APPENDIX C

Transportation and Traffic Analysis Report

Courtneypark Drive East Class EA Transportation and Traffic Analysis Report

Prepared for:
City of Mississauga

Prepared by:
Stantec Consulting Ltd.
300 – 675 Cochrane Dr., West Tower
Markham, ON
L3R 0B8

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Sign-off Sheet

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Prepared by _____
(signature)

Adrian Soo, P.Eng.

Stantec Consulting Ltd.
300-675 Cochrane Drive, West Tower
Markham, ON
Tel: (905) 944-6192
Adrian.soo@stantec.com

Prepared by _____
(signature)

Steven Kwan, P.Eng.

Stantec Consulting Ltd.
300-675 Cochrane Drive, West Tower
Markham, ON
Tel: (905) 944-7788
steven.kwan@stantec.com

Reviewed by _____
(signature)

Garry Pappin, BES, LEL

Stantec Consulting Ltd.
300-675 Cochrane Drive, West Tower
Markham, ON
Tel: (905) 944-4803
garry.pappin@stantec.comnm

Stantec

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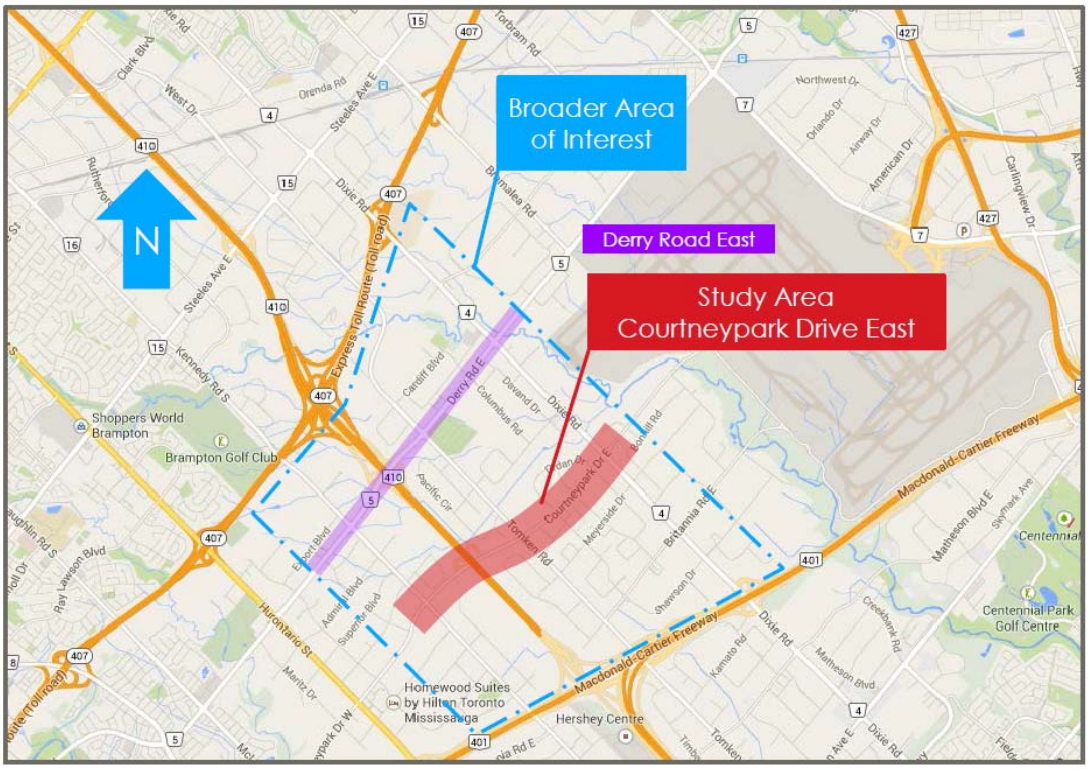
1.0 Introduction

The City of Mississauga (the City) and its co-proponent, the Region of Peel (the Region), are undertaking a Class Environmental Assessment (EA) for a 2.8 km section of Courtneypark Drive East from Kennedy Road to Dixie Road to:

- Address current and future operational deficiencies;
- Address current and future needs for additional east-west traffic capacity in the area;
- Identify and address safety concerns;
- Address the need for infrastructure improvements in the Study Area;
- Conduct a systematic evaluation of alternatives considering the effects on the natural, socio-economic, and cultural environments; and
- Develop a preliminary preferred design for the recommended alternative solution.

This Study also considers traffic operations on other major east-west roadways within a broader area of interest. Specifically, the Study examines how the capacity of Derry Road East is affected by improvements to Courtneypark Drive East. The Study Area is shown in **Figure 1**.



map via google.com

Figure 1 – Study Area (City of Mississauga)

The EA will also review opportunities for:

- Improving corridor and intersection operations;
- Improving the efficiency of both goods movements and access to, from, and/or through the Study Area;
- Improving pedestrian and bicycle facilities;
- Improving transit services; and
- Improving and protecting streetscaping/landscaping.

Based on the information available to date, the problem and opportunity statement for this Study is as follows:

Additional capacity and improved facilities are required within the Courtneypark Drive East Study Area to accommodate the existing traffic volumes and the anticipated growth in the Study Area to 2031; to facilitate safe and efficient east-west travel in northeast Mississauga; to enable

efficient movement of goods and improve access both within Mississauga and the Region of Peel; and to provide safe routes for users of various modes of active transportation.

This report focuses on the transportation and traffic conditions that contribute to the need and justification for improvements to Courtneypark Drive East. It describes the various tasks and methodology for the review and assessment of existing conditions, traffic forecasts, and operational performance for the Courtneypark Drive East Study Area. The key components of the transportation and traffic analysis include:

- Detailed description of the existing roadway, intersections, transit routes, and facilities for active transportation;
- Traffic operations assessment for existing conditions at key intersections;
- Determination of growth trends in the Corridor based on the City's travel demand model forecasts. The resultant growth indicators assist in the development of forecasts for the 2031 Study horizon year;
- Traffic operations assessment for future conditions;
- Assessment of goods movement within the Study Area; and
- Summary of transportation deficiencies and mitigation measures, which have been considered in the development of alternative solutions and alternative designs for improvements to Courtneypark Drive East.

A separate ***Safety Performance Report*** has also been conducted, which includes an examination of the collision history as well as a field review to identify where geometric or physical roadway conditions may contribute to safety issues or concerns.

2.0 Existing Conditions

2.1 ROADS AND TRAFFIC CONTROL

All of the Study Area roads operate under the jurisdiction of the City, with the exception of Highway 410 and its ramp terminals, which operate under the jurisdiction of the Ministry of Transportation, Ontario (MTO), and Derry Road and Dixie Road which operate under the jurisdiction of the Region of Peel. Using the City's Official Plan (OP) Schedule 5 – Long Term Road Network map as a reference, the characteristics of the roads and intersections within the Study Area and Broader Area of Interest are described as follows:

- Courtneypark Drive East is a four-lane east-west arterial providing access to the industrial and commercial lands between Highways 401 and 407 and to Toronto Pearson International Airport, Highway 410 and Hurontario Street. It is one of two east-west roadways (the other being Derry Road) that crosses Highway 410 between Highways 401 and 407. The posted speed limit on this road through the Study Area is 70 km/h;
    - The Highway 410 Courtneypark Drive On-Ramp forms an unsignalized intersection with Courtneypark Drive East. An eastbound auxiliary left turn lane is provided, along with a westbound channelized auxiliary on-ramp;
    - The Highway 410 Courtneypark Drive Off-Ramp forms a signalized "tee" intersection with Courtneypark Drive East. Southbound dual auxiliary left turn lanes, and an auxiliary right turn lane are provided;
- Derry Road is a six-lane east-west regional arterial road providing a major through route across the Region and beyond to adjacent municipalities. It is one of two east-west roadways (the other being Courtneypark Drive East) that crosses Highway 410 between Highways 401 and 407. It has a posted 70 km/h maximum speed limit through the Study Area;
    - The Highway 410 Derry Road Northbound Off-Ramp forms a signalized "tee" intersection with Derry Road. The lane configuration is a three lane approach with an auxiliary left, shared left/right, and auxiliary right turn lane provided;
    - The Highway 410 Derry Road Southbound Off-Ramp forms a signalized "tee" intersection with Derry Road. The lane configuration is a three lane approach with an auxiliary left, shared left/right, and auxiliary right turn lane provided;
- Highway 410 is a 400-series controlled-access highway serving north-south traffic between Highway 401 and the north end of Brampton. The freeway has a posted speed limit of 100 km/h;

- Kennedy Road is a four-lane north-south road with two lanes in each travel direction. It is classified as a major collector with a posted maximum speed limit of 70 km/h. A signalized intersection is formed with Courtneypark Drive East, with auxiliary left turn lanes provided on all intersection approaches. Pedestrian signals and delineated crosswalks are provided on all approaches;

- Tomken Road is a four-lane north-south road with two lanes in each travel direction. It is classified as a major collector with a posted maximum speed limit of 60 km/h. A signalized intersection is formed with Courtneypark Drive East, with auxiliary left turn lanes provided on the north, east, and west approaches. The south approach (northbound direction) provides dual auxiliary left turn lanes. Auxiliary right turn lanes are provided on the north, south, and west approaches. Pedestrian signals and delineated crosswalks are provided on all approaches of the intersection;

- Ordan Drive is a two-lane road and classified as a local road with a statutory posted speed limit of 50 km/h. Ordan Drive intersects with Courtneypark Drive East at two locations, both of which are signalized intersections. At the westerly intersection, auxiliary left turn lanes are provided on all intersection approaches. At the easterly intersection, auxiliary left turn lanes are provided on the eastbound and westbound Courtneypark Drive East approaches only. Pedestrian signals and delineated crosswalks are provided on all approaches for both intersections;

- Shawson Drive is classified as a minor collector road. With a two-lane cross-section, and no posted speed limit it is assumed that the statutory 50 km/h maximum governs. A signalized intersection is formed with Courtneypark Drive East as the south approach of the westerly Ordan Drive intersection with Courtneypark Drive East. Auxiliary left turn lanes are provided on all intersection approaches. Pedestrian signals and delineated crosswalks are provided on all approaches of the intersection;

- Vipond Drive is a north-south road. It is a local road serving the local commercial and industrial land uses. Posted speed limit signs were not observed within the Study Area, and therefore, it is assumed that the statutory 50 km/h limit governs. A signalized intersection is formed with Courtneypark Drive East, with auxiliary left turn lanes provided on all approaches. Pedestrian signals and delineated crosswalks are provided on all approaches of the intersection; and

- Dixie Road is a north-south six-lane regional arterial road with a posted speed limit of 70 km/h. A signalized intersection is formed with Courtneypark Drive East, with auxiliary left turn lanes provided on all approaches. Auxiliary right turn lanes are provided on the east, north, and south approaches. The auxiliary right turn lanes provided on the north and south approaches are channelized right turn lanes under yield control. Pedestrian signals and delineated crosswalks are provided on all approaches of the intersection.

2.2 GOODS MOVEMENT

The Region's *Strategic Goods Movement Network Study (SGMNS)*, was completed in 2013 to identify a comprehensive system of truck routes that enable the efficient movement of goods between freight terminals and major logistics activity centres including Toronto Pearson International Airport, the CN Brampton Intermodal Terminal, and the CP Vaughan Intermodal Terminal. The SGMNS has identified Courtneypark Drive East, Kennedy Road, Tomken Road, and Dixie Road as Primary Truck Routes within the Study Area.

These roadways are critical links in the multi-modal transportation network which support goods movement and manufacturing in the Region as well as the Region's role as a major freight hub for the GTHA, Southern Ontario, and the rest of Canada. Other key indicators of the importance of goods movement in the Region and through the Study Area include:

- Freight transportation and warehousing account for almost 11% of the Region's employment (roughly twice the share of other regions in the GTA). With manufacturing, the combined sectors account for nearly 27% of the Region's employment;
- Over 2,000 trucking companies are located within the Region;
- Pearson International Airport handles more air cargo than the Vancouver and Montreal airports combined;
- The Region accounts for 15% of Ontario's exports;
- Approximately $1.5 billion worth of goods move through the Region every day on the east-west highways; and
- Truck activity in the Region represents about 25% of all truck activity in Ontario.

Courtneypark Drive East provides local access to some of the highest concentration of truck origins/destinations within the Region as well as access to Highway 401, Highway 407 and Highway 403 via Highway 410 which provide access to origins/destinations beyond Ontario and Canada.

Further information can be found at the links below:

1. Peel Region Strategic Goods Movement Network Study: http://www.peelregion.ca/pw/transportation/goodsmovement/pdf/peel-final-technical-report.pdf
2. Peel Region Goods Movement Strategic Plan 2012-2016: https://www.peelregion.ca/pw/transportation/goodsmovement/pdf/PeelRegionGoodsMovementStrategicPlan-2012-2016.pdf

2.3 TRANSIT

The Study Area roads are served by several Mississauga MiWAY transit routes. Courtneypark Drive East is serviced by Route 57 during the peak periods only. Transit service along Kennedy Road is provided by Route 53, Monday through Friday, with some route variations during the peak periods and off-peak periods. Route 51 provides transit service along Tomken Road Monday through Saturday. Route 51A also serves Tomken Road in addition to the industrial and commercial land uses along Ordan Drive, Vipond Drive, and Shawson Drive during the weekday peak periods. Dixie Road is serviced by Route 5, which provides weekly transit service Monday through to Sunday. Routes 42 and 15 provide transit services along Derry Road, with Route 42 running Monday through Sunday, and Route 15 operating only during the weekday peak periods. The City's OP Schedule 6 – Long Term Transit Network, classifies Derry Road and Dixie Road as transit priority corridors.

Route 57 provides access to the Meadowvale GO Station and the Milton GO Train line. Route 42 provides access to the Malton GO Station and the Kitchener GO Train line. These stations also are major stops for a number of GO Transit bus routes such as the 407 West and the Bolton/Malton/North York. However these routes are oriented towards longer distance trips between major destinations such as university campuses, shopping centres and other transit hubs.

