Nyx Capital Corp

Tannery Street Townhouse Residential Development

TRANSPORTATION IMPACT STUDY

18031 June 2019 Update

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June 18, 2019 Our Ref.: 18031

Mr. Tim Jessop
NYX Capital Corp.
201-1131 Leslie Street
Toronto, Ontario
M3C 3L8

Dear Mr. Jessop

Re: **Transportation Impact Study for the Tannery Street Townhouse Development, Mississauga, Ontario**

LEA Consulting Ltd. (LEA) previously prepared a Transportation Impact Study (dated June 2018) for the proposed townhouse residential development at 51 and 57 Tannery Street in the City of Mississauga, Ontario.

Since then, the City of Mississauga has provided preliminary comments for the TIS. The revised study has been completed and LEA is pleased to present the enclosed updated TIS.

Should you have any questions regarding this updated Transportation Impact Study, please feel free to contact Chris Sidlar at 416-572-1791.

Yours very truly,

LEA Consulting Ltd.

Chris Sidlar, M.Sc.Pl., MCIP, RPP
Manager, Transportation Planning

Encl.: Tannery Street Townhouse Development Transportation Impact Study Update

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1.0 INTRODUCTION

LEA Consulting Limited (LEA) was retained by Nyx Capital Corp, to prepare a traffic impact study for the proposed residential development to be located at 51, 57 Tannery Street and 208 Emby Drive, in the City of Mississauga. By way of background, LEA prepared the traffic impact study dated June 2018. Since then, the City has provided preliminary comments for the TIS. The revised study has been completed and the detail related to the traffic study update is outlined herein.

Figure 1 below illustrates the site location. For the purposes of this report Queen Street South will be referred to as north-south and Tannery Street and Thomas Street will be referred to as east-west roads. Subsequently all other intersecting roads will be referred to as north-south roads.

The study area for the proposed development is also illustrated in **Figure 1** and extends along Tannery Street or Thomas Street from Joymar Drive to Queen Street South. Details of the trip generation and distribution are provided in **Section 5.0**.

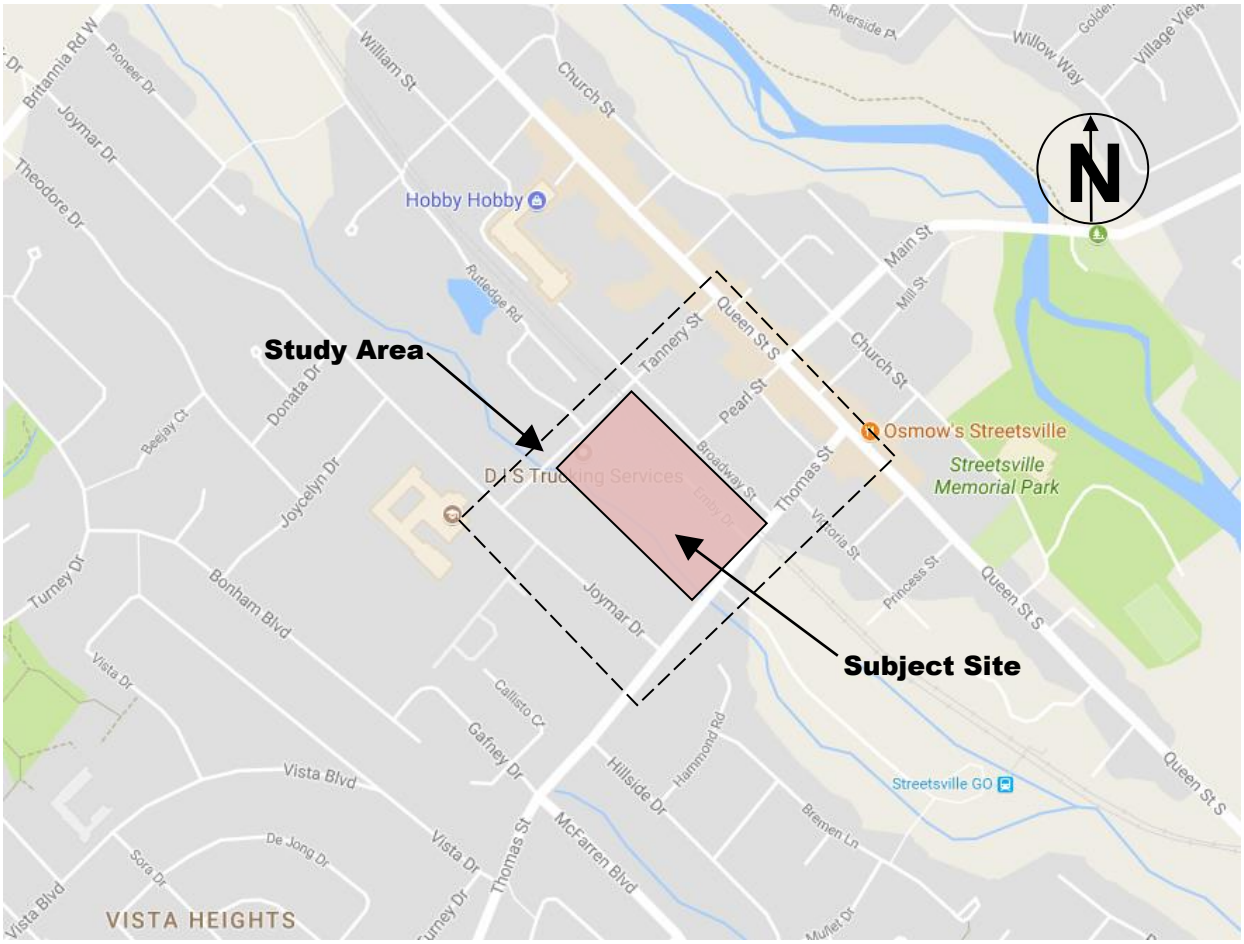


Figure 1: Site Location – 51, 57 Tannery Street & 208 Emby Drive

The proposed development will replace the existing used auto parts stores on Tannery Street and Emby Drive, west of Broadway Street. The proposed residential development will consist of 155 stacked townhouse units. **Figure 2** illustrates the proposed site plan. The proposed development will provide a total of 233 parking spaces, consisting of 202 resident spaces and 31 visitor spaces through structure facilities.

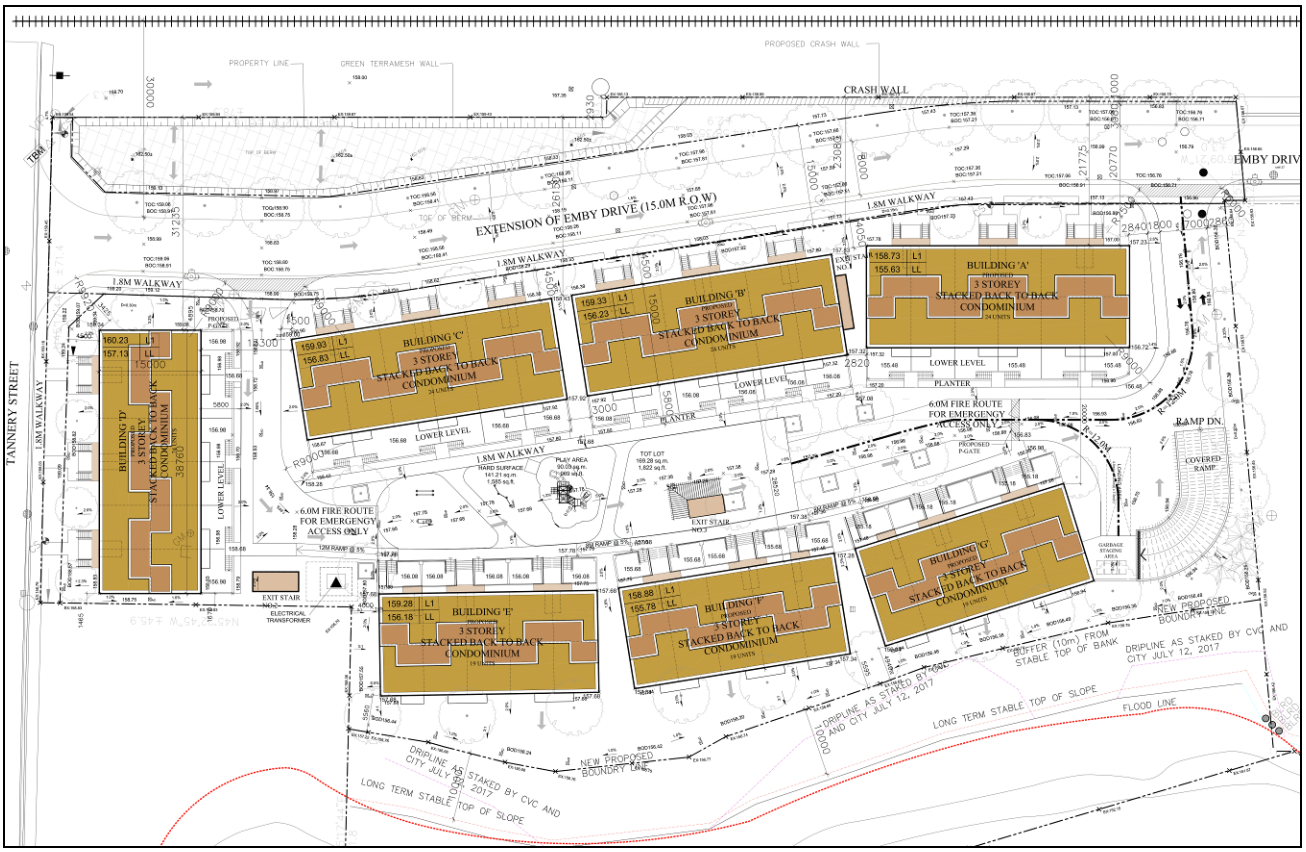


Figure 2: Proposed Site Plan

2.0 EXISTING ROAD NETWORK

The study area for this traffic impact is bounded by Joymar Drive to the west and Queen Street South to the east and the following existing intersections have been included in this study:

- Tannery Street & Crumbie Street/Broadway Street;
- Tannery Street & Rutledge Road;
- Tannery Street & Joymar Drive;
- Tannery Street & Queen Street;
- Thomas Street & Emby Drive;
- Thomas Street & Queen Street;
- Thomas Street & GO Station; and
- Thomas Street & Joymar Drive, where;

Tannery Street is a northeast-southwest two-lane minor collector road north of the subject lands, with an assumed speed limit of 50 km/h as there are no posted speed limit sign. It terminates at Queen Street South to the north-east. For the purposes of this report, Tannery Street will be referred to as an east-west road.

Thomas Street is northeast-southwest four-lane major collector road beginning at Ninth Line at the southwest to Queen Street South at the northeast. Within the study area, Thomas Street has a posted speed limit of 50 km/h. For the purposes of this report, Thomas Street will be referred to as an east-west road.

Crumbie Street/Broadway Street is a northwest-southeast two-lane local road east of the subject lands, with an assumed speed limit of 50 km/h as there are no posted speed limit sign. Crumbie Street begins north of Tannery Street and transitions to Broadway Street south of Tannery Street and terminates at Thomas Street.

Rutledge Road is a northwest-southeast two-lane local road that is currently in construction due to a development located on the southeast corner of Tannery Street and Rutledge Road. The speed limit is assumed to be 30 km/h in consideration of construction. It begins north of Tannery Street and transitions to Brookside Drive to the northwest, just south of Britannia Road West.

Joymar Drive is a northwest-southeast two-lane minor collector road that begins north of Thomas Street and terminates at Britannia Road West. Within the study area, Joymar Drive does not have a posted speed limit but it is assumed to be 40 km/h.

Queen Street South is a northwest-southeast two-lane major collector road that begins south of Britannia Road West and transitions to Mississauga Road to the southeast. Within the study area, Queen Street South has a posted speed limit of 40 km/h.

Emby Drive is a northwest-southeast two-lane local road that begins north of Thomas Street and extends into the subject area. Emby Drive does not have a posted speed limit, but it is assumed to have a speed limit of 30 km/h.

There is an unnamed road for the **GO Station** that is a northwest-southeast four-lane transit road that loops west of the Streetsville GO Station. The posted speed limit for the transit road is 25 km/h.

Figure 3 illustrates a diagram of the existing lane configurations within the study area.

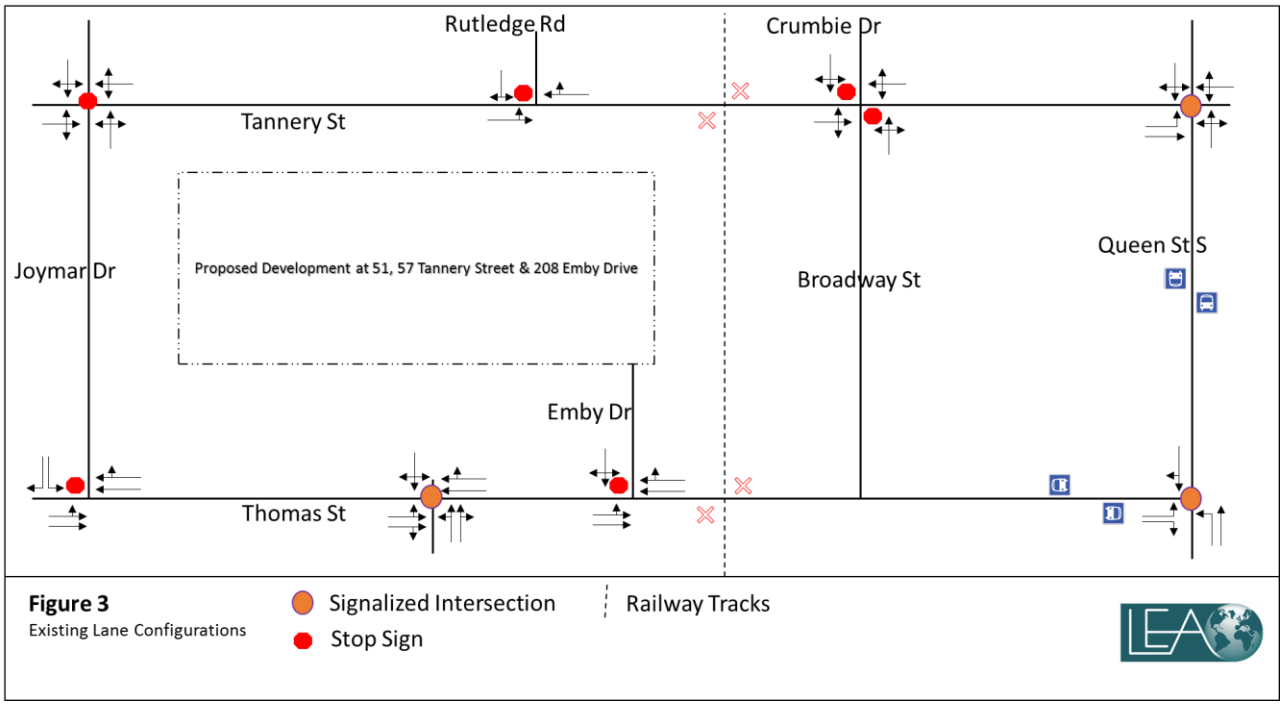


Figure 3: Existing Lane Configurations – Signalized Intersections

2.1 EXISTING TRANSIT NETWORK

The subject site currently has access to a variety of transit services that include MiWay transit service. The subject site is approximately 800 m from the Streetsville GO Station and is serviced by Route 9, 49A, and 67. **Figure 4** illustrates all existing transit services in the area.

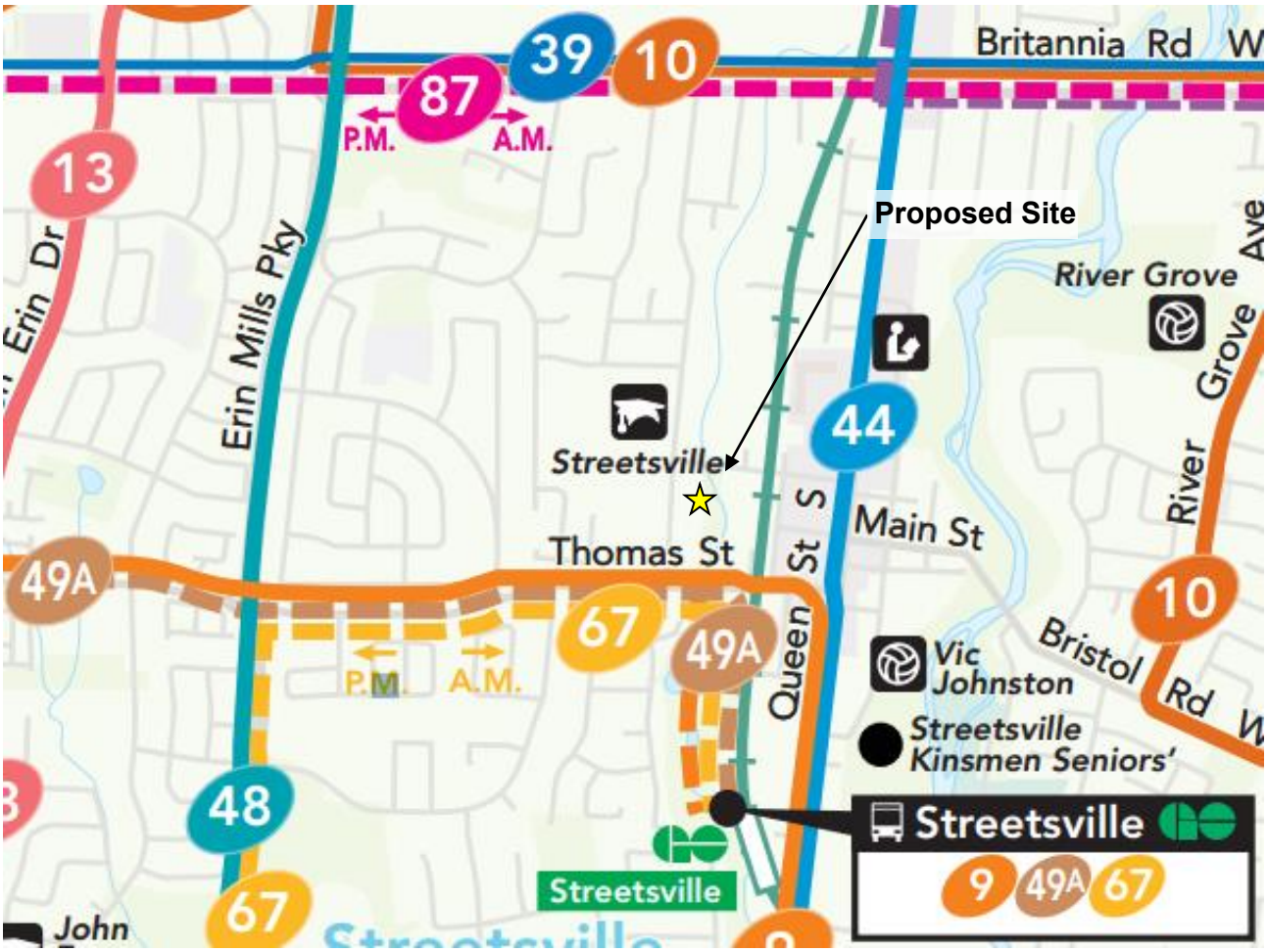


Figure 4: Existing Transit Network

Frequency of Transit Service	AM Peak Hour	PM Peak Hour
GO Transit	15 minutes	30 minutes
MiWay Buses	10 minutes	15 minutes

Table 1: Service Frequency of Existing Transit Service

Within the GO Transit network, the Streetsville GO Station is located south of Thomas Street. During weekdays, approximately twenty GO trains stop at the station, which is on the Milton line. During the peak periods, GO trains operate with headway of approximately 15 minutes, while headways during the off-peak period are approximately 30 minutes. The Milton line connects Union Station in the east and Milton GO Station in the west.

2.2 TRAFFIC DATA COLLECTION

LEA conducted existing traffic volumes for the peak periods within the study area (7:00 a.m. to 9:30 a.m. and 4:00 p.m. to 6:30 p.m). **Table 2** summarizes the sources and dates of the data utilized in this traffic study.

Intersection	Date of Survey	Source
Tannery Street & Crumbie Street/Broadway Street	May 31, 2017	LEA Consulting Ltd.
Tannery Street & Rutledge Road	May 31, 2017	LEA Consulting Ltd.
Tannery Street & Joymar Drive	June 26, 2017	LEA Consulting Ltd.
Tannery Street & Queen Street	June 7, 2017	LEA Consulting Ltd.
Thomas Street & Emby Drive	June 26, 2017	LEA Consulting Ltd.
Thomas Street & Queen Street	June 11, 2017	LEA Consulting Ltd.
Thomas Street & GO Station	June 26, 2017	LEA Consulting Ltd.
Thomas Street & Joymar Drive	June 26, 2017	LEA Consulting Ltd.

Table 2: Existing Traffic Volumes

2.3 PEAK HOUR FACTORS

According to the Region of Peel Guidelines for Using Synchro (version 7.73 Rev 8, December 2010), the peak hour factor (PHF) shall be 1.00 for all movements on all approaches. Therefore, the synchro analysis performed for this report assumes a PHF of 1.00 for all movements on all approaches.

3.0 EXISTING TRAFFIC CONDITIONS

The existing balanced traffic volumes are shown in **Figure 5**.

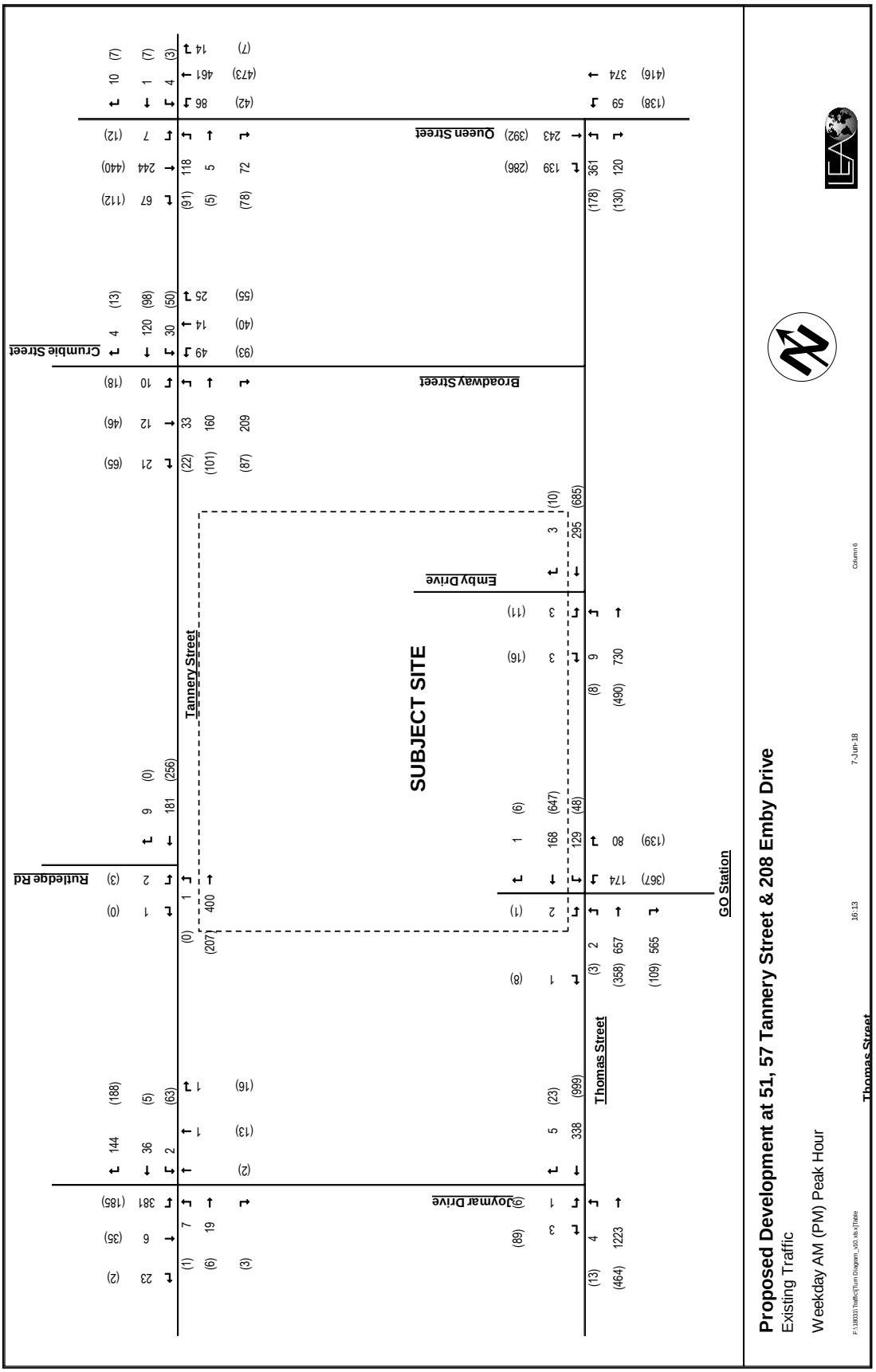


Figure 5: Existing Peak Hour Traffic Volumes

3.1 EXISTING INTERSECTION CAPACITY ANALYSIS

Intersection capacity analyses for this report were conducted using Synchro version 9.0, which incorporates the Highway Capacity Manual 2000 methodology. The analyses were undertaken in accordance with the Region of Peel's Synchro guidelines and incorporate signal timing plans obtained from the City. The signal timing plans can be found in **Appendix A**. **Table 3** and **Table 4** summarize the results of existing traffic analysis for the signalized and unsignalized intersections respectively. Detailed outputs can be found in **Appendix B**.

A.M. Peak Hour									
Intersection	Overall			Movements of Interest					
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m) 50th	Queue (m) 95th
Queen St & Tannery St	0.49	18.4	B	EBL	0.25	20.8	C	14.2	27.0
				EBT	0.06	19.1	B	0.6	9.2
				WBT	0.02	18.8	B	0.6	4.5
				NBT	0.66	20.3	C	67.9	103.5
				SBT	0.34	14.0	B	28.6	46.2
Queen St & Thomas St	0.48	18.5	B	EBL	0.71	33.4	C	55.5	85.7
				EBR	0.08	23.5	C	0.0	11.9
				NBL	0.11	9.2	A	4.3	10.1
				NBT	0.35	11.2	B	31.6	49.8
				SBT	0.36	11.4	B	27.6	46.2
GO Station & Thomas St	0.61	16.2	B	EBT	0.58	12.2	B	55.7	80.1
				WBT	0.22	4.6	A	8.3	13.2
				NBL	0.78	56.8	E	32.3	#58.4
				NBR	0.05	32.2	C	0.0	10.1
P.M. Peak Hour									
Queen St & Tannery St	0.43	14.0	B	EBL	0.31	35.9	D	16.3	31.1
				EBT	0.07	33.4	C	0.8	13.0
				WBT	0.03	33.1	C	1.7	7.4
				NBT	0.45	10.2	B	48.8	70.3
				SBT	0.47	10.4	B	51.4	74.1
Queen St & Thomas St	0.54	16.6	B	EBL	0.42	36.3	D	32.6	53.3
				EBR	0.09	32.9	C	0.0	14.5
				NBL	0.37	11.8	B	12.7	25.8
				NBT	0.34	9.7	A	37.2	53.9
				SBT	0.59	13.5	B	68.9	101.4
GO Station & Thomas St	0.62	19.6	B	EBT	0.36	18.4	B	23.9	46.0
				WBT	0.42	12.2	B	31.6	60.1
				NBL	0.82	36.1	D	53.9	85.4
				NBR	0.10	15.3	B	0.7	8.5

Table 3: Signalized Levels of Service – Existing Balanced Traffic

The analysis indicates that all the signalized intersections in the study area are operating at good overall levels of service.

