6	15.4	15.4
Actuated g/C Ratio	0.80			0.80	0.11	0.11
v/c Ratio	0.26			0.46	0.36	0.66
Control Delay	6.1			8.4	61.1	74.8
Queue Delay	0.0			0.2	0.0	0.0
Total Delay	6.1			8.6	61.1	74.8
LOS	A			A	E	E
Approach Delay	6.1			8.6	69.6	
Approach LOS	A			A	E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 11.4 Intersection LOS: B
Intersection Capacity Utilization 62.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 43: Hwy 407 NB Off-Ramp & Britannia Road



Queues
43: Hwy 407 NB Off-Ramp & Britannia Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1161	2113	79	128
v/c Ratio	0.26	0.46	0.36	0.66
Control Delay	6.1	8.4	61.1	74.8
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	6.1	8.6	61.1	74.8
Queue Length 50th (m)	44.3	79.3	20.6	34.5
Queue Length 95th (m)	48.9	m107.2	35.3	53.6
Internal Link Dist (m)	274.5	192.7	159.4	
Turn Bay Length (m)				36.0
Base Capacity (vph)	4547	4592	439	393
Starvation Cap Reductn	0	1405	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.66	0.18	0.33

Intersection Summary

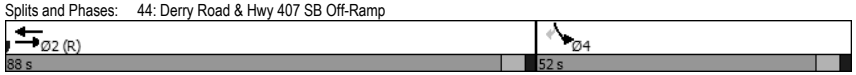
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	853	2377	0	153	286
Future Volume (vph)	0	853	2377	0	153	286
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	0.0	100.0
Storage Lanes	0			0	2	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	5655	5711	0	3817	1778
Flt Permitted					0.950	
Satd. Flow (perm)	0	5655	5711	0	3817	1778
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						3
Link Speed (k/h)		60	60		60	
Link Distance (m)		333.0	308.6		229.4	
Travel Time (s)		20.0	18.5		13.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%
Adj. Flow (vph)	0	907	2529	0	163	304
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	907	2529	0	163	304
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		20.0	20.0		20.0	20.0
Total Split (s)		88.0	88.0		52.0	52.0
Total Split (%)		62.9%	62.9%		37.1%	37.1%
Maximum Green (s)		82.0	82.0		46.0	46.0
Yellow Time (s)		4.0	4.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	-2.9
Total Lost Time (s)		6.0	6.0		6.0	3.1
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Act Effct Green (s)		98.7	98.7		29.3	32.2
Actuated g/C Ratio		0.70	0.70		0.21	0.23
v/c Ratio		0.23	0.63		0.20	0.74
Control Delay		8.0	11.4		44.8	59.9
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.0	11.4		44.8	59.9
LOS		A	B		D	E
Approach Delay		8.0	11.4		54.7	
Approach LOS		A	B		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 119 (85%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 15.8		Intersection LOS: B	
Intersection Capacity Utilization 66.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 44: Derry Road & Hwy 407 SB Off-Ramp



Queues
44: Derry Road & Hwy 407 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	907	2529	163	304
v/c Ratio	0.23	0.63	0.20	0.74
Control Delay	8.0	11.4	44.8	59.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.0	11.4	44.8	59.9
Queue Length 50th (m)	29.6	88.3	19.3	77.9
Queue Length 95th (m)	43.6	104.8	26.9	101.8
Internal Link Dist (m)	309.0	284.6	205.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	3985	4024	1254	622
Starvation Cap Reductn	0	68	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.64	0.13	0.49

Intersection Summary

Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1110	0	0	2447	100	125
Future Volume (vph)	1110	0	0	2447	100	125
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		0.0	100.0
Storage Lanes		0	0		2	1
Taper Length (m)			2.5		2.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Ped Bike Factor						0.99
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	5655	0	0	5655	3856	1743
Flt Permitted					0.950	
Satd. Flow (perm)	5655	0	0	5655	3856	1722
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						132
Link Speed (k/h)	60			60	60	
Link Distance (m)	308.6			229.8	258.4	
Travel Time (s)	18.5			13.8	15.5	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	2%	1%	0%	2%
Adj. Flow (vph)	1168	0	0	2576	105	132
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1168	0	0	2576	105	132
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