Brampton Transit routes operating through the Study Area include Route 7 and 7A on Kennedy Road and Courtneypark Drive East, and Route 18 and 18A on Dixie Road. Immediately to the west of the Study Area, the City of Brampton's Züm Bus Rapid Transit (BRT) Main Street route operates along Hurontario Street between the Mississauga City Centre terminal and Sandalwood Parkway.

2.4 ACTIVE TRANSPORTATION

Sidewalk facilities are provided generally on one side only of Courtneypark Drive East, and specifically on the north side between Dixie Road and Tomken Road, and on the south side between Tomken Road and Kennedy Road.

Along Tomken Road from south of Courtneypark Drive East to Britannia Road East, there is a multi-use trail provided on the west side. Additionally, there are small sections of multi-use trails provided along the south side of Derry Road. The multi-use trail is defined by the 2013 Mississauga Bikeways and Trails Map as a paved path separate from the road, shared by pedestrians and bicycles. The Region is proposing for a multi-use trail to be provided on Dixie Road which would accommodate both pedestrians and cyclists and would connect to facilities to be provided on Courtneypark Drive East. No other dedicated bicycle facilities are currently provided on any of the Study Area roads. Therefore, cycling trips would be accommodated along the shoulders or within the travelled sections of the existing roadways.

The City's *Cycling Master Plan* completed in 2010, has designated the roadways within the Study Area as they relate to cycling facilities and is illustrated in **Figure 2**.

Source: *Mississauga Cycling Master Plan*, March 2010
map via google.com

Figure 2 – Roadway Cycling Designations

2.5 TRAFFIC AND TRUCK VOLUMES

Traffic data along the Courtneypark Drive East corridor Study Area was collected on Tuesday, November 12, 2013 by Traffic Survey Analysis (TSA). This consisted of eight-hour turning

movement counts at the eight Study Area intersections for the a.m., mid-day and p.m. peak periods including volume, vehicle classification, and pedestrians. Historical turning movement counts, signal timing plans, and various automatic traffic recorder (ATR) counts along the corridor were provided by the City and Region.

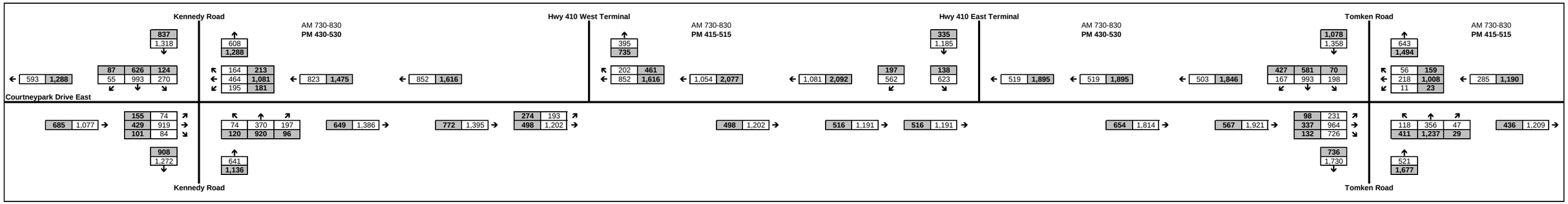
The existing base year a.m. and p.m. peak hour traffic volumes for the Courtneypark Drive East corridor is shown in **Figure 3A**. A review of the vehicle classification data provided sufficient information to identify the following key points regarding existing truck activity in the Study Area:

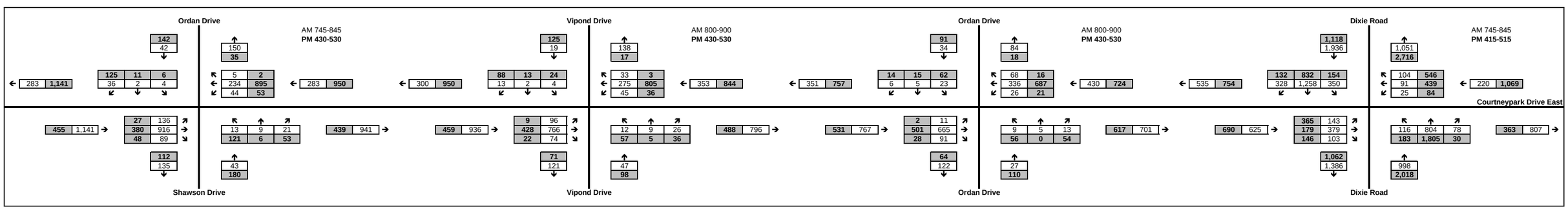
- Existing two-way truck volumes on Courtneypark Drive range from 120-290 trucks and 120-270 trucks in the a.m. and p.m. peak hours, respectively;
- Over the eight-hour count period, existing two-way truck volumes on Courtneypark Drive range from 1,150-2,500 trucks, representing approximately 16% of all traffic;
- Existing two-way truck volumes on Derry Road range from 320-430 trucks and 240-450 trucks in the a.m. and p.m. peak hours respectively;
- Over the eight-hour count period, existing two-way truck volumes on Derry Road range from 1,950-3,610 trucks, representing approximately 13% of total traffic; and
- In the a.m. peak, hour truck volumes along Highway 410 between Highway 401 and Highway 407 are approximately 690 trucks and 450 trucks, 8.5% and 9.5% of total traffic in the northbound and southbound directions, respectively;
- In the p.m. peak hour, truck volumes along Highway 410 between Highway 401 and Highway 407, are approximately 730 trucks and 430 trucks, 9% and 10% of total traffic in the northbound and southbound directions, respectively; and
- On a typical weekday, existing two-way truck volumes along Highway 410 are typically in the range of 18,000 trucks.

Traffic data for the Highway 410 mainline, which included seasonal volumes, vehicle classification, travel time, and vehicle speeds, were provided by MTO. The existing base year a.m. and p.m. peak hour traffic volumes for the Highway 410 corridor is illustrated in **Figure 3B**. All traffic data has been included for reference in **Appendix A**.

2.6 ANALYSIS

An analysis of existing conditions was undertaken for Courtneypark Drive East, Derry Road East and Highway 410 through the Study Area and broader area of interest. In order to accurately assess these different types of facilities, two software packages were utilized. With Trafficware's Synchro 8.0, a macroscopic, deterministic model, was used to assess the Study Area signalized and unsignalized intersections including ramp terminals along the arterial roads, Courtneypark



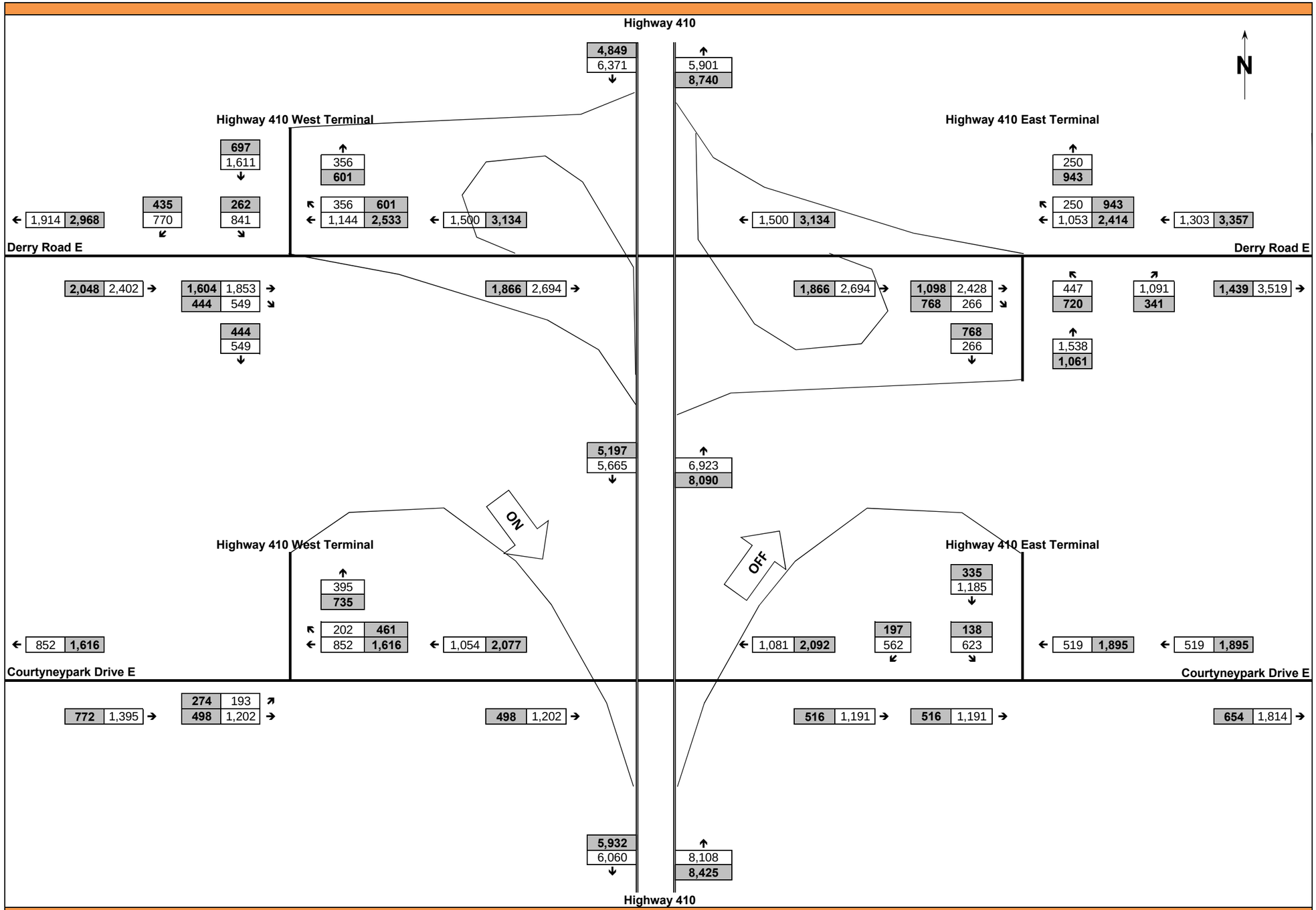


AM Peak Hour 123

PM Peak Hour 123

N.T.S

Figure 3A
Existing Peak Hour Traffic Volumes - Courtneypark Drive E



AM Peak Hour 123
PM Peak Hour 123

N.T.S

Figure 3B
Existing Peak Hour Traffic Volumes - Highway 410

Drive East and Derry Road East. With PTV's VISSIM 5.4, a stochastic micro-simulation model, was used to assess the freeway operations including merging and diverging areas on Highway 410.

2.6.1 Intersection Analysis

The quality of intersection operations is typically measured in terms of level of service (LOS) and volume to capacity (v/c) ratio during the peak hour periods as defined by the *Highway Capacity Manual (HCM)*. The LOS is evaluated on the basis of average delay per vehicle and includes deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections, LOS ranges from A for 10 seconds average delay or less to F for delays greater than 80 seconds as shown in **Table 1**.

Table 1
LOS Criteria for Signalized Intersections

Level of Service (LOS)	Delay (seconds/vehicle)
A	0 – 10 seconds
B	> 10 – 20 seconds
C	> 20 – 35 seconds
D	> 35 – 55 seconds
E	> 55 – 80 seconds
F	> 80 seconds

The LOS criteria for unsignalized intersections are somewhat different from the criteria for signalized intersections primarily because different transportation facilities result in different driver perceptions. The expectation is that a signalized intersection is designed to carry higher traffic volumes and experience greater delay than an unsignalized intersection. The delay values for unsignalized intersections range from 10 seconds or less for LOS A to greater than 50 seconds for LOS F as shown in **Table 2**.

Table 2
LOS Criteria for Unsignalized Intersections

Level of Service (LOS)	Delay (seconds/vehicle)
A	0 – 10 seconds
B	> 10 – 15 seconds
C	> 15 – 25 seconds
D	> 25 – 35 seconds
E	> 35 – 50 seconds
F	> 50 seconds

Acceptable intersection operations are generally considered to be LOS D or better, and for left turn movements, a LOS E is acceptable during peak hours. Similar to LOS, the v/c ratio is calculated for individual movements at an intersection, and for the sum of critical movements at

a signalized intersection. The v/c ratio provides a measure of traffic volume demand relative to capacity, where at capacity conditions is represented by a v/c ratio of 1.0 (i.e., volume demand equals capacity). For unsignalized intersections, LOS is only calculated for those movements that conflict with opposing free-flow traffic and is not defined for the intersection as a whole.

While the LOS and v/c ratio for each movement are related, they are calculated independently. Therefore it is possible to have a poor level of service associated with a low v/c ratio or a good level of service associated with a high v/c ratio. The designation LOS F does not automatically imply that the intersection or movement is over-capacity, nor does a LOS better than E automatically imply that unused capacity is available.

The key parameters used in the analysis included:

- Saturation flow rates – The preliminary analysis results indicated that in the am. and p.m. peak hours, several movements at the intersections of Kennedy Road, Tomken Road and Dixie Road with Courtneypark Drive East were operating at an above capacity situation. However, because the traffic counts record the number of vehicles served by the intersection (i.e. able to complete their movement), a v/c ratio greater than 1.0 is theoretically impossible. Therefore, saturation flow rates were incrementally increased until these v/c ratios were approximately equal to 1.0 for the movement. Calibration was validated through field observations of traffic operations and signal timings. A summary of the changes have been documented for reference in **Appendix B**;
- At the Highway 410 off-ramps at Derry Road intersections, MTO objected to the proposed saturation flow rates (typically 2,200 ideal, 1,850 adjusted). A saturation flow rate study was conducted which identified observed passenger vehicle saturation flow rates ranging from 1,740 to 1,790 corresponding to ideal saturation flow rates in excess of 2,000. However, these results were not accepted by MTO and the saturation flow rates were left as the Synchro default value of 1,900 ideal (approximately 1,500 adjusted);
- Existing lane configurations;
- Heavy vehicle percentages as derived from existing traffic counts;
- Calculated peak hour factors (PHF) utilized. The use of the PHF results in an analysis of the peak 15 minute period flow during each peak hour;
- Signal timing plans as provided by the City and Region;
- Posted maximum speed limit; and
- Synchro default values for all other inputs.