A.M. Peak Hour							
Intersection	**Movement of Interest**	**Flow Rate (vph)**	**Capacity (vph)**	**Control Delay (s)**	**95th Queue (m)**	**V/C**	**LOS**
Joymar Dr & Tannery St	EBLTR	29	619	8.5	-	-	A
	WBLTR	185	737	8.8	-	-	A
	NBLTR	2	715	7.6	-	-	A
	SBLTR	412	760	12.5	-	-	B
Thomas St & Joymar Dr	EBLT	4	1219	0.1	0.1	0.00	A
	SBL	1	251	19.4	0.1	0.00	C
	SBR	3	827	9.4	0.1	0.00	A
Thomas St & Emby Dr	EBLT	9	1285	0.3	0.2	0.01	A
	SBLR	6	541	11.7	0.3	0.01	B
Broadway St/Crumbie St & Tannery St	EBLTR	41	1475	0.9	0.7	0.03	A
	WBLTR	30	1111	1.8	0.6	0.03	A
	NBLTR	88	432	15.5	5.7	0.20	C
	SBLTR	43	499	12.9	2.1	0.09	B
Tannery St & Rutledge Rd	EBL	1	1396	0.0	0.0	0.00	A
	SBLR	3	558	11.5	0.1	0.01	B
P.M. Peak Hour							
Joymar Dr & Tannery St	EBLTR	11	701	7.8	-	-	A
	WBLTR	256	820	8.9	-	-	A
	NBLTR	31	742	7.7	-	-	A
	SBLTR	222	726	9.6	-	-	A
Thomas St & Joymar Dr	EBLT	13	727	1.0	0.4	0.02	A
	SBL	6	179	25.8	0.8	0.03	D
	SBR	89	630	11.7	3.7	0.14	B
Thomas St & Emby Dr	EBLT	8	925	0.5	0.2	0.01	A
	SBLR	27	461	13.3	1.4	0.06	B
Broadway St/Crumbie St & Tannery St	EBLTR	22	1492	0.9	0.3	0.01	A
	WBLTR	50	1398	2.6	0.8	0.04	A
	NBLTR	188	519	15.8	12.5	0.36	C
	SBLTR	129	634	12.1	5.8	0.20	B
Tannery St & Rutledge Rd	EBL	1	1396	0.0	0.0	0.00	A
	SBLR	3	561	11.5	0.1	0.01	B

Table 4: Unsignalized Levels of Service – Existing Balanced Traffic

During the weekday a.m. and p.m. peak hours, the analysis indicates all the unsignalized intersections are operating at good overall levels of service.

4.0 FUTURE BACKGROUND TRAFFIC

This traffic impact study considers a horizon year of 2022 (five years from the data collection date). Background growth rates were obtained from the City for Thomas Street and Queen Street only, as the City only provides growth rates for major collectors and arterials; correspondence with the City regarding background traffic growth is provided in **Appendix F**. These compounded annual growth rates are shown in **Table 5** below and were applied to through movements only. For the other roads in the study area, no growth was applied as traffic data from the nearest Region of Peel permanent count station shows a general reduction in AADT since 2011.

Time Period	Thomas Street		Queen Street	
	EB	WB	NB	SB
Weekday AM Peak Hour	0.0%	0.0%	0.5%	0.5%
Weekday PM Peak Hour	0.5%	0.0%	0.5%	0.0%

Table 5: Compounded Annual Growth Rates for Thomas Street and Queen Street

Background developments were identified in the surrounding area to be included in the study and no infrastructure changes were assumed in the future background analyses. Background developments that were incorporated into the future background traffic volumes include office, residential, commercial and mixed-used buildings as shown in **Table 6** below.

The estimated traffic volumes generated by the surrounding background developments for the weekday a.m. and p.m. peak are shown in **Figure 6**. The 2022 future background traffic volumes for the weekday a.m. peak and p.m. peak are shown in **Figure 7**.

Site Address	Application Type	Application Status	Description
170, 180 & 190 Rutledge Rd (Formerly 60 Tannery St)	Condominium	Application in process	62 apartment unit standard condominium
56 Tannery St	Rezoning	Application in process	67 Condominium Townhouse and 143 Condominium Apartment in 7 Storey Building
142-148 Queen Street South	Site Plan	Withheld	3-Storey Residential (108) and Commercial (1870m^2) Mixed-Use Building
38, 40, 44 Main St	Rezoning	Application in process	25 three-storey townhouses
215 Broadway St	Site Plan	Approved	3-Storey mixed use building (at grade office; 16 residential units on the 2 and 3 storeys) – max 440m^2 of non-residential
80 Thomas St	Rezoning	Withheld	203 residential units (14 semi-detached, 59 standard townhouses, 130 back to back townhouses)

Table 6: Future Background Developments

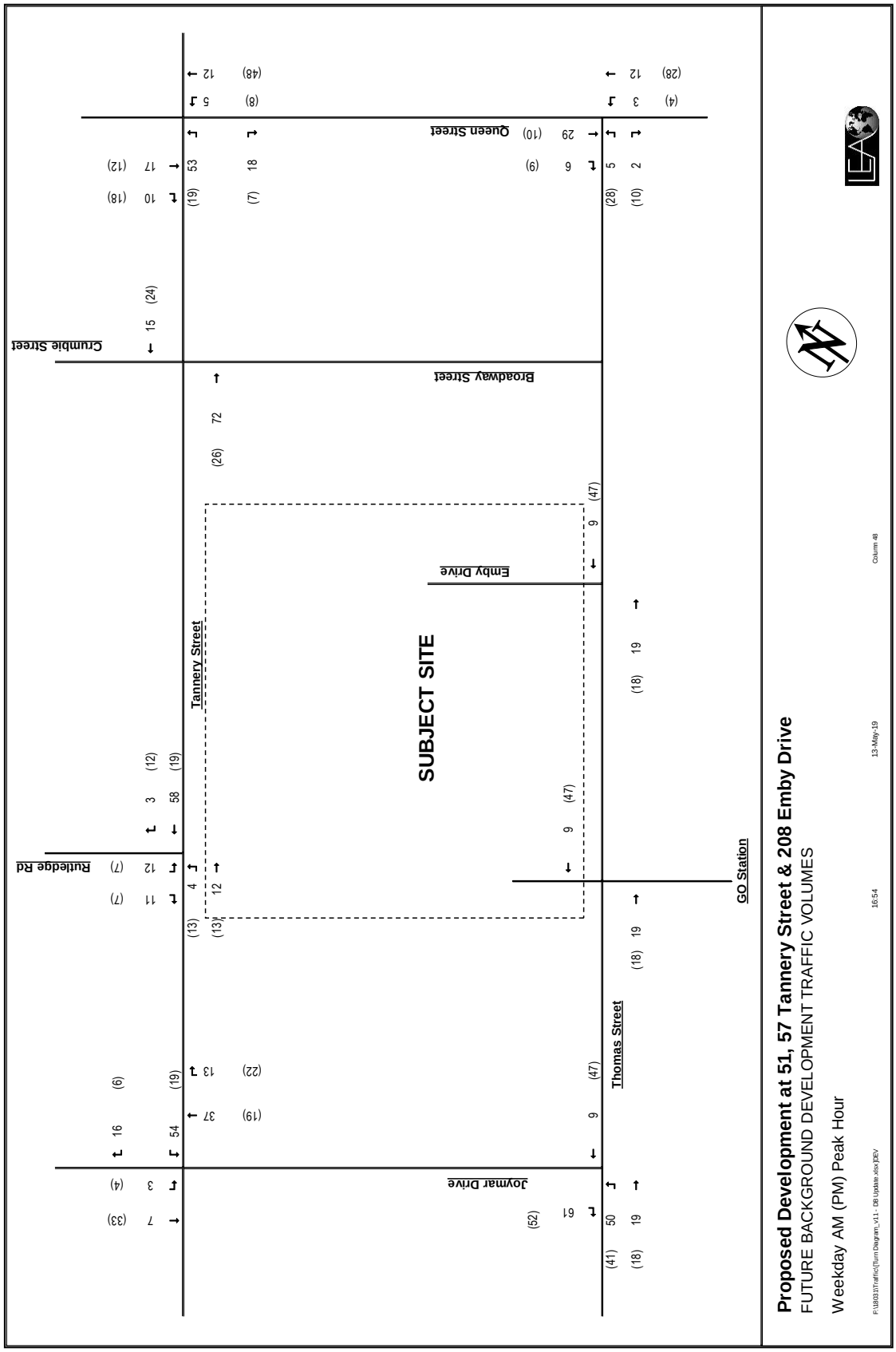


Figure 6: Future Background Development Peak Hour Traffic Volumes

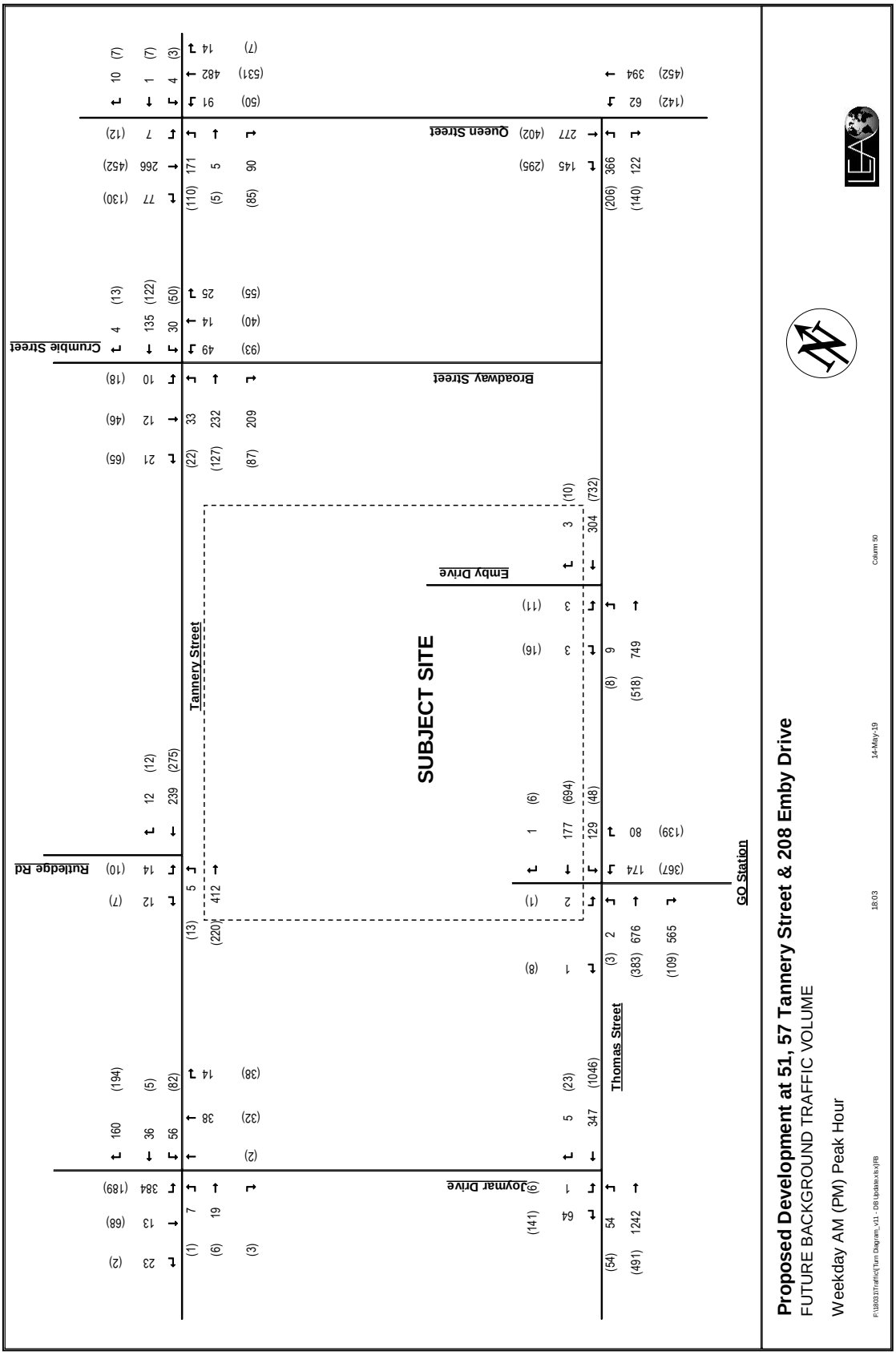


Figure 7: Future Background Peak Hour Traffic Volumes

4.1 FUTURE BACKGROUND INTERSECTION CAPACITY ANALYSIS

Intersection capacity analyses were performed for the future background volumes, with existing signal timing plans acquired from the City. **Table 7** and **Table 8** summarizes the analysis results for the future background traffic for the signalized and unsignalized intersections respectively. Detailed outputs can be found in **Appendix C**.

A.M. Peak Hour									
Intersection	Overall			Movements of Interest					
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Queen St & Tannery St	0.56	19.3	B	EBL	0.36	21.9	C	21.5	38.1
				EBT	0.07	19.2	B	0.6	10.0
				WBT	0.02	18.8	B	0.6	4.5
				NBT	0.70	21.4	C	72.9	111.5
				SBT	0.37	14.5	B	32.3	51.6
Queen St & Thomas St	0.51	18.6	B	EBL	0.72	33.9	C	56.5	87.2
				EBR	0.08	23.5	C	0.0	11.9
				NBL	0.13	9.4	A	4.5	10.7
				NBT	0.37	11.4	B	33.7	53.0
				SBT	0.40	11.9	B	32.5	53.1
GO Station & Thomas St	0.61	16.2	B	EBT	0.59	12.4	B	58.1	83.0
				WBT	0.24	4.7	A	9.0	14.2
				NBL	0.78	56.8	E	32.3	58.4
				NBR	0.05	32.2	C	0.0	10.1
P.M. Peak Hour									
Queen St & Tannery St	0.48	14.7	B	EBL	0.37	36.7	D	20.1	36.7
				EBT	0.07	33.5	C	0.8	13.4
				WBT	0.03	33.1	C	1.7	7.4
				NBT	0.52	11.2	B	58.7	84.3
				SBT	0.50	10.8	B	55.5	80.3
Queen St & Thomas St	0.57	17.2	B	EBL	0.49	37.2	D	38.3	61.1
				EBR	0.10	32.9	C	0.0	15.1
				NBL	0.39	12.4	B	13.2	26.8
				NBT	0.37	10.0	A	41.5	59.6
				SBT	0.61	13.8	B	72.2	106.4
GO Station & Thomas St	0.62	18.8	B	EBT	0.37	18.0	B	25.0	47.6
				WBT	0.44	11.8	B	32.8	62.2
				NBL	0.81	35.5	D	50.3	80.3
				NBR	0.11	15.5	B	1.6	9.5
				SBT	0.01	18.5	B	0.0	0.0

Table 7: Signalized Levels of Service – Future Background Traffic

Under the future background traffic conditions, the capacity analysis indicates all the signalized intersections in the study area will operate at good overall levels of service in the weekday a.m. peak and p.m. peak hours.

Intersection	Movement of Interest	Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
A.M. Peak Hour							
Joymar Dr & Tannery St	EBLTR	29	568	8.8	-	-	A
	WBLTR	255	690	10.3	-	-	B
	NBLTR	52	650	8.4	-	-	A
	SBLTR	422	714	14.0	-	-	B
Thomas St & Joymar Dr	EBLT	54	1209	1.4	1.1	0.04	A
	SBL	1	201	23.0	0.1	0.00	C
	SBR	64	821	9.8	1.9	0.08	A
Thomas St & Emby Dr	EBLT	9	1276	0.3	0.2	0.01	A
	SBLR	6	530	11.9	0.3	0.01	B
Broadway St/Crumbie St & Tannery St	EBLTR	33	1457	0.7	0.5	0.02	A
	WBLTR	30	1130	1.7	0.6	0.03	A
	NBLTR	88	430	15.5	5.8	0.20	C
	SBLTR	43	503	12.8	2.1	0.09	B
Tannery St & Rutledge Rd	EBL	5	1326	0.1	0.1	0.00	A
	SBLR	26	542	12.0	1.1	0.05	B
P.M. Peak Hour							
Joymar Dr & Tannery St	EBLTR	11	649	8.0	-	-	A
	WBLTR	281	772	9.6	-	-	A
	NBLTR	72	717	8.1	-	-	A
	SBLTR	259	707	10.3	-	-	B
Thomas St & Joymar Dr	EBLT	54	704	3.3	1.9	0.08	A
	SBL	6	137	32.5	1.0	0.04	D
	SBR	141	635	12.3	6.4	0.22	B
Thomas St & Emby Dr	EBLT	8	890	0.5	0.2	0.01	A
	SBLR	27	439	13.7	1.5	0.06	B
Broadway St/Crumbie St & Tannery St	EBLTR	22	1462	0.8	0.3	0.02	A
	WBLTR	50	1368	2.3	0.9	0.04	A
	NBLTR	188	483	17.1	13.9	0.39	C
	SBLTR	129	599	12.7	6.2	0.22	B
Tannery St & Rutledge Rd	EBL	13	1287	0.5	0.2	0.01	A
	SBLR	17	590	11.3	0.7	0.03	B

Table 8: Unsignalized Levels of Service – Future Background Traffic

During the weekday a.m. and p.m. peak hours, the capacity analysis indicates the unsignalized intersections in the study area will operate at good overall levels of service.

5.0 TRIP GENERATION AND DISTRIBUTION

5.1 TRIP GENERATION

The proposed development consists of seven stacked back to back townhouse buildings, which combined have a total of 155 townhouse units. Trip generation for the proposed development was estimated using the trip rate regression formulas provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th edition, for land use code 230 – "Residential Condominium / Townhouse". **Table 9** summarizes the trip generation volumes for the proposed development during weekday a.m. and p.m. peak hours for the development.

Weekday AM Peak Hour			**In**	**Out**	**Total**
Townhouse	155 units	Trip Rate / Unit	0.17	0.83	100%
		Trips Generated	12	61	73
		Total Trips	**12**	**61**	**73**
Weekday PM Peak Hour			**In**	**Out**	**Total**
Townhouse	155 units	Trip Rate / Unit	0.67	0.33	100%
		Trips Generated	58	28	86
		Total trips	**58**	**28**	**86**

Table 9: Trip Generation Summary

5.2 MODAL SPLIT

At the request of the City, trip reductions were applied to the generated vehicular trips given the site's proximity to the Streetsville GO Station. Assumed ITE auto mode splits were taken from the ITE Trip Generation Handbook, 3rd edition for residential land use and are shown in **Table 10** below. More applicable mode splits for the area were derived from 2011 Transportation Tomorrow Survey (TTS) data and applied to the ITE auto trip generation to account for higher transit use to/from the site (when compared to ITE rates).

		Weekday AM			**Weekday PM**		
		Inbound	**Outbound**	**Total**	**Inbound**	**Outbound**	**Total**
ITE Auto Trip Generation		12	61	73	58	28	86
ITE Auto Mode Split		89%	97%	-	96%	95%	-
TTS 2011 Mode Splits	Auto Mode	85%	84%		76%	92%	
	Transit Mode	10%	12%		24%	7%	
	Active Mode	5%	4%		0%	1%	
Total trips (reduced)		**11**	**53**	**64**	**46**	**27**	**73**

Table 10: Trip Generation Summary with Mode Split Reductions

5.3 TRIP DISTRIBUTION AND TRIP ASSIGNMENT

The trip distribution for the proposed development was derived from TTS 2011 data for the weekday a.m. and p.m. peak periods. **Table 11** summarizes the traffic distribution used for the inbound and outbound trips in the weekday a.m. and p.m. peak hours. Detailed traffic distribution calculations and trip assignments are included in **Appendix D**. Traffic assignment for the proposed development is derived based on the shortest path routes and existing traffic patterns. The future peak hour site traffic volumes are shown in **Figure 8**. Existing site trips were removed from the area and the net traffic volumes are shown in **Figure 9.**

Weekday AM		
Direction To/From	**Outgoing**	**Incoming**
East	19%	18%
West	45%	36%
South	29%	33%
North	8%	13%
Weekday PM		
Direction To/From	**Trip Assignment**	**Incoming**
East	19%	12%
West	45%	48%
South	29%	22%
North	8%	18%

Table 11: Site Traffic Trip Distribution

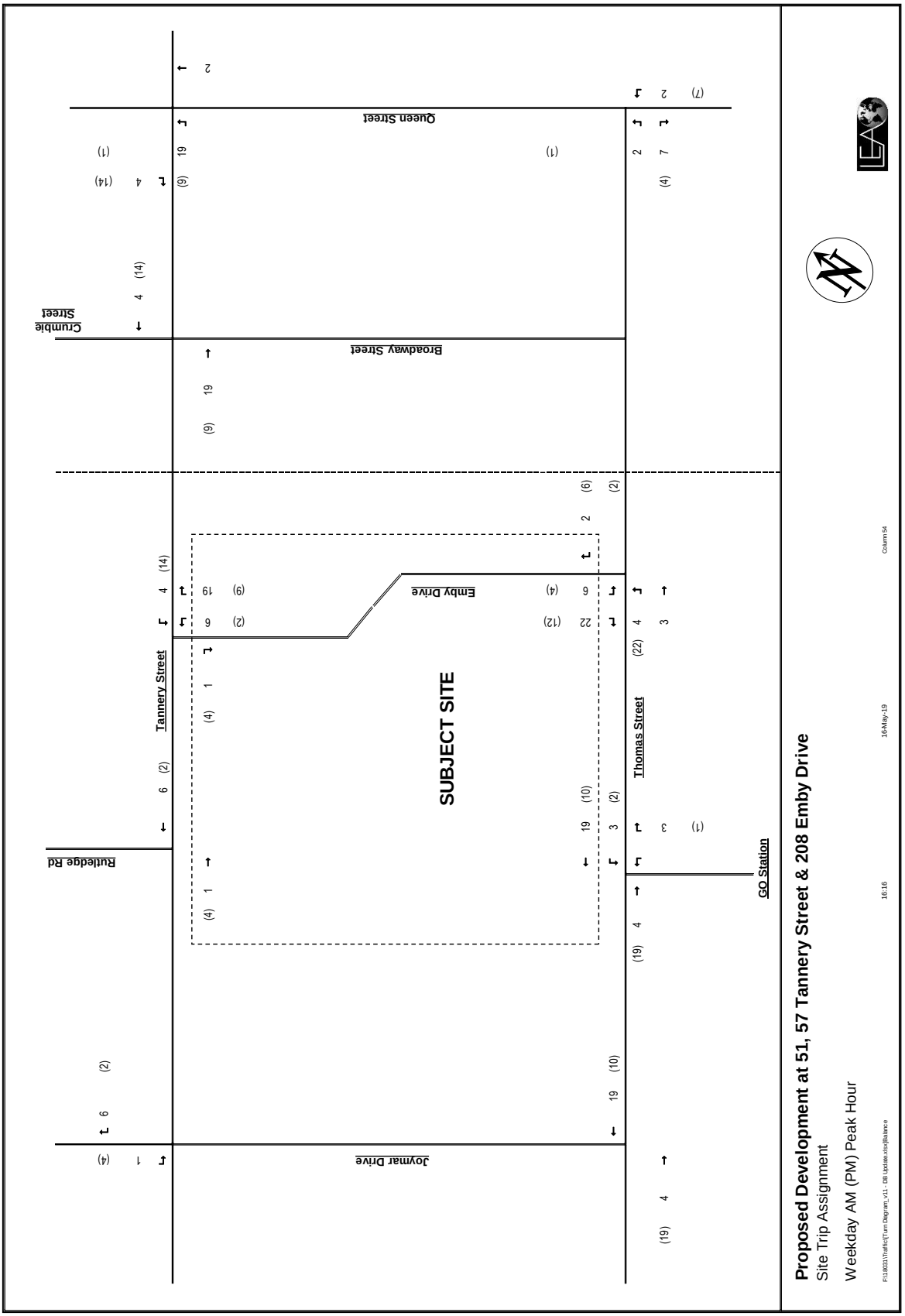


Figure 8: Peak Hour Site Trips

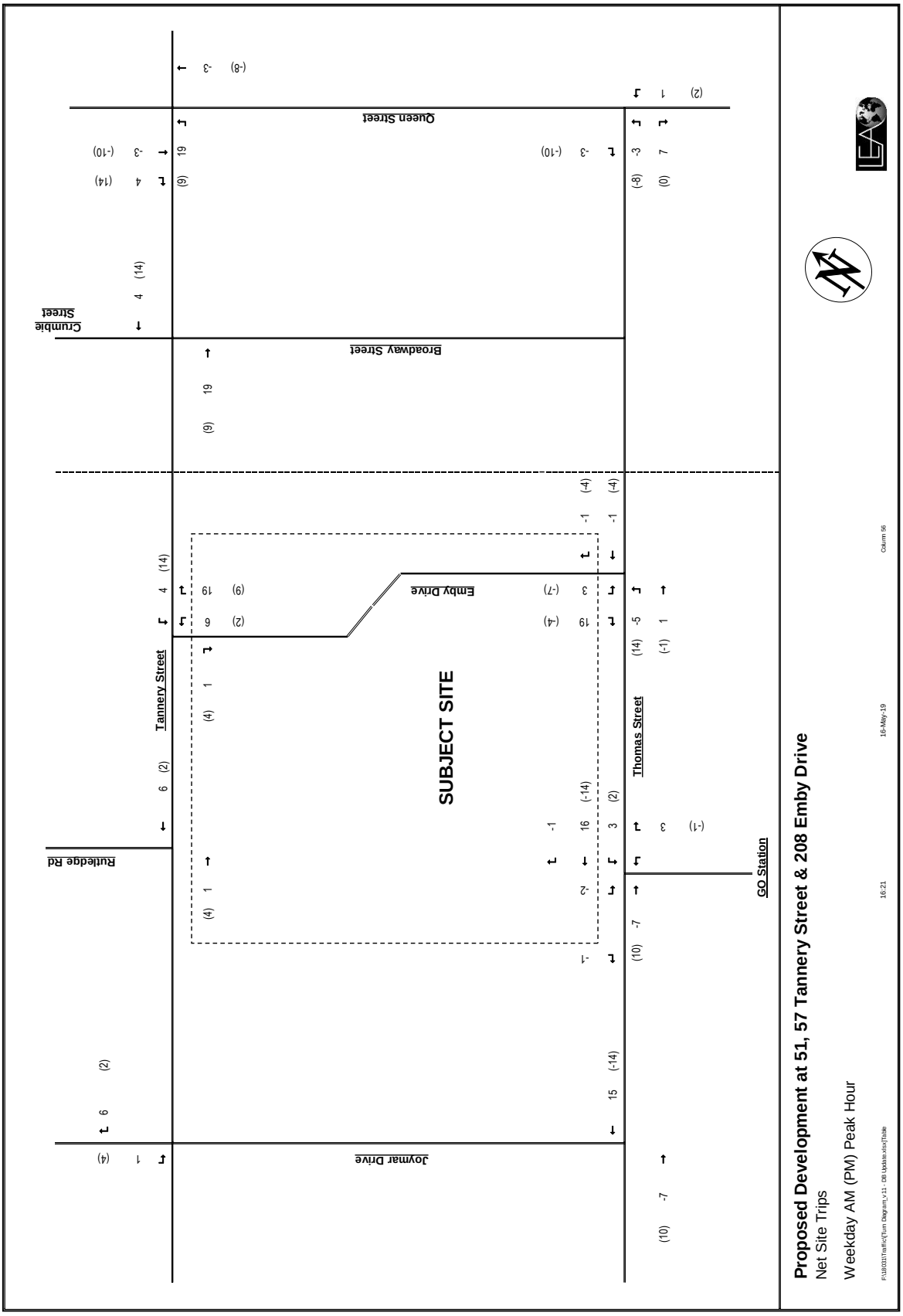


Figure 9: Net Site Trips

6.0 FUTURE TOTAL TRAFFIC CONDITIONS

A Future Total traffic analysis was performed for the 2022 planning horizon. The only change to the future background network is the extension of Emby Drive from Thomas Street to Tannery Street, which is further discussed in **Section 6.2**. **Figure 10** illustrates the future total traffic volumes for the weekday A.M. and P.M. peak hours.