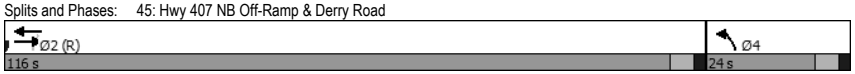
Lanes, Volumes, Timings
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	
Permitted Phases						2
Detector Phase	2			2	4	2
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	4.0
Minimum Split (s)	20.0			20.0	20.0	20.0
Total Split (s)	116.0			116.0	24.0	116.0
Total Split (%)	82.9%			82.9%	17.1%	82.9%
Maximum Green (s)	110.0			110.0	18.0	110.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	C-Max
Act Effct Green (s)	118.6			118.6	9.4	118.6
Actuated g/C Ratio	0.85			0.85	0.07	0.85
v/c Ratio	0.24			0.54	0.41	0.09
Control Delay	1.2			0.9	67.0	0.4
Queue Delay	0.0			0.2	0.0	0.0
Total Delay	1.2			1.1	67.0	0.4
LOS	A			A	E	A
Approach Delay	1.2			1.1	29.9	
Approach LOS	A			A	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 119 (85%), Referenced to phase 2:WBEB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 2.8	Intersection LOS: A
Intersection Capacity Utilization 66.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 45: Hwy 407 NB Off-Ramp & Derry Road



Queues
45: Hwy 407 NB Off-Ramp & Derry Road

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1168	2576	105	132
v/c Ratio	0.24	0.54	0.41	0.09
Control Delay	1.2	0.9	67.0	0.4
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	1.2	1.1	67.0	0.4
Queue Length 50th (m)	7.3	10.1	14.6	0.0
Queue Length 95th (m)	11.8	13.8	23.8	2.8
Internal Link Dist (m)	284.6	205.8	234.4	
Turn Bay Length (m)				100.0
Base Capacity (vph)	4789	4789	495	1478
Starvation Cap Reductn	0	973	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	0.68	0.21	0.09

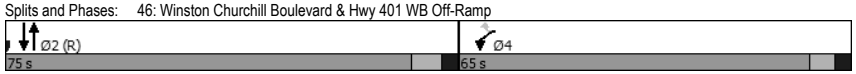
Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1155	1065	2882	0	0	1652
Future Volume (vph)	1155	1065	2882	0	0	1652
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Ped Bike Factor	1.00					
Frt	0.964	0.850				
Flt Protected	0.963					
Satd. Flow (prot)	3741	1571	5491	0	0	5545
Flt Permitted	0.963					
Satd. Flow (perm)	3737	1571	5491	0	0	5545
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	339.0		113.2			415.6
Travel Time (s)	20.3		6.8			24.9
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	4%	1%	0%	3%
Adj. Flow (vph)	1216	1121	3034	0	0	1739
Shared Lane Traffic (%)		34%				
Lane Group Flow (vph)	1597	740	3034	0	0	1739
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2
Permitted Phases		4				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	29.0			29.0
Total Split (s)	65.0	65.0	75.0			75.0
Total Split (%)	46.4%	46.4%	53.6%			53.6%
Maximum Green (s)	58.0	58.0	67.0			67.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	7.0	7.0	8.0			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			9.0			9.0
Flash Dont Walk (s)			12.0			12.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	58.0	58.0	67.0			67.0
Actuated g/C Ratio	0.41	0.41	0.48			0.48
v/c Ratio	1.03	1.14	1.15			0.66
Control Delay	71.4	118.0	106.9			29.2
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	71.4	118.0	106.9			29.2
LOS	E	F	F			C
Approach Delay	86.1		106.9			29.2
Approach LOS	F		F			C

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 49 (35%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.15			
Intersection Signal Delay: 81.1		Intersection LOS: F	
Intersection Capacity Utilization 116.6%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp



Queues
46: Winston Churchill Boulevard & Hwy 401 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1597	740	3034	1739
v/c Ratio	1.03	1.14	1.15	0.66
Control Delay	71.4	118.0	106.9	29.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	71.4	118.0	106.9	29.2
Queue Length 50th (m)	~243.4	~261.7	~361.7	131.3
Queue Length 95th (m)	#284.8	#343.7	#385.6	147.1
Internal Link Dist (m)	315.0		89.2	391.6
Turn Bay Length (m)				
Base Capacity (vph)	1549	650	2627	2653
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	1.14	1.15	0.66

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	259	283	0	3401	2567	0
Future Volume (vph)	259	283	0	3401	2567	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Lane Util. Factor	0.97	0.91	1.00	0.91	0.91	1.00
Frt	0.955	0.850				
Flt Protected	0.966					
Satd. Flow (prot)	3457	1586	0	5545	5599	0
Flt Permitted	0.966					
Satd. Flow (perm)	3457	1586	0	5545	5599	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	6	6				
Link Speed (k/h)	60			60	60	
Link Distance (m)	239.7			113.9	258.4	
Travel Time (s)	14.4			6.8	15.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	2%	0%	3%	2%	7%
Adj. Flow (vph)	278	304	0	3657	2760	0
Shared Lane Traffic (%)		39%				
Lane Group Flow (vph)	397	185	0	3657	2760	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						

Lanes, Volumes, Timings
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

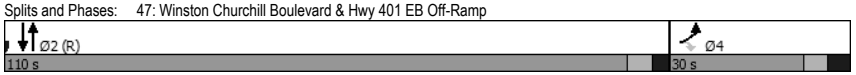
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	4.0	4.0		8.0	8.0	
Minimum Split (s)	12.0	12.0		25.0	25.0	
Total Split (s)	30.0	30.0		110.0	110.0	
Total Split (%)	21.4%	21.4%		78.6%	78.6%	
Maximum Green (s)	22.0	22.0		103.0	103.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.0	8.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				10.0	10.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	20.0	20.0		105.0	105.0	
Actuated g/C Ratio	0.14	0.14		0.75	0.75	
v/c Ratio	0.80	0.80		0.88	0.66	
Control Delay	69.3	80.2		16.7	7.1	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	69.3	80.2		16.7	7.1	
LOS	E	F		B	A	
Approach Delay	72.8			16.7	7.1	
Approach LOS	E			B	A	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 32.2 (23%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 17.6 Intersection LOS: B
Intersection Capacity Utilization 82.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp



Queues
47: Winston Churchill Boulevard & Hwy 401 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	397	185	3657	2760
v/c Ratio	0.80	0.80	0.88	0.66
Control Delay	69.3	80.2	16.7	7.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	69.3	80.2	16.7	7.1
Queue Length 50th (m)	54.0	52.8	252.9	101.6
Queue Length 95th (m)	71.5	#87.4	276.9	m108.8
Internal Link Dist (m)	215.7		89.9	234.4
Turn Bay Length (m)				
Base Capacity (vph)	548	254	4157	4197
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.73	0.88	0.66