The results of the analysis for the overall intersections are presented in **Table 3.** Intersections/movements with v/c ratios greater than 0.85, i.e. at critical levels have been

highlighted. Detailed analysis results at the individual movement level and the Synchro analysis output worksheets for existing conditions are provided for reference in **Appendix C**.

Table 3
Existing Conditions
Intersection Peak Hour Level of Service Analysis

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	v/c	LOS	v/c
Kennedy Road / Courtneypark Drive E *Signalized*	D	0.92	D	0.97
Highway 410 West Terminal / Courtneypark Drive E *Unsignalized*	A	0.41	C	0.67
Highway 410 East Terminal / Courtneypark Drive E *Signalized*	C	0.73	C	0.82
Tomken Road / Courtneypark Drive E *Signalized*	D	0.91	E	0.99
Ordan Drive-Shawson Drive / Courtneypark Drive E *Signalized*	A	0.35	B	0.46
Vipond Drive/ Courtneypark Drive E *Signalized*	A	0.30	B	0.37
Ordan Drive/ Courtneypark Drive E *Signalized*	A	0.31	A	0.35
Dixie Road/ Courtneypark Drive E *Signalized*	C	0.88	E	0.98
Kennedy Road / Derry Road E *Signalized*	D	0.99	D	1.05
Hwy 410 West Terminal / Derry Road E *Signalized*	E	0.84	C	0.76
Hwy 410 East Terminal / Derry Road E *Signalized*	D	1.02	C	0.85
Tomken Road / Derry Road E *Signalized*	D	0.90	F	1.13
Dixie Road / Derry Road E *Signalized*	E	1.01	E	0.96

For existing conditions, in the a.m and p.m. peak hours at all of the major intersections (arterial-arterial), there are movements operating at capacity and with long delays, which are reflected in the overall intersection results. In the a.m. peak hour, the majority of the long delays are experienced in the eastbound and southbound directions. In the p.m. peak hour, there are greater delays, primarily for movements in the northbound and westbound directions.

2.6.2 Freeway Analysis

2.6.2.1 VISSIM Model Development

From the traffic data, an origin-destination matrix was formulated for the VISSIM network to determine the model's vehicle inputs and outputs. The matrix was utilized in coding the vehicle inputs as well as vehicle routing decisions.

The calibration process involves the adjustment of model parameters, which is done iteratively until an acceptable match is converged upon between the observed field data and the results of the modeling of existing conditions. The calibration process involved an assessment and comparison between the modeled and observed link volume flows and turning movement volumes at intersections. Further calibration efforts involved establishing an appropriate profile for driver behavior characteristics. Adjustments were made for aggressiveness and awareness factors, which affect the level to which modeled vehicles desire to achieve target speeds and headways. More detailed discussion of the calibration effort follows in subsequent report sections.

On-screen review of the traffic animation video was also undertaken to ensure correctness of model inputs and to visually confirm that the network has been replicated accurately in the model. A summary of the model parameters and adjustments have been attached in **Appendix B** for reference.

2.6.2.2 Traffic Volume Calibration

As part of the volume flow comparison, the GEH statistic was utilized as a criterion for determining how well the results matched. The GEH statistic is a modified Chi-Squared test that incorporates both relative and absolute differences and can be represented by the following equation:

$$GEH = \sqrt{\frac{(M-O)^2}{0.5 * (M+O)}}$$

Where:
M = Simulated/Modeled flows
O = Observed flows

GEH values provide an indication of the goodness of fit as outlined below:

GEH < 5	Flows can be considered a good fit
5 < GEH < 10	Flows may require further investigation
GEH > 10	Flows cannot be considered to be a good fit

A comparison of modeled and observed volumes was conducted at freeway sections and for individual turning movement volumes at intersections. The modeled traffic volumes as well as all simulation outputs were obtained as a mean of multiple model runs. Averaged results provide an appropriate representation as this kind of micro-simulation analysis is a stochastic process in which every model run represents a single observation. A complete experiment therefore requires multiple computer runs, whose outputs are averaged to obtain the final modeled results that are then compared with the observed data.

The calibration effort was aimed at achieving the following targets:

- For individual link flows > 2,700 veh/h, volumes should be within 400 veh/h for greater than 85% of all cases;
- GEH < 5 for individual link flow for greater than 85% of all cases;
- GEH < 4 for sum of all link flows;
- GEH value between 5 and 10 for 80% of the compared turning movement data sets overall;
- Verify that no significant link, intersection approach or turning movement flows have a GEH value of greater than 10; and
- An absolute variation between the modeled and observed data of not more than 25%.

The comparison of observed and modeled link flow traffic volumes for existing conditions is summarized in **Table 4**.

Table 4
VISSIM Model Development
Existing Conditions – Comparison of Link Flow Volumes

Road Section	Direction	AM Peak Hour			PM Peak Hour		
		Observed	Modeled	GEH	Observed	Modeled	GEH
Highway 410: Highway 401/403 I/C – Courtneypark Dr E I/C	NB	8,108	8,167	0.7	8,425	8,212	2.3
	SB	6,060	6,062	0.0	5,932	5,980	0.6
Highway 410: Courtneypark Dr E I/C – Derry Rd I/C	NB	6,923	7,016	1.1	8,090	7,938	1.7
	SB	5,665	5,665	0.0	5,197	5,269	1.0
Sum of all link flows		***26,756***	***26,910***	***0.9***	***27,644***	***27,399***	***1.5***

The model results indicate that for all (100%) of the individual link flows, GEH values of less than 5 were obtained and the GEH is less than 4 for the sum of all link counts. On all individual freeway

links, link flows are within the 400 veh/h permissible variation. As a result, the absolute variation between the modeled and observed data is well within the 25% variation limit. The GEH values for link flows meet the specified calibration targets.

The comparison of observed and modeled intersection traffic volumes for existing conditions is summarized in **Table 5**. Full intersection turning movement tables detailing delay and queues are attached for reference in **Appendix D**.

Table 5
VISSM Model Development
Existing Conditions – Comparison of Total Volumes at Study Area Intersections

Intersection	AM Peak Hour			PM Peak Hour		
	Observed	Modeled	GEH	Observed	Modeled	GEH
Derry Road West Terminal/ Highway 410 *Signalized*	5,513	5,691	2.4	5,879	5,960	1.0
Derry Road East Terminal/ Highway 410 *Signalized*	5,536	5,870	4.4	6,284	6,680	4.9
Courtneypark Drive West Terminal/ Highway 410 *Unsignalized*	2,476	2,448	0.6	2,882	2,839	0.8
Courtneypark Drive East Terminal/ Highway 410 *Signalized*	2,906	2,837	1.3	2,746	2,657	1.7
Total Intersections	4			4		
# of Intersections GEH < 5	4			4		
% of Intersections GEH < 5	100%			100%		

The model results indicate that all (100%) of the intersections met the calibration target of GEH values less than 5.

2.6.2.3 Travel Time Calibration

The calibrated model was used to estimate travel time times along the Highway 410 corridor, and the results were compared with travel time data provided by the MTO. **Table 6** and **Table 7**, are excerpts from the ITE publication, *Manual of Transportation Engineering Studies 2nd Edition* (Quiroga, C. A. and D. Bullock, 1998), which recommends the minimum number of test runs to perform for travel-time and delay studies to achieve specified confidence levels in the collected data. The shaded cells indicate the number of test runs undertaken and the respective resultant confidence level.

Table 6
Minimum Number of Test Runs for Travel-Time and Delay Studies
95% and 97.3% Confidence Levels

R	Minimum Sample Size *n* for Specified Permitted Error ε									
	Confidence Level: 99.73%					Confidence Level: 95%				
mph (kph)	1 (1.6)	2 (3.2)	3 (4.8)	4 (6.4)	5 (8.0)	1 (1.6)	2 (3.2)	3 (4.8)	4 (6.4)	5 (8.0)
1 (1.6)	6	5	4	4	4	4	3	3	3	3
2 (3.2)	9	6	5	5	4	6	4	3	3	3
3 (4.8)	13	8	6	5	5	8	5	4	4	3
4 (6.4)	17	9	7	6	6	10	6	5	4	4
5 (8.0)	21	11	8	7	6	12	7	5	4	4
6 (9.7)	26	13	9	8	7	15	8	6	5	4
7 (11.3)	32	15	10	8	7	18	9	6	5	5
8 (12.9)	37	17	12	9	8	21	10	7	6	5
9 (14.5)	43	19	13	10	9	21	11	8	6	5
10 (16.1)	50	21	14	11	9	27	12	8	7	6
11 (17.7)	57	24	15	12	10	31	13	9	7	6
12 (19.3)	64	26	17	13	11	34	15	10	8	6
13 (20.9)	72	29	18	14	11	38	16	11	8	7
14 (22.5)	80	32	20	15	12	43	18	11	9	7
15 (24.1)	89	34	21	16	13	47	19	12	9	8
20 (32.2)	-	50	30	21	17	71	27	17	12	10
25 (40.2)	-	68	39	27	21	99	36	22	15	12
30 (48.3)	-	89	50	34	26	-	47	27	19	15

Table 7
Minimum Number of Test Runs for Travel-Time and Delay Studies
75% and 85% Confidence Levels

R	Minimum Sample Size *n* for Specified Permitted Error ε									
	Confidence Level: 85%					Confidence Level: 75%				
mph (kph)	1 (1.6)	2 (3.2)	3 (4.8)	4 (6.4)	5 (8.0)	1 (1.6)	2 (3.2)	3 (4.8)	4 (6.4)	5 (8.0)
1 (1.6)	3	3	2	2	2	3	2	2	2	2
2 (3.2)	4	3	3	3	3	4	3	3	2	2
3 (4.8)	6	4	3	3	3	5	3	3	3	2
4 (6.4)	7	4	4	3	3	6	4	3	3	3
5 (8.0)	9	5	4	3	3	7	4	3	3	3
6 (9.7)	10	6	4	4	3	8	5	4	3	3
7 (11.3)	12	6	5	4	4	9	5	4	3	3
8 (12.9)	14	7	5	4	4	11	6	4	4	3
9 (14.5)	16	8	6	5	4	12	6	5	4	3
10 (16.1)	18	9	6	5	4	14	7	5	4	4
11 (17.7)	20	9	7	5	5	15	7	5	4	4
12 (19.3)	23	10	7	6	5	17	8	6	5	4
13 (20.9)	25	11	7	6	5	19	9	6	5	4
14 (22.5)	28	12	8	6	5	20	9	6	5	4
15 (24.1)	30	13	9	7	6	22	10	7	5	5
20 (32.2)	45	18	11	9	7	33	14	9	7	6
25 (40.2)	62	24	15	11	9	44	18	11	8	7
30 (48.3)	81	30	18	13	10	58	22	14	10	8

The travel-time surveys provided by the MTO were undertaken in September of 2010. Along Highway 410 within our Study Area, nine test runs were made in the northbound and southbound directions, respectively over a period of three days (three runs in each direction each day). Based on the number of runs and confidence level, the following conclusions can be reached:

- For the a.m. peak period in the northbound direction, a difference in maximum and minimum running speeds of 8 km/h was obtained, and at a desired permitted error of ± 1 mph (1.6 km/h), a confidence level of 85% is achieved;

- For the a.m. peak period in the southbound direction, a difference in maximum and minimum running speeds of 61 km/h was obtained, and at a desired permitted error of ± 5 mph (8.0 km/h), a confidence level of less than 75% is achieved;

- For the p.m. peak period in the northbound direction, a difference in maximum and minimum running speeds of 50 km/h was obtained, and at a desired permitted error of ± 4 mph (6.4 km/h), a confidence level of 75% is achieved; and

- For the p.m. peak period in the southbound direction, a difference in maximum and minimum running speeds of 18 km/h was obtained, and at a desired permitted error of ± 3 mph (4.8 km/h), a confidence level of 95% is achieved.

The analysis indicates that the travel-time surveys conducted by MTO provide a reasonable level of confidence for the travel time and speed in the corridor. The data was also compared to a travel-time run spot check undertaken by Stantec staff in the field and was found to be comparable. The calibration targets for travel times to be achieved are that journey times through the network should be within 15% (or 1.0 minute, if higher) for greater than 85% of cases.

The travel-time survey comparison results are summarized in **Table 8**.

Table 8
Comparison of Modeled and Observed Travel Times

Direction	Section	AM Travel Times [mm:ss]			PM Travel Times [mm:ss]		
		Observed	Modeled	Diff	Observed	Modeled	Diff
NB	Highway 401/403 – Courtneypark Drive	0:46	0:49	0:03	2:12	1:31	-0:41
	Courtneypark Drive – Derry Road	0:52	0:51	-0:01	1:15	1:08	-0:07
SB	Derry Road – Courtneypark Drive	1:52	1:42	-0:09	0:57	0:49	-0:08
	Courtyneypark Drive – Highway 401/403	0:38	0:39	0:01	0:48	0:38	-0:10
Total Northbound Travel Time		***1:37***	***1:40***	***0:03 (3%)***	***3:26***	***2:39***	***-0:48 (-23%)***
Total Southbound Travel Time		***2:30***	***2:21***	***-0:09 (-6%)***	***1:44***	***1:27***	***-0:17 (-17%)***

The modeled travel times were well matched and within the target calibration criteria. The northbound and southbound journey times through the network are within the 15% or within 1.0 minute for all cases.

2.6.2.4 Freeway Level of Service

In order to assess the a.m. and p.m. peak hour freeway operations, the microsimulation model was run for a three-hour period, with a one-hour peak analysis period. A series of five simulation runs were undertaken, with the results averaged.

The level of service on a freeway segment is defined by density. Density describes the proximity to other vehicles and is related to the freedom to maneuver within the traffic stream. The level of service thresholds for a basic freeway segment is summarized in **Table 9**.

Table 9
LOS Criteria for Freeways

LOS	Density Range (pc/km/ln)
A	0 – 7
B	> 7 – 11
C	> 11 – 16
D	> 16 – 22
E	> 22 – 28
F	> 28

These levels of service can be described qualitatively as the following:

- LOS A represents free-flow operations, where free-flow speed prevails on the freeway, where individual users are virtually unaffected by the presence of others in the traffic stream. Any incidents or point breakdowns are easily absorbed.