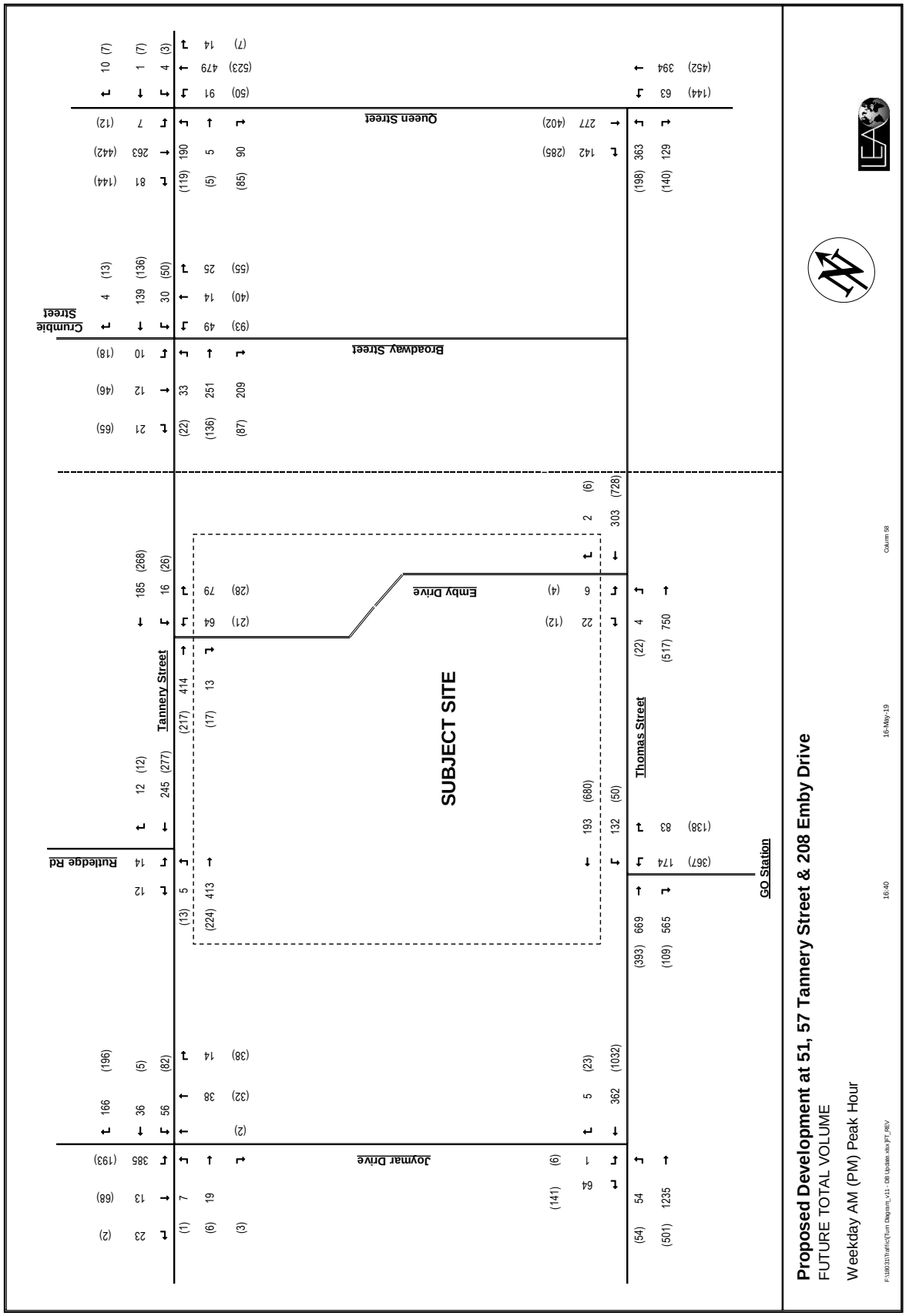


Figure 10: Future Total Traffic with Emby Extension

6.1 FUTURE TOTAL INTERSECTION CAPACITY ANALYSIS

The intersection capacity analysis was performed for the future total traffic conditions using future total traffic volumes, existing signal timings and existing lane configurations. **Table 12** and **Table 13** provide a summary of the results from the capacity analysis for the signalized and unsignalized intersections in the study area. **Appendix E** includes the detailed Synchro outputs.

A.M. Peak Hour									
Intersection	Overall			Movements of Interest					
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Queen St & Tannery St	0.57	19.3	B	EBL	0.40	22.3	C	24.3	42.4
				EBT	0.07	19.2	B	0.6	10.0
				WBT	0.02	18.8	B	0.6	4.5
				NBT	0.69	21.3	C	72.3	110.6
				SBT	0.38	14.5	B	32.3	51.3
Queen St & Thomas St	0.50	18.5	B	EBL	0.72	33.5	C	55.8	86.3
				EBR	0.09	23.6	C	0.0	12.2
				NBL	0.13	9.4	A	4.6	10.7
				NBT	0.37	11.4	B	33.7	53.0
				SBT	0.40	11.8	B	32.3	52.9
GO Station & Thomas St	0.56	14.3	B	EBT	0.55	10.9	B	51.3	74.3
				WBT	0.23	4.2	A	8.2	13.3
				NBL	0.69	47.9	D	31.4	52.7
				NBR	0.05	32.8	C	0.0	10.6
P.M. Peak Hour									
Queen St & Tannery St	0.48	14.9	B	EBL	0.40	37.0	D	21.9	39.4
				EBT	0.07	33.5	C	0.8	13.4
				WBT	0.03	33.1	C	1.7	7.4
				NBT	0.51	11.1	B	57.5	82.8
				SBT	0.51	10.9	B	55.7	80.7
Queen St & Thomas St	0.56	17.0	B	EBL	0.47	36.9	D	36.7	58.7
				EBR	0.10	32.9	C	0.0	15.1
				NBL	0.39	12.3	B	13.4	26.9
				NBT	0.37	10.0	A	41.5	59.6
				SBT	0.60	13.6	B	70.9	104.1
GO Station & Thomas St	0.56	16.2	B	EBT	0.33	15.0	B	22.1	39.7
				WBT	0.40	9.1	A	26.6	47.5
				NBL	0.76	31.6	C	46.9	74.1
				NBR	0.12	16.7	B	2.0	10.4

Table 12: Signalized Levels of Service – Future Total Traffic

The capacity analysis indicates the signalized intersections within the study area will continue to operate at good overall levels of service.

Intersection	Movement of Interest	Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
A.M. Peak Hour							
Joymar Dr & Tannery St	EBLTR	29	566	8.9	-	-	A
	WBLTR	261	690	10.4	-	-	B
	NBLTR	52	647	8.5	-	-	A
	SBLTR	423	711	14.2	-	-	B
Thomas St & Joymar Dr	EBLT	54	1194	1.4	1.1	0.05	A
	SBL	1	198	23.3	0.1	0.01	C
	SBR	64	812	9.8	1.9	0.08	A
Thomas St & Emby Dr	EBLT	4	1234	0.2	0.1	0.00	A
	SBLR	28	661	10.7	1.0	0.04	B
Broadway St/Crumbie St & Tannery St	EBLTR	33	1452	0.7	0.5	0.02	A
	WBLTR	30	1112	1.6	0.6	0.03	A
	NBLTR	88	416	16.0	6.0	0.21	C
	SBLTR	43	490	13.1	2.2	0.09	B
Emby Extension & Tannery St	WBLT	17	1097	0.8	0.4	0.02	A
	NBLR	156	494	15.6	10.2	0.32	C
Tannery St & Rutledge Rd	EBL	5	1320	0.1	0.1	0.00	A
	SBLR	26	538	12.0	1.2	0.05	B
P.M. Peak Hour							
Joymar Dr & Tannery St	EBLTR	11	647	8.1	-	-	A
	WBLTR	283	770	9.7	-	-	A
	NBLTR	72	715	8.1	-	-	A
	SBLTR	263	706	10.4	-	-	B
Thomas St & Joymar Dr	EBLT	54	699	3.3	1.9	0.08	A
	SBL	6	133	33.3	1.1	0.05	D
	SBR	141	596	12.9	7.0	0.24	B
Thomas St & Emby Dr	EBLT	22	896	1.3	0.6	0.02	A
	SBLR	16	490	12.6	0.8	0.03	B
Broadway St/Crumbie St & Tannery St	EBLTR	22	1445	0.8	0.4	0.02	A
	WBLTR	50	1358	2.2	0.9	0.04	A
	NBLTR	188	467	17.8	14.6	0.40	C
	SBLTR	129	582	12.9	6.4	0.22	B
Emby Extension & Tannery St	WBLT	28	1311	0.9	0.5	0.02	A
	NBLR	53	603	11.5	2.2	0.09	B
Tannery St & Rutledge Rd	EBL	13	1284	0.5	0.2	0.01	A
	SBLR	17	587	11.3	0.7	0.03	B

Table 13: Unsignalized Levels of Service – Future Total Traffic

During the weekday a.m. peak hour and p.m. peak hour future total traffic conditions, the intersection capacity analysis indicates that the unsignalized intersections within the study area are expected to operate at good overall levels of service.

6.2 EMBY DRIVE EXTENSION

The site plan shows an extension of Emby Drive northwest through the subject site. This extension provides additional connectivity from Tannery Street to the Streetsville GO station, and will assist to mitigate impacts of increased traffic volumes on the intersection of Thomas and Joymar. It was provided

at the request of the City of Mississauga and is designed in accordance with the City's specifications and with CP Rail requirements. The alignment of the roadway was planned to minimize curvature of the roadway while complying with the Transport Canada Grade Crossing standards. The Transport Canada standards require a setback of 30m from the access location to the nearest railway track. The existing segment of Emby Drive at Thomas Street was constructed before the setback regulations were established, however the extension is expected to comply with them.

The roadway will have a cross-section of 15.0m, with a pavement of 8.0m and a 1.8m sidewalk. The connection of Emby Drive with Tannery Street is aligned to create a right-angle intersection that is set back 30m from the rail track. The Emby Drive intersection will be offset approximately 35m from the nearby intersection of Rutledge Road. The offset of the intersections is acceptable to provide appropriate sightlines for outbound left turn movements, and the inbound left turning movements do not overlap.

The extension as proposed is recommended to comply with federal and municipal design standards while minimizing impacts to the overall site layout.

7.0 PARKING AND LOADING REQUIREMENTS

7.1 VEHICULAR PARKING REQUIREMENTS

The City of Mississauga Zoning By-law (No. 0225-2007) parking requirements were considered for the proposed development. The zoning by-law has a rate of 2 residential spaces per unit and 0.25 visitor parking spaces. **Table 14** outlines the development parking recommendations as indicated by Zoning By-law 0225-2007.

Type of Use	Total GFA (m2) or Number of Units	By-law 0225-2007 Parking Rates	Parking Supply
Townhouse	155 units	2 (Residential) spaces / unit	310
Townhouse		0.25 (Visitor) spaces / unit	39
Total Residential		Total	349

Table 14: Zoning By-Law Parking Standards

According to Zoning by-law 0225-2007, there are a total of 349 spaces considered to be adequate for the proposed development.

7.2 FUTURE PARKING DEMAND

The subject site is located proximate to the Streetsville GO Station, which is a higher order transit station and a significant commuter trip attractor. All townhouses are within a 10-15 minute walk to the platform. Given this location, a reduced demand for parking is considered reasonable for the subject site.

To verify demand for comparable sites within Mississauga, data from proxy surveys at 2929 Aquitaine Avenue was collected. 2929 Aquitaine Avenue has 175 residential units and provides 388 parking spaces (348 underground for residents and 40 surface spaces for visitors). 2929 Aquitaine Avenue is a residential apartment building located within a 20-minute walk of the Meadowvale GO station. In comparison, the subject site is within a 15-minute walk to Streetsville GO station. The parking supply for the proxy study's building is 2.0 spaces per unit, which is consistent with the Zoning By-law 0225-2007 minimum requirements. Therefore, this survey represents a relatively unconstrained supply for a development within walking and cycling distance of a GO station.

The proxy surveys were conducted on Friday, August 25th, and Saturday, August 26th, 2017 from 5:00 p.m. to 9:00 p.m. and Saturday, August 26th from 11:00 a.m. to 9:00 p.m. at 30-minute intervals.
A summary of peak resident and visitor demand rates for the study period is in **Table 15** below.

Date	Number of Residential Units	Peak Residential Demand	Peak Residential Demand Rate	Peak Visitor Demand	Peak Visitor Demand Rate
Friday, August 25	175	117	0.67	32	0.18
Saturday, August 26		167	0.95	11	0.06

Table 15: Resident and Visitor Parking Demand of Proxy Survey (2929 Aquitaine Avenue)

The proxy survey results show a peak resident demand of 167 spaces (0.95 spaces per unit) and a peak visitor demand of 32 spaces (0.18 spaces per unit). The data from the proxy surveys reveal that the typical parking demand rate is significantly lower than the building provisions, and lower than the By-law 0225-2007 demand rate of 2.0 resident spaces per unit and 0.25 visitor spaces per unit that applies to the given site. Given this difference in demand between the observed and By-law rates, it is recommended that a comparable reduced demand rate be applied to the proposed development.

7.3 PROPOSED PARKING SUPPLY

The total proposed parking supply for the development is 233 residential parking spaces. A breakdown of parking by type is outlined in **Table 16**.

Parking Type	Number of Residential Units	Number of Parking Spaces	Proposed Parking Rate
Residential Parking	155	202	1.30
Visitor Parking		31	0.20
Total		233	-

Table 16: Proposed Parking Supply by Type

Rates of 1.30 for resident parking and 0.20 for visitor parking on the subject site are proposed. Given the proxy data collected from 2929 Aquitaine Avenue and the proximity of the development to Streetsville GO Station, as well as access to a variety of other transit services as mentioned in Section 2.1, the proposed development is expected to be able to accommodate the expected parking demand through the proposed parking supply.

8.0 CONCLUSIONS

- The proposed development will consist of 155 stacked townhouse units. Site access is proposed with a westbound-eastbound movement access driveway off Thomas Street near the southerly limits of the property.

- The traffic analysis study area consisted of three signalized intersections and five unsignalized intersections.

- There were 6 background developments that were incorporated into the future background traffic volumes which included office, residential, commercial and mixed-used buildings.

- Under existing and future background traffic conditions all signalized and unsignalized intersections within the study area were found to be operating at good overall levels of service during both the weekday a.m. and p.m. peak hours.

- The study has found that the proposed development with Emby extension is expected to generate 64 total trips during the weekday a.m. peak hour and 73 total trips during the weekday p.m. peak hour.

- Under future total traffic conditions, all intersections operate at an overall acceptable level of service.

- The proposed development is subjected to the City of Mississauga Zoning By-law (No. 0225-2007). Based on the zoning by-law parking standards, the proposed development is required to provide 310 residential parking spaces and 39 visitor parking spaces.

- Considering the proximity of the site to Streetsville GO Station and a proxy study completed at 2929 Aquitaine Avenue, a supply of 233 total parking spots (202 residential, 31 visitor) is reasonable for the subject site.

- This report concludes that the traffic associated with the proposed development will have minimal impacts to the current local road network configurations.

APPENDIX A

Existing Signal Timings

```
?? SHOW TIMING REPORT,ACT1-3,I520
  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   520 00:00   /     /     /     /     /     /    LO  101   2     2    2
   520 07:00  1/1    /     /     /    1/1    /    CC  100   1     1    1
1080

  LOCATION:  MISS (QUEEN)@TANNERY            INTERSECTION NO.:   520
  DATE:      27-JUN-2017                     TIME:              07:00
  SCHEDULE:   1                              SPEC. FUNC.: 1 - Y  2 - N  3
- N

  MAIN ST.:  MISS (QUEEN)                    CONTROLLER TYPE:   S4
  NO. OF PH: 2                               CONTROL MODE:      CC

  2.   NS                          - Walk           =  48 seconds
       MISS (QUEEN)                - FL. Don't Walk =  12 seconds
                                   - Amber          =   4 seconds
                                   - All Red        =   2 seconds

  4.   EB                          - Walk           =   8 seconds
       TANNERY ST                  - FL. Don't Walk =   8 seconds
                                   - Sd. Don't Walk =  12 seconds
                                   - Maximum        =  28 seconds
                                   - Amber          =   4 seconds
                                   - All Red        =   2 seconds

                                 Total Cycle Length = 100 seconds

  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   520 09:00  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080

  LOCATION:  MISS (QUEEN)@TANNERY            INTERSECTION NO.:   520
  DATE:      27-JUN-2017                     TIME:              09:00
  SCHEDULE:   1                              SPEC. FUNC.: 1 - Y  2 - N  3
- N

  MAIN ST.:  MISS (QUEEN)                    CONTROLLER TYPE:   S4
  NO. OF PH: 2                               CONTROL MODE:      CC

  2.   NS                          - Walk           =  24 seconds
       MISS (QUEEN)                - FL. Don't Walk =  12 seconds
                                   - Amber          =   4 seconds
                                   - All Red        =   2 seconds
```

```
  4.   EB                              - Walk           =   8 seconds
       TANNERY ST                      - FL. Don't Walk =   8 seconds
                                       - Sd. Don't Walk =   6 seconds
                                       - Maximum        =  22 seconds
                                       - Amber          =   4 seconds
                                       - All Red        =   2 seconds

                                     Total Cycle Length =  70 seconds

  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   520 16:00  1/1    /     /     /    1/1    /    CC  110   3     3    3
1080

  LOCATION:  MISS (QUEEN)@TANNERY           INTERSECTION NO.:   520
  DATE:      27-JUN-2017                    TIME:              16:00
  SCHEDULE:   1                             SPEC. FUNC.: 1 - Y  2 - N  3
- N

  MAIN ST.:  MISS (QUEEN)                   CONTROLLER TYPE:   S4
  NO. OF PH: 2                              CONTROL MODE:      CC

  2.   NS                              - Walk           =  65 seconds
       MISS (QUEEN)                    - FL. Don't Walk =  12 seconds
                                       - Amber          =   4 seconds
                                       - All Red        =   2 seconds

  4.   EB                              - Walk           =   8 seconds
       TANNERY ST                      - FL. Don't Walk =   8 seconds
                                       - Sd. Don't Walk =   5 seconds
                                       - Maximum        =  21 seconds
                                       - Amber          =   4 seconds
                                       - All Red        =   2 seconds

                                     Total Cycle Length = 110 seconds

  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   520 18:30  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080

  LOCATION:  MISS (QUEEN)@TANNERY           INTERSECTION NO.:   520
  DATE:      27-JUN-2017                    TIME:              18:30
  SCHEDULE:   1                             SPEC. FUNC.: 1 - Y  2 - N  3
- N
```

MAIN ST.: MISS (QUEEN) CONTROLLER TYPE: S4
NO. OF PH: 2 CONTROL MODE: CC

2. NS - Walk = 24 seconds
MISS (QUEEN) - FL. Don't Walk = 12 seconds
- Amber = 4 seconds
- All Red = 2 seconds

4. EB - Walk = 8 seconds
TANNERY ST - FL. Don't Walk = 8 seconds
- Sd. Don't Walk = 6 seconds
- Maximum = 22 seconds
- Amber = 4 seconds
- All Red = 2 seconds

Total Cycle Length = 70 seconds

SCHEDULED DATA

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
520	21:30	/	/	/	/	/	/	LO	101	2	2	2	1080

SCHEDULED DATA

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
520	00:00	/	/	/	/	/	/	LO	101	2	2	2	
520	09:00	1/1	/	/	/	1/1	/	CC	70	2	2	2	1080

LOCATION: MISS (QUEEN)@TANNERY INTERSECTION NO.: 520
DATE: 27-JUN-2017 TIME: 09:00
SCHEDULE: 2 SPEC. FUNC.: 1 - Y 2 - N 3 - N

MAIN ST.: MISS (QUEEN) CONTROLLER TYPE: S4
NO. OF PH: 2 CONTROL MODE: CC

2. NS - Walk = 24 seconds
MISS (QUEEN) - FL. Don't Walk = 12 seconds
- Amber = 4 seconds
- All Red = 2 seconds

4. EB - Walk = 8 seconds
TANNERY ST - FL. Don't Walk = 8 seconds
- Sd. Don't Walk = 6 seconds
- Maximum = 22 seconds
- Amber = 4 seconds

```
                                    - All Red        =   2 seconds

                                  Total Cycle Length =  70 seconds

  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   520 21:30   /     /     /     /     /     /    LO  101   2     2    2
1080
  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   520 00:00   /     /     /     /     /     /    LO  101   2     2    2
   520 10:00  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080

  LOCATION:  MISS (QUEEN)@TANNERY            INTERSECTION NO.:   520
  DATE:      27-JUN-2017                     TIME:              10:00
  SCHEDULE:   3                              SPEC. FUNC.: 1 - Y  2 - N  3
- N

  MAIN ST.:  MISS (QUEEN)                    CONTROLLER TYPE:   S4
  NO. OF PH: 2                               CONTROL MODE:      CC

  2.   NS                          - Walk           =  24 seconds
       MISS (QUEEN)                - FL. Don't Walk =  12 seconds
                                   - Amber          =   4 seconds
                                   - All Red        =   2 seconds

  4.   EB                          - Walk           =   8 seconds
       TANNERY ST                  - FL. Don't Walk =   8 seconds
                                   - Sd. Don't Walk =   6 seconds
                                   - Maximum        =  22 seconds
                                   - Amber          =   4 seconds
                                   - All Red        =   2 seconds

                                  Total Cycle Length =  70 seconds

  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   520 18:30   /     /     /     /     /     /    LO  101   2     2    2
1080
?? SHOW CDT520
CYCLE DEFINITION TABLE: 520
```

```
 PHASE  DIR  VEH  PED   PED   AMBER  ALL  COMM  SPECIAL  STREET
             MIN  MIN  CLEAR        RED  DELAY FEATURE  NAME
   1                                      1
   2    NS       8    12      4     2     1    C       MISS (QUEEN)
   3                                      1
   4    EB       8     8      4     2     1            TANNERY ST
   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
?? SHOW DINTREP,ACT1-3,I520
  DAILY INTERSECTION REPORT FOR ACT SCH  1 ( MON TUE WED THU FRI )
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   520 00:00   /     /     /     /     /     /    LO  101   2     2    2
   520 07:00  1/1    /     /     /    1/1    /    CC  100   1     1    1
1080
   520 09:00  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080
   520 16:00  1/1    /     /     /    1/1    /    CC  110   3     3    3
1080
   520 18:30  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080
   520 21:30   /     /     /     /     /     /    LO  101   2     2    2
1080
  DAILY INTERSECTION REPORT FOR ACT SCH  2 ( SAT )
   520 00:00   /     /     /     /     /     /    LO  101   2     2    2
   520 09:00  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080
   520 21:30   /     /     /     /     /     /    LO  101   2     2    2
1080
  DAILY INTERSECTION REPORT FOR ACT SCH  3 ( SUN HOL )
   520 00:00   /     /     /     /     /     /    LO  101   2     2    2
   520 10:00  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080
   520 18:30   /     /     /     /     /     /    LO  101   2     2    2
1080
?? SHOW SPL1-3,I520
   SPLIT TABLE
    INTERSECTION  520           MISS (QUEEN)@TANNERY
    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        66      34                       0       0
     2        61      39                       0       0
     3        76      24                       0       0
?? SHOW OFF1-3,I520
   OFFSET TABLE
```

```
    INTERSECTION  520           MISS (QUEEN)@TANNERY
    OFFSET #   OFFSET %
        1         84
        2         69
        3         34
?? SHOW SPF1-3,I520
   SPECIAL FUNCTIONS
    INTERSECTION  520   MISS (QUEEN)@TANNERY
    SPECIAL   IN(Y)/OUT(N)
    FUNCTION  #  1   2   3
                NA  NA  CAL   PHASE OMIT
      1          Y   N   N
      2          Y   N   N
      3          Y   N   N
??
```

```
?? SHOW TIMING REPORT,ACT1-3,I524
  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   524 00:00   /     /     /     /     /     /    LO  101   2     2    2
   524 07:00  1/1    /     /     /    1/1    /    CC  100   1     1    1
1080

  LOCATION:  MISS (QUEEN)@ THOMAS            INTERSECTION NO.:   524
  DATE:      27-JUN-2017                     TIME:              07:00
  SCHEDULE:   1                              SPEC. FUNC.: 1 - Y  2 - Y  3
- N

  MAIN ST.:  MISS (QUEEN)                    CONTROLLER TYPE:   S4
  NO. OF PH: 2                               CONTROL MODE:      CC

  2.   NS                          - Walk           =  45 seconds
       MISS (QUEEN)                - FL. Don't Walk =   9 seconds
                                   - Amber          =   4 seconds
                                   - All Red        =   4 seconds

  4.   EB                          - Walk           =   8 seconds
       THOMAS ST                   - FL. Don't Walk =  12 seconds
                                   - Sd. Don't Walk =  12 seconds
                                   - Maximum        =  32 seconds
                                   - Amber          =   4 seconds
                                   - All Red        =   2 seconds

                                 Total Cycle Length = 100 seconds

  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   524 09:00  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080

  LOCATION:  MISS (QUEEN)@ THOMAS            INTERSECTION NO.:   524
  DATE:      27-JUN-2017                     TIME:              09:00
  SCHEDULE:   1                              SPEC. FUNC.: 1 - Y  2 - Y  3
- N

  MAIN ST.:  MISS (QUEEN)                    CONTROLLER TYPE:   S4
  NO. OF PH: 2                               CONTROL MODE:      CC

  2.   NS                          - Walk           =  22 seconds
       MISS (QUEEN)                - FL. Don't Walk =   9 seconds
                                   - Amber          =   4 seconds
                                   - All Red        =   4 seconds
```

```
  4.   EB                              - Walk           =   8 seconds
       THOMAS ST                       - FL. Don't Walk =  12 seconds
                                       - Sd. Don't Walk =   5 seconds
                                       - Maximum        =  25 seconds
                                       - Amber          =   4 seconds
                                       - All Red        =   2 seconds

                                     Total Cycle Length =  70 seconds

  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   524 16:00  1/1    /     /     /    1/1    /    CC  110   3     3    3
1080

  LOCATION:  MISS (QUEEN)@ THOMAS           INTERSECTION NO.:   524
  DATE:      27-JUN-2017                    TIME:              16:00
  SCHEDULE:   1                             SPEC. FUNC.: 1 - Y  2 - Y  3
- N

  MAIN ST.:  MISS (QUEEN)                   CONTROLLER TYPE:   S4
  NO. OF PH: 2                              CONTROL MODE:      CC

  2.   NS                              - Walk           =  61 seconds
       MISS (QUEEN)                    - FL. Don't Walk =   9 seconds
                                       - Amber          =   4 seconds
                                       - All Red        =   4 seconds

  4.   EB                              - Walk           =   8 seconds
       THOMAS ST                       - FL. Don't Walk =  12 seconds
                                       - Sd. Don't Walk =   6 seconds
                                       - Maximum        =  26 seconds
                                       - Amber          =   4 seconds
                                       - All Red        =   2 seconds

                                     Total Cycle Length = 110 seconds

  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   524 18:30  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080

  LOCATION:  MISS (QUEEN)@ THOMAS           INTERSECTION NO.:   524
  DATE:      27-JUN-2017                    TIME:              18:30
  SCHEDULE:   1                             SPEC. FUNC.: 1 - Y  2 - Y  3
- N
```

MAIN ST.: MISS (QUEEN) CONTROLLER TYPE: S4
NO. OF PH: 2 CONTROL MODE: CC

2. NS - Walk = 22 seconds
MISS (QUEEN) - FL. Don't Walk = 9 seconds
- Amber = 4 seconds
- All Red = 4 seconds

4. EB - Walk = 8 seconds
THOMAS ST - FL. Don't Walk = 12 seconds
- Sd. Don't Walk = 5 seconds
- Maximum = 25 seconds
- Amber = 4 seconds
- All Red = 2 seconds

Total Cycle Length = 70 seconds

SCHEDULED DATA

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 DUP FUNC ISEC
524	21:30	/	/	/	/	/	/	LO	101	2	2	2 1080

SCHEDULED DATA

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 DUP FUNC ISEC
524	00:00	/	/	/	/	/	/	LO	101	2	2	2
524	09:00	1/1	/	/	/	1/1	/	CC	70	2	2	2 1080

LOCATION: MISS (QUEEN)@ THOMAS INTERSECTION NO.: 524
DATE: 27-JUN-2017 TIME: 09:00
SCHEDULE: 2 SPEC. FUNC.: 1 - Y 2 - Y 3 - N