Intersection Summary

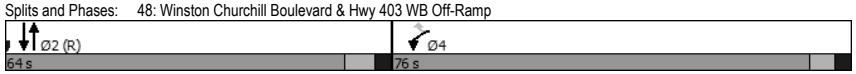
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1094	1821	2252	0	0	2398
Future Volume (vph)	1094	1821	2252	0	0	2398
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	52.0	0.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	100.0				2.5	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	0.91
Frt	0.937	0.850				
Flt Protected	0.972					
Satd. Flow (prot)	3681	1602	5655	0	0	5655
Flt Permitted	0.972					
Satd. Flow (perm)	3681	1602	5655	0	0	5655
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	60		60			60
Link Distance (m)	233.6		116.0			270.1
Travel Time (s)	14.0		7.0			16.2
Peak Hour Factor	0.89	0.96	0.93	0.93	0.89	0.89
Heavy Vehicles (%)	0%	1%	1%	0%	0%	1%
Adj. Flow (vph)	1229	1897	2422	0	0	2694
Shared Lane Traffic (%)		47%				
Lane Group Flow (vph)	2121	1005	2422	0	0	2694
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.4		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	6.1	6.1	30.5			30.5
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	6.1	6.1	1.8			1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		2			2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		4				
Detector Phase	4	4	2			2
Switch Phase						
Minimum Initial (s)	8.0	8.0	4.0			4.0
Minimum Split (s)	15.0	15.0	26.0			26.0
Total Split (s)	76.0	76.0	64.0			64.0
Total Split (%)	54.3%	54.3%	45.7%			45.7%
Maximum Green (s)	69.0	69.0	56.0			56.0
Yellow Time (s)	4.0	4.0	5.0			5.0
All-Red Time (s)	3.0	3.0	3.0			3.0
Lost Time Adjust (s)	0.0	-2.9	-2.9			0.0
Total Lost Time (s)	7.0	4.1	5.1			8.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Recall Mode	None	None	C-Max			C-Max
Walk Time (s)			8.0			8.0
Flash Dont Walk (s)			10.0			10.0
Pedestrian Calls (#/hr)			0			0
Act Effct Green (s)	69.0	71.9	58.9			56.0
Actuated g/C Ratio	0.49	0.51	0.42			0.40
v/c Ratio	1.17	1.22	1.02			1.19
Control Delay	115.9	142.7	65.4			128.3
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	115.9	142.7	65.4			128.3
LOS	F	F	E			F
Approach Delay	124.5		65.4			128.3
Approach LOS	F		E			F

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 2.8 (2%), Referenced to phase 2:NBSB, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 108.4		Intersection LOS: F	
Intersection Capacity Utilization 116.7%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp



Queues
48: Winston Churchill Boulevard & Hwy 403 WB Off-Ramp

16/06/2017

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	2121	1005	2422	2694
v/c Ratio	1.17	1.22	1.02	1.19
Control Delay	115.9	142.7	65.4	128.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	115.9	142.7	65.4	128.3
Queue Length 50th (m)	~359.4	~374.7	~265.2	~328.9
Queue Length 95th (m)	#391.3	#461.2	#292.6	#347.6
Internal Link Dist (m)	209.6		92.0	246.1
Turn Bay Length (m)	52.0			
Base Capacity (vph)	1814	822	2379	2262
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.17	1.22	1.02	1.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	519	206	0	2192	2750	0
Future Volume (vph)	519	206	0	2192	2750	0
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	2	1	0			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3817	1726	0	5655	5655	0
Flt Permitted	0.950					
Satd. Flow (perm)	3817	1726	0	5655	5655	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		2				
Link Speed (k/h)	60			60	60	
Link Distance (m)	243.1			90.0	136.2	
Travel Time (s)	14.6			5.4	8.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	3%	0%	1%	1%	0%
Adj. Flow (vph)	570	226	0	2409	3022	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	570	226	0	2409	3022	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.4			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	6.1	6.1		30.5	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	6.1		1.8	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				28.7	28.7	
Detector 2 Size(m)				1.8	1.8	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lanes, Volumes, Timings
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

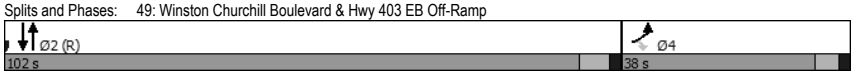
16/06/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0		4.0	4.0	
Minimum Split (s)	14.0	14.0		26.0	26.0	
Total Split (s)	38.0	38.0		102.0	102.0	
Total Split (%)	27.1%	27.1%		72.9%	72.9%	
Maximum Green (s)	32.0	32.0		95.0	95.0	
Yellow Time (s)	4.0	4.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		7.0	7.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)				8.0	8.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)	26.5	26.5		100.5	100.5	
Actuated g/C Ratio	0.19	0.19		0.72	0.72	
v/c Ratio	0.79	0.69		0.59	0.74	
Control Delay	62.3	63.3		10.9	24.4	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	62.3	63.3		10.9	24.4	
LOS	E	E		B	C	
Approach Delay	62.6			10.9	24.4	
Approach LOS	E			B	C	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 81.2 (58%), Referenced to phase 2:NBSB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 24.0 Intersection LOS: C
Intersection Capacity Utilization 116.7% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp



Queues
49: Winston Churchill Boulevard & Hwy 403 EB Off-Ramp

16/06/2017

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	570	226	2409	3022
v/c Ratio	0.79	0.69	0.59	0.74
Control Delay	62.3	63.3	10.9	24.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	62.3	63.3	10.9	24.4
Queue Length 50th (m)	78.1	58.2	110.1	232.0
Queue Length 95th (m)	93.8	82.8	138.7	m190.4
Internal Link Dist (m)	219.1		66.0	112.2
Turn Bay Length (m)		25.0		
Base Capacity (vph)	872	396	4060	4060
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.57	0.59	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

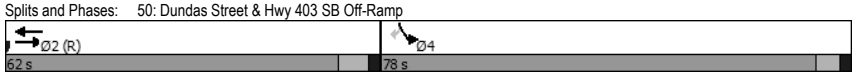
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1870	1804	0	513	1482
Future Volume (vph)	0	1870	1804	0	513	1482
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)	0.0			0.0	26.0	0.0
Storage Lanes	0			0	1	1
Taper Length (m)	2.5				100.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.91
Ped Bike Factor						
Frt					0.911	0.850
Flt Protected					0.980	
Satd. Flow (prot)	0	5338	5599	0	3409	1571
Flt Permitted					0.980	
Satd. Flow (perm)	0	5338	5599	0	3409	1571
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					1	1
Link Speed (k/h)		60	60		60	
Link Distance (m)		94.5	381.5		263.0	
Travel Time (s)		5.7	22.9		15.8	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	7%	2%	0%	11%	3%
Adj. Flow (vph)	0	1908	1841	0	523	1512
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	0	1908	1841	0	1279	756
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)	24			14	24	14
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (m)		30.5	30.5		6.1	6.1
Trailing Detector (m)		0.0	0.0		0.0	0.0
Detector 1 Position(m)		0.0	0.0		0.0	0.0
Detector 1 Size(m)		1.8	1.8		6.1	6.1
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(m)		28.7	28.7			
Detector 2 Size(m)		1.8	1.8			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		4	
Permitted Phases						4
Detector Phase		2	2		4	4
Switch Phase						
Minimum Initial (s)		4.0	4.0		8.0	8.0
Minimum Split (s)		25.0	25.0		14.0	14.0
Total Split (s)		62.0	62.0		78.0	78.0
Total Split (%)		44.3%	44.3%		55.7%	55.7%
Maximum Green (s)		55.0	55.0		72.0	72.0
Yellow Time (s)		5.0	5.0		4.0	4.0
All-Red Time (s)		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		7.0	7.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		8.0	8.0			
Flash Dont Walk (s)		10.0	10.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)		56.2	56.2		70.8	70.8
Actuated g/C Ratio		0.40	0.40		0.51	0.51
v/c Ratio		0.89	0.82		0.87dr	0.95
Control Delay		45.5	65.0		30.5	55.4
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		45.5	65.0		30.5	55.4
LOS		D	E		C	E
Approach Delay		45.5	65.0		39.7	
Approach LOS		D	E		D	

Intersection Summary	
Area Type: Other	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 4.2 (3%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 49.7	Intersection LOS: D
Intersection Capacity Utilization 99.0%	ICU Level of Service F
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 50: Dundas Street & Hwy 403 SB Off-Ramp



Queues
50: Dundas Street & Hwy 403 SB Off-Ramp

16/06/2017

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1908	1841	1279	756
v/c Ratio	0.89	0.82	0.87dr	0.95
Control Delay	45.5	65.0	30.5	55.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	45.5	65.0	30.5	55.4
Queue Length 50th (m)	181.4	195.9	138.0	209.3
Queue Length 95th (m)	202.4	213.4	164.0	#305.2
Internal Link Dist (m)	70.5	357.5	239.0	
Turn Bay Length (m)			26.0	
Base Capacity (vph)	2144	2249	1753	808
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.89	0.82	0.73	0.94