- LOS B represents reasonably free-flow operations, and the free-flow speed on the freeway is maintained. The presence of other users in the traffic stream begins to be noticeable. The effects of minor incidents and point breakdowns are still easily absorbed.

- LOS C provides for flow with speeds near the free-flow speed of the freeway. The freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver. Minor incidents may still be absorbed, but the local deterioration in service quality will be significant. Queues may be expected to form behind any significant blockages.

- LOS D represents high-density but stable flow. The freedom to maneuver within the traffic stream is seriously limited and drivers experience reduced physical and psychological comfort levels. Minor incidents can be expected to create queuing as the traffic stream has little space to absorb disruptions.

- LOS E represents operation at capacity. Operations on the freeway at this level are highly volatile because there are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption, such as vehicles entering from a ramp or a vehicle changing lanes, can establish a disruption wave that propagates throughout the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate even the most minor disruption and any incident can be expected to produce a serious breakdown and substantial queuing.

- LOS F is used to define forced, breakdown or unstable flow. Such conditions exist within queues forming behind bottlenecks. Breakdowns can occur for a number of reasons:
    - Traffic incidents can temporarily reduce the capacity of a short segment, so that the number of vehicles arriving at a point is greater than the number of vehicles that can move through it.
    - Points of recurring congestion, such as merge or weaving segments and lane drops, experience high demand in which the number of vehicles arriving is greater than the number of vehicles that can be discharged.
    - In analyses using forecast volumes, the projected flow rate can exceed the estimated capacity of a given location.

The relationship between speed, flow and density for basic freeway segments is shown in **Figure 4**.

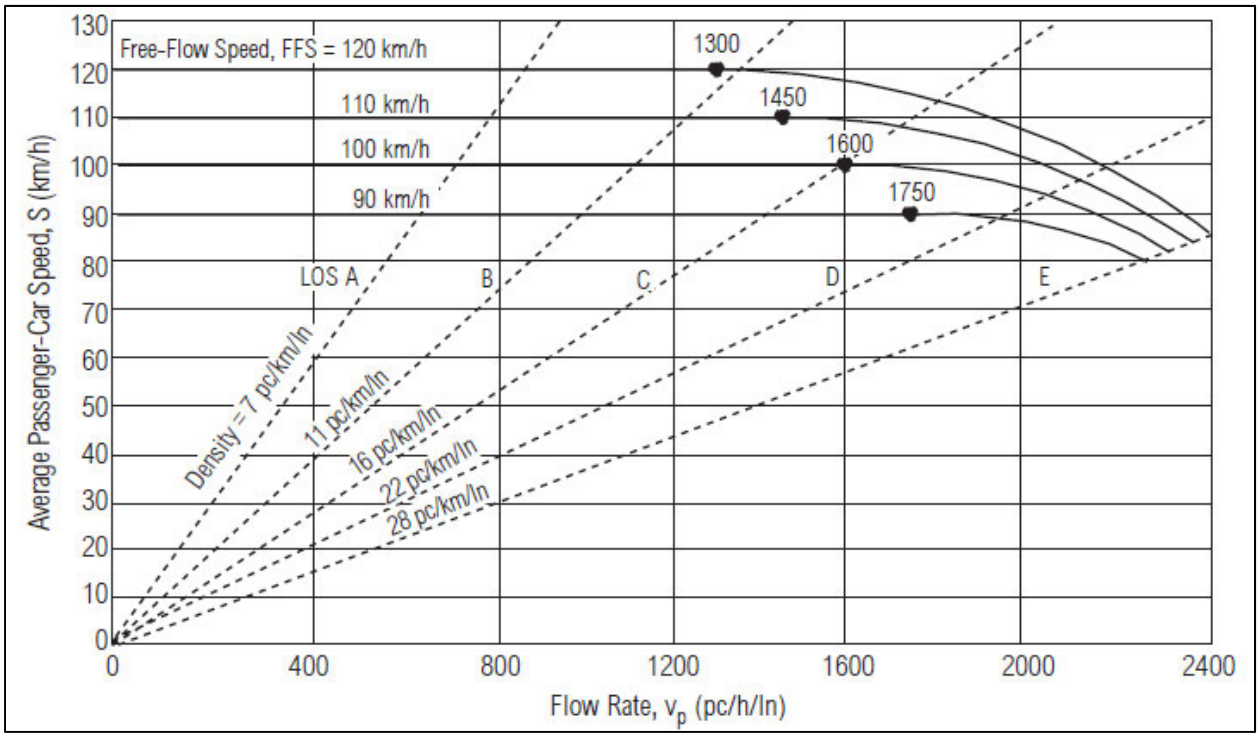


Figure 4 – Speed-Flow Curves and LOS for Basic Freeway Segments

The freeway LOS results were determined by the link flow volumes generated by the VISSIM model. The results of the existing conditions freeway analysis are summarized in **Table 10.**

Table 10 Existing Conditions Peak Hour Freeway LOS Analysis			
Highway 410 Freeway Sections	**Direction of Travel**	**LOS**	
		AM Peak Hour	**PM Peak Hour**
Highway 401/403 I/C – Courtneypark Drive I/C	NB	LOS D Flow = 8,167 veh/h Distance = 2.0 km @ 4 lanes Speed = 93 km/h	LOS F Flow = 8,212 veh/h Distance = 2.0 km @ 4 lanes Speed = 51 km/h
	SB	LOS D Flow = 6,052 veh/h Distance = 2.0 km @ 3 lanes Speed = 92 km/h	LOS D Flow = 5,979 veh/h Distance = 2.0 km @ 3 lanes Speed = 93 km/h
Courtneypark Drive I/C – Derry Road I/C	NB	LOS D Flow = 7,016 veh/h Distance = 1.5 km @ 4 lanes Speed = 102 km/h	LOS E Flow = 7,938 veh/h Distance = 1.5 km @ 4 lanes Speed = 76 km/h
	SB	LOS E Flow = 5,660 veh/h Distance = 1.5 km @ 4 lanes Speed = 50 km/h	LOS C Flow = 5,266 veh/h Distance = 1.5 km @ 4 lanes Speed = 94 km/h

The existing conditions results of the VISSIM model report that the mainline segments of Highway 410 between the Highway 401/403 interchange and Derry Road interchange operate at levels of service E or better during the AM and PM peak hours. With the exception of the northbound link between the Highway 401/403 interchange and Courtneypark Drive East interchange, where during the PM peak hour the freeway level of service is a LOS F.

3.0 Future Travel Demand Forecasting

In order to develop traffic forecasts for the future 2031 horizon year, model outputs were obtained from the City's EMME/3 travel demand forecasting model. The City uses the "Simplified GTA Model" which was developed by Peter Dalton Inc. The model is calibrated based on the 2006 Transportation Tomorrow Survey (TTS) and validated by several data sources including the TTS, cordon and automatic traffic recorder traffic data.

As part of the calibration process for this Study, and after discussions between City, Region and MTO staff, lane capacities were adjusted to account for the impact of truck volumes. These discussions also included the future 2031 network lane configurations that are applicable to this Study. These network changes are expected to occur regardless of the outcome of this Study and include the following:

- Widening of Hwy 410;
- Widening of Hwy 407;
- Widening of Hwy 401;
- Extension of Creekbank Road across Highway 401; and
- Reduction of lanes on Hurontario Street to accommodate the LRT.

Collectively, these network changes along with the future changes in population and employment represent the 2031 "Do Nothing" scenario.

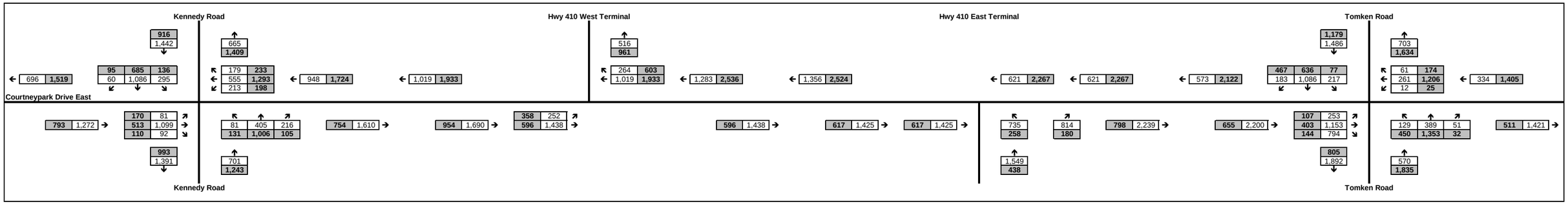
The impact of widening Courtneypark Drive East and converting the Highway 410 partial interchange at Courtneypark Drive East to a full interchange were reviewed as part of the forecasting work within this Study. This results in the 2031 "Widen Courtneypark Drive East with Partial Interchange", and 2031 "Widen Courtneypark Drive East with Full Interchange" scenarios.

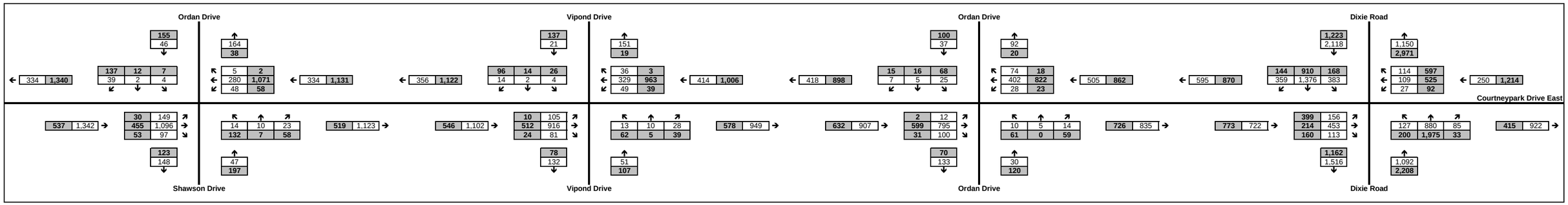
Using volume plots from the City's model, traffic volumes at a screenline level were compared between the Do Nothing and Widen Courtneypark Drive East with Partial Interchange scenarios to derive the appropriate growth rates. The growth rates are summarized in **Table 11**.

Table 11 2031 Growth Rates	
Road	**Growth Rate**
Courtneypark Drive East	1.0% Per Annum
Derry Road	0.5% Per Annum
Kennedy Road	
Tomken Road	
Dixie Road	
Highway 410	1.5% Per Annum

In order to assess the impact of a full interchange at Courtneypark Drive East with Highway 410, the volume plots for these scenarios were compared as well as select link plots for the new ramps providing access to northbound Hwy 410 and from southbound Hwy 410. Traffic volumes using these new ramps were manually reassigned from their existing routes onto the new routes using the new interchange ramps. The majority of trips utilizing the full Courtneypark Drive East interchange are expected to divert from the Derry Road East interchange.

The resulting traffic forecasts for the 2031 Do Nothing and 2031 Widened Courtneypark Drive East with Partial Interchange scenarios are shown in **Figure 5A** and **Figure 5B**. The traffic forecasts for the 2031 Widened Courtneypark Drive East with Full Interchange scenario is shown in **Figure 6A** and **Figure 6B**. A detailed memorandum outlining the forecasting methodology and results has been attached for reference in **Appendix E**.