MAIN ST.: MISS (QUEEN) CONTROLLER TYPE: S4
NO. OF PH: 2 CONTROL MODE: CC

2. NS - Walk = 22 seconds
MISS (QUEEN) - FL. Don't Walk = 9 seconds
- Amber = 4 seconds
- All Red = 4 seconds

4. EB - Walk = 8 seconds
THOMAS ST - FL. Don't Walk = 12 seconds
- Sd. Don't Walk = 5 seconds
- Maximum = 25 seconds
- Amber = 4 seconds

```
                                    - All Red        =   2 seconds

                                  Total Cycle Length =  70 seconds

  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   524 21:30   /     /     /     /     /     /    LO  101   2     2    2
1080
  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   524 00:00   /     /     /     /     /     /    LO  101   2     2    2
   524 10:00  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080

  LOCATION:  MISS (QUEEN)@ THOMAS            INTERSECTION NO.:   524
  DATE:      27-JUN-2017                     TIME:              10:00
  SCHEDULE:   3                              SPEC. FUNC.: 1 - Y  2 - Y  3
- N

  MAIN ST.:  MISS (QUEEN)                    CONTROLLER TYPE:   S4
  NO. OF PH: 2                               CONTROL MODE:      CC

  2.   NS                          - Walk           =  22 seconds
       MISS (QUEEN)                - FL. Don't Walk =   9 seconds
                                   - Amber          =   4 seconds
                                   - All Red        =   4 seconds

  4.   EB                          - Walk           =   8 seconds
       THOMAS ST                   - FL. Don't Walk =  12 seconds
                                   - Sd. Don't Walk =   5 seconds
                                   - Maximum        =  25 seconds
                                   - Amber          =   4 seconds
                                   - All Red        =   2 seconds

                                  Total Cycle Length =  70 seconds

  SCHEDULED DATA
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   524 18:30   /     /     /     /     /     /    LO  101   2     2    2
1080
?? SHOW CDT524
CYCLE DEFINITION TABLE: 524
```

```
 PHASE  DIR  VEH  PED   PED   AMBER  ALL  COMM  SPECIAL  STREET
             MIN  MIN  CLEAR        RED  DELAY FEATURE  NAME
   1    NBL                              1             MISS (QUEEN)
   2    NS         8     9      4     4     1    C       MISS (QUEEN)
   3                                     1
   4    EB         8    12      4     2     1            THOMAS ST
   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
?? SHOW DINTREP,ACT1-3,I524
  DAILY INTERSECTION REPORT FOR ACT SCH  1 ( MON TUE WED THU FRI )
  INT  TIME          SELECTION PLANS  IN USE         ALTERNATES
             MODE   CYC   OFF  SPLT  SPEC  DUP   MODE CYC  OFF  SPLT SPEC
DUP
                    LEN   NO.  NO.   FUNC  ISEC       LEN  NO.   NO. FUNC
ISEC
   524 00:00   /     /     /     /     /     /    LO  101   2     2    2
   524 07:00  1/1    /     /     /    1/1    /    CC  100   1     1    1
1080
   524 09:00  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080
   524 16:00  1/1    /     /     /    1/1    /    CC  110   3     3    3
1080
   524 18:30  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080
   524 21:30   /     /     /     /     /     /    LO  101   2     2    2
1080
  DAILY INTERSECTION REPORT FOR ACT SCH  2 ( SAT )
   524 00:00   /     /     /     /     /     /    LO  101   2     2    2
   524 09:00  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080
   524 21:30   /     /     /     /     /     /    LO  101   2     2    2
1080
  DAILY INTERSECTION REPORT FOR ACT SCH  3 ( SUN HOL )
   524 00:00   /     /     /     /     /     /    LO  101   2     2    2
   524 10:00  1/1    /     /     /    1/1    /    CC   70   2     2    2
1080
   524 18:30   /     /     /     /     /     /    LO  101   2     2    2
1080
?? SHOW SPL1-3,I524
   SPLIT TABLE
    INTERSECTION  524          MISS (QUEEN)@ THOMAS
    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
          NBL NS      EB
     1        62      38                       0       0
     2        57      43                       0       0
     3        71      29                       0       0
?? SHOW OFF1-3,I524
   OFFSET TABLE
```

```
    INTERSECTION  524           MISS (QUEEN)@ THOMAS
    OFFSET #   OFFSET %
        1         70
        2         63
        3         53
?? SHOW SPF1-3,I524
   SPECIAL FUNCTIONS
    INTERSECTION  524   MISS (QUEEN)@ THOMAS
    SPECIAL   IN(Y)/OUT(N)
    FUNCTION  #  1   2   3
                NA  NA  CAL   PHASE OMIT
      1          Y   Y   N
      2          Y   Y   N
      3          Y   Y   N
??
```

APPENDIX B

Existing Traffic Conditions

Timings
2: Queen St & Tannery St

AM PEAK

02/23/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	118	5	4	1	86	461	7	244
Future Volume (vph)	118	5	4	1	86	461	7	244
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)	32.0	32.0	32.0	32.0	46.0	46.0	46.0	46.0
Minimum Split (s)	38.0	38.0	38.0	38.0	52.0	52.0	52.0	52.0
Total Split (s)	38.0	38.0	38.0	38.0	52.0	52.0	52.0	52.0
Total Split (%)	42.2%	42.2%	42.2%	42.2%	57.8%	57.8%	57.8%	57.8%
Yellow Time (s)	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	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0		6.0		6.0		6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Ped	Ped	Ped	Ped	Max	Max	Max	Max
Act Effct Green (s)	32.0	32.0		32.0		46.0		46.0
Actuated g/C Ratio	0.36	0.36		0.36		0.51		0.51
v/c Ratio	0.25	0.13		0.03		0.66		0.35
Control Delay	22.3	6.3		12.4		21.0		13.4
Queue Delay	0.0	0.0		0.0		0.0		0.0
Total Delay	22.3	6.3		12.4		21.0		13.4
LOS	C	A		B		C		B
Approach Delay		15.9		12.4		21.0		13.4
Approach LOS		B		B		C		B

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 17.7		Intersection LOS: B	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 2: Queen St & Tannery St

HCM Unsignalized Intersection Capacity Analysis
1: Joymar Dr & Tannery St

02/23/2018

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	19	0	2	36	144	0	1	1	381	6	23
Future Volume (vph)	7	19	0	2	36	144	0	1	1	381	6	23
Peak Hour Factor	0.92	0.92	0.92	1.00	0.92	1.00	0.92	1.00	1.00	1.00	1.00	0.92
Hourly flow rate (vph)	8	21	0	2	39	144	0	1	1	381	6	25

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	29	185	2	412
Volume Left (vph)	8	2	0	381
Volume Right (vph)	0	144	1	25
Hadj (s)	0.09	-0.46	-0.30	0.15
Departure Headway (s)	5.2	4.5	4.6	4.6
Degree Utilization, x	0.04	0.23	0.00	0.52
Capacity (veh/h)	619	737	715	760
Control Delay (s)	8.5	8.8	7.6	12.5
Approach Delay (s)	8.5	8.8	7.6	12.5
Approach LOS	A	A	A	B

Intersection Summary				
Delay		11.2		
Level of Service		B		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
2: Queen St & Tannery St

02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	5	72	4	1	10	86	461	14	7	244	67
Future Volume (vph)	118	5	72	4	1	10	86	461	14	7	244	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.95			0.96			1.00			0.98	
Flpb, ped/bikes	0.96	1.00			0.99			0.99			1.00	
Frt	1.00	0.86			0.91			1.00			0.97	
Flt Protected	0.95	1.00			0.99			0.99			1.00	
Satd. Flow (prot)	1709	1529			1601			1845			1792	
Flt Permitted	0.75	1.00			0.96			0.89			0.99	
Satd. Flow (perm)	1345	1529			1553			1657			1773	
Peak-hour factor, PHF	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)	118	5	72	4	1	10	86	461	14	7	244	67
RTOR Reduction (vph)	0	46	0	0	6	0	0	1	0	0	11	0
Lane Group Flow (vph)	118	31	0	0	9	0	0	560	0	0	307	0
Confl. Peds. (#/hr)	26		21	21		26	32		29	29		32
Confl. Bikes (#/hr)			3			2						2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.0	32.0			32.0			46.0			46.0	
Effective Green, g (s)	32.0	32.0			32.0			46.0			46.0	
Actuated g/C Ratio	0.36	0.36			0.36			0.51			0.51	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	478	543			552			846			906	
v/s Ratio Prot		0.02										
v/s Ratio Perm	c0.09				0.01			c0.34			0.17	
v/c Ratio	0.25	0.06			0.02			0.66			0.34	
Uniform Delay, d1	20.5	19.1			18.8			16.3			13.0	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.3	0.0			0.0			4.1			1.0	
Delay (s)	20.8	19.1			18.8			20.3			14.0	
Level of Service	C	B			B			C			B	
Approach Delay (s)		20.1			18.8			20.3			14.0	
Approach LOS		C			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	108.6%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Queues
2: Queen St & Tannery St

02/23/2018

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	118	77	15	561	318
v/c Ratio	0.25	0.13	0.03	0.66	0.35
Control Delay	22.3	6.3	12.4	21.0	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	6.3	12.4	21.0	13.4
Queue Length 50th (m)	14.2	0.6	0.6	67.9	28.6
Queue Length 95th (m)	27.0	9.2	4.5	103.5	46.2
Internal Link Dist (m)		271.4	49.6	443.9	101.6
Turn Bay Length (m)	35.0				
Base Capacity (vph)	478	590	558	846	916
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	0.25	0.13	0.03	0.66	0.35

Intersection Summary

Queues
3: Queen St & Thomas St

02/23/2018

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	361	120	59	374	382
v/c Ratio	0.71	0.24	0.11	0.35	0.37
Control Delay	37.7	6.1	9.7	11.5	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	6.1	9.7	11.5	10.2
Queue Length 50th (m)	55.5	0.0	4.3	31.6	27.6
Queue Length 95th (m)	85.7	11.9	10.1	49.8	46.2
Internal Link Dist (m)	320.4			113.4	443.9
Turn Bay Length (m)			40.0		
Base Capacity (vph)	519	514	521	1071	1023
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	0.70	0.23	0.11	0.35	0.37

Intersection Summary

Timings
3: Queen St & Thomas St

02/23/2018

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	361	120	59	374	243
Future Volume (vph)	361	120	59	374	243
Turn Type	Prot	Perm	Perm	NA	NA
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	25.0	25.0	5.0	5.0	5.0
Minimum Split (s)	31.0	31.0	23.0	23.0	26.0
Total Split (s)	32.0	32.0	58.0	58.0	58.0
Total Split (%)	35.6%	35.6%	64.4%	64.4%	64.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Ped	Ped	Max	Max	Max
Act Effct Green (s)	25.4	25.4	51.0	51.0	51.0
Actuated g/C Ratio	0.28	0.28	0.57	0.57	0.57
v/c Ratio	0.71	0.24	0.11	0.35	0.37
Control Delay	37.7	6.1	9.7	11.5	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	6.1	9.7	11.5	10.2
LOS	D	A	A	B	B
Approach Delay	29.8			11.3	10.2
Approach LOS	C			B	B

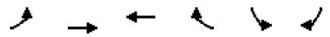
Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 17.8 — Intersection LOS: B
Intersection Capacity Utilization 63.9% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: Queen St & Thomas St

HCM Unsignalized Intersection Capacity Analysis
4: Thomas St & Joymar Dr

02/23/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	1223	338	5	1	3
Future Volume (Veh/h)	4	1223	338	5	1	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	1223	338	5	1	3
Pedestrians		7	7		4	
Lane Width (m)		3.5	3.5		3.5	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		1	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			218			
pX, platoon unblocked						
vC, conflicting volume	347				971	182
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	347				971	182
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1219				251	827

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	412	815	225	118	1	3
Volume Left	4	0	0	0	1	0
Volume Right	0	0	0	5	0	3
cSH	1219	1700	1700	1700	251	827
Volume to Capacity	0.00	0.48	0.13	0.07	0.00	0.00
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.1	0.1
Control Delay (s)	0.1	0.0	0.0	0.0	19.4	9.4
Lane LOS	A				C	A
Approach Delay (s)	0.0		0.0		11.9	
Approach LOS					B	

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	48.7%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: Queen St & Thomas St

02/23/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	361	120	59	374	243	139
Future Volume (vph)	361	120	59	374	243	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.93	1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1785	1479	1747	1879	1754	
Flt Permitted	0.95	1.00	0.50	1.00	1.00	
Satd. Flow (perm)	1785	1479	920	1879	1754	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	361	120	59	374	243	139
RTOR Reduction (vph)	0	86	0	0	23	0
Lane Group Flow (vph)	361	34	59	374	359	0
Confl. Peds. (#/hr)	17	20	28			28
Confl. Bikes (#/hr)		2				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	25.4	25.4	51.0	51.0	51.0	
Effective Green, g (s)	25.4	25.4	51.0	51.0	51.0	
Actuated g/C Ratio	0.28	0.28	0.57	0.57	0.57	
Clearance Time (s)	6.0	6.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	507	420	524	1071	1000	
v/s Ratio Prot	c0.20			0.20	c0.20	
v/s Ratio Perm		0.02	0.06			
v/c Ratio	0.71	0.08	0.11	0.35	0.36	
Uniform Delay, d1	28.7	23.4	8.8	10.3	10.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.7	0.1	0.4	0.9	1.0	
Delay (s)	33.4	23.5	9.2	11.2	11.4	
Level of Service	C	C	A	B	B	
Approach Delay (s)	30.9			10.9	11.4	
Approach LOS	C			B	B	

Intersection Summary				
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	89.4	Sum of lost time (s)		13.0
Intersection Capacity Utilization	63.9%	ICU Level of Service		B
Analysis Period (min)	15			

c Critical Lane Group

Queues
5: GO Station & Thomas St

02/23/2018

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1224	298	174	80	3
v/c Ratio	0.60	0.22	0.78	0.19	0.01
Control Delay	10.1	4.9	63.3	7.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	4.9	63.3	7.4	0.0
Queue Length 50th (m)	55.7	8.3	32.3	0.0	0.0
Queue Length 95th (m)	80.1	13.2	#58.4	10.1	0.0
Internal Link Dist (m)	194.1	107.3	76.3		58.2
Turn Bay Length (m)					
Base Capacity (vph)	2041	1360	249	665	334
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	0.60	0.22	0.70	0.12	0.01

Intersection Summary

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

Timings
5: GO Station & Thomas St

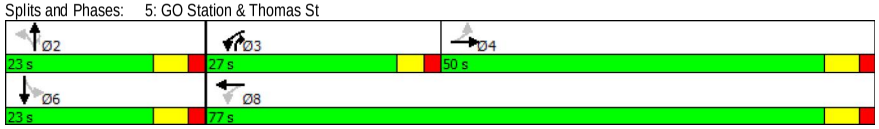
02/23/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	657	129	168	174	0	80	2	0
Future Volume (vph)	2	657	129	168	174	0	80	2	0
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases		4	3	8		2	3		6
Permitted Phases	4		8		2		2	6	
Detector Phase	4	4	3	8	2	2	3	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	50.0	50.0	10.0	77.0	23.0	23.0	10.0	23.0	23.0
Total Split (s)	50.0	50.0	27.0	77.0	23.0	23.0	27.0	23.0	23.0
Total Split (%)	50.0%	50.0%	27.0%	77.0%	23.0%	23.0%	27.0%	23.0%	23.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0
Total Lost Time (s)		6.0		6.0		6.0	5.0		6.0
Lead/Lag	Lag	Lag	Lead				Lead		
Lead-Lag Optimize?	Yes	Yes	Yes				Yes		
Recall Mode	Max	Max	None	Max	Min	Min	None	Min	Min
Act Effct Green (s)		62.7		71.0		15.6	22.2		15.6
Actuated g/C Ratio		0.64		0.72		0.16	0.22		0.16
v/c Ratio		0.60		0.22		0.78	0.19		0.01
Control Delay		10.1		4.9		63.3	7.4		0.0
Queue Delay		0.0		0.0		0.0	0.0		0.0
Total Delay		10.1		4.9		63.3	7.4		0.0
LOS		B		A		E	A		A
Approach Delay		10.1		4.9		45.7			
Approach LOS		B		A		D			

Intersection Summary

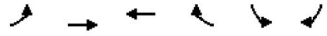
Cycle Length: 100
Actuated Cycle Length: 98.7
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 14.3 — Intersection LOS: B
Intersection Capacity Utilization 78.8% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 5: GO Station & Thomas St



HCM Unsignalized Intersection Capacity Analysis
7: Thomas St & Emby Dr

02/23/2018



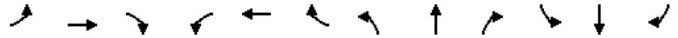
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	730	295	3	3	3
Future Volume (Veh/h)	9	730	295	3	3	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	730	295	3	3	3
Pedestrians		8	1			
Lane Width (m)		3.7	3.7			
Walking Speed (m/s)		1.1	1.1			
Percent Blockage		1	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		131	43			
pX, platoon unblocked	0.99				0.99	0.99
vC, conflicting volume	298				680	157
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	281				666	139
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	100
cM capacity (veh/h)	1285				391	877

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	252	487	197	101	6
Volume Left	9	0	0	0	3
Volume Right	0	0	0	3	3
cSH	1285	1700	1700	1700	541
Volume to Capacity	0.01	0.29	0.12	0.06	0.01
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.3
Control Delay (s)	0.3	0.0	0.0	0.0	11.7
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		11.7
Approach LOS					B

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	38.9%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
5: GO Station & Thomas St

02/23/2018



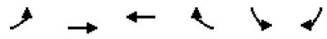
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	657	565	129	168	1	174	0	80	2	0	1
Future Volume (vph)	2	657	565	129	168	1	174	0	80	2	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0			6.0			6.0	5.0		6.0	
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	
Frpb, ped/bikes		0.96			1.00			1.00	0.97		0.99	
Flpb, ped/bikes		1.00			1.00			1.00	1.00		0.99	
Frt		0.93			1.00			1.00	0.85		0.95	
Flt Protected		1.00			0.98			0.95	1.00		0.97	
Satd. Flow (prot)		3199			3492			1779	1557		1708	
Flt Permitted		0.95			0.51			0.76	1.00		0.84	
Satd. Flow (perm)		3054			1804			1416	1557		1491	
Peak-hour factor, PHF	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)	2	657	565	129	168	1	174	0	80	2	0	1
RTOR Reduction (vph)	0	103	0	0	0	0	0	0	64	0	3	0
Lane Group Flow (vph)	0	1121	0	0	298	0	0	174	16	0	0	0
Confl. Peds. (#/hr)	17		18	18		17	2		13	13		2
Confl. Bikes (#/hr)			3									3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases		4		3	8			2	3		6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		62.7			72.1			15.7	20.1		15.7	
Effective Green, g (s)		62.7			72.1			15.7	20.1		15.7	
Actuated g/C Ratio		0.63			0.72			0.16	0.20		0.16	
Clearance Time (s)		6.0			6.0			6.0	5.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		1918			1377			222	313		234	
v/s Ratio Prot					c0.01				0.00			
v/s Ratio Perm		c0.37			0.15			c0.12	0.01		0.00	
v/c Ratio		0.58			0.22			0.78	0.05		0.00	
Uniform Delay, d1		10.9			4.6			40.4	32.2		35.4	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.3			0.1			16.4	0.1		0.0	
Delay (s)		12.2			4.6			56.8	32.2		35.4	
Level of Service		B			A			E	C		D	
Approach Delay (s)		12.2			4.6			49.1			35.4	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
15: Tannery St & Rutledge Rd

02/23/2018



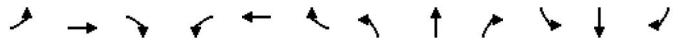
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	400	181	9	2	1
Future Volume (Veh/h)	1	400	181	9	2	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	400	181	9	2	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			129			
pX, platoon unblocked						
vC, conflicting volume	190				588	186
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	190				588	186
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1396				475	862

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	401	190	3
Volume Left	1	0	2
Volume Right	0	9	1
cSH	1396	1700	558
Volume to Capacity	0.00	0.11	0.01
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	11.5
Lane LOS	A		B
Approach Delay (s)	0.0	0.0	11.5
Approach LOS			B

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	31.8%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
13: Broadway St/Crumbie St & Tannery St

02/23/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	160	209	30	120	4	49	14	25	10	12	21
Future Volume (Veh/h)	33	160	209	30	120	4	49	14	25	10	12	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	41	200	261	30	120	4	49	14	25	10	12	21
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		57			295							
pX, platoon unblocked												
vC, conflicting volume	124			461			622	596	330	626	725	122
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	124			461			622	596	330	626	725	122
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			87	96	97	97	96	98
cM capacity (veh/h)	1475			1111			367	397	716	359	335	935

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	502	154	88	43
Volume Left	41	30	49	10
Volume Right	261	4	25	21
cSH	1475	1111	432	499
Volume to Capacity	0.03	0.03	0.20	0.09
Queue Length 95th (m)	0.7	0.6	5.7	2.1
Control Delay (s)	0.9	1.8	15.5	12.9
Lane LOS	A	A	C	B
Approach Delay (s)	0.9	1.8	15.5	12.9
Approach LOS			C	B

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	42.9%	ICU Level of Service		A
Analysis Period (min)	15			

Queues
19: Rail Corridor & Tannery St 02/23/2018

Lane Group
Lane Group Flow (vph)
v/c Ratio
Control Delay
Queue Delay
Total Delay
Queue Length 50th (m)
Queue Length 95th (m)
Internal Link Dist (m)
Turn Bay Length (m)
Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced v/c Ratio

Intersection Summary

Timings
19: Rail Corridor & Tannery St 02/23/2018

Lane Group	Ø2	Ø4	Ø6	Ø8
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type				
Protected Phases	2	4	6	8
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	120.0	1680.0	120.0	1680.0
Total Split (%)	7%	93%	7%	93%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary		
Cycle Length: 1800		
Actuated Cycle Length: 1800		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 45		
Control Type: Pretimed		
Maximum v/c Ratio: 0.00		
Intersection Signal Delay: 0.0		Intersection LOS: A
Intersection Capacity Utilization 0.0%		ICU Level of Service A
Analysis Period (min) 15		

Splits and Phases: 19: Rail Corridor & Tannery St

Timings
23: Rail Corridor & Thomas St

02/23/2018

Lane Group	EBT	WBT	Ø2	Ø6
Lane Configurations				
Traffic Volume (vph)	733	298		
Future Volume (vph)	733	298		
Turn Type	NA	NA		
Protected Phases	4	8	2	6
Permitted Phases				
Detector Phase	4	8		
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	1680.0	1680.0	120.0	120.0
Total Split (%)	93.3%	93.3%	7%	7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		
Total Lost Time (s)	4.5	4.5		
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	1675.5	1675.5		
Actuated g/C Ratio	0.93	0.93		
v/c Ratio	0.24	0.09		
Control Delay	5.7	4.8		
Queue Delay	12.6	2.5		
Total Delay	18.3	7.3		
LOS	B	A		
Approach Delay	18.3	7.3		
Approach LOS	B	A		

Intersection Summary			
Cycle Length: 1800			
Actuated Cycle Length: 1800			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 45			
Control Type: Pretimed			
Maximum v/c Ratio: 0.24			
Intersection Signal Delay: 15.3		Intersection LOS: B	
Intersection Capacity Utilization 24.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Rail Corridor & Thomas St

HCM Signalized Intersection Capacity Analysis
19: Rail Corridor & Tannery St

02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Peak-hour factor, PHF	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)	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	0.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
23: Rail Corridor & Thomas St

02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	733	0	0	298	0	0	0	0	0	0	0
Future Volume (vph)	0	733	0	0	298	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5							
Lane Util. Factor		0.95			0.95							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3579			3579							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3579			3579							
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	797	0	0	298	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	797	0	0	298	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)		1675.5			1675.5							
Effective Green, g (s)		1675.5			1675.5							
Actuated g/C Ratio		0.93			0.93							
Clearance Time (s)		4.5			4.5							
Lane Grp Cap (vph)		3331			3331							
v/s Ratio Prot		c0.22			0.08							
v/s Ratio Perm												
v/c Ratio		0.24			0.09							
Uniform Delay, d1		5.5			4.7							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.2			0.1							
Delay (s)		5.7			4.7							
Level of Service		A			A							
Approach Delay (s)		5.7			4.7			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues
23: Rail Corridor & Thomas St

02/23/2018

Lane Group	EBT	WBT
Lane Group Flow (vph)	797	298
v/c Ratio	0.24	0.09
Control Delay	5.7	4.8
Queue Delay	12.6	2.5
Total Delay	18.3	7.3
Queue Length 50th (m)	135.0	42.8
Queue Length 95th (m)	130.7	43.7
Internal Link Dist (m)	19.3	320.4
Turn Bay Length (m)		
Base Capacity (vph)	3331	3331
Starvation Cap Reductn	2515	2891
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.98	0.68

Intersection Summary

Timings
2: Queen St & Tannery St

PM PEAK

02/23/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	91	5	3	7	42	473	12	440
Future Volume (vph)	91	5	3	7	42	473	12	440
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)	25.0	25.0	25.0	25.0	46.0	46.0	46.0	46.0
Minimum Split (s)	31.0	31.0	31.0	31.0	52.0	52.0	52.0	52.0
Total Split (s)	31.0	31.0	31.0	31.0	79.0	79.0	79.0	79.0
Total Split (%)	28.2%	28.2%	28.2%	28.2%	71.8%	71.8%	71.8%	71.8%
Yellow Time (s)	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	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0		6.0		6.0		6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Ped	Ped	Ped	Ped	Max	Max	Max	Max
Act Effct Green (s)	25.0	25.0		25.0		73.0		73.0
Actuated g/C Ratio	0.23	0.23		0.23		0.66		0.66
v/c Ratio	0.31	0.21		0.05		0.46		0.48
Control Delay	38.8	10.2		24.8		10.5		10.3
Queue Delay	0.0	0.0		0.0		0.0		0.0
Total Delay	38.8	10.2		24.8		10.5		10.3
LOS	D	B		C		B		B
Approach Delay		25.1		24.8		10.5		10.3
Approach LOS		C		C		B		B

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 110			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 12.6		Intersection LOS: B	
Intersection Capacity Utilization 78.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Queen St & Tannery St

HCM Unsignalized Intersection Capacity Analysis
1: Joymar Dr & Tannery St

02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	6	3	63	5	188	2	13	16	185	35	2
Future Volume (vph)	1	6	3	63	5	188	2	13	16	185	35	2
Peak Hour Factor	0.92	0.92	0.92	1.00	0.92	1.00	0.92	1.00	1.00	1.00	1.00	0.92
Hourly flow rate (vph)	1	7	3	63	5	188	2	13	16	185	35	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	256	31	222
Volume Left (vph)	1	63	2	185
Volume Right (vph)	3	188	16	2
Hadj (s)	-0.11	-0.39	-0.29	0.16
Departure Headway (s)	4.7	4.1	4.5	4.7
Degree Utilization, x	0.01	0.29	0.04	0.29
Capacity (veh/h)	701	820	742	726
Control Delay (s)	7.8	8.9	7.7	9.6
Approach Delay (s)	7.8	8.9	7.7	9.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay		9.1		
Level of Service		A		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
2: Queen St & Tannery St

02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	5	78	3	7	7	42	473	7	12	440	112
Future Volume (vph)	91	5	78	3	7	7	42	473	7	12	440	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.92			0.96			1.00			0.98	
Flpb, ped/bikes	0.93	1.00			0.99			1.00			1.00	
Frt	1.00	0.86			0.94			1.00			0.97	
Flt Protected	0.95	1.00			0.99			1.00			1.00	
Satd. Flow (prot)	1660	1491			1676			1862			1792	
Flt Permitted	0.75	1.00			0.97			0.93			0.99	
Satd. Flow (perm)	1304	1491			1634			1729			1771	
Peak-hour factor, PHF	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)	91	5	78	3	7	7	42	473	7	12	440	112
RTOR Reduction (vph)	0	60	0	0	5	0	0	0	0	0	8	0
Lane Group Flow (vph)	91	23	0	0	12	0	0	522	0	0	556	0
Confl. Peds. (#/hr)	26		21	21		26	32		29	29		32
Confl. Bikes (#/hr)			3			2						2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.0	25.0			25.0			73.0			73.0	
Effective Green, g (s)	25.0	25.0			25.0			73.0			73.0	
Actuated g/C Ratio	0.23	0.23			0.23			0.66			0.66	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	296	338			371			1147			1175	
v/s Ratio Prot		0.02										
v/s Ratio Perm	c0.07				0.01			0.30			c0.31	
v/c Ratio	0.31	0.07			0.03			0.45			0.47	
Uniform Delay, d1	35.3	33.4			33.1			8.9			9.1	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.6	0.1			0.0			1.3			1.4	
Delay (s)	35.9	33.4			33.1			10.2			10.4	
Level of Service	D	C			C			B			B	
Approach Delay (s)		34.7			33.1			10.2			10.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues
2: Queen St & Tannery St

02/23/2018

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	91	83	17	522	564
v/c Ratio	0.31	0.21	0.05	0.46	0.48
Control Delay	38.8	10.2	24.8	10.5	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	10.2	24.8	10.5	10.3
Queue Length 50th (m)	16.3	0.8	1.7	48.8	51.4
Queue Length 95th (m)	31.1	13.0	7.4	70.3	74.1
Internal Link Dist (m)		271.4	49.6	443.9	101.6
Turn Bay Length (m)	35.0				
Base Capacity (vph)	295	399	376	1147	1182
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	0.05	0.46	0.48