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1692	0	0	2399	123	821
Future Volume (vph)	1692	0	0	2399	123	821
Ideal Flow (vphpl)	2069	2069	2069	2069	2069	2069
Storage Length (m)		0.0	0.0		30.0	0.0
Storage Lanes		0	0		1	1
Taper Length (m)			2.5		100.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	0.91
Frt					0.885	0.850
Flt Protected					0.989	
Satd. Flow (prot)	5491	0	0	5655	3483	1586
Flt Permitted					0.989	
Satd. Flow (perm)	5491	0	0	5655	3483	1586
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					13	13
Link Speed (k/h)	60			60	60	
Link Distance (m)	381.5			304.9	234.1	
Travel Time (s)	22.9			18.3	14.0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	4%	0%	0%	1%	2%	2%
Adj. Flow (vph)	1744	0	0	2473	127	846
Shared Lane Traffic (%)						50%
Lane Group Flow (vph)	1744	0	0	2473	550	423
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	7.4	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (k/h)		14	24		24	14
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (m)	30.5			30.5	6.1	6.1
Trailing Detector (m)	0.0			0.0	0.0	0.0
Detector 1 Position(m)	0.0			0.0	0.0	0.0
Detector 1 Size(m)	1.8			1.8	6.1	6.1
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(m)	28.7			28.7		
Detector 2 Size(m)	1.8			1.8		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	4	

Lanes, Volumes, Timings
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases						4
Detector Phase	2			2	4	4
Switch Phase						
Minimum Initial (s)	4.0			4.0	8.0	8.0
Minimum Split (s)	24.0			24.0	14.0	14.0
Total Split (s)	83.0			83.0	57.0	57.0
Total Split (%)	59.3%			59.3%	40.7%	40.7%
Maximum Green (s)	76.0			76.0	51.0	51.0
Yellow Time (s)	5.0			5.0	4.0	4.0
All-Red Time (s)	2.0			2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	7.0			7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	8.0			8.0		
Flash Dont Walk (s)	9.0			9.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	84.8			84.8	42.2	42.2
Actuated g/C Ratio	0.61			0.61	0.30	0.30
v/c Ratio	0.52			0.72	0.52	0.87
Control Delay	9.6			22.0	40.5	62.9
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	9.6			22.0	40.5	62.9
LOS	A			C	D	E
Approach Delay	9.6			22.0	50.2	
Approach LOS	A			C	D	

Intersection Summary

Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 43.4 (31%), Referenced to phase 2:EBWB, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 99.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 51: Hwy 403 NB Off-Ramp & Dundas Street

Queues
51: Hwy 403 NB Off-Ramp & Dundas Street

16/06/2017

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1744	2473	550	423
v/c Ratio	0.52	0.72	0.52	0.87
Control Delay	9.6	22.0	40.5	62.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.6	22.0	40.5	62.9
Queue Length 50th (m)	80.2	170.1	63.0	117.8
Queue Length 95th (m)	167.1	215.7	73.5	151.9
Internal Link Dist (m)	357.5	280.9	210.1	
Turn Bay Length (m)			30.0	
Base Capacity (vph)	3327	3426	1277	586
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.72	0.43	0.72

Intersection Summary

Lanes, Volumes, Timings
52: Ninth Line & Argentia Road

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	172	131	759	45	16	602
Future Volume (vph)	172	131	759	45	16	602
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		45.0	20.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.850	0.992			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3550	0	1789	3579
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1789	1601	3550	0	1789	3579
Link Speed (k/h)	48		70			70
Link Distance (m)	289.7		780.0			514.0
Travel Time (s)	21.7		40.1			26.4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	172	131	759	45	16	602
Shared Lane Traffic (%)						
Lane Group Flow (vph)	172	131	804	0	16	602
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
52: Ninth Line & Argentia Road

16/06/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	172	131	759	45	16	602
Future Volume (Veh/h)	172	131	759	45	16	602
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	172	131	759	45	16	602
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1114	402			804	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1114	402			804	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	13	78			98	
cM capacity (veh/h)	198	598			816	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	172	131	506	298	16	301	301
Volume Left	172	0	0	0	16	0	0
Volume Right	0	131	0	45	0	0	0
cSH	198	598	1700	1700	816	1700	1700
Volume to Capacity	0.87	0.22	0.30	0.18	0.02	0.18	0.18
Queue Length 95th (m)	49.9	6.3	0.0	0.0	0.5	0.0	0.0
Control Delay (s)	82.9	12.7	0.0	0.0	9.5	0.0	0.0
Lane LOS	F	B			A		
Approach Delay (s)	52.5		0.0		0.2		
Approach LOS	F						