AM Peak Hour 123

PM Peak Hour 123

N.T.S

Figure 5A

2031 Traffic Forecasts - Widened Courtneypark Drive E with Partial Interchange - Courtneypark Drive E

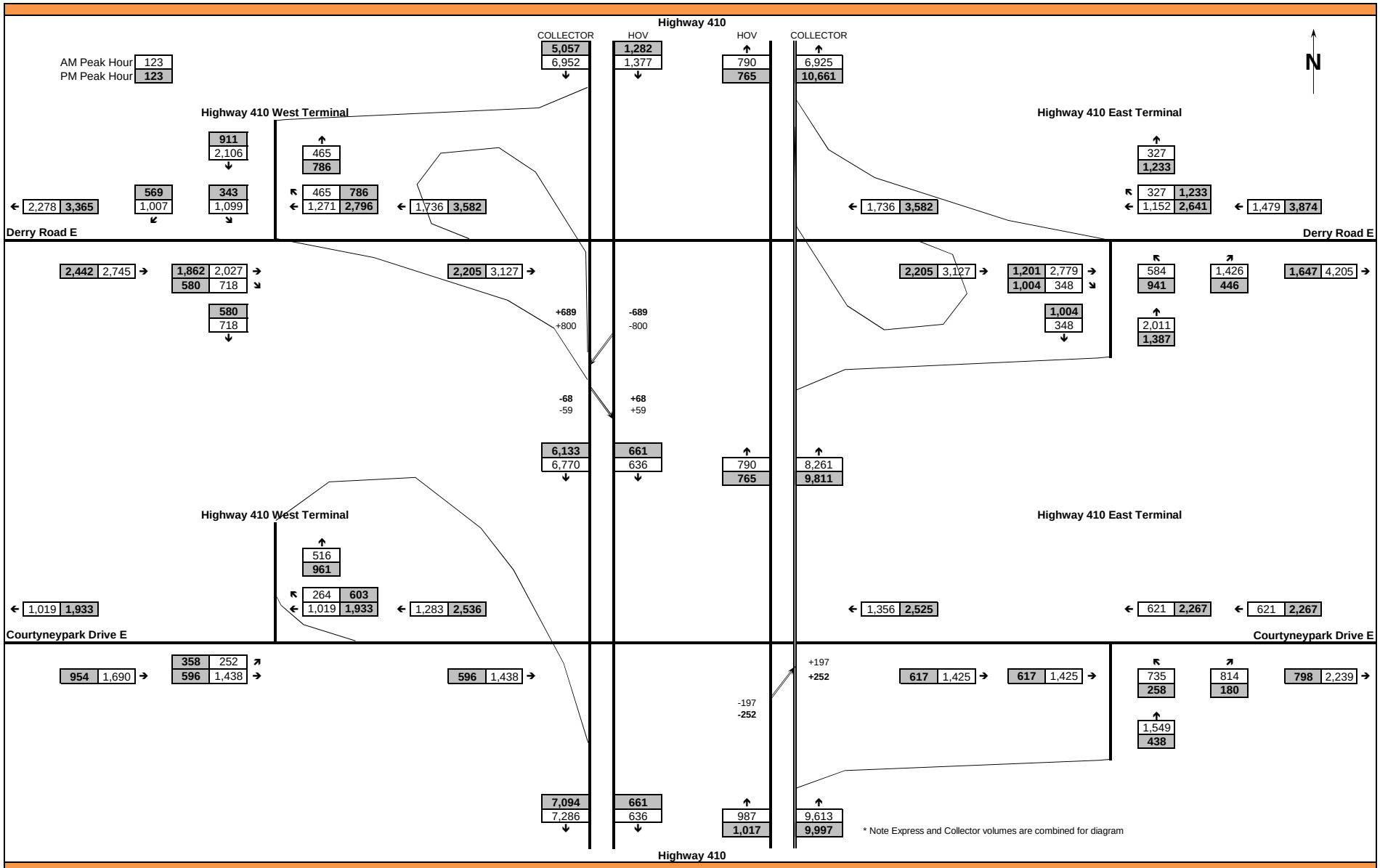
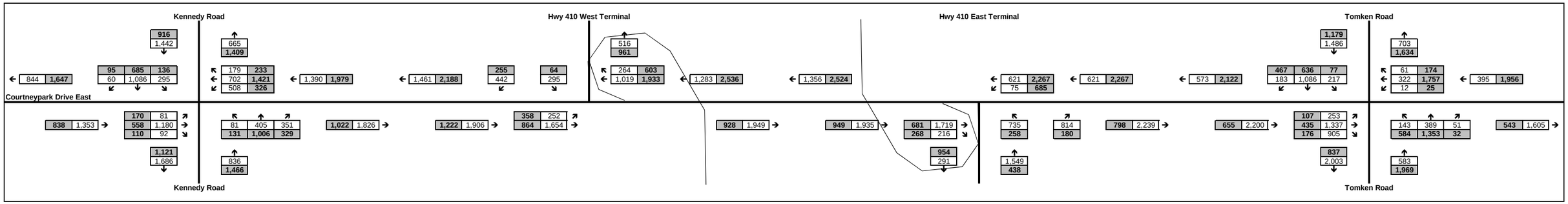
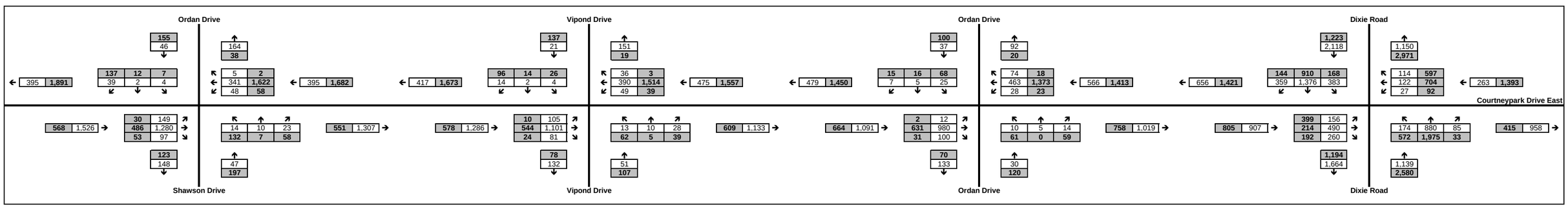


Figure 5B
2031 Traffic Forecasts - Widened Courtneypark Drive E with Partial Interchange - Highway 410 Volumes





AM Peak Hour 123

PM Peak Hour **123**

N.T.S

Figure 6A

2031 Traffic Forecasts - Widened Courtneypark Drive E with Full Interchange - Courtneypark Drive E

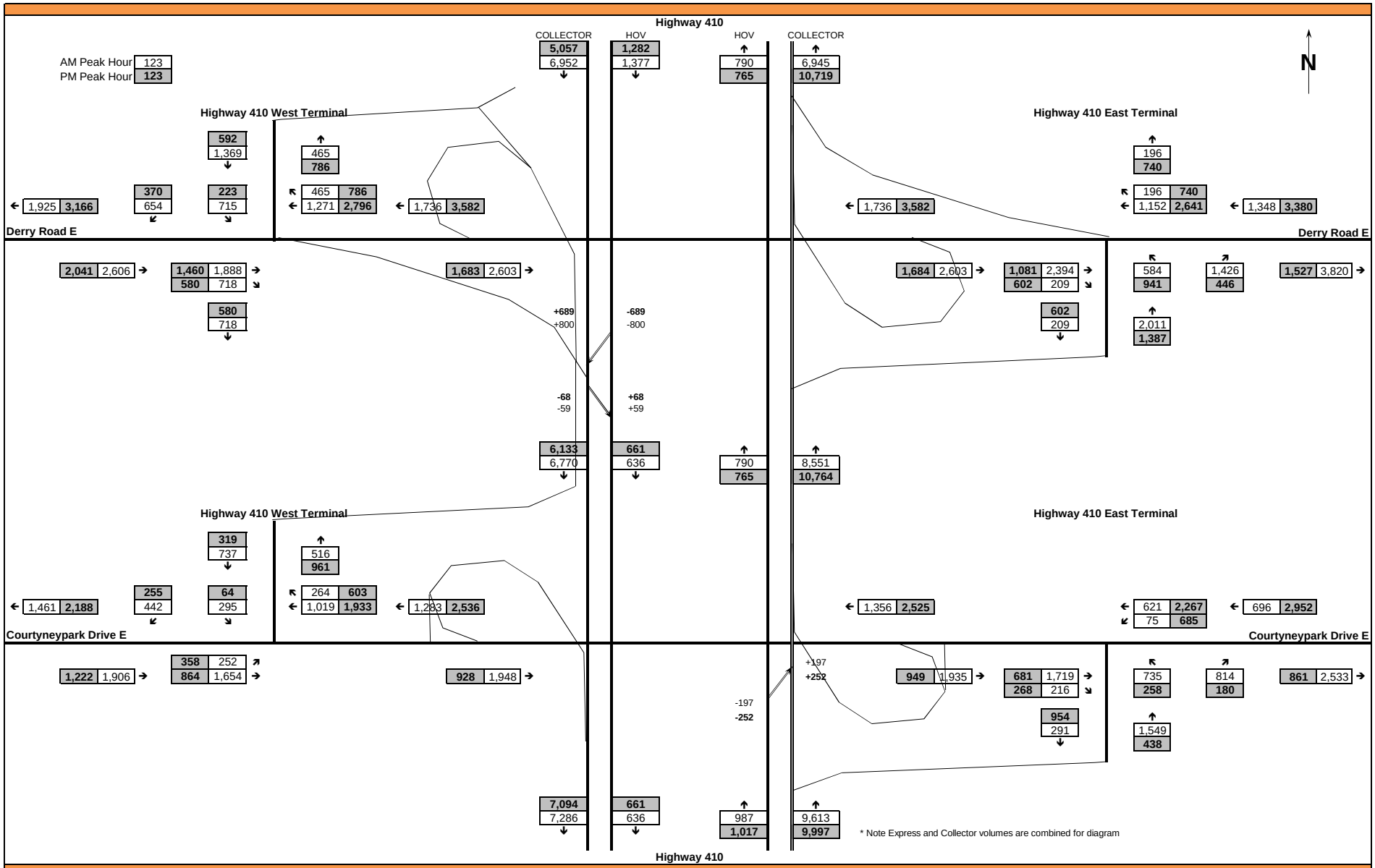


Figure 6B

2031 Traffic Forecasts - Widened Courtneypark Drive E with Full Interchange - Highway 410 Volumes

4.0 2031 Do Nothing Scenario Analysis

The 2031 Do Nothing Scenario comprises the widening of Highway 410 and reconfiguration of the Courtneypark Drive East interchange as per the Highway 410 ESR recommended design, although it still remains a partial interchange. Additional capacity is provided at the Highway 410 Derry Road off-ramps with an additional auxiliary turn lane. No improvements to Courtneypark Drive East or the other roadways in the Study Area are proposed as part of this scenario.

4.1 INTERSECTION ANALYSIS

The results of the analysis with optimized signal timings are presented in **Table 12.** Intersections/movements with v/c ratios greater than 0.85, have been highlighted. Detailed analysis results at the individual movement level and the Synchro analysis output worksheets for this scenario are provided for reference in **Appendix F**.

Table 12 2031 Do Nothing Scenario Intersection Peak Hour Level of Service Analysis				
Intersection	**AM Peak Hour**		**PM Peak Hour**	
	LOS	**v/c**	**LOS**	**v/c**
Kennedy Road / Courtneypark Drive E *Signalized*	E	1.05	E	1.09
Highway 410 West Terminal / Courtneypark Drive E *Signalized*	A	0.49	B	0.84
Highway 410 East Terminal / Courtneypark Drive E *Signalized*	C	0.83	C	0.88
Tomken Road / Courtneypark Drive E *Signalized*	E	1.09	E	1.11
Ordan Drive-Shawson Drive / Courtneypark Drive E *Signalized*	A	0.42	C	0.53
Vipond Drive/ Courtneypark Drive E *Signalized*	A	0.36	B	0.44
Ordan Drive/ Courtneypark Drive E *Signalized*	B	0.36	B	0.42
Dixie Road/ Courtneypark Drive E *Signalized*	D	1.07	E	1.08
Kennedy Road / Derry Road E *Signalized*	E	1.24	E	1.28
Hwy 410 West Terminal / Derry Road E *Signalized*	E	1.04	B	0.88
Hwy 410 East Terminal / Derry Road E *Signalized*	F	1.21	C	0.97
Tomken Road / Derry Road E *Signalized*	D	0.93	F	1.21
Dixie Road / Derry Road E *Signalized*	F	1.12	F	1.05

For the 2031 Do Nothing scenario, the analysis shows that there are movements operating at or above capacity and with long delays in the a.m. and p.m. peak hours at all of the major intersections (arterial-arterial). These results are worse than in the existing conditions analysis as traffic volumes have increased, but no additional capacity has been provided.

4.2 FREEWAY ANALYSIS

As there are no differences in the freeway configuration and volumes between the 2031 Do Nothing scenario and the 2031 Widening of Courtneypark Drive with Partial Interchange scenario, the freeway analysis results for this scenario have been documented in **Section 6.2**.

5.0 Improvement Alternatives

In order to address the capacity deficiencies along Courtneypark Drive East and take advantage of the opportunity to construct a full interchange, two alternatives were developed as follow:

Alternative 1: Widening of Courtneypark Drive East, with Partial Interchange

Alternative 1 includes widening Courtneypark Drive East to three travel lanes in each direction. The interchange at Courtneypark Drive East would be reconfigured as proposed in the *Highway 410 Improvements Class EA Study*, but would remain a partial interchange. For the section of Courtneypark Drive East across Highway 410, it was assumed that the bridge structure would be widened to accommodate the three travel lanes in the eastbound and westbound directions as well as eastbound and westbound deceleration lanes for the Highway 410 on-ramps, for an eight-lane cross-section.

Alternative 2: Widening along Courtneypark Drive East, with a Full Interchange

Alternative 2 also includes widening Courtneypark Drive East to three travel lanes in each direction, but would also include a full interchange at Courtneypark Drive East. For the section of Courtneypark Drive East across Highway 410, it was assumed that the bridge structure would be widened to accommodate the three travel lanes in the eastbound and westbound directions as well as eastbound and westbound deceleration lanes for the Highway 410 on-ramps, for an eight-lane cross-section.

5.1 ROUNDABOUT ALTERNATIVE ANALYSIS

In the development of the two alternatives, it was noted that both would require widening the structure crossing Highway 410. Therefore, a preliminary analysis of the Highway 410 ramp terminals at Courtneypark Drive East was completed assuming that both intersections were converted to roundabout control, while maintaining the existing number of lanes across the structure. This analysis was completed in Sidra Intersection 6.0 using the HCM 2010 methodology for the 2031 Widening of Courtneypark Drive with Full Interchange scenario volumes. The results of this analysis are summarized in **Table 13**. Sidra analysis worksheets are attached in **Appendix G**.

Table 13
2031 Ramp Terminal Roundabout Analysis
Intersection Peak Hour Level of Service Analysis

Intersection	Approach / Movement		AM Peak Hour		PM Peak Hour	
			LOS	v/c	LOS	v/c
Highway 410 East Ramp Terminal / Courtneypark Drive E *Roundabout*	EB	Through	D	0.917	E	0.789
		Through	D	0.917	E	0.789
		Right	A	0.215	C	0.513
	WB	Left	A	0.103	D	0.835
		Through	C	0.553	F	1.438
		Through	C	0.553	F	1.438
	NB	Left	F	1.540	B	0.297
		Left	F	1.540	B	0.297
		Right	F	1.593	B	0.215
		Right	F	1.593	B	0.215
	Overall Intersection		*F*	*1.593*	*F*	*1.438*
Highway 410 West Ramp Terminal / Courtneypark Drive E *Roundabout*	EB	Left	B	0.417	A	0.397
		Through	F	1.046	B	0.495
		Through	F	1.046	B	0.495
	WB	Through	D	0.794	F	1.456
		Through	D	0.794	F	1.456
		Right	C	0.512	D	0.859
	SB	Left	C	0.572	B	0.177
		Left/Right	C	0.572	C	0.339
		Right	C	0.572	C	0.339
	Overall Intersection		*E*	*1.046*	*F*	*1.456*

At the west ramp terminal, there are capacity issues, primarily in the p.m. peak hour for the westbound approach. The volumes are very high, approximately 1,900 through vehicles between 2 lanes, as well as 600 right turns within an auxiliary lane. While the 350 circulating vehicles (making a left-turn onto Hwy 410) is not particularly high, there is insufficient capacity to accommodate the 1,900 through vehicles with a roundabout intersection.