Intersection Summary

Queues
3: Queen St & Thomas St

02/23/2018

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	178	130	138	416	678
v/c Ratio	0.42	0.29	0.38	0.34	0.60
Control Delay	39.3	7.8	12.8	9.8	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	7.8	12.8	9.8	12.6
Queue Length 50th (m)	32.6	0.0	12.7	37.2	68.9
Queue Length 95th (m)	53.3	14.5	25.8	53.9	101.4
Internal Link Dist (m)	320.4			113.4	443.9
Turn Bay Length (m)			40.0		
Base Capacity (vph)	421	447	367	1212	1134
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	0.29	0.38	0.34	0.60

Intersection Summary

Timings
3: Queen St & Thomas St

02/23/2018

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	178	130	138	416	392
Future Volume (vph)	178	130	138	416	392
Turn Type	Prot	Perm	Perm	NA	NA
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	26.0	26.0	5.0	5.0	5.0
Minimum Split (s)	32.0	32.0	23.0	23.0	26.0
Total Split (s)	32.0	32.0	78.0	78.0	78.0
Total Split (%)	29.1%	29.1%	70.9%	70.9%	70.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Ped	Ped	Max	Max	Max
Act Effct Green (s)	26.0	26.0	71.0	71.0	71.0
Actuated g/C Ratio	0.24	0.24	0.65	0.65	0.65
v/c Ratio	0.42	0.29	0.38	0.34	0.60
Control Delay	39.3	7.8	12.8	9.8	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	7.8	12.8	9.8	12.6
LOS	D	A	B	A	B
Approach Delay	26.0			10.6	12.6
Approach LOS	C			B	B

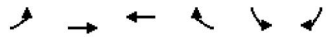
Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 14.6 Intersection LOS: B
Intersection Capacity Utilization 85.2% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Queen St & Thomas St

HCM Unsignalized Intersection Capacity Analysis
4: Thomas St & Joymar Dr

02/23/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	464	999	23	6	89
Future Volume (Veh/h)	13	464	999	23	6	89
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	13	464	999	23	6	89
Pedestrians		7	7		4	
Lane Width (m)		3.5	3.5		3.5	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		1	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			218			
pX, platoon unblocked	0.92				0.92	0.92
vC, conflicting volume	1026				1280	522
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	858				1133	311
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	86
cM capacity (veh/h)	727				179	630

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	168	309	666	356	6	89
Volume Left	13	0	0	0	6	0
Volume Right	0	0	0	23	0	89
cSH	727	1700	1700	1700	179	630
Volume to Capacity	0.02	0.18	0.39	0.21	0.03	0.14
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.8	3.7
Control Delay (s)	1.0	0.0	0.0	0.0	25.8	11.7
Lane LOS	A				D	B
Approach Delay (s)	0.3		0.0		12.5	
Approach LOS					B	

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: Queen St & Thomas St

02/23/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	178	130	138	416	392	286
Future Volume (vph)	178	130	138	416	392	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.92	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1785	1474	1785	1879	1721	
Flt Permitted	0.95	1.00	0.31	1.00	1.00	
Satd. Flow (perm)	1785	1474	587	1879	1721	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	178	130	138	416	392	286
RTOR Reduction (vph)	0	99	0	0	24	0
Lane Group Flow (vph)	178	31	138	416	654	0
Confl. Peds. (#/hr)	17	20	28			28
Confl. Bikes (#/hr)		2				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	26.0	26.0	71.0	71.0	71.0	
Effective Green, g (s)	26.0	26.0	71.0	71.0	71.0	
Actuated g/C Ratio	0.24	0.24	0.65	0.65	0.65	
Clearance Time (s)	6.0	6.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	421	348	378	1212	1110	
v/s Ratio Prot	c0.10			0.22	c0.38	
v/s Ratio Perm		0.02	0.24			
v/c Ratio	0.42	0.09	0.37	0.34	0.59	
Uniform Delay, d1	35.6	32.8	9.0	8.9	11.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.1	2.7	0.8	2.3	
Delay (s)	36.3	32.9	11.8	9.7	13.5	
Level of Service	D	C	B	A	B	
Approach Delay (s)	34.9			10.2	13.5	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues
5: GO Station & Thomas St

02/23/2018

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	470	701	386	146	9
v/c Ratio	0.37	0.42	0.82	0.20	0.02
Control Delay	18.9	14.3	39.9	3.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	14.3	39.9	3.0	0.0
Queue Length 50th (m)	23.9	31.6	53.9	0.7	0.0
Queue Length 95th (m)	46.0	60.1	85.4	8.5	0.0
Internal Link Dist (m)	194.1	107.3	76.3		58.2
Turn Bay Length (m)					
Base Capacity (vph)	1270	1709	782	858	915
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	0.37	0.41	0.49	0.17	0.01

Intersection Summary

Timings
5: GO Station & Thomas St

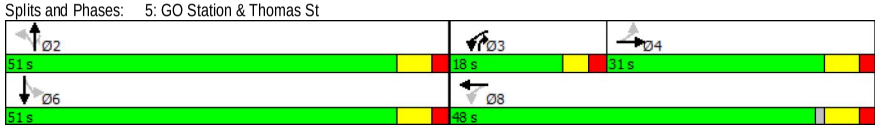
02/23/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	3	358	48	647	367	0	139	1	0
Future Volume (vph)	3	358	48	647	367	0	139	1	0
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases		4	3	8		2	3		6
Permitted Phases	4		8		2		2	6	
Detector Phase	4	4	3	8	2	2	3	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	21.0	21.0	10.0	21.0	25.0	25.0	10.0	25.0	25.0
Total Split (s)	31.0	31.0	18.0	48.0	51.0	51.0	18.0	51.0	51.0
Total Split (%)	31.0%	31.0%	18.0%	48.0%	51.0%	51.0%	18.0%	51.0%	51.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0
Total Lost Time (s)		6.0		6.0		6.0	5.0		6.0
Lead/Lag	Lag	Lag	Lead				Lead		
Lead-Lag Optimize?	Yes	Yes	Yes				Yes		
Recall Mode	Max	Max	None	Max	Min	Min	None	Min	Min
Act Effct Green (s)		31.8		42.4		27.2	33.9		27.2
Actuated g/C Ratio		0.39		0.52		0.33	0.41		0.33
v/c Ratio		0.37		0.42		0.82	0.20		0.02
Control Delay		18.9		14.3		39.9	3.0		0.0
Queue Delay		0.0		0.0		0.0	0.0		0.0
Total Delay		18.9		14.3		39.9	3.0		0.0
LOS		B		B		D	A		A
Approach Delay		18.9		14.3		29.8			
Approach LOS		B		B		C			

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 81.8
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 20.3 — Intersection LOS: C
Intersection Capacity Utilization 75.4% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 5: GO Station & Thomas St



HCM Unsignalized Intersection Capacity Analysis
7: Thomas St & Emby Dr

02/23/2018

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	490	685	10	11	16
Future Volume (Veh/h)	8	490	685	10	11	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	8	490	685	10	11	16
Pedestrians		8	1			
Lane Width (m)		3.7	3.7			
Walking Speed (m/s)		1.1	1.1			
Percent Blockage		1	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		131	43			
pX, platoon unblocked	0.98				0.96	0.98
vC, conflicting volume	695				952	356
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	656				788	311
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	925				316	674

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	171	327	457	238	27
Volume Left	8	0	0	0	11
Volume Right	0	0	0	10	16
cSH	925	1700	1700	1700	461
Volume to Capacity	0.01	0.19	0.27	0.14	0.06
Queue Length 95th (m)	0.2	0.0	0.0	0.0	1.4
Control Delay (s)	0.5	0.0	0.0	0.0	13.3
Lane LOS	A				B
Approach Delay (s)	0.2		0.0		13.3
Approach LOS					B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
5: GO Station & Thomas St

02/23/2018

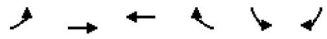
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	358	109	48	647	6	367	0	139	1	0	8
Future Volume (vph)	3	358	109	48	647	6	367	0	139	1	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0			6.0			6.0	5.0		6.0	
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	
Frpb, ped/bikes		0.98			1.00			1.00	0.98		0.99	
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	
Frt		0.97			1.00			1.00	0.85		0.88	
Flt Protected		1.00			1.00			0.95	1.00		0.99	
Satd. Flow (prot)		3388			3547			1780	1559		1619	
Flt Permitted		0.95			0.89			0.75	1.00		0.97	
Satd. Flow (perm)		3223			3178			1409	1559		1577	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Adj. Flow (vph)	3	358	109	48	647	6	386	0	146	1	0	8
RTOR Reduction (vph)	0	23	0	0	0	0	0	0	82	0	6	0
Lane Group Flow (vph)	0	447	0	0	701	0	0	386	64	0	3	0
Confl. Peds. (#/hr)	17		18	18		17	2		13	13		2
Confl. Bikes (#/hr)			3									3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases		4		3	8			2	3		6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		31.8			42.4			27.2	32.8		27.2	
Effective Green, g (s)		31.8			42.4			27.2	32.8		27.2	
Actuated g/C Ratio		0.39			0.52			0.33	0.40		0.33	
Clearance Time (s)		6.0			6.0			6.0	5.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		1256			1676			469	626		525	
v/s Ratio Prot					c0.03				0.01			
v/s Ratio Perm		0.14			c0.19			c0.27	0.03		0.00	
v/c Ratio		0.36			0.42			0.82	0.10		0.01	
Uniform Delay, d1		17.6			12.0			25.0	15.2		18.2	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.8			0.2			11.1	0.1		0.0	
Delay (s)		18.4			12.2			36.1	15.3		18.2	
Level of Service		B			B			D	B		B	
Approach Delay (s)		18.4			12.2			30.4			18.2	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	81.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
15: Tannery St & Rutledge Rd

02/23/2018



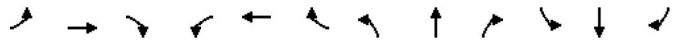
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	207	256	0	3	0
Future Volume (Veh/h)	0	207	256	0	3	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	207	256	0	3	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			129			
pX, platoon unblocked						
vC, conflicting volume	256				463	256
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	256				463	256
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1321				561	788

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	207	256	3
Volume Left	0	0	3
Volume Right	0	0	0
cSH	1321	1700	561
Volume to Capacity	0.00	0.15	0.01
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	11.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.5
Approach LOS			B

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		23.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
13: Broadway St/Crumbie St & Tannery St

02/23/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	101	87	50	98	13	93	40	55	18	46	65
Future Volume (Veh/h)	22	101	87	50	98	13	93	40	55	18	46	65
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	22	101	87	50	98	13	93	40	55	18	46	65
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		57			295							
pX, platoon unblocked												
vC, conflicting volume	111			188			481	400	144	468	436	104
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	111			188			481	400	144	468	436	104
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			78	92	94	96	91	93
cM capacity (veh/h)	1492			1398			415	515	908	433	491	956

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	210	161	188	129
Volume Left	22	50	93	18
Volume Right	87	13	55	65
cSH	1492	1398	519	634
Volume to Capacity	0.01	0.04	0.36	0.20
Queue Length 95th (m)	0.3	0.8	12.5	5.8
Control Delay (s)	0.9	2.6	15.8	12.1
Lane LOS	A	A	C	B
Approach Delay (s)	0.9	2.6	15.8	12.1
Approach LOS			C	B

Intersection Summary				
Average Delay		7.5		
Intersection Capacity Utilization		43.1%	ICU Level of Service	A
Analysis Period (min)		15		

Queues
19: Rail Corridor & Tannery St 02/23/2018

Lane Group
Lane Group Flow (vph)
v/c Ratio
Control Delay
Queue Delay
Total Delay
Queue Length 50th (m)
Queue Length 95th (m)
Internal Link Dist (m)
Turn Bay Length (m)
Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced v/c Ratio

Intersection Summary

Timings
19: Rail Corridor & Tannery St 02/23/2018

Lane Group	Ø2	Ø4	Ø6	Ø8
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type				
Protected Phases	2	4	6	8
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	120.0	1680.0	120.0	1680.0
Total Split (%)	7%	93%	7%	93%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary		
Cycle Length: 1800		
Actuated Cycle Length: 1800		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 45		
Control Type: Pretimed		
Maximum v/c Ratio: 0.00		
Intersection Signal Delay: 0.0		Intersection LOS: A
Intersection Capacity Utilization 0.0%		ICU Level of Service A
Analysis Period (min) 15		

Splits and Phases: 19: Rail Corridor & Tannery St

Timings
23: Rail Corridor & Thomas St

02/23/2018

Lane Group	EBT	WBT	Ø2	Ø6
Lane Configurations				
Traffic Volume (vph)	501	695		
Future Volume (vph)	501	695		
Turn Type	NA	NA		
Protected Phases	4	8	2	6
Permitted Phases				
Detector Phase	4	8		
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	1680.0	1680.0	120.0	120.0
Total Split (%)	93.3%	93.3%	7%	7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		
Total Lost Time (s)	4.5	4.5		
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	1675.5	1675.5		
Actuated g/C Ratio	0.93	0.93		
v/c Ratio	0.16	0.21		
Control Delay	5.2	5.5		
Queue Delay	9.7	4.3		
Total Delay	14.9	9.8		
LOS	B	A		
Approach Delay	14.9	9.8		
Approach LOS	B	A		

Intersection Summary			
Cycle Length: 1800			
Actuated Cycle Length: 1800			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 45			
Control Type: Pretimed			
Maximum v/c Ratio: 0.21			
Intersection Signal Delay: 12.0		Intersection LOS: B	
Intersection Capacity Utilization 23.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Rail Corridor & Thomas St

HCM Signalized Intersection Capacity Analysis
19: Rail Corridor & Tannery St

02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Peak-hour factor, PHF	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)	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	0.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
23: Rail Corridor & Thomas St

02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	501	0	0	695	0	0	0	0	0	0	0
Future Volume (vph)	0	501	0	0	695	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5							
Lane Util. Factor		0.95			0.95							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3579			3579							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3579			3579							
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	545	0	0	695	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	545	0	0	695	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)		1675.5			1675.5							
Effective Green, g (s)		1675.5			1675.5							
Actuated g/C Ratio		0.93			0.93							
Clearance Time (s)		4.5			4.5							
Lane Grp Cap (vph)		3331			3331							
v/s Ratio Prot		0.15			c0.19							
v/s Ratio Perm												
v/c Ratio		0.16			0.21							
Uniform Delay, d1		5.1			5.3							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.1			0.1							
Delay (s)		5.2			5.5							
Level of Service		A			A							
Approach Delay (s)		5.2			5.5			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues
23: Rail Corridor & Thomas St

02/23/2018

Lane Group	EBT	WBT
Lane Group Flow (vph)	545	695
v/c Ratio	0.16	0.21
Control Delay	5.2	5.5
Queue Delay	9.7	4.3
Total Delay	14.9	9.8
Queue Length 50th (m)	84.6	113.6
Queue Length 95th (m)	83.5	110.5
Internal Link Dist (m)	19.3	320.4
Turn Bay Length (m)		
Base Capacity (vph)	3331	3331
Starvation Cap Reductn	2747	2535
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.93	0.87

Intersection Summary

APPENDIX C

Future Background Traffic Conditions

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	171	5	4	1	91	482	7	266
Future Volume (vph)	171	5	4	1	91	482	7	266
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)	32.0	32.0	32.0	32.0	46.0	46.0	46.0	46.0
Minimum Split (s)	38.0	38.0	38.0	38.0	52.0	52.0	52.0	52.0
Total Split (s)	38.0	38.0	38.0	38.0	52.0	52.0	52.0	52.0
Total Split (%)	42.2%	42.2%	42.2%	42.2%	57.8%	57.8%	57.8%	57.8%
Yellow Time (s)	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	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0		6.0		6.0		6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Ped	Ped	Ped	Ped	Max	Max	Max	Max
Act Effct Green (s)	32.0	32.0		32.0		46.0		46.0
Actuated g/C Ratio	0.36	0.36		0.36		0.51		0.51
v/c Ratio	0.36	0.16		0.03		0.70		0.38
Control Delay	24.1	5.8		12.4		22.1		13.9
Queue Delay	0.0	0.0		0.0		0.0		0.0
Total Delay	24.1	5.8		12.4		22.1		13.9
LOS	C	A		B		C		B
Approach Delay		17.6		12.4		22.1		13.9
Approach LOS		B		B		C		B

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 18.6		Intersection LOS: B	
Intersection Capacity Utilization 114.2%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: Queen St & Tannery St

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	19	0	56	36	160	0	38	14	384	13	23
Future Volume (vph)	7	19	0	56	36	160	0	38	14	384	13	23
Peak Hour Factor	0.92	0.92	0.92	1.00	0.92	1.00	0.92	1.00	1.00	1.00	1.00	0.92
Hourly flow rate (vph)	8	21	0	56	39	160	0	38	14	384	13	25

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	29	255	52	422
Volume Left (vph)	8	56	0	384
Volume Right (vph)	0	160	14	25
Hadj (s)	0.09	-0.33	-0.16	0.15
Departure Headway (s)	5.6	4.8	5.0	4.9
Degree Utilization, x	0.04	0.34	0.07	0.57
Capacity (veh/h)	568	690	650	714
Control Delay (s)	8.8	10.3	8.4	14.0
Approach Delay (s)	8.8	10.3	8.4	14.0
Approach LOS	A	B	A	B

Intersection Summary				
Delay		12.2		
Level of Service		B		
Intersection Capacity Utilization	55.8%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	5	90	4	1	10	91	482	14	7	266	77
Future Volume (vph)	171	5	90	4	1	10	91	482	14	7	266	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.95			0.96			1.00			0.98	
Flpb, ped/bikes	0.96	1.00			0.99			1.00			1.00	
Frt	1.00	0.86			0.91			1.00			0.97	
Flt Protected	0.95	1.00			0.99			0.99			1.00	
Satd. Flow (prot)	1709	1524			1602			1846			1788	
Flt Permitted	0.75	1.00			0.95			0.89			0.99	
Satd. Flow (perm)	1345	1524			1549			1651			1770	
Peak-hour factor, PHF	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)	171	5	90	4	1	10	91	482	14	7	266	77
RTOR Reduction (vph)	0	58	0	0	6	0	0	1	0	0	11	0
Lane Group Flow (vph)	171	37	0	0	9	0	0	586	0	0	339	0
Confl. Peds. (#/hr)	26		21	21		26	32		29	29		32
Confl. Bikes (#/hr)			3			2						2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.0	32.0			32.0			46.0			46.0	
Effective Green, g (s)	32.0	32.0			32.0			46.0			46.0	
Actuated g/C Ratio	0.36	0.36			0.36			0.51			0.51	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	478	541			550			843			904	
v/s Ratio Prot		0.02										
v/s Ratio Perm	c0.13				0.01			c0.36			0.19	
v/c Ratio	0.36	0.07			0.02			0.70			0.37	
Uniform Delay, d1	21.4	19.2			18.8			16.7			13.3	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.1			0.0			4.7			1.2	
Delay (s)	21.9	19.2			18.8			21.4			14.5	
Level of Service	C	B			B			C			B	
Approach Delay (s)		20.9			18.8			21.4			14.5	
Approach LOS		C			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	114.2%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	171	95	15	587	350
v/c Ratio	0.36	0.16	0.03	0.70	0.38
Control Delay	24.1	5.8	12.4	22.1	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	5.8	12.4	22.1	13.9
Queue Length 50th (m)	21.5	0.6	0.6	72.9	32.3
Queue Length 95th (m)	38.1	10.0	4.5	111.5	51.6
Internal Link Dist (m)		271.4	49.6	443.9	101.6
Turn Bay Length (m)	35.0				
Base Capacity (vph)	478	600	557	844	915
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	0.36	0.16	0.03	0.70	0.38

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	366	122	62	394	422
v/c Ratio	0.72	0.24	0.13	0.37	0.41
Control Delay	38.3	6.1	9.9	11.7	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	6.1	9.9	11.7	10.9
Queue Length 50th (m)	56.5	0.0	4.5	33.7	32.5
Queue Length 95th (m)	87.2	11.9	10.7	53.0	53.1
Internal Link Dist (m)	320.4			113.4	443.9
Turn Bay Length (m)			40.0		
Base Capacity (vph)	519	516	491	1071	1025
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	0.71	0.24	0.13	0.37	0.41

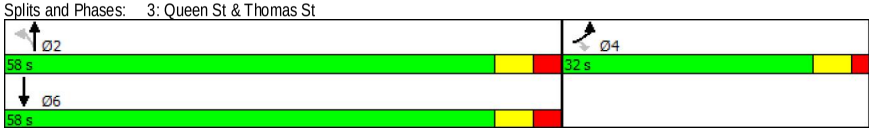
Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	366	122	62	394	277
Future Volume (vph)	366	122	62	394	277
Turn Type	Prot	Perm	Perm	NA	NA
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	25.0	25.0	5.0	5.0	5.0
Minimum Split (s)	31.0	31.0	23.0	23.0	26.0
Total Split (s)	32.0	32.0	58.0	58.0	58.0
Total Split (%)	35.6%	35.6%	64.4%	64.4%	64.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Ped	Ped	Max	Max	Max
Act Effct Green (s)	25.4	25.4	51.0	51.0	51.0
Actuated g/C Ratio	0.28	0.28	0.57	0.57	0.57
v/c Ratio	0.72	0.24	0.13	0.37	0.41
Control Delay	38.3	6.1	9.9	11.7	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	6.1	9.9	11.7	10.9
LOS	D	A	A	B	B
Approach Delay	30.2			11.5	10.9
Approach LOS	C			B	B

Intersection Summary

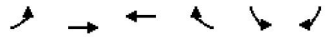
Cycle Length: 90
Actuated Cycle Length: 89.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 18.0 Intersection LOS: B
Intersection Capacity Utilization 66.0% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: Queen St & Thomas St



HCM Unsignalized Intersection Capacity Analysis
4: Thomas St & Joymar Dr

FB - AM Peak
05-16-2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	54	1242	347	5	1	64
Future Volume (Veh/h)	54	1242	347	5	1	64
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	54	1242	347	5	1	64
Pedestrians		7	7		4	
Lane Width (m)		3.5	3.5		3.5	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		1	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			218			
pX, platoon unblocked						
vC, conflicting volume	356				1090	187
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	356				1090	187
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	92
cM capacity (veh/h)	1209				201	821

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	468	828	231	121	1	64
Volume Left	54	0	0	0	1	0
Volume Right	0	0	0	5	0	64
cSH	1209	1700	1700	1700	201	821
Volume to Capacity	0.04	0.49	0.14	0.07	0.00	0.08
Queue Length 95th (m)	1.1	0.0	0.0	0.0	0.1	1.9
Control Delay (s)	1.4	0.0	0.0	0.0	23.0	9.8
Lane LOS	A				C	A
Approach Delay (s)	0.5		0.0		10.0	
Approach LOS					A	

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: Queen St & Thomas St

FB - AM Peak
05-16-2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	366	122	62	394	277	145
Future Volume (vph)	366	122	62	394	277	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.93	1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1785	1479	1751	1879	1761	
Flt Permitted	0.95	1.00	0.47	1.00	1.00	
Satd. Flow (perm)	1785	1479	862	1879	1761	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	366	122	62	394	277	145
RTOR Reduction (vph)	0	87	0	0	21	0
Lane Group Flow (vph)	366	35	62	394	401	0
Confl. Peds. (#/hr)	17	20	28			28
Confl. Bikes (#/hr)		2				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	25.4	25.4	51.0	51.0	51.0	
Effective Green, g (s)	25.4	25.4	51.0	51.0	51.0	
Actuated g/C Ratio	0.28	0.28	0.57	0.57	0.57	
Clearance Time (s)	6.0	6.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	507	420	491	1071	1004	
v/s Ratio Prot	c0.21			0.21	c0.23	
v/s Ratio Perm		0.02	0.07			
v/c Ratio	0.72	0.08	0.13	0.37	0.40	
Uniform Delay, d1	28.8	23.5	8.9	10.4	10.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.0	0.1	0.5	1.0	1.2	
Delay (s)	33.9	23.5	9.4	11.4	11.9	
Level of Service	C	C	A	B	B	
Approach Delay (s)	31.3			11.1	11.9	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	89.4	Sum of lost time (s)	13.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1243	323	174	80	3
v/c Ratio	0.61	0.24	0.78	0.19	0.01
Control Delay	10.4	5.0	63.3	7.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	5.0	63.3	7.4	0.0
Queue Length 50th (m)	58.1	9.0	32.3	0.0	0.0
Queue Length 95th (m)	83.0	14.2	#58.4	10.1	0.0
Internal Link Dist (m)	194.1	107.3	76.3		58.2
Turn Bay Length (m)					
Base Capacity (vph)	2042	1356	249	665	334
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	0.61	0.24	0.70	0.12	0.01

Intersection Summary

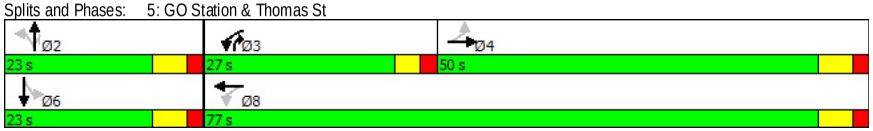
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

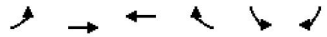
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	676	129	177	174	0	80	2	0
Future Volume (vph)	2	676	129	177	174	0	80	2	0
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases		4	3	8		2	3		6
Permitted Phases	4		8		2		2	6	
Detector Phase	4	4	3	8	2	2	3	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	50.0	50.0	10.0	77.0	23.0	23.0	10.0	23.0	23.0
Total Split (s)	50.0	50.0	27.0	77.0	23.0	23.0	27.0	23.0	23.0
Total Split (%)	50.0%	50.0%	27.0%	77.0%	23.0%	23.0%	27.0%	23.0%	23.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0
Total Lost Time (s)		6.0		6.0		6.0	5.0		6.0
Lead/Lag	Lag	Lag	Lead				Lead		
Lead-Lag Optimize?	Yes	Yes	Yes				Yes		
Recall Mode	Max	Max	None	Max	Min	Min	None	Min	Min
Act Effct Green (s)		62.7		71.0		15.6	22.2		15.6
Actuated g/C Ratio		0.64		0.72		0.16	0.22		0.16
v/c Ratio		0.61		0.24		0.78	0.19		0.01
Control Delay		10.4		5.0		63.3	7.4		0.0
Queue Delay		0.0		0.0		0.0	0.0		0.0
Total Delay		10.4		5.0		63.3	7.4		0.0
LOS		B		A		E	A		A
Approach Delay		10.4		5.0		45.7			
Approach LOS		B		A		D			

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 98.7
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 14.3 — Intersection LOS: B
Intersection Capacity Utilization 79.3% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 5: GO Station & Thomas St

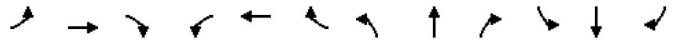




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	749	304	3	3	3
Future Volume (Veh/h)	9	749	304	3	3	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	749	304	3	3	3
Pedestrians		8	1			
Lane Width (m)		3.7	3.7			
Walking Speed (m/s)		1.1	1.1			
Percent Blockage		1	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		131	43			
pX, platoon unblocked	0.99				0.99	0.99
vC, conflicting volume	307				699	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	290				684	143
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	100
cM capacity (veh/h)	1276				381	872

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	259	499	203	104	6
Volume Left	9	0	0	0	3
Volume Right	0	0	0	3	3
cSH	1276	1700	1700	1700	530
Volume to Capacity	0.01	0.29	0.12	0.06	0.01
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.3
Control Delay (s)	0.3	0.0	0.0	0.0	11.9
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		11.9
Approach LOS					B