Intersection Summary			
Average Delay	9.3		
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
97: Winston Churchill Boulevard

16/06/2017

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	1118	362	0	1820	0	0
Future Volume (vph)	1118	362	0	1820	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	3579	1601	0	5142	0	0
Flt Permitted						
Satd. Flow (perm)	3579	1601	0	5142	0	0
Link Speed (k/h)	60			60	48	
Link Distance (m)	258.4			113.2	120.9	
Travel Time (s)	15.5			6.8	9.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1118	362	0	1820	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1118	362	0	1820	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 116.6%		ICU Level of Service H	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
97: Winston Churchill Boulevard

16/06/2017

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	46	47	921	67	49	1465
Future Volume (vph)	46	47	921	67	49	1465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	15.0		50.0	80.0	
Storage Lanes	1	1		0	1	
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor		0.98				
Frt		0.850	0.990			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1585	3481	0	1825	3544
Flt Permitted	0.950				0.256	
Satd. Flow (perm)	1789	1560	3481	0	492	3544
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		51	17			
Link Speed (k/h)	50		70			70
Link Distance (m)	205.8		603.1			716.6
Travel Time (s)	14.8		31.0			36.9
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	3%	4%	1%	0%	3%
Adj. Flow (vph)	50	51	1001	73	53	1592
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	51	1074	0	53	1592
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	6.1	6.1	30.5		6.1	30.5
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	6.1	6.1	1.8		6.1	1.8
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)			28.7			28.7
Detector 2 Size(m)			1.8			1.8
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0

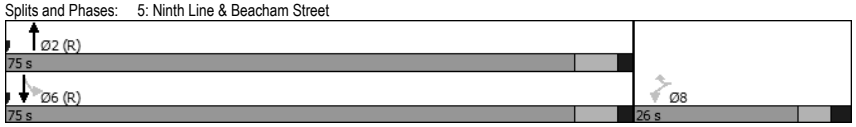
Lanes, Volumes, Timings
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	45.0		45.0	45.0
Minimum Split (s)	25.5	25.5	53.0		53.0	53.0
Total Split (s)	26.0	26.0	75.0		75.0	75.0
Total Split (%)	25.7%	25.7%	74.3%		74.3%	74.3%
Maximum Green (s)	19.5	19.5	68.0		68.0	68.0
Yellow Time (s)	4.0	4.0	5.0		5.0	5.0
All-Red Time (s)	2.5	2.5	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	5.5	5.5	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max
Walk Time (s)	8.0	8.0	35.0		35.0	35.0
Flash Dont Walk (s)	8.0	8.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	10.0	10.0	83.6		83.6	83.6
Actuated g/C Ratio	0.10	0.10	0.83		0.83	0.83
v/c Ratio	0.28	0.26	0.37		0.13	0.54
Control Delay	46.1	15.2	0.6		3.6	4.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	46.1	15.2	0.6		3.6	4.6
LOS	D	B	A		A	A
Approach Delay	30.5		0.6			4.5
Approach LOS	C		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 101			
Actuated Cycle Length: 101			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 4.0		Intersection LOS: A	
Intersection Capacity Utilization 57.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Ninth Line & Beacham Street



Queues
5: Ninth Line & Beacham Street

16/06/2017

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	50	51	1074	53	1592
v/c Ratio	0.28	0.26	0.37	0.13	0.54
Control Delay	46.1	15.2	0.6	3.6	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	15.2	0.6	3.6	4.6
Queue Length 50th (m)	9.3	0.0	1.0	1.8	47.3
Queue Length 95th (m)	19.9	10.5	1.1	5.4	70.9
Internal Link Dist (m)	181.8		579.1		692.6
Turn Bay Length (m)		15.0		80.0	
Base Capacity (vph)	363	357	2885	407	2934
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.14	0.37	0.13	0.54

Intersection Summary