For the east terminal, there are capacity issues in both the a.m. and p.m. peak hours, although for different approaches. In the a.m. peak hour, the northbound approach off Highway 410 operates over capacity. There are four northbound lanes to accommodate the 1,500 vehicles, which consist of approximately 700 left turns and 800 right turns. However, the 1,700 eastbound through vehicles along Courtneypark Drive substantially limits the available capacity within the roundabout resulting in the over-capacity condition.

In the p.m. peak hour, the westbound approach operates above capacity. There are 2,200 through movements and 700 left turns, which cannot be accommodated within the capacity of

two through lanes and one left turn lane. When combined with the 250 northbound left turns from Highway 410 (again a relatively small number), there is insufficient capacity to accommodate the 2,900 vehicle approach volume.

Based on this analysis, it was determined that roundabouts at the ramp terminals would not preclude the need for a widening of the structure across Highway 410 and were not carried forward for further analysis. It is acknowledged that the HCM 2010 roundabout analysis methodology is conservative as it was based on driver behavior in the United States in the mid-2000s where driver familiarity with roundabout operations was relatively low. However, even applying calibration factors of up to 25% to reflect increased driver familiarity by 2031 would still result in over capacity conditions.

6.0 2031 Widening of Courtneypark Drive with Partial Interchange Scenario – Alternative 1 Analysis

6.1 INTERSECTION ANALYSIS

The results of the intersection analysis with optimized signal timings are presented in **Table 14.** Intersections/movements with v/c ratios greater than 0.85, i.e. at critical levels have been highlighted. Detailed analysis results at the individual movement level and the Synchro analysis output worksheets for this scenario are provided for reference in **Appendix H**.

Table 14
2031 Widening of Courtneypark Drive East with Partial I/C Scenario
Intersection Peak Hour Level of Service Analysis

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	v/c	LOS	v/c
Kennedy Road / Courtneypark Drive E *Signalized*	D	0.87	D	0.82
Highway 410 West Terminal / Courtneypark Drive E *Signalized*	A	0.35	A	0.63
Highway 410 East Terminal / Courtneypark Drive E *Signalized*	C	0.69	B	0.65
Tomken Road / Courtneypark Drive E *Signalized*	D	1.05	E	0.95
Ordan Drive-Shawson Drive / Courtneypark Drive E *Signalized*	A	0.29	B	0.41
Vipond Drive/ Courtneypark Drive E *Signalized*	B	0.25	B	0.33
Ordan Drive/ Courtneypark Drive E *Signalized*	A	0.26	B	0.31
Dixie Road/ Courtneypark Drive E *Signalized*	C	0.68	E	1.08
Kennedy Road / Derry Road E *Signalized*	E	1.24	E	1.28
Hwy 410 West Terminal / Derry Road E *Signalized*	C	0.93	B	0.88
Hwy 410 East Terminal / Derry Road E *Signalized*	F	1.23	C	0.97
Tomken Road / Derry Road E *Signalized*	D	0.93	F	1.21
Dixie Road / Derry Road E *Signalized*	F	1.12	F	1.05

The analysis results show improved levels of service along the Courtneypark Drive East corridor with only the Tomken Road at Courtneypark Drive East intersection operating above capacity in

the a.m. peak hour and the Dixie Road at Courtneypark Drive East intersection operating above capacity in the p.m. peak hour.

The operational results of the Derry Road intersections remain unchanged under the 2031 Widening of Courtneypark Drive East with the Partial Interchange when compared to the Do Nothing Scenario. These results remain unchanged as the volume projections and intersection lane configurations along Derry Road remain the same between the two scenarios.

6.2 FREEWAY ANALYSIS

The results of the freeway analysis are shown in **Table 15**.

Table 15
2031 Widening of Courtneypark Drive East with Partial I/C Scenario
Peak Hour Conditions Freeway LOS Analysis

Highway 410 Freeway Sections	Direction of Travel		LOS	
			AM	PM
Highway 401/403 I/C – Courtneypark Drive I/C	NB	Collector	LOS E	LOS C
		HOV	LOS B	LOS B
		Express	LOS D	LOS D
	SB	Collector	LOS C	LOS C
		HOV	LOS A	LOS A
Courtneypark Drive I/C – Derry Road I/C	NB	Collector	LOS E	LOS D
		HOV	LOS A	LOS B
	SB	Collector	LOS C	LOS C
		HOV	LOS A	LOS A

In the a.m. peak hour, the northbound collector lanes on both analysis sections of Highway 410 operate at LOS E. In the p.m. peak hour, all lane sections operate at acceptable levels of service.

6.2.1 Travel Times

Vehicle travel times output from the model for the freeway sections are summarized in **Table 16**.

Table 16 2031 Widening of Courtneypark Drive with Partial I/C Scenario Peak Hour Travel Time			
Highway 410 Road Section		**AM Peak Hour**	**PM Peak Hour**
NB Direction			
Highway 401/403 I/C – Courtneypark Drive I/C	Collector	1:48	0:47
	HOV	0:44	0:44
	Express	0:45	0:45
Courtneypark Drive I/C – Derry Road I/C	Collector	1:21	0:52
	HOV	0:50	0:51
SB Direction			
Derry Road I/C – Courtneypark Drive I/C	Collector	0:56	0:50
	HOV	0:50	0:50
Courtneypark Drive I/C – Highway 401/403 I/C	Collector	0:37	0:37
	HOV	0:37	0:37

6.2.2 Speed Contours

In order to assist in illustrating freeway operations for both the a.m. and p.m. three-hour simulation periods, vehicle speeds through the freeway Study Area have been plotted based on time and location to develop speed contour graphs. Individual lane speeds throughout the Study Area corridor were also plotted at individual lane level of detail for the a.m. and p.m. peak hours.

It should be noted that one of the comments received from MTO regarding the VISSIM model was that the reduced speed area values of 30 km/h for right turning vehicles at the ramp terminal intersections was too high. A vehicle turning speed study was conducted using GPS tracking units in test vehicles applying the average-car technique. Based on the thirteen test runs completed, and comparing the speed profiles of turning vehicles in the VISSIM model, it was determined that a reduced speed zone value of 25 km/h would best match field conditions; however, this value was not accepted by MTO. MTO subsequently identified that the maximum acceptable value would be 18 km/h. Therefore, the following results are based on the reduced speed area value of 18 km/h.

The speed contours prepared for this scenario are as follows:

- Figure 7 – AM Peak Period NB and SB Speed Contours – Collector Lanes;
- Figure 8 – AM Peak Period NB and SB Speed Contours – HOV Lanes;
- Figure 9 – AM Peak Period NB Speed Contour – Express Lanes;

- Figure 10 – AM Peak Hour NB and SB Lane Speeds;
- Figure 11 – PM Peak Period NB and SB Speed Contours – Collector Lanes;
- Figure 12 – PM Peak Period NB and SB Speed Contours – HOV Lanes;
- Figure 13 – PM Peak Period NB Speed Contour – Express Lanes; and
- Figure 14 – PM Peak Hour NB and SB Lane Speeds.

The peak period speed contours illustrate freeway speeds through the Study Area over the a.m. and p.m. peak periods. The location in the Study Area is plotted along the x-axis with time plotted along the y-axis. Vehicle speeds in the 10-20 km/h range are shown in red, 60 km/h range in yellow, and 90 km/h or greater shown in green.

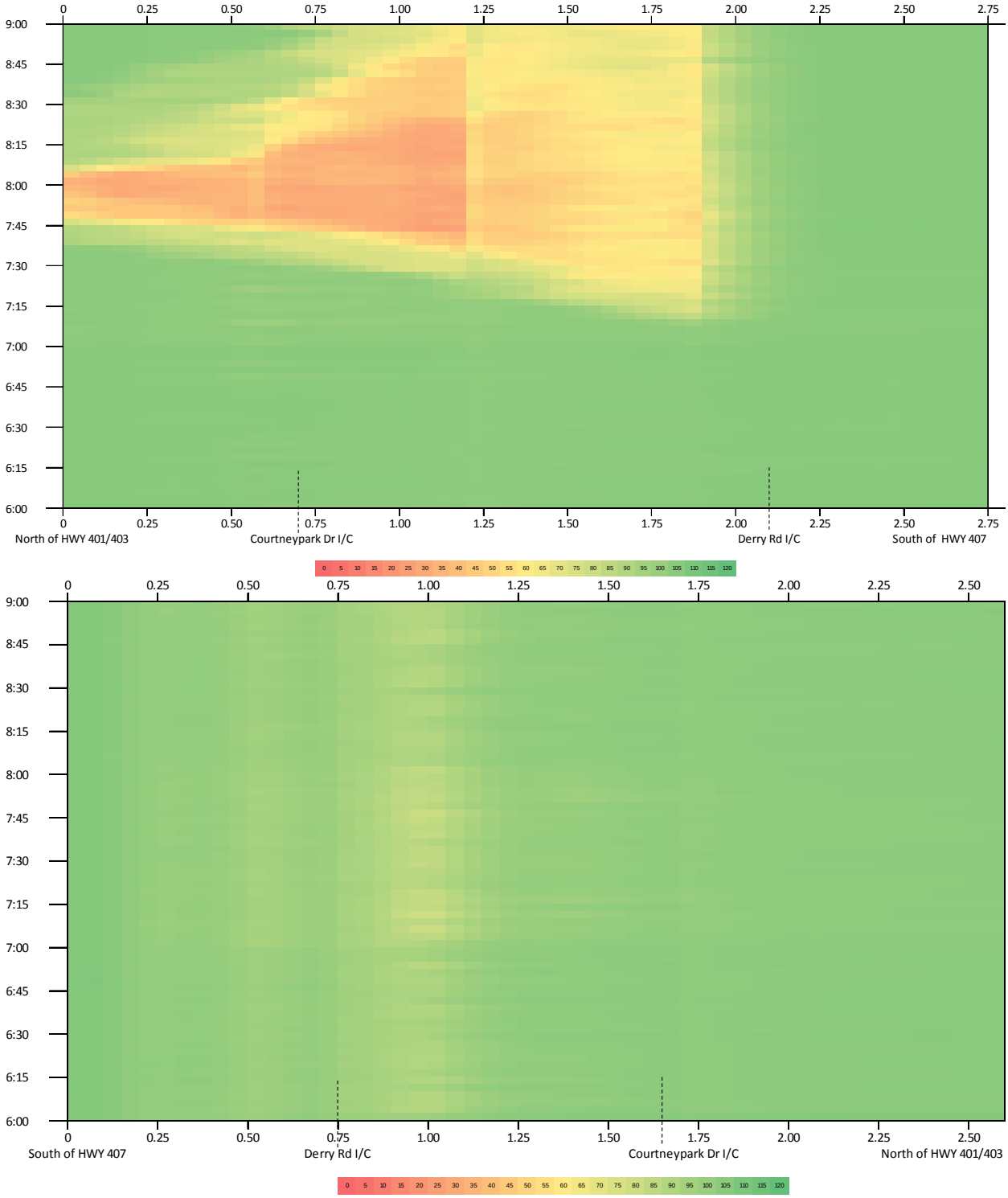
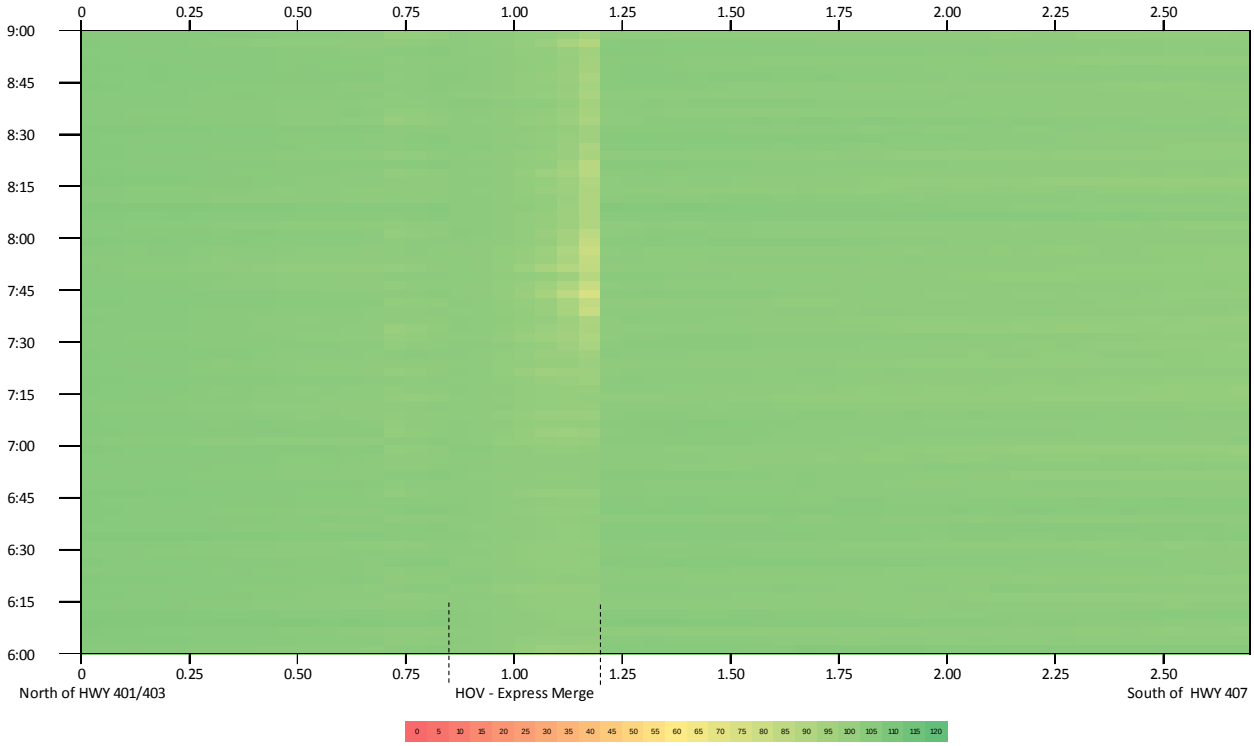