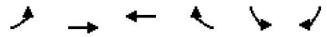
Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		39.4%	ICU Level of Service	A
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	676	565	129	177	1	174	0	80	2	0	1
Future Volume (vph)	2	676	565	129	177	1	174	0	80	2	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0			6.0			6.0	5.0		6.0	
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	
Frpb, ped/bikes		0.96			1.00			1.00	0.97		0.99	
Flpb, ped/bikes		1.00			1.00			1.00	1.00		0.99	
Frt		0.93			1.00			1.00	0.85		0.95	
Flt Protected		1.00			0.98			0.95	1.00		0.97	
Satd. Flow (prot)		3205			3494			1779	1557		1708	
Flt Permitted		0.95			0.50			0.76	1.00		0.84	
Satd. Flow (perm)		3060			1798			1416	1557		1491	
Peak-hour factor, PHF	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	676	565	136	186	1	174	0	80	2	0	1
RTOR Reduction (vph)	0	100	0	0	0	0	0	0	64	0	3	0
Lane Group Flow (vph)	0	1143	0	0	323	0	0	174	16	0	0	0
Confl. Peds. (#/hr)	17		18	18		17	2		13	13		2
Confl. Bikes (#/hr)			3									3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases		4		3	8			2	3		6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		62.7			72.1			15.7	20.1		15.7	
Effective Green, g (s)		62.7			72.1			15.7	20.1		15.7	
Actuated g/C Ratio		0.63			0.72			0.16	0.20		0.16	
Clearance Time (s)		6.0			6.0			6.0	5.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		1922			1373			222	313		234	
v/s Ratio Prot					c0.01				0.00			
v/s Ratio Perm		c0.37			0.16			c0.12	0.01		0.00	
v/c Ratio		0.59			0.24			0.78	0.05		0.00	
Uniform Delay, d1		11.0			4.6			40.4	32.2		35.4	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.4			0.1			16.4	0.1		0.0	
Delay (s)		12.4			4.7			56.8	32.2		35.4	
Level of Service		B			A			E	C		D	
Approach Delay (s)		12.4			4.7			49.1			35.4	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	79.3%	ICU Level of Service	D	
Analysis Period (min)	15			

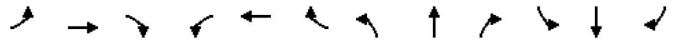
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	412	239	12	14	12
Future Volume (Veh/h)	5	412	239	12	14	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	412	239	12	14	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			129			
pX, platoon unblocked						
vC, conflicting volume	251				667	245
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	251				667	245
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	98
cM capacity (veh/h)	1326				425	799

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	417	251	26
Volume Left	5	0	14
Volume Right	0	12	12
cSH	1326	1700	542
Volume to Capacity	0.00	0.15	0.05
Queue Length 95th (m)	0.1	0.0	1.1
Control Delay (s)	0.1	0.0	12.0
Lane LOS	A		B
Approach Delay (s)	0.1	0.0	12.0
Approach LOS			B

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		35.7%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	232	209	30	135	4	49	14	25	10	12	21
Future Volume (Veh/h)	33	232	209	30	135	4	49	14	25	10	12	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	33	232	209	30	135	4	49	14	25	10	12	21
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		57			295							
pX, platoon unblocked												
vC, conflicting volume	139			441			626	602	336	632	704	137
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	139			441			626	602	336	632	704	137
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			87	96	96	97	97	98
cM capacity (veh/h)	1457			1130			366	396	710	358	346	917

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	474	169	88	43
Volume Left	33	30	49	10
Volume Right	209	4	25	21
cSH	1457	1130	430	503
Volume to Capacity	0.02	0.03	0.20	0.09
Queue Length 95th (m)	0.5	0.6	5.8	2.1
Control Delay (s)	0.7	1.7	15.5	12.8
Lane LOS	A	A	C	B
Approach Delay (s)	0.7	1.7	15.5	12.8
Approach LOS			C	B

Intersection Summary			
Average Delay		3.3	
Intersection Capacity Utilization		47.0%	ICU Level of Service A
Analysis Period (min)		15	

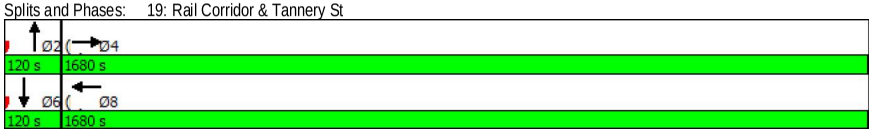
Lane Group
Lane Group Flow (vph)
v/c Ratio
Control Delay
Queue Delay
Total Delay
Queue Length 50th (m)
Queue Length 95th (m)
Internal Link Dist (m)
Turn Bay Length (m)
Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced v/c Ratio

Intersection Summary

Lane Group	Ø2	Ø4	Ø6	Ø8
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type				
Protected Phases	2	4	6	8
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	120.0	1680.0	120.0	1680.0
Total Split (%)	7%	93%	7%	93%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary	
Cycle Length: 1800	
Actuated Cycle Length: 1800	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.00	
Intersection Signal Delay: 0.0	Intersection LOS: A
Intersection Capacity Utilization 0.0%	ICU Level of Service A
Analysis Period (min) 15	

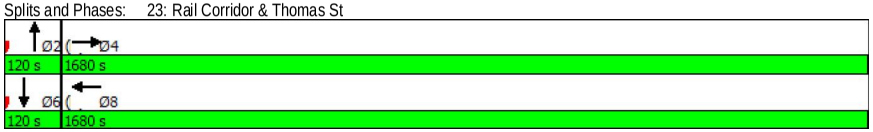
Splits and Phases: 19: Rail Corridor & Tannery St



Lane Group	EBT	WBT	Ø2	Ø6
Lane Configurations				
Traffic Volume (vph)	752	307		
Future Volume (vph)	752	307		
Turn Type	NA	NA		
Protected Phases	4	8	2	6
Permitted Phases				
Detector Phase	4	8		
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	1680.0	1680.0	120.0	120.0
Total Split (%)	93.3%	93.3%	7%	7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		
Total Lost Time (s)	4.5	4.5		
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	1675.5	1675.5		
Actuated g/C Ratio	0.93	0.93		
v/c Ratio	0.25	0.09		
Control Delay	5.8	4.8		
Queue Delay	12.7	2.5		
Total Delay	18.4	7.3		
LOS	B	A		
Approach Delay	18.4	7.3		
Approach LOS	B	A		

Intersection Summary			
Cycle Length: 1800			
Actuated Cycle Length: 1800			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 45			
Control Type: Pretimed			
Maximum v/c Ratio: 0.25			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 24.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Rail Corridor & Thomas St



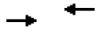
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Peak-hour factor, PHF	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)	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary					
HCM 2000 Control Delay	0.0	HCM 2000 Level of Service	A		
HCM 2000 Volume to Capacity ratio	0.00				
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A		
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Traffic Volume (vph)	0	752	0	0	307	0	0	0	0	0	0	0
Future Volume (vph)	0	752	0	0	307	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5							
Lane Util. Factor		0.95			0.95							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3579			3579							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3579			3579							
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	817	0	0	307	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	817	0	0	307	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)		1675.5			1675.5							
Effective Green, g (s)		1675.5			1675.5							
Actuated g/C Ratio		0.93			0.93							
Clearance Time (s)		4.5			4.5							
Lane Grp Cap (vph)		3331			3331							
v/s Ratio Prot		c0.23			0.09							
v/s Ratio Perm												
v/c Ratio		0.25			0.09							
Uniform Delay, d1		5.6			4.7							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.2			0.1							
Delay (s)		5.8			4.8							
Level of Service		A			A							
Approach Delay (s)		5.8			4.8			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	24.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT
Lane Group Flow (vph)	817	307
v/c Ratio	0.25	0.09
Control Delay	5.8	4.8
Queue Delay	12.7	2.5
Total Delay	18.4	7.3
Queue Length 50th (m)	139.4	44.2
Queue Length 95th (m)	134.5	45.1
Internal Link Dist (m)	19.3	320.4
Turn Bay Length (m)		
Base Capacity (vph)	3331	3331
Starvation Cap Reductn	2496	2882
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.98	0.68

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	110	5	3	7	50	531	12	452
Future Volume (vph)	110	5	3	7	50	531	12	452
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)	25.0	25.0	25.0	25.0	46.0	46.0	46.0	46.0
Minimum Split (s)	31.0	31.0	31.0	31.0	52.0	52.0	52.0	52.0
Total Split (s)	31.0	31.0	31.0	31.0	79.0	79.0	79.0	79.0
Total Split (%)	28.2%	28.2%	28.2%	28.2%	71.8%	71.8%	71.8%	71.8%
Yellow Time (s)	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	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0		6.0		6.0		6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Ped	Ped	Ped	Ped	Max	Max	Max	Max
Act Effct Green (s)	25.0	25.0		25.0		73.0		73.0
Actuated g/C Ratio	0.23	0.23		0.23		0.66		0.66
v/c Ratio	0.37	0.22		0.05		0.52		0.50
Control Delay	40.2	9.9		24.8		11.5		10.7
Queue Delay	0.0	0.0		0.0		0.0		0.0
Total Delay	40.2	9.9		24.8		11.5		10.7
LOS	D	A		C		B		B
Approach Delay		26.6		24.8		11.5		10.7
Approach LOS		C		C		B		B

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 110			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 13.5		Intersection LOS: B	
Intersection Capacity Utilization 85.9%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Queen St & Tannery St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	6	3	82	5	194	2	32	38	189	68	2
Future Volume (vph)	1	6	3	82	5	194	2	32	38	189	68	2
Peak Hour Factor	0.92	0.92	0.92	1.00	0.92	1.00	0.92	1.00	1.00	1.00	1.00	0.92
Hourly flow rate (vph)	1	7	3	82	5	194	2	32	38	189	68	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	281	72	259
Volume Left (vph)	1	82	2	189
Volume Right (vph)	3	194	38	2
Hadj (s)	-0.11	-0.36	-0.31	0.14
Departure Headway (s)	5.0	4.4	4.6	4.8
Degree Utilization, x	0.02	0.34	0.09	0.35
Capacity (veh/h)	649	772	717	707
Control Delay (s)	8.0	9.6	8.1	10.3
Approach Delay (s)	8.0	9.6	8.1	10.3
Approach LOS	A	A	A	B

Intersection Summary				
Delay		9.7		
Level of Service		A		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
2: Queen St & Tannery St

FB - PM Peak
05-16-2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	5	85	3	7	7	50	531	7	12	452	130
Future Volume (vph)	110	5	85	3	7	7	50	531	7	12	452	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.92			0.96			1.00			0.98	
Flpb, ped/bikes	0.93	1.00			0.99			1.00			1.00	
Frt	1.00	0.86			0.94			1.00			0.97	
Flt Protected	0.95	1.00			0.99			1.00			1.00	
Satd. Flow (prot)	1660	1489			1676			1862			1784	
Flt Permitted	0.75	1.00			0.97			0.91			0.99	
Satd. Flow (perm)	1304	1489			1633			1708			1762	
Peak-hour factor, PHF	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)	110	5	85	3	7	7	50	531	7	12	452	130
RTOR Reduction (vph)	0	66	0	0	5	0	0	0	0	0	9	0
Lane Group Flow (vph)	110	24	0	0	12	0	0	588	0	0	585	0
Confl. Peds. (#/hr)	26		21	21		26	32		29	29		32
Confl. Bikes (#/hr)			3			2						2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.0	25.0			25.0			73.0			73.0	
Effective Green, g (s)	25.0	25.0			25.0			73.0			73.0	
Actuated g/C Ratio	0.23	0.23			0.23			0.66			0.66	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	296	338			371			1133			1169	
v/s Ratio Prot		0.02										
v/s Ratio Perm	c0.08				0.01			c0.34			0.33	
v/c Ratio	0.37	0.07			0.03			0.52			0.50	
Uniform Delay, d1	35.9	33.4			33.1			9.5			9.3	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.8	0.1			0.0			1.7			1.5	
Delay (s)	36.7	33.5			33.1			11.2			10.8	
Level of Service	D	C			C			B			B	
Approach Delay (s)		35.2			33.1			11.2			10.8	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	85.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Queues
2: Queen St & Tannery St

FB - PM Peak
05-16-2019

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	110	90	17	588	594
v/c Ratio	0.37	0.22	0.05	0.52	0.50
Control Delay	40.2	9.9	24.8	11.5	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	9.9	24.8	11.5	10.7
Queue Length 50th (m)	20.1	0.8	1.7	58.7	55.5
Queue Length 95th (m)	36.7	13.4	7.4	84.3	80.3
Internal Link Dist (m)		271.4	49.6	443.9	101.6
Turn Bay Length (m)	35.0				
Base Capacity (vph)	296	403	376	1132	1177
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	0.37	0.22	0.05	0.52	0.50

Intersection Summary

Queues
3: Queen St & Thomas St

FB - PM Peak
05-16-2019

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	206	140	142	452	697
v/c Ratio	0.49	0.31	0.39	0.37	0.61
Control Delay	40.9	7.7	13.1	10.2	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	7.7	13.1	10.2	13.0
Queue Length 50th (m)	38.3	0.0	13.2	41.5	72.2
Queue Length 95th (m)	61.1	15.1	26.8	59.6	106.4
Internal Link Dist (m)	320.4			113.4	443.9
Turn Bay Length (m)			40.0		
Base Capacity (vph)	421	455	365	1212	1134
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	0.49	0.31	0.39	0.37	0.61

Intersection Summary

Timings
3: Queen St & Thomas St

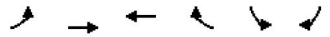
FB - PM Peak
05-16-2019

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	206	140	142	452	402
Future Volume (vph)	206	140	142	452	402
Turn Type	Prot	Perm	Perm	NA	NA
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	26.0	26.0	5.0	5.0	5.0
Minimum Split (s)	32.0	32.0	23.0	23.0	26.0
Total Split (s)	32.0	32.0	78.0	78.0	78.0
Total Split (%)	29.1%	29.1%	70.9%	70.9%	70.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Ped	Ped	Max	Max	Max
Act Effct Green (s)	26.0	26.0	71.0	71.0	71.0
Actuated g/C Ratio	0.24	0.24	0.65	0.65	0.65
v/c Ratio	0.49	0.31	0.39	0.37	0.61
Control Delay	40.9	7.7	13.1	10.2	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	7.7	13.1	10.2	13.0
LOS	D	A	B	B	B
Approach Delay	27.5			10.9	13.0
Approach LOS	C			B	B

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 15.3 Intersection LOS: B
Intersection Capacity Utilization 86.5% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Queen St & Thomas St



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	54	491	1046	23	6	141
Future Volume (Veh/h)	54	491	1046	23	6	141
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	54	491	1046	23	6	141
Pedestrians		7	7		4	
Lane Width (m)		3.5	3.5		3.5	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		1	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			218			
pX, platoon unblocked	0.91				0.91	0.91
vC, conflicting volume	1073				1422	546
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	876				1261	295
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				96	78
cM capacity (veh/h)	704				137	635

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	218	327	697	372	6	141
Volume Left	54	0	0	0	6	0
Volume Right	0	0	0	23	0	141
cSH	704	1700	1700	1700	137	635
Volume to Capacity	0.08	0.19	0.41	0.22	0.04	0.22
Queue Length 95th (m)	1.9	0.0	0.0	0.0	1.0	6.4
Control Delay (s)	3.3	0.0	0.0	0.0	32.5	12.3
Lane LOS	A				D	B
Approach Delay (s)	1.3		0.0		13.1	
Approach LOS					B	

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	206	140	142	452	402	295
Future Volume (vph)	206	140	142	452	402	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.92	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1785	1474	1785	1879	1720	
Flt Permitted	0.95	1.00	0.30	1.00	1.00	
Satd. Flow (perm)	1785	1474	565	1879	1720	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	206	140	142	452	402	295
RTOR Reduction (vph)	0	107	0	0	24	0
Lane Group Flow (vph)	206	33	142	452	673	0
Confl. Peds. (#/hr)	17	20	28			28
Confl. Bikes (#/hr)		2				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	26.0	26.0	71.0	71.0	71.0	
Effective Green, g (s)	26.0	26.0	71.0	71.0	71.0	
Actuated g/C Ratio	0.24	0.24	0.65	0.65	0.65	
Clearance Time (s)	6.0	6.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	421	348	364	1212	1110	
v/s Ratio Prot	c0.12			0.24	c0.39	
v/s Ratio Perm		0.02	0.25			
v/c Ratio	0.49	0.10	0.39	0.37	0.61	
Uniform Delay, d1	36.3	32.8	9.2	9.1	11.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.1	3.1	0.9	2.5	
Delay (s)	37.2	32.9	12.4	10.0	13.8	
Level of Service	D	C	B	A	B	
Approach Delay (s)	35.5			10.6	13.8	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	495	748	367	139	9
v/c Ratio	0.38	0.44	0.81	0.20	0.02
Control Delay	18.6	13.8	39.5	3.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	13.8	39.5	3.8	0.0
Queue Length 50th (m)	25.0	32.8	50.3	1.6	0.0
Queue Length 95th (m)	47.6	62.2	80.3	9.5	0.0
Internal Link Dist (m)	194.1	107.3	76.3		58.2
Turn Bay Length (m)					
Base Capacity (vph)	1293	1743	797	836	930
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	0.38	0.43	0.46	0.17	0.01

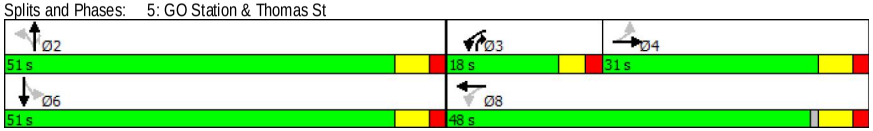
Intersection Summary

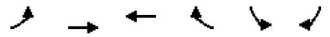
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	3	383	48	694	367	0	139	1	0
Future Volume (vph)	3	383	48	694	367	0	139	1	0
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases		4	3	8		2	3		6
Permitted Phases	4		8		2		2	6	
Detector Phase	4	4	3	8	2	2	3	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	21.0	21.0	10.0	21.0	25.0	25.0	10.0	25.0	25.0
Total Split (s)	31.0	31.0	18.0	48.0	51.0	51.0	18.0	51.0	51.0
Total Split (%)	31.0%	31.0%	18.0%	48.0%	51.0%	51.0%	18.0%	51.0%	51.0%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0
Total Lost Time (s)		6.0		6.0		6.0	5.0		6.0
Lead/Lag	Lag	Lag	Lead				Lead		
Lead-Lag Optimize?	Yes	Yes	Yes				Yes		
Recall Mode	Max	Max	None	Max	Min	Min	None	Min	Min
Act Effct Green (s)		31.7		42.4		25.8	32.4		25.8
Actuated g/C Ratio		0.39		0.53		0.32	0.40		0.32
v/c Ratio		0.38		0.44		0.81	0.20		0.02
Control Delay		18.6		13.8		39.5	3.8		0.0
Queue Delay		0.0		0.0		0.0	0.0		0.0
Total Delay		18.6		13.8		39.5	3.8		0.0
LOS		B		B		D	A		A
Approach Delay		18.6		13.8		29.7			
Approach LOS		B		B		C			

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 80.3
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 19.6 Intersection LOS: B
Intersection Capacity Utilization 77.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 5: GO Station & Thomas St

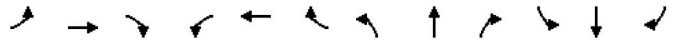




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	518	732	10	11	16
Future Volume (Veh/h)	8	518	732	10	11	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	8	518	732	10	11	16
Pedestrians		8	1			
Lane Width (m)		3.7	3.7			
Walking Speed (m/s)		1.1	1.1			
Percent Blockage		1	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		131	43			
pX, platoon unblocked	0.98				0.95	0.98
vC, conflicting volume	742				1013	379
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	700				824	331
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	98
cM capacity (veh/h)	890				297	654

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	181	345	488	254	27
Volume Left	8	0	0	0	11
Volume Right	0	0	0	10	16
cSH	890	1700	1700	1700	439
Volume to Capacity	0.01	0.20	0.29	0.15	0.06
Queue Length 95th (m)	0.2	0.0	0.0	0.0	1.5
Control Delay (s)	0.5	0.0	0.0	0.0	13.7
Lane LOS	A				B
Approach Delay (s)	0.2		0.0		13.7
Approach LOS					B

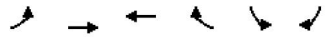
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	383	109	48	694	6	367	0	139	1	0	8
Future Volume (vph)	3	383	109	48	694	6	367	0	139	1	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0			6.0			6.0	5.0		6.0	
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	
Frpb, ped/bikes		0.98			1.00			1.00	0.98		0.99	
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	
Frt		0.97			1.00			1.00	0.85		0.88	
Flt Protected		1.00			1.00			0.95	1.00		0.99	
Satd. Flow (prot)		3398			3549			1780	1560		1619	
Flt Permitted		0.95			0.89			0.75	1.00		0.97	
Satd. Flow (perm)		3232			3183			1409	1560		1577	
Peak-hour factor, PHF	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)	3	383	109	48	694	6	367	0	139	1	0	8
RTOR Reduction (vph)	0	21	0	0	0	0	0	0	72	0	6	0
Lane Group Flow (vph)	0	474	0	0	748	0	0	367	67	0	3	0
Confl. Peds. (#/hr)	17		18	18		17	2		13	13		2
Confl. Bikes (#/hr)			3									3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases		4		3	8			2	3		6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		31.7			42.4			25.8	31.5		25.8	
Effective Green, g (s)		31.7			42.4			25.8	31.5		25.8	
Actuated g/C Ratio		0.40			0.53			0.32	0.39		0.32	
Clearance Time (s)		6.0			6.0			6.0	5.0		6.0	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		1277			1708			453	612		507	
v/s Ratio Prot					c0.03				0.01			
v/s Ratio Perm		0.15			c0.20			c0.26	0.04		0.00	
v/c Ratio		0.37			0.44			0.81	0.11		0.01	
Uniform Delay, d1		17.2			11.6			25.0	15.4		18.5	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.8			0.2			10.5	0.1		0.0	
Delay (s)		18.0			11.8			35.5	15.5		18.5	
Level of Service		B			B			D	B		B	
Approach Delay (s)		18.0			11.8			30.0			18.5	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

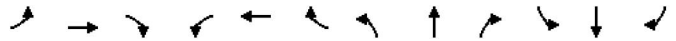
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	220	275	12	10	7
Future Volume (Veh/h)	13	220	275	12	10	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	13	220	275	12	10	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			129			
pX, platoon unblocked						
vC, conflicting volume	287				527	281
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	287				527	281
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	99
cM capacity (veh/h)	1287				510	763

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	233	287	17
Volume Left	13	0	10
Volume Right	0	12	7
cSH	1287	1700	590
Volume to Capacity	0.01	0.17	0.03
Queue Length 95th (m)	0.2	0.0	0.7
Control Delay (s)	0.5	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	0.5	0.0	11.3
Approach LOS			B

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		32.2%	ICU Level of Service	A
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	127	87	50	122	13	93	40	55	18	46	65
Future Volume (Veh/h)	22	127	87	50	122	13	93	40	55	18	46	65
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	22	127	87	50	122	13	93	40	55	18	46	65
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		57			295							
pX, platoon unblocked												
vC, conflicting volume	135			214			531	450	170	518	486	128
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	135			214			531	450	170	518	486	128
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			76	92	94	95	90	93
cM capacity (veh/h)	1462			1368			382	482	879	398	459	927

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	236	185	188	129
Volume Left	22	50	93	18
Volume Right	87	13	55	65
cSH	1462	1368	483	599
Volume to Capacity	0.02	0.04	0.39	0.22
Queue Length 95th (m)	0.3	0.9	13.9	6.2
Control Delay (s)	0.8	2.3	17.1	12.7
Lane LOS	A	A	C	B
Approach Delay (s)	0.8	2.3	17.1	12.7
Approach LOS			C	B

Intersection Summary				
Average Delay		7.4		
Intersection Capacity Utilization		45.0%	ICU Level of Service	A
Analysis Period (min)		15		

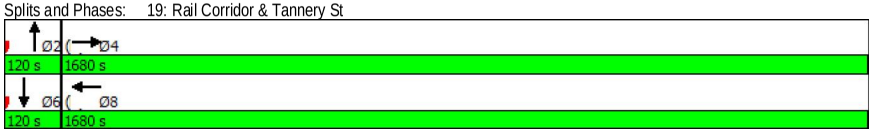
Lane Group
Lane Group Flow (vph)
v/c Ratio
Control Delay
Queue Delay
Total Delay
Queue Length 50th (m)
Queue Length 95th (m)
Internal Link Dist (m)
Turn Bay Length (m)
Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced v/c Ratio

Intersection Summary

Lane Group	Ø2	Ø4	Ø6	Ø8
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type				
Protected Phases	2	4	6	8
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	120.0	1680.0	120.0	1680.0
Total Split (%)	7%	93%	7%	93%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary	
Cycle Length: 1800	
Actuated Cycle Length: 1800	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.00	
Intersection Signal Delay: 0.0	Intersection LOS: A
Intersection Capacity Utilization 0.0%	ICU Level of Service A
Analysis Period (min) 15	

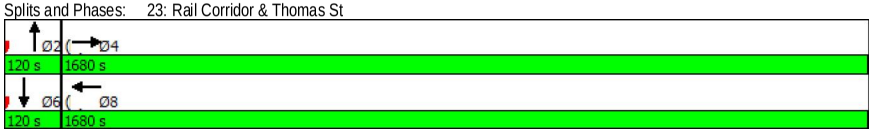
Splits and Phases: 19: Rail Corridor & Tannery St



Lane Group	EBT	WBT	Ø2	Ø6
Lane Configurations				
Traffic Volume (vph)	524	742		
Future Volume (vph)	524	742		
Turn Type	NA	NA		
Protected Phases	4	8	2	6
Permitted Phases				
Detector Phase	4	8		
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	1680.0	1680.0	120.0	120.0
Total Split (%)	93.3%	93.3%	7%	7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		
Total Lost Time (s)	4.5	4.5		
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	1675.5	1675.5		
Actuated g/C Ratio	0.93	0.93		
v/c Ratio	0.17	0.22		
Control Delay	5.2	5.6		
Queue Delay	10.0	4.5		
Total Delay	15.2	10.1		
LOS	B	B		
Approach Delay	15.2	10.1		
Approach LOS	B	B		

Intersection Summary			
Cycle Length: 1800			
Actuated Cycle Length: 1800			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 45			
Control Type: Pretimed			
Maximum v/c Ratio: 0.22			
Intersection Signal Delay: 12.3		Intersection LOS: B	
Intersection Capacity Utilization 24.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Rail Corridor & Thomas St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Peak-hour factor, PHF	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)	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary					
HCM 2000 Control Delay	0.0	HCM 2000 Level of Service	A		
HCM 2000 Volume to Capacity ratio	0.00				
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A		
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Traffic Volume (vph)	0	524	0	0	742	0	0	0	0	0	0	0
Future Volume (vph)	0	524	0	0	742	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5							
Lane Util. Factor		0.95			0.95							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3579			3579							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3579			3579							
Peak-hour factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	570	0	0	742	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	570	0	0	742	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)		1675.5			1675.5							
Effective Green, g (s)		1675.5			1675.5							
Actuated g/C Ratio		0.93			0.93							
Clearance Time (s)		4.5			4.5							
Lane Grp Cap (vph)		3331			3331							
v/s Ratio Prot		0.16			c0.21							
v/s Ratio Perm												
v/c Ratio		0.17			0.22							
Uniform Delay, d1		5.1			5.4							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.1			0.2							
Delay (s)		5.2			5.6							
Level of Service		A			A							
Approach Delay (s)		5.2			5.6			0.0			0.0	
Approach LOS		A			A			A			A	