Figure 7 – AM Peak Period NB (Top) & SB (Bottom) Speed Contour – Collector Lanes



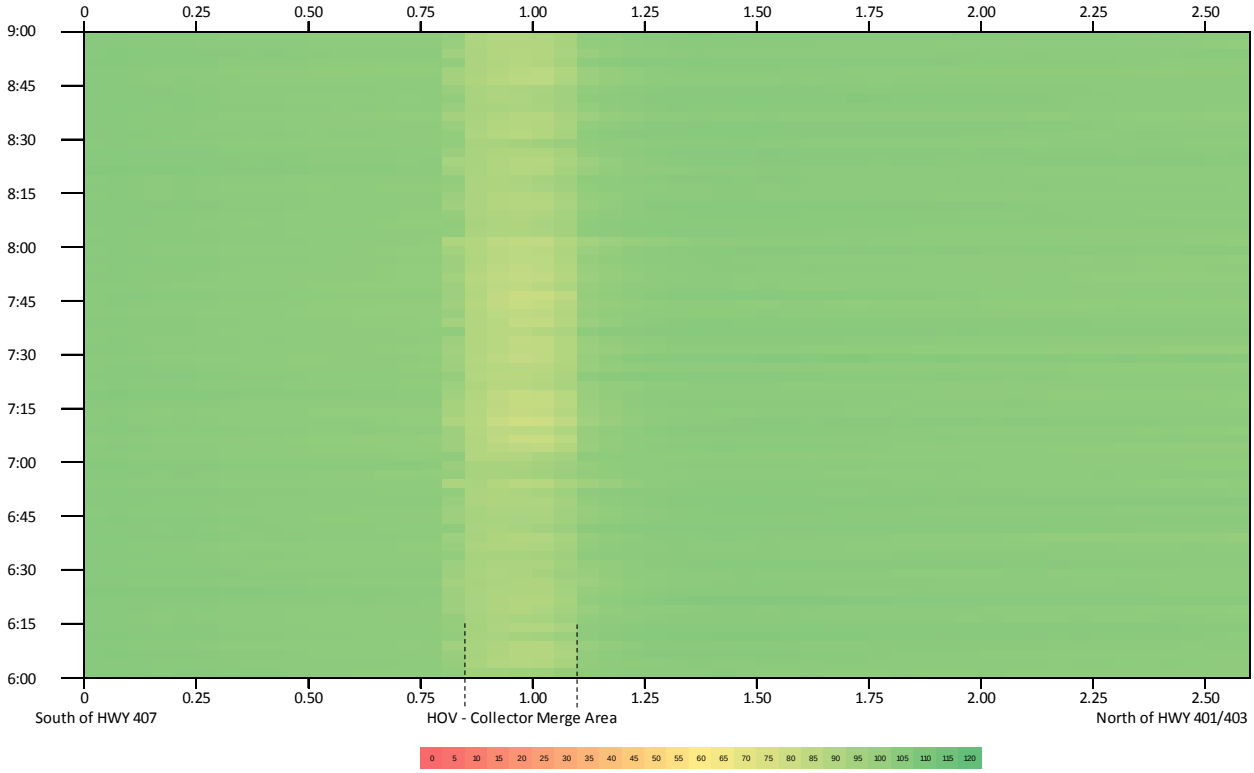


Figure 8 – AM Peak Period NB (Top) & SB (Bottom) Speed Contour – HOV Lanes

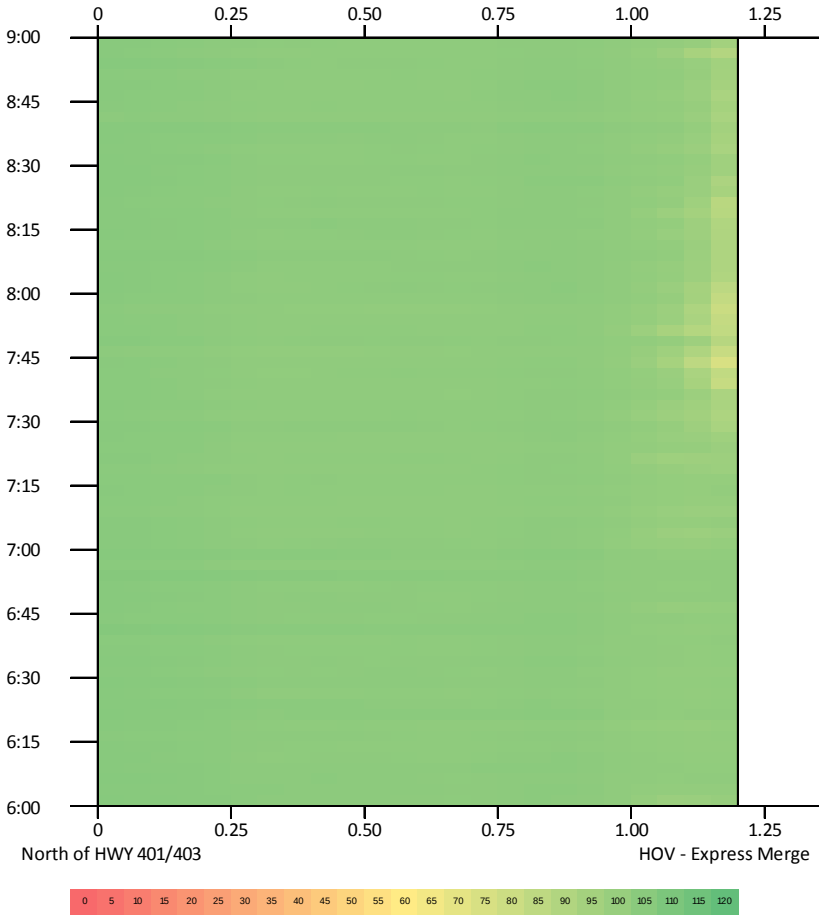


Figure 9 – AM Peak Period NB Speed Contour – Express Lanes

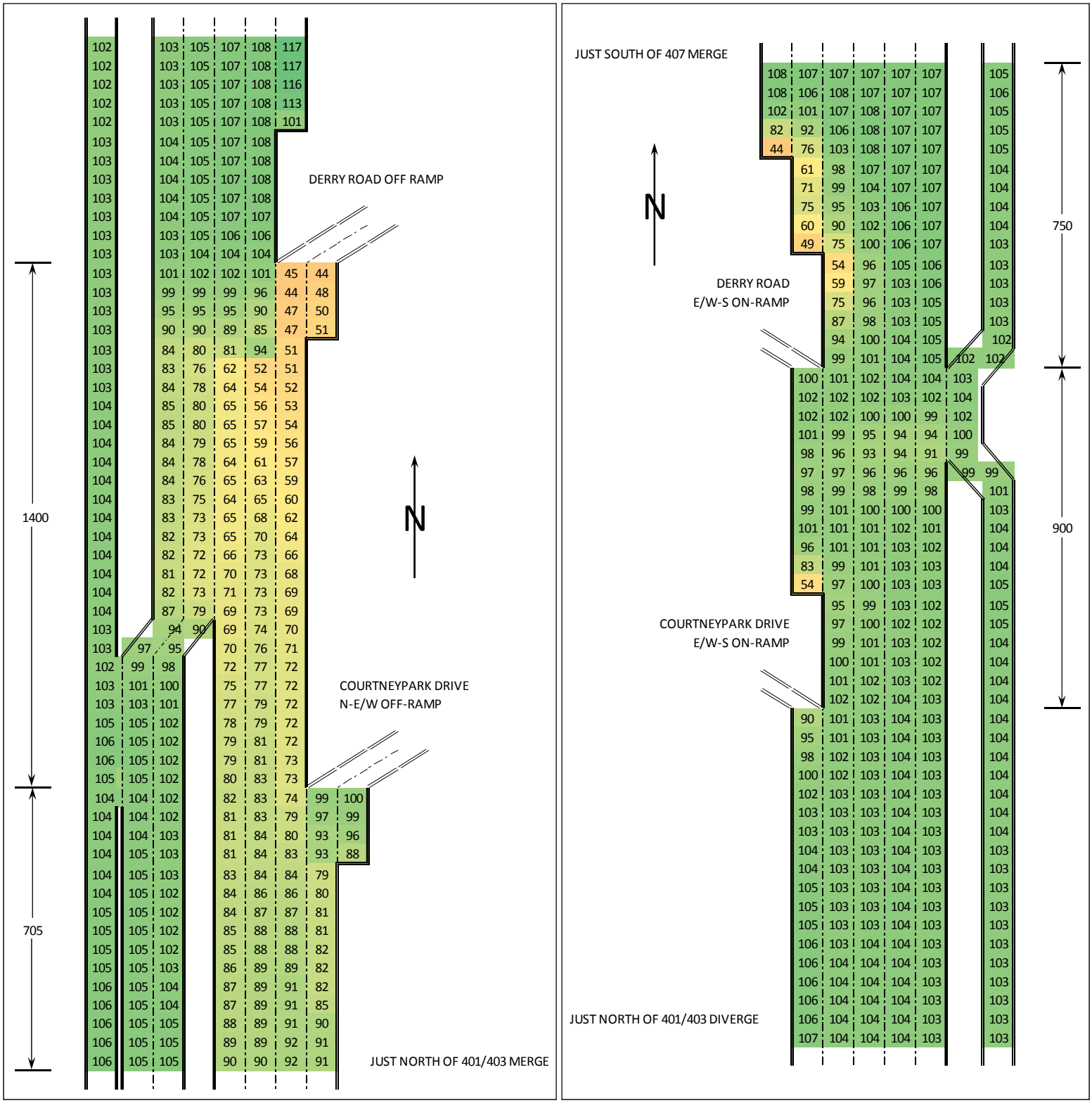


Figure 10 – AM Peak Hour NB (Left) & SB (Right) Lane Speeds

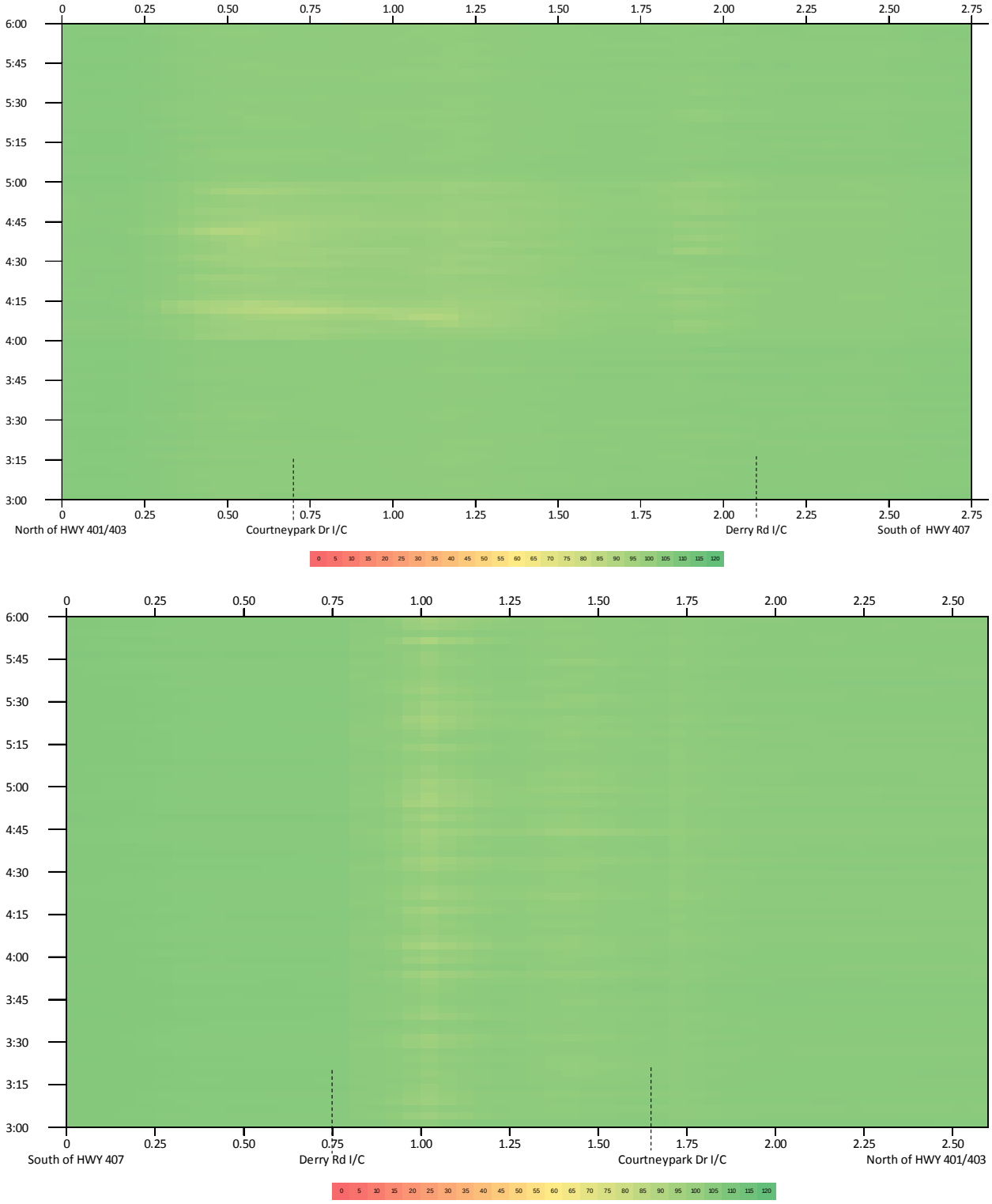
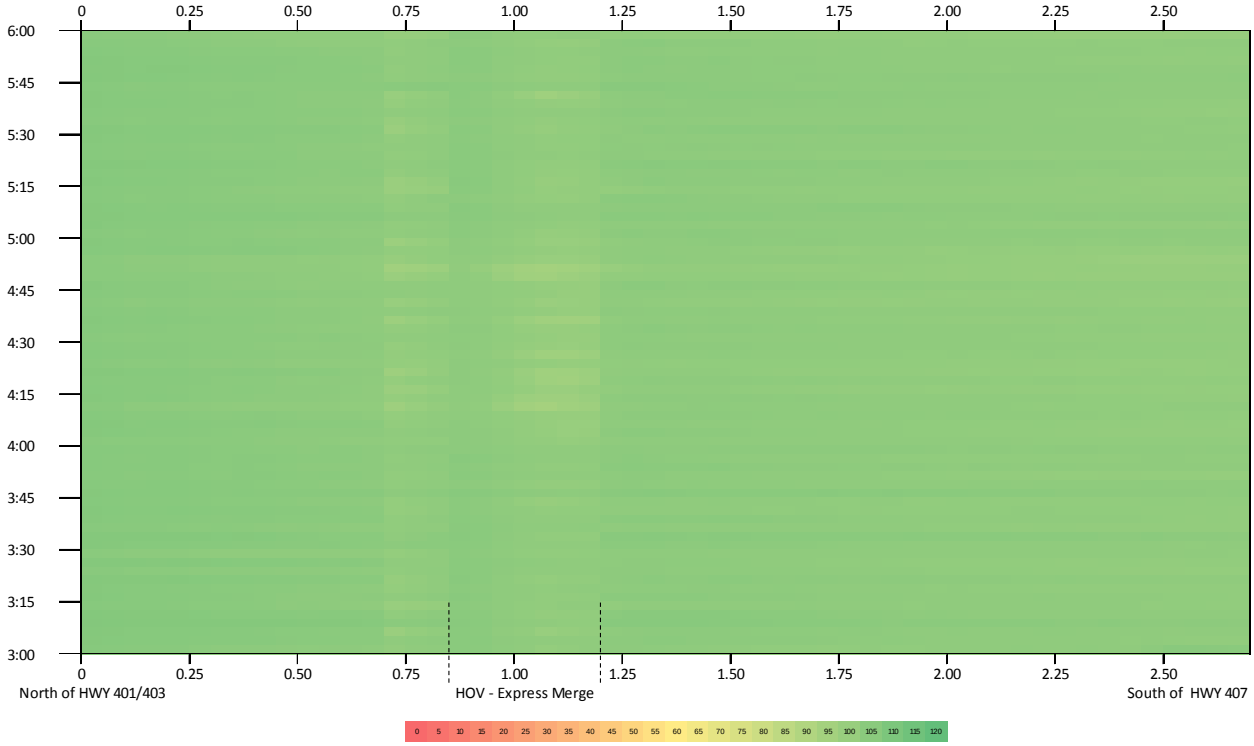