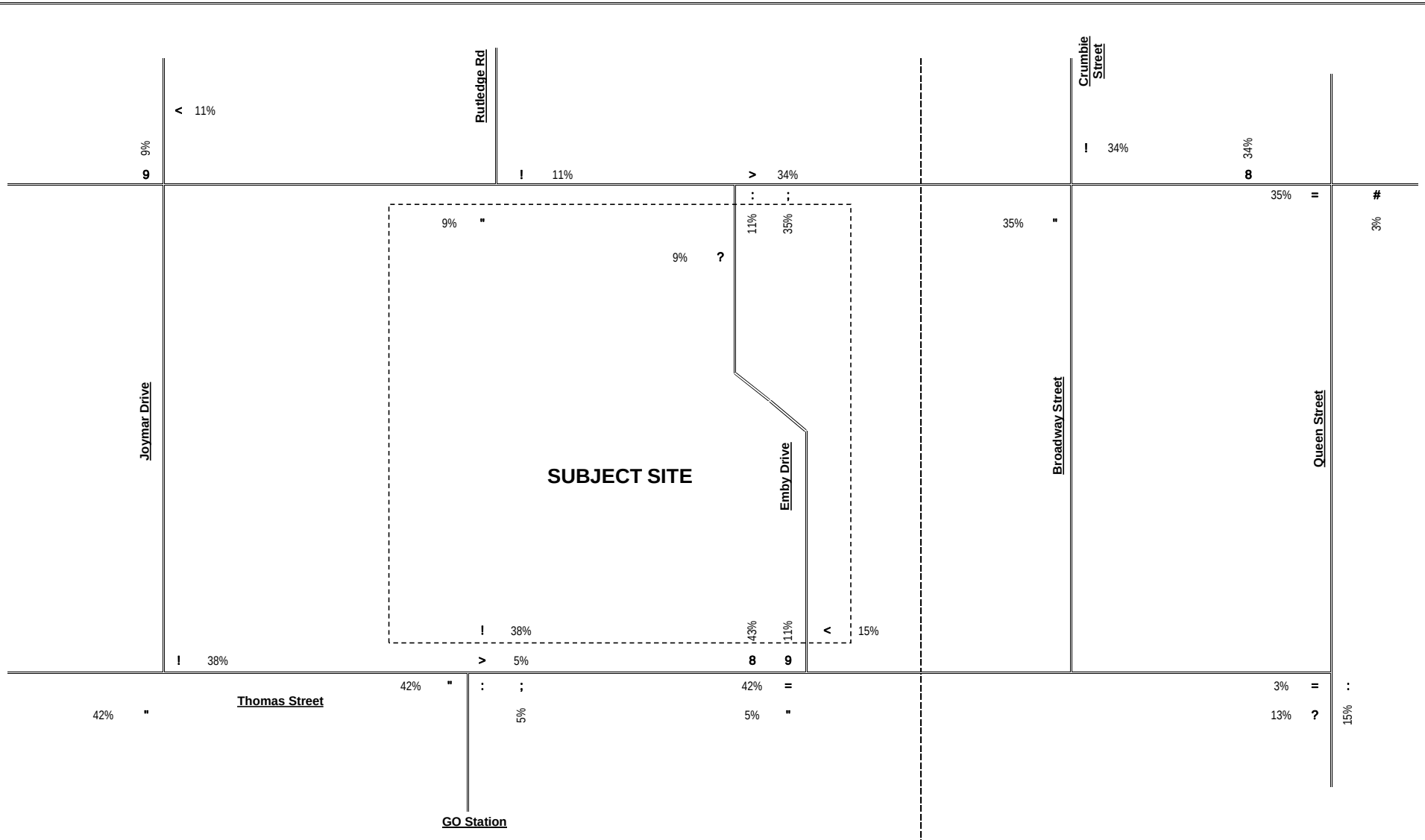
Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT
Lane Group Flow (vph)	570	742
v/c Ratio	0.17	0.22
Control Delay	5.2	5.6
Queue Delay	10.0	4.5
Total Delay	15.2	10.1
Queue Length 50th (m)	89.2	123.2
Queue Length 95th (m)	88.0	119.7
Internal Link Dist (m)	19.3	320.4
Turn Bay Length (m)		
Base Capacity (vph)	3331	3331
Starvation Cap Reductn	2724	2493
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.94	0.89

Intersection Summary

APPENDIX D

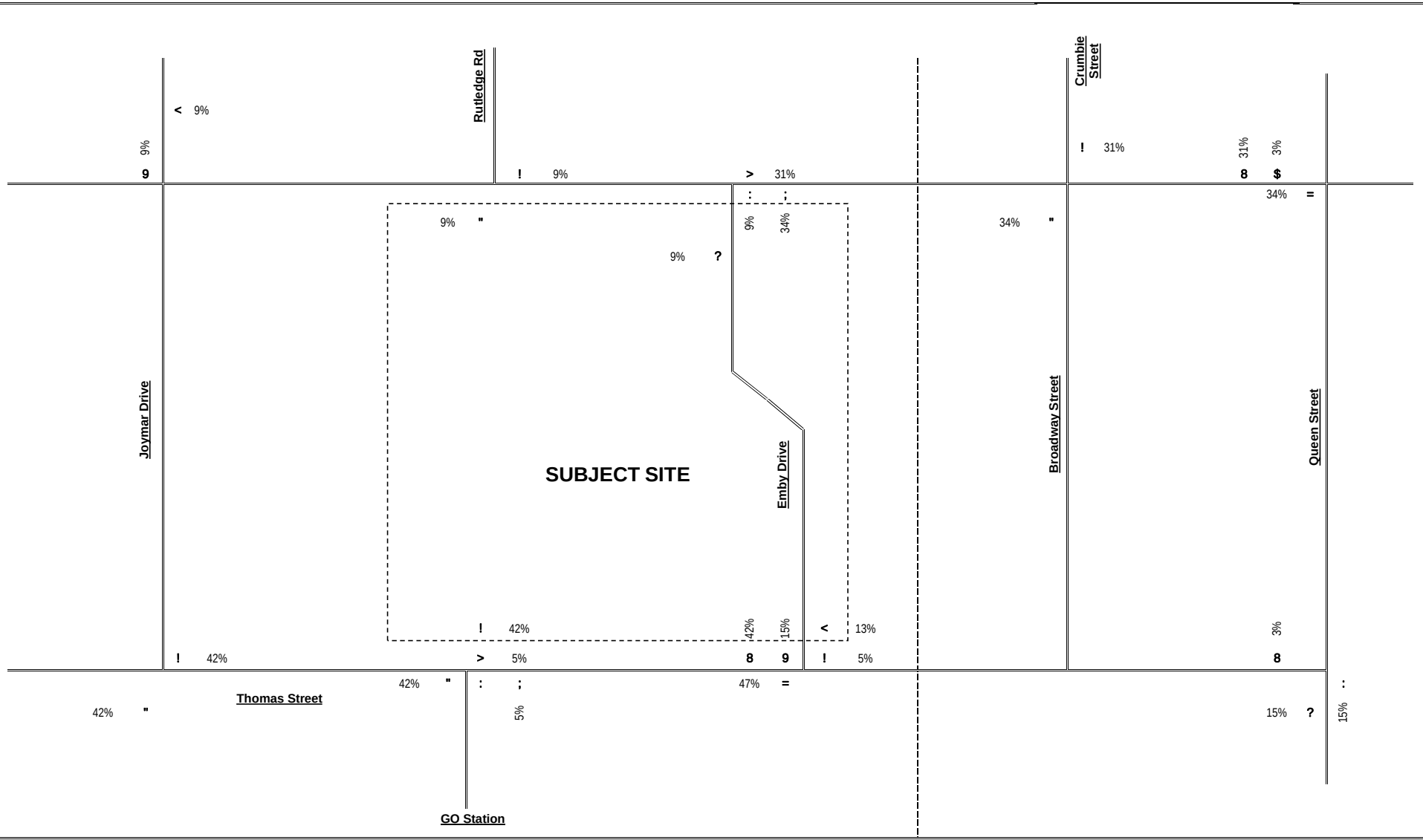
Trip Distribution and Assignment



Proposed Development at 51, 57 Tannery Street & 208 Emby Drive

Site Distribution

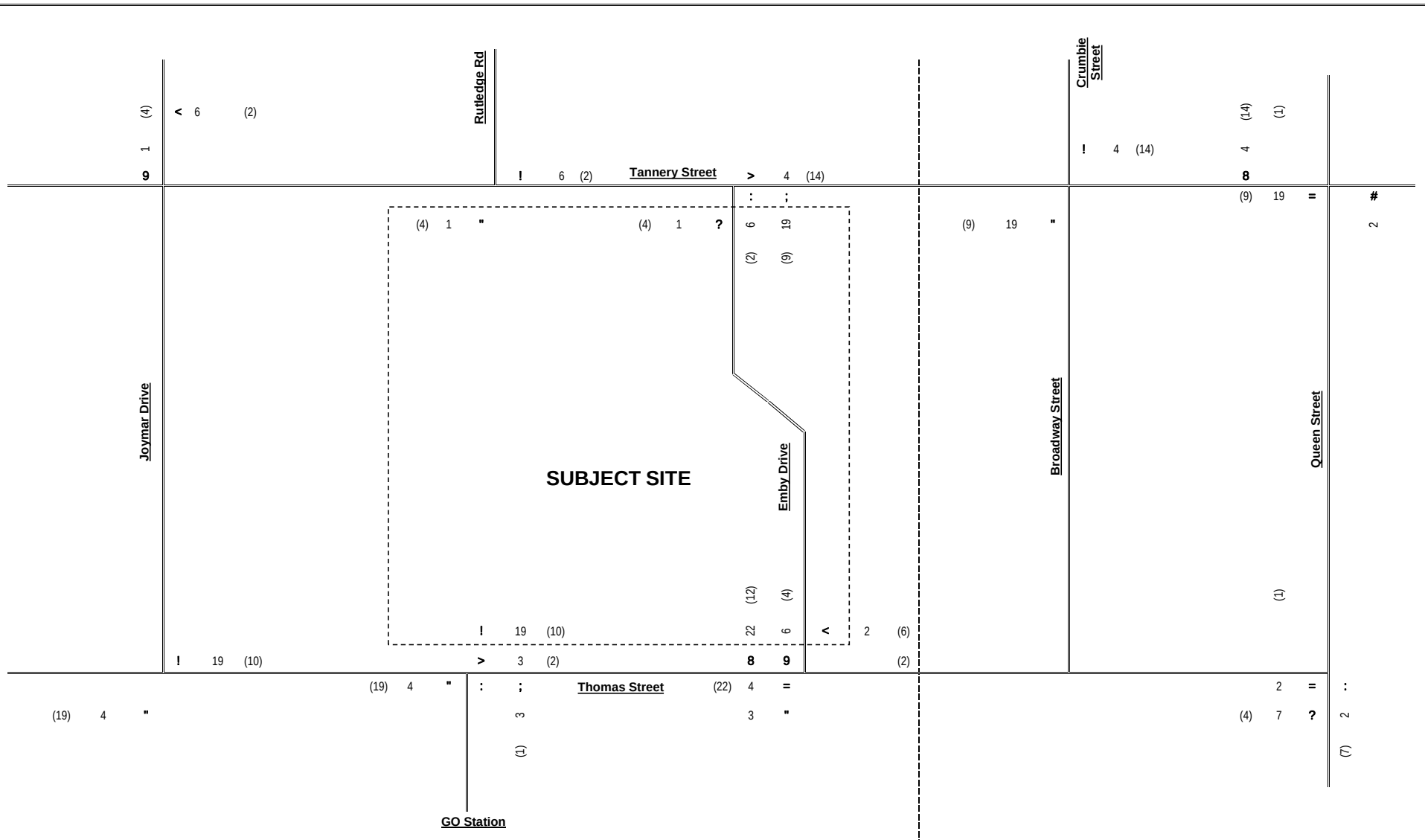
Weekday AM Peak Hour



Proposed Development at 51, 57 Tannery Street & 208 Emby Drive

Site Distribution

Weekday PM Peak Hour



Proposed Development at 51, 57 Tannery Street & 208 Emby Drive

Site Trip Assignment

Weekday AM (PM) Peak Hour

APPENDIX E

Future Total Traffic Conditions

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	190	5	4	1	91	479	7	263
Future Volume (vph)	190	5	4	1	91	479	7	263
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)	32.0	32.0	32.0	32.0	46.0	46.0	46.0	46.0
Minimum Split (s)	38.0	38.0	38.0	38.0	52.0	52.0	52.0	52.0
Total Split (s)	38.0	38.0	38.0	38.0	52.0	52.0	52.0	52.0
Total Split (%)	42.2%	42.2%	42.2%	42.2%	57.8%	57.8%	57.8%	57.8%
Yellow Time (s)	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	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0		6.0		6.0		6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Ped	Ped	Ped	Ped	Max	Max	Max	Max
Act Effct Green (s)	32.0	32.0		32.0		46.0		46.0
Actuated g/C Ratio	0.36	0.36		0.36		0.51		0.51
v/c Ratio	0.40	0.16		0.03		0.69		0.38
Control Delay	24.9	5.8		12.4		22.0		13.9
Queue Delay	0.0	0.0		0.0		0.0		0.0
Total Delay	24.9	5.8		12.4		22.0		13.9
LOS	C	A		B		C		B
Approach Delay		18.5		12.4		22.0		13.9
Approach LOS		B		B		C		B

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 18.7		Intersection LOS: B	
Intersection Capacity Utilization 114.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: Queen St & Tannery St

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	19	0	56	36	166	0	38	14	385	13	23
Future Volume (vph)	7	19	0	56	36	166	0	38	14	385	13	23
Peak Hour Factor	0.92	0.92	0.92	1.00	0.92	1.00	0.92	1.00	1.00	1.00	1.00	0.92
Hourly flow rate (vph)	8	21	0	56	39	166	0	38	14	385	13	25

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	29	261	52	423
Volume Left (vph)	8	56	0	385
Volume Right (vph)	0	166	14	25
Hadj (s)	0.09	-0.33	-0.16	0.15
Departure Headway (s)	5.6	4.8	5.1	4.9
Degree Utilization, x	0.05	0.35	0.07	0.57
Capacity (veh/h)	566	690	647	711
Control Delay (s)	8.9	10.4	8.5	14.2
Approach Delay (s)	8.9	10.4	8.5	14.2
Approach LOS	A	B	A	B

Intersection Summary				
Delay		12.3		
Level of Service		B		
Intersection Capacity Utilization	56.2%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
2: Queen St & Tannery St

FT - AM Peak
05-16-2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	5	90	4	1	10	91	479	14	7	263	81
Future Volume (vph)	190	5	90	4	1	10	91	479	14	7	263	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.95			0.96			1.00			0.98	
Flpb, ped/bikes	0.96	1.00			0.99			0.99			1.00	
Frt	1.00	0.86			0.91			1.00			0.97	
Flt Protected	0.95	1.00			0.99			0.99			1.00	
Satd. Flow (prot)	1709	1524			1602			1846			1784	
Flt Permitted	0.75	1.00			0.95			0.89			0.99	
Satd. Flow (perm)	1345	1524			1549			1649			1766	
Peak-hour factor, PHF	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)	190	5	90	4	1	10	91	479	14	7	263	81
RTOR Reduction (vph)	0	58	0	0	6	0	0	1	0	0	12	0
Lane Group Flow (vph)	190	37	0	0	9	0	0	583	0	0	339	0
Confl. Peds. (#/hr)	26		21	21		26	32		29	29		32
Confl. Bikes (#/hr)			3			2						2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.0	32.0			32.0			46.0			46.0	
Effective Green, g (s)	32.0	32.0			32.0			46.0			46.0	
Actuated g/C Ratio	0.36	0.36			0.36			0.51			0.51	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	478	541			550			842			902	
v/s Ratio Prot		0.02										
v/s Ratio Perm	c0.14				0.01			c0.35			0.19	
v/c Ratio	0.40	0.07			0.02			0.69			0.38	
Uniform Delay, d1	21.8	19.2			18.8			16.6			13.3	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.1			0.0			4.7			1.2	
Delay (s)	22.3	19.2			18.8			21.3			14.5	
Level of Service	C	B			B			C			B	
Approach Delay (s)		21.3			18.8			21.3			14.5	
Approach LOS		C			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	114.1%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Queues
2: Queen St & Tannery St

FT - AM Peak
05-16-2019

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	190	95	15	584	351
v/c Ratio	0.40	0.16	0.03	0.69	0.38
Control Delay	24.9	5.8	12.4	22.0	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	5.8	12.4	22.0	13.9
Queue Length 50th (m)	24.3	0.6	0.6	72.3	32.3
Queue Length 95th (m)	42.4	10.0	4.5	110.6	51.3
Internal Link Dist (m)		271.4	49.6	443.9	101.6
Turn Bay Length (m)	35.0				
Base Capacity (vph)	478	600	557	844	915
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	0.40	0.16	0.03	0.69	0.38

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	363	129	63	394	419
v/c Ratio	0.72	0.25	0.13	0.37	0.41
Control Delay	37.9	6.0	9.9	11.7	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	6.0	9.9	11.7	10.9
Queue Length 50th (m)	55.8	0.0	4.6	33.7	32.3
Queue Length 95th (m)	86.3	12.2	10.7	53.0	52.9
Internal Link Dist (m)	320.4			113.4	443.9
Turn Bay Length (m)			40.0		
Base Capacity (vph)	519	521	494	1071	1025
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	0.70	0.25	0.13	0.37	0.41

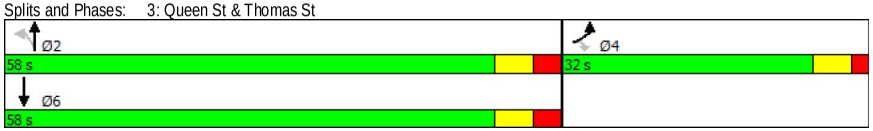
Intersection Summary

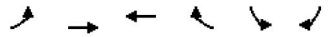
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	363	129	63	394	277
Future Volume (vph)	363	129	63	394	277
Turn Type	Prot	Perm	Perm	NA	NA
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	25.0	25.0	5.0	5.0	5.0
Minimum Split (s)	31.0	31.0	23.0	23.0	26.0
Total Split (s)	32.0	32.0	58.0	58.0	58.0
Total Split (%)	35.6%	35.6%	64.4%	64.4%	64.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Ped	Ped	Max	Max	Max
Act Effct Green (s)	25.4	25.4	51.0	51.0	51.0
Actuated g/C Ratio	0.28	0.28	0.57	0.57	0.57
v/c Ratio	0.72	0.25	0.13	0.37	0.41
Control Delay	37.9	6.0	9.9	11.7	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	6.0	9.9	11.7	10.9
LOS	D	A	A	B	B
Approach Delay	29.6			11.5	10.9
Approach LOS	C			B	B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 17.8 — Intersection LOS: B
Intersection Capacity Utilization 65.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: Queen St & Thomas St





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	54	1235	362	5	1	64
Future Volume (Veh/h)	54	1235	362	5	1	64
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	54	1235	362	5	1	64
Pedestrians		7	7		4	
Lane Width (m)		3.5	3.5		3.5	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		1	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			218			
pX, platoon unblocked						
vC, conflicting volume	371				1101	194
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	371				1101	194
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				99	92
cM capacity (veh/h)	1194				198	812

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	466	823	241	126	1	64
Volume Left	54	0	0	0	1	0
Volume Right	0	0	0	5	0	64
cSH	1194	1700	1700	1700	198	812
Volume to Capacity	0.05	0.48	0.14	0.07	0.01	0.08
Queue Length 95th (m)	1.1	0.0	0.0	0.0	0.1	1.9
Control Delay (s)	1.4	0.0	0.0	0.0	23.3	9.8
Lane LOS	A				C	A
Approach Delay (s)	0.5		0.0		10.0	
Approach LOS					B	

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	363	129	63	394	277	142
Future Volume (vph)	363	129	63	394	277	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.93	1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1785	1479	1750	1879	1762	
Flt Permitted	0.95	1.00	0.47	1.00	1.00	
Satd. Flow (perm)	1785	1479	866	1879	1762	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	363	129	63	394	277	142
RTOR Reduction (vph)	0	92	0	0	20	0
Lane Group Flow (vph)	363	37	63	394	399	0
Confl. Peds. (#/hr)	17	20	28			28
Confl. Bikes (#/hr)		2				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	25.4	25.4	51.0	51.0	51.0	
Effective Green, g (s)	25.4	25.4	51.0	51.0	51.0	
Actuated g/C Ratio	0.28	0.28	0.57	0.57	0.57	
Clearance Time (s)	6.0	6.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	507	420	494	1071	1005	
v/s Ratio Prot	c0.20			0.21	c0.23	
v/s Ratio Perm		0.02	0.07			
v/c Ratio	0.72	0.09	0.13	0.37	0.40	
Uniform Delay, d1	28.8	23.5	8.9	10.4	10.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.8	0.1	0.5	1.0	1.2	
Delay (s)	33.5	23.6	9.4	11.4	11.8	
Level of Service	C	C	A	B	B	
Approach Delay (s)	30.9			11.1	11.8	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	89.4	Sum of lost time (s)	13.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1234	325	174	83
v/c Ratio	0.57	0.23	0.68	0.21
Control Delay	9.2	4.6	53.4	7.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.2	4.6	53.4	7.6
Queue Length 50th (m)	51.3	8.2	31.4	0.0
Queue Length 95th (m)	74.3	13.3	52.7	10.6
Internal Link Dist (m)	194.1	107.3	76.3	
Turn Bay Length (m)				
Base Capacity (vph)	2165	1391	312	652
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	0.23	0.56	0.13

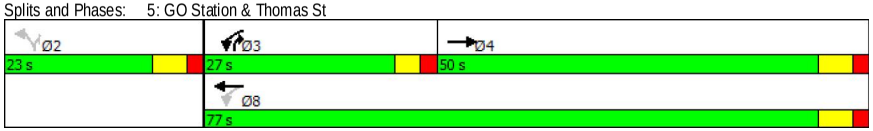
Intersection Summary

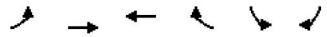
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	669	132	193	174	83
Future Volume (vph)	669	132	193	174	83
Turn Type	NA	pm+pt	NA	Perm	pm+ov
Protected Phases	4	3	8		3
Permitted Phases		8		2	2
Detector Phase	4	3	8	2	3
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	50.0	10.0	77.0	23.0	10.0
Total Split (s)	50.0	27.0	77.0	23.0	27.0
Total Split (%)	50.0%	27.0%	77.0%	23.0%	27.0%
Yellow Time (s)	4.0	3.0	4.0	4.0	3.0
All-Red Time (s)	2.0	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	5.0
Lead/Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes			Yes
Recall Mode	Max	None	Max	Min	None
Act Effct Green (s)	62.7		71.1	13.9	20.5
Actuated g/C Ratio	0.65		0.73	0.14	0.21
v/c Ratio	0.57		0.23	0.68	0.21
Control Delay	9.2		4.6	53.4	7.6
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	9.2		4.6	53.4	7.6
LOS	A		A	D	A
Approach Delay	9.2		4.6	38.6	
Approach LOS	A		A	D	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 97
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 12.5 — Intersection LOS: B
Intersection Capacity Utilization 73.4% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 5: GO Station & Thomas St

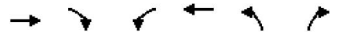




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	750	303	2	6	22
Future Volume (Veh/h)	4	750	303	2	6	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	0.88	0.88	1.00	1.00
Hourly flow rate (vph)	4	750	344	2	6	22
Pedestrians		8	1			
Lane Width (m)		3.7	3.7			
Walking Speed (m/s)		1.1	1.1			
Percent Blockage		1	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		131	43			
pX, platoon unblocked	0.99				0.99	0.99
vC, conflicting volume	346				729	181
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	329				715	163
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	97
cM capacity (veh/h)	1234				366	847

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	254	500	229	117	28
Volume Left	4	0	0	0	6
Volume Right	0	0	0	2	22
cSH	1234	1700	1700	1700	661
Volume to Capacity	0.00	0.29	0.13	0.07	0.04
Queue Length 95th (m)	0.1	0.0	0.0	0.0	1.0
Control Delay (s)	0.2	0.0	0.0	0.0	10.7
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		10.7
Approach LOS					B

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		35.9%	ICU Level of Service	A
Analysis Period (min)		15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	669	565	132	193	174	83
Future Volume (vph)	669	565	132	193	174	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0			6.0	6.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	0.96			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.93			1.00	1.00	0.85
Flt Protected	1.00			0.98	0.95	1.00
Satd. Flow (prot)	3204			3499	1779	1559
Flt Permitted	1.00			0.51	0.95	1.00
Satd. Flow (perm)	3204			1812	1779	1559
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	669	565	132	193	174	83
RTOR Reduction (vph)	98	0	0	0	0	68
Lane Group Flow (vph)	1136	0	0	325	174	15
Confl. Peds. (#/hr)		18	18		2	13
Confl. Bikes (#/hr)		3				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	NA		pm+pt	NA	Perm	pm+ov
Protected Phases	4		3	8		3
Permitted Phases			8		2	2
Actuated Green, G (s)	62.7			72.1	13.9	18.3
Effective Green, g (s)	62.7			72.1	13.9	18.3
Actuated g/C Ratio	0.64			0.74	0.14	0.19
Clearance Time (s)	6.0			6.0	6.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2049			1408	252	291
v/s Ratio Prot	c0.35			c0.01		0.00
v/s Ratio Perm				0.16	c0.10	0.01
v/c Ratio	0.55			0.23	0.69	0.05
Uniform Delay, d1	9.9			4.1	40.0	32.7
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.1			0.1	7.9	0.1
Delay (s)	10.9			4.2	47.9	32.8
Level of Service	B			A	D	C
Approach Delay (s)	10.9			4.2	43.0	
Approach LOS	B			A	D	

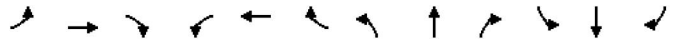
Intersection Summary				
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	73.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	414	13	16	185	64	79
Future Volume (Veh/h)	414	13	16	185	64	79
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	450	14	17	201	70	86
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				48		
pX, platoon unblocked						
vC, conflicting volume			464		692	457
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			464		692	457
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		83	86
cM capacity (veh/h)			1097		404	604

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	464	218	156
Volume Left	0	17	70
Volume Right	14	0	86
cSH	1700	1097	494
Volume to Capacity	0.27	0.02	0.32
Queue Length 95th (m)	0.0	0.4	10.2
Control Delay (s)	0.0	0.8	15.6
Lane LOS		A	C
Approach Delay (s)	0.0	0.8	15.6
Approach LOS			C

Intersection Summary				
Average Delay		3.1		
Intersection Capacity Utilization	38.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	251	209	30	139	4	49	14	25	10	12	21
Future Volume (Veh/h)	33	251	209	30	139	4	49	14	25	10	12	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	33	251	209	30	139	4	49	14	25	10	12	21
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		57			295							
pX, platoon unblocked												
vC, conflicting volume	143			460			650	624	356	654	727	141
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	143			460			650	624	356	654	727	141
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			86	96	96	97	96	98
cM capacity (veh/h)	1452			1112			353	384	693	345	336	912

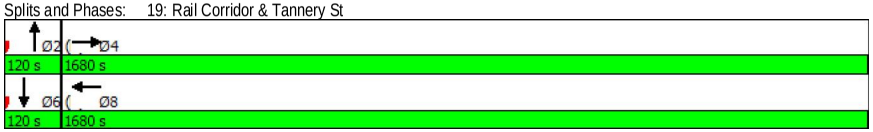
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	493	173	88	43
Volume Left	33	30	49	10
Volume Right	209	4	25	21
cSH	1452	1112	416	490
Volume to Capacity	0.02	0.03	0.21	0.09
Queue Length 95th (m)	0.5	0.6	6.0	2.2
Control Delay (s)	0.7	1.6	16.0	13.1
Lane LOS	A	A	C	B
Approach Delay (s)	0.7	1.6	16.0	13.1
Approach LOS			C	B

Intersection Summary				
Average Delay		3.3		
Intersection Capacity Utilization	48.0%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	Ø2	Ø4	Ø6	Ø8
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type				
Protected Phases	2	4	6	8
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	120.0	1680.0	120.0	1680.0
Total Split (%)	7%	93%	7%	93%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary		
Cycle Length: 1800		
Actuated Cycle Length: 1800		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 45		
Control Type: Pretimed		
Maximum v/c Ratio: 0.00		
Intersection Signal Delay: 0.0	Intersection LOS: A	
Intersection Capacity Utilization 0.0%	ICU Level of Service A	
Analysis Period (min) 15		

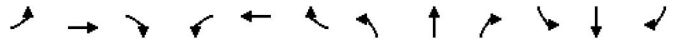
Splits and Phases: 19: Rail Corridor & Tannery St



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	413	245	12	14	12
Future Volume (Veh/h)	5	413	245	12	14	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	413	245	12	14	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			129			
pX, platoon unblocked						
vC, conflicting volume	257				674	251
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	257				674	251
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	98
cM capacity (veh/h)	1320				421	793

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	418	257	26
Volume Left	5	0	14
Volume Right	0	12	12
cSH	1320	1700	538
Volume to Capacity	0.00	0.15	0.05
Queue Length 95th (m)	0.1	0.0	1.2
Control Delay (s)	0.1	0.0	12.0
Lane LOS	A		B
Approach Delay (s)	0.1	0.0	12.0
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Peak-hour factor, PHF	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)	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	0.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group
Lane Group Flow (vph)
v/c Ratio
Control Delay
Queue Delay
Total Delay
Queue Length 50th (m)
Queue Length 95th (m)
Internal Link Dist (m)
Turn Bay Length (m)
Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced v/c Ratio

Intersection Summary

Lane Group	EBT	WBT
Lane Group Flow (vph)	752	305
v/c Ratio	0.23	0.09
Control Delay	5.6	4.8
Queue Delay	12.0	2.5
Total Delay	17.6	7.3
Queue Length 50th (m)	125.3	43.8
Queue Length 95th (m)	121.6	44.8
Internal Link Dist (m)	19.3	320.4
Turn Bay Length (m)		
Base Capacity (vph)	3331	3331
Starvation Cap Reductn	2556	2884
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.97	0.68

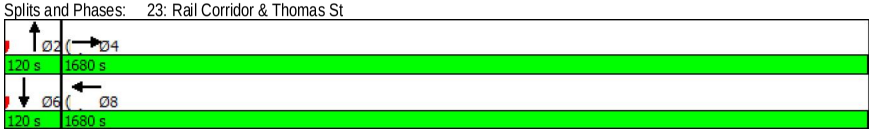
Intersection Summary

Lane Group	EBT	WBT	Ø2	Ø6
Lane Configurations				
Traffic Volume (vph)	752	305		
Future Volume (vph)	752	305		
Turn Type	NA	NA		
Protected Phases	4	8	2	6
Permitted Phases				
Detector Phase	4	8		
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	1680.0	1680.0	120.0	120.0
Total Split (%)	93.3%	93.3%	7%	7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		
Total Lost Time (s)	4.5	4.5		
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	1675.5	1675.5		
Actuated g/C Ratio	0.93	0.93		
v/c Ratio	0.23	0.09		
Control Delay	5.6	4.8		
Queue Delay	12.0	2.5		
Total Delay	17.6	7.3		
LOS	B	A		
Approach Delay	17.6	7.3		
Approach LOS	B	A		

Intersection Summary

Cycle Length: 1800
Actuated Cycle Length: 1800
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 45
Control Type: Pretimed
Maximum v/c Ratio: 0.23
Intersection Signal Delay: 14.6 — Intersection LOS: B
Intersection Capacity Utilization 24.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 23: Rail Corridor & Thomas St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Traffic Volume (vph)	0	752	0	0	305	0	0	0	0	0	0	0
Future Volume (vph)	0	752	0	0	305	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5							
Lane Util. Factor		0.95			0.95							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3579			3579							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3579			3579							
Peak-hour factor, PHF	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)	0	752	0	0	305	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	752	0	0	305	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)		1675.5			1675.5							
Effective Green, g (s)		1675.5			1675.5							
Actuated g/C Ratio		0.93			0.93							
Clearance Time (s)		4.5			4.5							
Lane Grp Cap (vph)		3331			3331							
v/s Ratio Prot		c0.21			0.09							
v/s Ratio Perm												
v/c Ratio		0.23			0.09							
Uniform Delay, d1		5.5			4.7							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.2			0.1							
Delay (s)		5.6			4.8							
Level of Service		A			A							
Approach Delay (s)		5.6			4.8			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary					
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A		
HCM 2000 Volume to Capacity ratio	0.21				
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0		
Intersection Capacity Utilization	24.5%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	119	5	3	7	50	523	12	442
Future Volume (vph)	119	5	3	7	50	523	12	442
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)	25.0	25.0	25.0	25.0	46.0	46.0	46.0	46.0
Minimum Split (s)	31.0	31.0	31.0	31.0	52.0	52.0	52.0	52.0
Total Split (s)	31.0	31.0	31.0	31.0	79.0	79.0	79.0	79.0
Total Split (%)	28.2%	28.2%	28.2%	28.2%	71.8%	71.8%	71.8%	71.8%
Yellow Time (s)	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	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0		6.0		6.0		6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Ped	Ped	Ped	Ped	Max	Max	Max	Max
Act Effct Green (s)	25.0	25.0		25.0		73.0		73.0
Actuated g/C Ratio	0.23	0.23		0.23		0.66		0.66
v/c Ratio	0.40	0.22		0.05		0.51		0.51
Control Delay	41.0	9.9		24.8		11.4		10.7
Queue Delay	0.0	0.0		0.0		0.0		0.0
Total Delay	41.0	9.9		24.8		11.4		10.7
LOS	D	A		C		B		B
Approach Delay		27.6		24.8		11.4		10.7
Approach LOS		C		C		B		B

Intersection Summary			
Cycle Length: 110			
Actuated Cycle Length: 110			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 13.7		Intersection LOS: B	
Intersection Capacity Utilization 85.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Queen St & Tannery St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	6	3	82	5	196	2	32	38	193	68	2
Future Volume (vph)	1	6	3	82	5	196	2	32	38	193	68	2
Peak Hour Factor	0.92	0.92	0.92	1.00	0.92	1.00	0.92	1.00	1.00	1.00	1.00	0.92
Hourly flow rate (vph)	1	7	3	82	5	196	2	32	38	193	68	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	283	72	263
Volume Left (vph)	1	82	2	193
Volume Right (vph)	3	196	38	2
Hadj (s)	-0.11	-0.36	-0.31	0.14
Departure Headway (s)	5.0	4.4	4.6	4.8
Degree Utilization, x	0.02	0.34	0.09	0.35
Capacity (veh/h)	647	770	715	706
Control Delay (s)	8.1	9.7	8.1	10.4
Approach Delay (s)	8.1	9.7	8.1	10.4
Approach LOS	A	A	A	B

Intersection Summary				
Delay		9.8		
Level of Service		A		
Intersection Capacity Utilization	51.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	5	85	3	7	7	50	523	7	12	442	144
Future Volume (vph)	119	5	85	3	7	7	50	523	7	12	442	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.92			0.96			1.00			0.98	
Flpb, ped/bikes	0.93	1.00			0.99			1.00			1.00	
Frt	1.00	0.86			0.94			1.00			0.97	
Flt Protected	0.95	1.00			0.99			1.00			1.00	
Satd. Flow (prot)	1660	1489			1676			1862			1774	
Flt Permitted	0.75	1.00			0.97			0.91			0.99	
Satd. Flow (perm)	1304	1489			1633			1705			1753	
Peak-hour factor, PHF	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)	119	5	85	3	7	7	50	523	7	12	442	144
RTOR Reduction (vph)	0	66	0	0	5	0	0	0	0	0	10	0
Lane Group Flow (vph)	119	24	0	0	12	0	0	580	0	0	588	0
Confl. Peds. (#/hr)	26		21	21		26	32		29	29		32
Confl. Bikes (#/hr)			3			2						2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.0	25.0			25.0			73.0			73.0	
Effective Green, g (s)	25.0	25.0			25.0			73.0			73.0	
Actuated g/C Ratio	0.23	0.23			0.23			0.66			0.66	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	296	338			371			1131			1163	
v/s Ratio Prot		0.02										
v/s Ratio Perm	c0.09				0.01			c0.34			0.34	
v/c Ratio	0.40	0.07			0.03			0.51			0.51	
Uniform Delay, d1	36.1	33.4			33.1			9.4			9.4	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.9	0.1			0.0			1.7			1.6	
Delay (s)	37.0	33.5			33.1			11.1			10.9	
Level of Service	D	C			C			B			B	
Approach Delay (s)		35.5			33.1			11.1			10.9	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	85.6%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	119	90	17	580	598
v/c Ratio	0.40	0.22	0.05	0.51	0.51
Control Delay	41.0	9.9	24.8	11.4	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	9.9	24.8	11.4	10.7
Queue Length 50th (m)	21.9	0.8	1.7	57.5	55.7
Queue Length 95th (m)	39.4	13.4	7.4	82.8	80.7
Internal Link Dist (m)		271.4	49.6	443.9	101.6
Turn Bay Length (m)	35.0				
Base Capacity (vph)	296	403	376	1131	1173
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	0.40	0.22	0.05	0.51	0.51

Intersection Summary

Queues
3: Queen St & Thomas St

FT - PM Peak
05-16-2019

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	198	140	144	452	687
v/c Ratio	0.47	0.31	0.39	0.37	0.61
Control Delay	40.4	7.7	13.0	10.2	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	7.7	13.0	10.2	12.9
Queue Length 50th (m)	36.7	0.0	13.4	41.5	70.9
Queue Length 95th (m)	58.7	15.1	26.9	59.6	104.1
Internal Link Dist (m)	320.4			113.4	443.9
Turn Bay Length (m)			40.0		
Base Capacity (vph)	421	455	372	1212	1135
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	0.47	0.31	0.39	0.37	0.61

Intersection Summary

Timings
3: Queen St & Thomas St

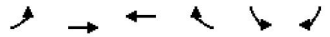
FT - PM Peak
05-16-2019

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	198	140	144	452	402
Future Volume (vph)	198	140	144	452	402
Turn Type	Prot	Perm	Perm	NA	NA
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phase	4	4	2	2	6
Switch Phase					
Minimum Initial (s)	26.0	26.0	5.0	5.0	5.0
Minimum Split (s)	32.0	32.0	23.0	23.0	26.0
Total Split (s)	32.0	32.0	78.0	78.0	78.0
Total Split (%)	29.1%	29.1%	70.9%	70.9%	70.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Ped	Ped	Max	Max	Max
Act Effct Green (s)	26.0	26.0	71.0	71.0	71.0
Actuated g/C Ratio	0.24	0.24	0.65	0.65	0.65
v/c Ratio	0.47	0.31	0.39	0.37	0.61
Control Delay	40.4	7.7	13.0	10.2	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	7.7	13.0	10.2	12.9
LOS	D	A	B	B	B
Approach Delay	26.9			10.9	12.9
Approach LOS	C			B	B

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 15.0 Intersection LOS: B
Intersection Capacity Utilization 85.9% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Queen St & Thomas St



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	54	501	1032	23	6	141
Future Volume (Veh/h)	54	501	1032	23	6	141
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	54	501	1032	23	6	141
Pedestrians		7	7		4	
Lane Width (m)		3.5	3.5		3.5	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		1	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			218			
pX, platoon unblocked	0.93				0.93	0.93
vC, conflicting volume	1059				1413	538
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	914				1295	355
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				95	76
cM capacity (veh/h)	699				133	596

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	221	334	688	367	6	141
Volume Left	54	0	0	0	6	0
Volume Right	0	0	0	23	0	141
cSH	699	1700	1700	1700	133	596
Volume to Capacity	0.08	0.20	0.40	0.22	0.05	0.24
Queue Length 95th (m)	1.9	0.0	0.0	0.0	1.1	7.0
Control Delay (s)	3.3	0.0	0.0	0.0	33.3	12.9
Lane LOS	A				D	B
Approach Delay (s)	1.3		0.0		13.7	
Approach LOS					B	

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	198	140	144	452	402	285
Future Volume (vph)	198	140	144	452	402	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0	6.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.92	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1785	1474	1785	1879	1723	
Flt Permitted	0.95	1.00	0.31	1.00	1.00	
Satd. Flow (perm)	1785	1474	576	1879	1723	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	198	140	144	452	402	285
RTOR Reduction (vph)	0	107	0	0	23	0
Lane Group Flow (vph)	198	33	144	452	664	0
Confl. Peds. (#/hr)	17	20	28			28
Confl. Bikes (#/hr)		2				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	26.0	26.0	71.0	71.0	71.0	
Effective Green, g (s)	26.0	26.0	71.0	71.0	71.0	
Actuated g/C Ratio	0.24	0.24	0.65	0.65	0.65	
Clearance Time (s)	6.0	6.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	421	348	371	1212	1112	
v/s Ratio Prot	c0.11			0.24	c0.39	
v/s Ratio Perm		0.02	0.25			
v/c Ratio	0.47	0.10	0.39	0.37	0.60	
Uniform Delay, d1	36.1	32.8	9.2	9.1	11.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	0.1	3.0	0.9	2.4	
Delay (s)	36.9	32.9	12.3	10.0	13.6	
Level of Service	D	C	B	A	B	
Approach Delay (s)	35.3			10.5	13.6	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	502	730	367	138
v/c Ratio	0.35	0.40	0.76	0.22
Control Delay	15.2	10.5	35.6	4.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	15.2	10.5	35.6	4.7
Queue Length 50th (m)	22.1	26.6	46.9	2.0
Queue Length 95th (m)	39.7	47.5	74.1	10.4
Internal Link Dist (m)	194.1	107.3	76.3	
Turn Bay Length (m)				
Base Capacity (vph)	1454	1866	1079	781
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	0.35	0.39	0.34	0.18

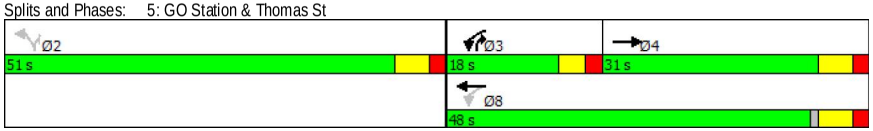
Intersection Summary

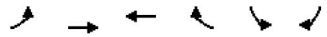
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	393	50	680	367	138
Future Volume (vph)	393	50	680	367	138
Turn Type	NA	pm+pt	NA	Perm	pm+ov
Protected Phases	4	3	8		3
Permitted Phases		8		2	2
Detector Phase	4	3	8	2	3
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	21.0	10.0	21.0	25.0	10.0
Total Split (s)	31.0	18.0	48.0	51.0	18.0
Total Split (%)	31.0%	18.0%	48.0%	51.0%	18.0%
Yellow Time (s)	4.0	3.0	4.0	4.0	3.0
All-Red Time (s)	2.0	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	5.0
Lead/Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes			Yes
Recall Mode	Max	None	Max	Min	None
Act Effct Green (s)	31.5		42.2	20.2	26.9
Actuated g/C Ratio	0.42		0.57	0.27	0.36
v/c Ratio	0.35		0.40	0.76	0.22
Control Delay	15.2		10.5	35.6	4.7
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	15.2		10.5	35.6	4.7
LOS	B		B	D	A
Approach Delay	15.2		10.5	27.1	
Approach LOS	B		B	C	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 74.5
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 16.7 — Intersection LOS: B
Intersection Capacity Utilization 70.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: GO Station & Thomas St





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	517	728	6	4	12
Future Volume (Veh/h)	22	517	728	6	4	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	22	517	728	6	4	12
Pedestrians		8	1			
Lane Width (m)		3.7	3.7			
Walking Speed (m/s)		1.1	1.1			
Percent Blockage		1	0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		131	43			
pX, platoon unblocked	0.98				0.96	0.98
vC, conflicting volume	734				1034	375
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	693				860	327
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	896				279	657

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	194	345	485	249	16
Volume Left	22	0	0	0	4
Volume Right	0	0	0	6	12
cSH	896	1700	1700	1700	490
Volume to Capacity	0.02	0.20	0.29	0.15	0.03
Queue Length 95th (m)	0.6	0.0	0.0	0.0	0.8
Control Delay (s)	1.3	0.0	0.0	0.0	12.6
Lane LOS	A				B
Approach Delay (s)	0.5		0.0		12.6
Approach LOS					B

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		42.8%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	393	109	50	680	367	138
Future Volume (vph)	393	109	50	680	367	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	6.0			6.0	6.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	0.99			1.00	1.00	0.98
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.97			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3404			3554	1781	1563
Flt Permitted	1.00			0.89	0.95	1.00
Satd. Flow (perm)	3404			3178	1781	1563
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	393	109	50	680	367	138
RTOR Reduction (vph)	20	0	0	0	0	74
Lane Group Flow (vph)	482	0	0	730	367	64
Confl. Peds. (#/hr)		18	18		2	13
Confl. Bikes (#/hr)		3				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	NA		pm+pt	NA	Perm	pm+ov
Protected Phases	4		3	8		3
Permitted Phases			8		2	2
Actuated Green, G (s)	31.6			42.2	20.2	25.8
Effective Green, g (s)	31.6			42.2	20.2	25.8
Actuated g/C Ratio	0.42			0.57	0.27	0.35
Clearance Time (s)	6.0			6.0	6.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1445			1830	483	542
v/s Ratio Prot	0.14			c0.03		0.01
v/s Ratio Perm				c0.20	c0.21	0.03
v/c Ratio	0.33			0.40	0.76	0.12
Uniform Delay, d1	14.3			9.0	24.9	16.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.6			0.1	6.8	0.1
Delay (s)	15.0			9.1	31.6	16.7
Level of Service	B			A	C	B
Approach Delay (s)	15.0			9.1	27.5	
Approach LOS	B			A	C	

Intersection Summary				
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	74.4	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	70.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	217	17	26	268	21	28
Future Volume (Veh/h)	217	17	26	268	21	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	236	18	28	291	23	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				42		
pX, platoon unblocked						
vC, conflicting volume			254		592	245
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			254		592	245
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	96
cM capacity (veh/h)			1311		459	794

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	254	319	53
Volume Left	0	28	23
Volume Right	18	0	30
cSH	1700	1311	603
Volume to Capacity	0.15	0.02	0.09
Queue Length 95th (m)	0.0	0.5	2.2
Control Delay (s)	0.0	0.9	11.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.9	11.5
Approach LOS			B

Intersection Summary				
Average Delay		1.4		
Intersection Capacity Utilization		41.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	136	87	50	136	13	93	40	55	18	46	65
Future Volume (Veh/h)	22	136	87	50	136	13	93	40	55	18	46	65
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	22	136	87	50	136	13	93	40	55	18	46	65
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		57			295							
pX, platoon unblocked												
vC, conflicting volume	149			223			554	472	180	541	510	142
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	149			223			554	472	180	541	510	142
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			75	91	94	95	90	93
cM capacity (veh/h)	1445			1358			367	468	869	383	446	910

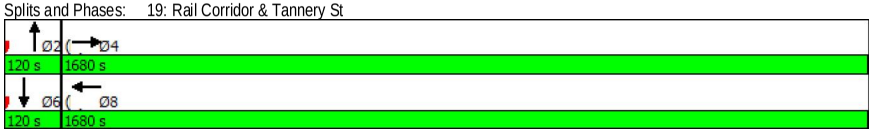
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	245	199	188	129
Volume Left	22	50	93	18
Volume Right	87	13	55	65
cSH	1445	1358	467	582
Volume to Capacity	0.02	0.04	0.40	0.22
Queue Length 95th (m)	0.4	0.9	14.6	6.4
Control Delay (s)	0.8	2.2	17.8	12.9
Lane LOS	A	A	C	B
Approach Delay (s)	0.8	2.2	17.8	12.9
Approach LOS			C	B

Intersection Summary				
Average Delay		7.4		
Intersection Capacity Utilization		45.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	Ø2	Ø4	Ø6	Ø8
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type				
Protected Phases	2	4	6	8
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	120.0	1680.0	120.0	1680.0
Total Split (%)	7%	93%	7%	93%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Intersection Summary		
Cycle Length: 1800		
Actuated Cycle Length: 1800		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 45		
Control Type: Pretimed		
Maximum v/c Ratio: 0.00		
Intersection Signal Delay: 0.0	Intersection LOS: A	
Intersection Capacity Utilization 0.0%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 19: Rail Corridor & Tannery St



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	224	277	12	10	7
Future Volume (Veh/h)	13	224	277	12	10	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	13	224	277	12	10	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			129			
pX, platoon unblocked						
vC, conflicting volume	289				533	283
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	289				533	283
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	99
cM capacity (veh/h)	1284				506	761

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	237	289	17
Volume Left	13	0	10
Volume Right	0	12	7
cSH	1284	1700	587
Volume to Capacity	0.01	0.17	0.03
Queue Length 95th (m)	0.2	0.0	0.7
Control Delay (s)	0.5	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	0.5	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Peak-hour factor, PHF	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)	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	0.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group
Lane Group Flow (vph)
v/c Ratio
Control Delay
Queue Delay
Total Delay
Queue Length 50th (m)
Queue Length 95th (m)
Internal Link Dist (m)
Turn Bay Length (m)
Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced v/c Ratio

Intersection Summary

Lane Group	EBT	WBT
Lane Group Flow (vph)	541	734
v/c Ratio	0.16	0.22
Control Delay	5.2	5.6
Queue Delay	9.6	4.5
Total Delay	14.7	10.1
Queue Length 50th (m)	83.8	121.6
Queue Length 95th (m)	83.0	118.0
Internal Link Dist (m)	19.3	320.4
Turn Bay Length (m)		
Base Capacity (vph)	3331	3331
Starvation Cap Reductn	2750	2500
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.93	0.88

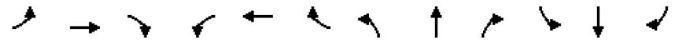
Intersection Summary

Lane Group	EBT	WBT	Ø2	Ø6
Lane Configurations				
Traffic Volume (vph)	541	734		
Future Volume (vph)	541	734		
Turn Type	NA	NA		
Protected Phases	4	8	2	6
Permitted Phases				
Detector Phase	4	8		
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5
Total Split (s)	1680.0	1680.0	120.0	120.0
Total Split (%)	93.3%	93.3%	7%	7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		
Total Lost Time (s)	4.5	4.5		
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	1675.5	1675.5		
Actuated g/C Ratio	0.93	0.93		
v/c Ratio	0.16	0.22		
Control Delay	5.2	5.6		
Queue Delay	9.6	4.5		
Total Delay	14.7	10.1		
LOS	B	B		
Approach Delay	14.7	10.1		
Approach LOS	B	B		

Intersection Summary

Cycle Length: 1800
Actuated Cycle Length: 1800
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 45
Control Type: Pretimed
Maximum v/c Ratio: 0.22
Intersection Signal Delay: 12.0 — Intersection LOS: B
Intersection Capacity Utilization 24.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 23: Rail Corridor & Thomas St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Traffic Volume (vph)	0	541	0	0	734	0	0	0	0	0	0	0
Future Volume (vph)	0	541	0	0	734	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5							
Lane Util. Factor		0.95			0.95							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3579			3579							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3579			3579							
Peak-hour factor, PHF	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)	0	541	0	0	734	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	541	0	0	734	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)		1675.5			1675.5							
Effective Green, g (s)		1675.5			1675.5							
Actuated g/C Ratio		0.93			0.93							
Clearance Time (s)		4.5			4.5							
Lane Grp Cap (vph)		3331			3331							
v/s Ratio Prot		0.15			c0.21							
v/s Ratio Perm												
v/c Ratio		0.16			0.22							
Uniform Delay, d1		5.1			5.4							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.1			0.2							
Delay (s)		5.2			5.6							
Level of Service		A			A							
Approach Delay (s)		5.2			5.6			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	1800.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F

Correspondence with City of Mississauga

Daniel Bragagnini

From: Tyler Xuereb <Tyler.Xuereb@mississauga.ca>
Sent: May-14-19 3:10 PM
To: Daniel Bragagnini
Subject: RE: 51, 57 Tannery St and 208 Emby Dr - Proposed Townhouse Development

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Daniel,

Below are the rates for Queen Street which are compounded annually (per year).

Queen Street

	Compounded Annual Growth from Existing to 2022	
	NB	SB
Time		
AM Peak Hour	0.5%	0.5%
PM Peak Hour	0.5%	0.0%

If you have any questions please let me know.

Regards,

Tyler

From: Daniel Bragagnini [mailto:DBragagnini@lea.ca]
Sent: 2019/05/14 2:22 PM
To: Tyler Xuereb
Subject: RE: 51, 57 Tannery St and 208 Emby Dr - Proposed Townhouse Development

Hi Tyler – could you please also clarify if the 0.5% compound growth on Thomas is per year or overall?

Thanks,

Daniel Bragagnini, B.A.Sc., M.Eng. Candidate, E.I.T.
Transportation Co-op
T: 905-470-0015 ext. 345 E: DBragagnini@lea.ca
LEA Consulting Ltd.

After reviewing the information provided and the results coming from the city's model as well as supporting traffic count data the City's Transportation Planning section has determined the projected growth on Thomas Street to be used as part of your study. The recommended projected growth is shown below:

	Compounded Annual Growth from Existing to 2022	
	EB	WB
Time		
AM Peak Hour	0.0%	0.0%
PM Peak Hour	0.5%	0.0%

The city only provides growth rates for major collectors and arterials, as such I can only provide information for Thomas Street.

If you have any questions regarding the information provided please let me know.

Thanks,

Tyler

From: Daniel Bragagnini [mailto:DBragagnini@lea.ca]
Sent: 2019/05/14 10:29 AM
To: Tyler Xuereb
Subject: RE: 51, 57 Tannery St and 208 Emby Dr - Proposed Townhouse Development

In addition, the horizon year is 2022 (5 years from the date of our data collection in 2017).

Daniel Bragagnini, B.A.Sc., M.Eng. Candidate, E.I.T.
Transportation Co-op
T: 905-470-0015 ext. 345 E: DBragagnini@lea.ca
LEA Consulting Ltd.

From: Daniel Bragagnini
Sent: May-14-19 9:30 AM
To: tyler.xuereb@mississauga.ca
Subject: 51, 57 Tannery St and 208 Emby Dr - Proposed Townhouse Development

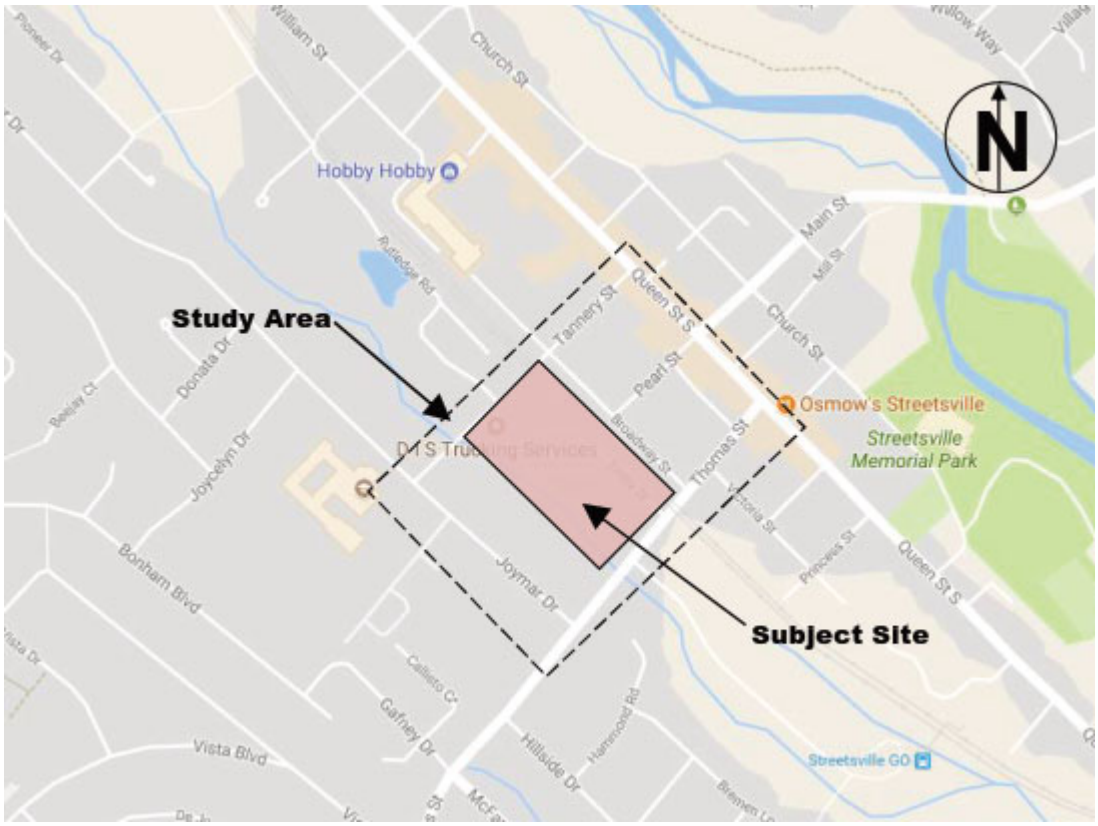
Hi Tyler,

Thanks for the call earlier today, here are the details for the TIS as requested. The study area is shown below and the study intersections are as follows:

- Tannery St & Crumbie St / Broadway St
- Tannery St & Rutledge Rd
- Tannery St & Joymar Dr

- Tannery St & Queen St
- Thomas St & Emby Dr
- Thomas St & Queen St
- Thomas St & GO Station Access
- Thomas St & Joymar Dr

As discussed over the phone, we based our background traffic growth assumptions on the closest Region of Peele count station. The AADT counts showed an overall decline in traffic since 2011. For this reason, we kept growth level (though we did include surrounding background developments in the area) – just wanted to confirm our traffic growth assumptions with you per Linda's comments. Thanks!



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