Figure 11 – PM Peak Period NB (Top) & SB (Bottom) Speed Contours – Collector Lanes



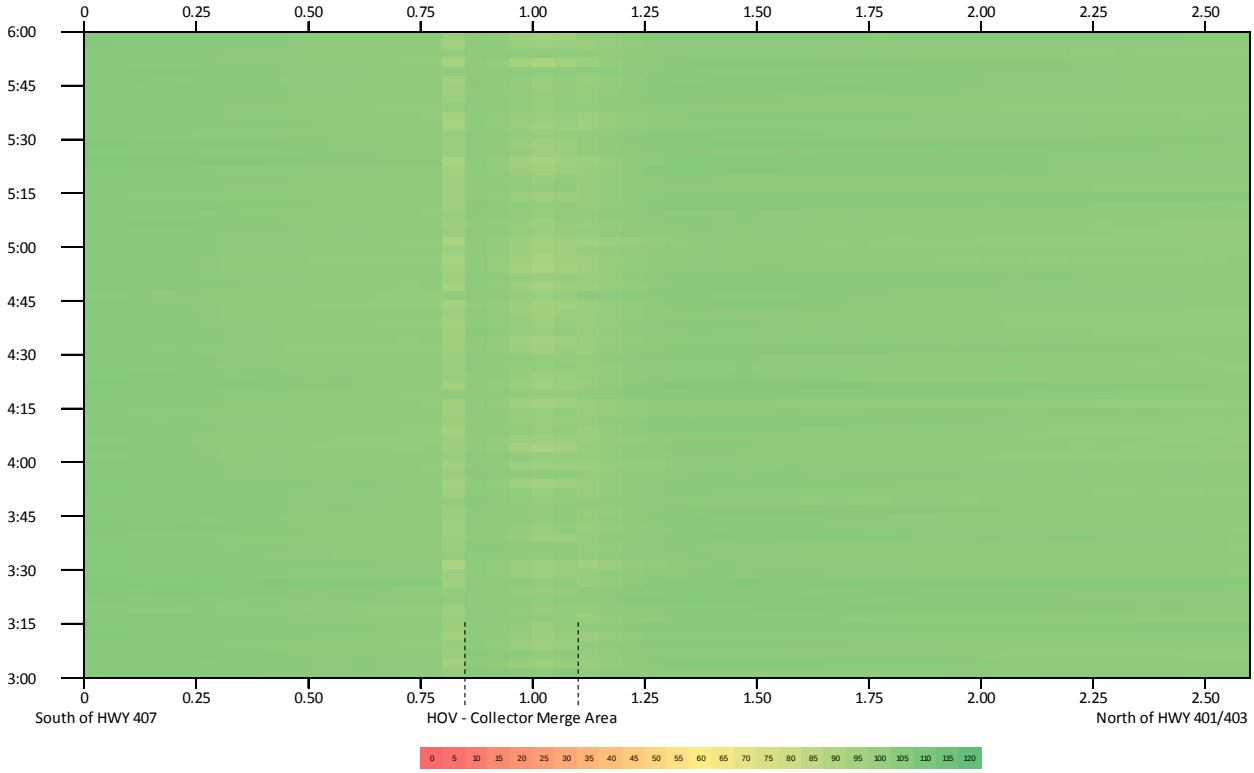


Figure 12 – PM Peak Period NB (Top) & SB (Bottom) Speed Contours – HOV Lanes

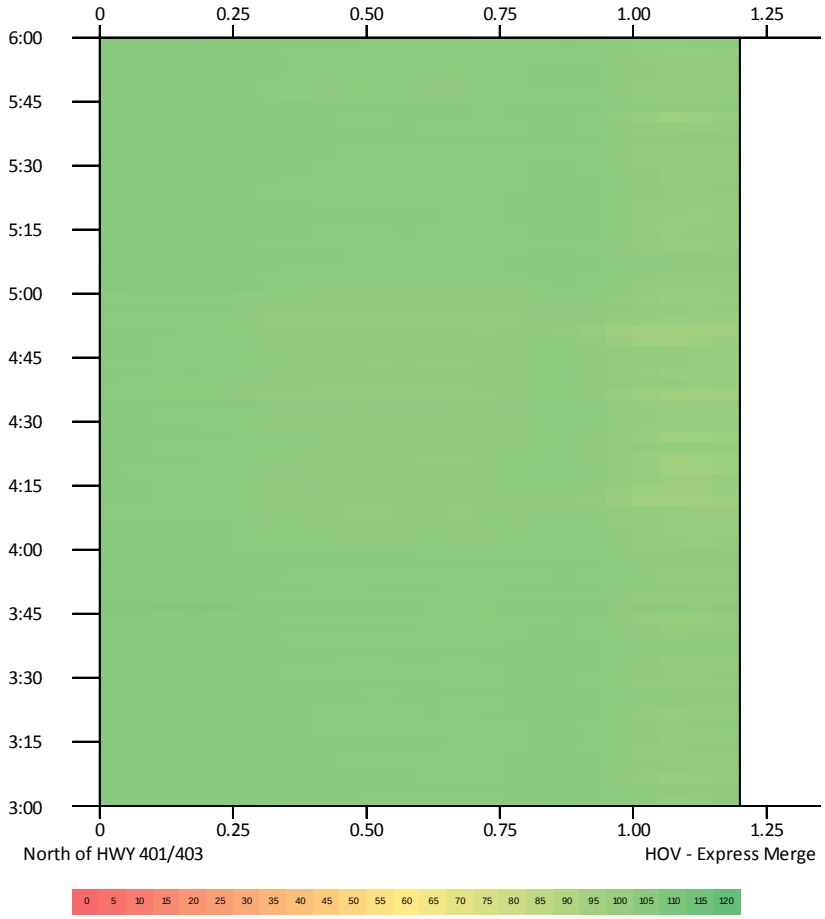


Figure 13 – PM Peak Period NB Speed Contour – Express Lanes

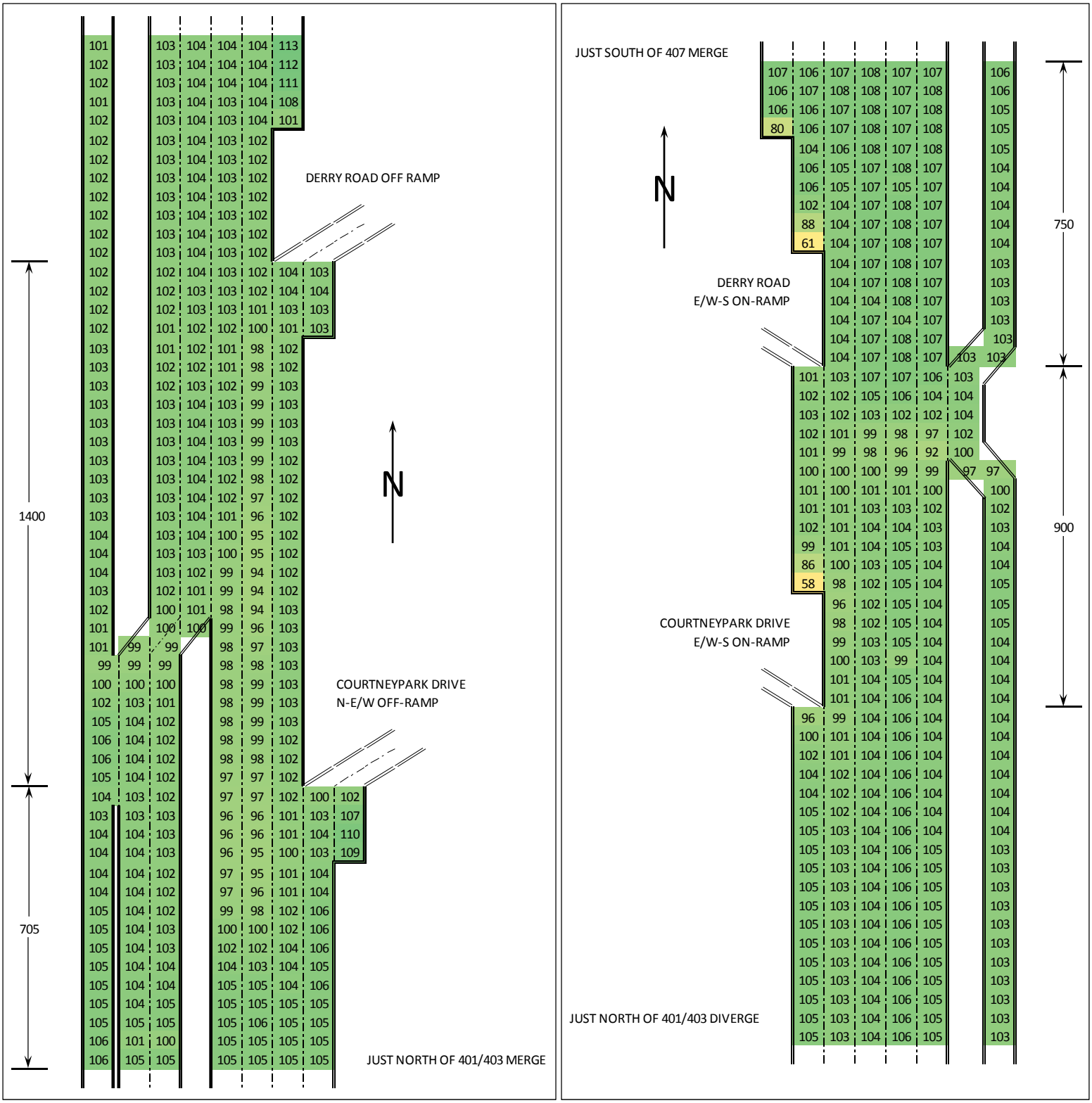


Figure 14 – PM Peak Hour NB (Left) and SB (Right) Lane Speeds

Key conclusions from the speed contours include:

- In the a.m. peak period in the northbound direction, speed reductions begin at 7:15 a.m. due to queuing at the Highway 410 northbound off-ramp at Derry Road. The effect of these reduced speeds continues to grow with slow speeds reaching the southern limits of the model for a 20 minute period. The queues then begin to decrease with speeds gradually increasing although free-flow speeds are not achieved before the end of the analysis period. During the peak hour, speeds between the Derry Road and Courtneypark Drive East off-ramps range from 52-83 km/h. In the southbound direction, minimal reductions in speeds are experienced throughout the analysis period at the Highway 410 lane drops before the Derry Road on-ramp;

- In the a.m. peak period, the speeds in the HOV and express lanes are generally good with minimal delays through the merge areas; and

- In the p.m. peak period, in the collector, HOV and express lanes, there are minimal reductions in speeds at the merge and weave areas.

7.0 2031 Widening of Courtneypark Drive with Full Interchange Scenario – Alternative 2 Analysis

7.1 INTERSECTION ANALYSIS

The results of the intersection analysis with optimized signal timings are presented in **Table 17.** Intersections/movements with v/c ratios greater than 0.85, i.e. at critical levels have been highlighted. Detailed analysis results at the individual movement level and the Synchro analysis output worksheets for this scenario are provided for reference in **Appendix I**.

Table 17
2031 Widening of Courtneypark Drive East with Full I/C Scenario
Intersection Peak Hour Level of Service Analysis

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	v/c	LOS	v/c
Kennedy Road / Courtneypark Drive E *Signalized*	E	1.13	D	0.89
Highway 410 West Terminal / Courtneypark Drive E *Signalized*	C	0.76	D	0.74
Highway 410 East Terminal / Courtneypark Drive E *Signalized*	D	0.84	D	0.90
Tomken Road / Courtneypark Drive E *Signalized*	E	1.14	F	1.13
Ordan Drive-Shawson Drive / Courtneypark Drive E *Signalized*	A	0.34	A	0.55
Vipond Drive/ Courtneypark Drive E *Signalized*	B	0.30	B	0.48
Ordan Drive/ Courtneypark Drive E *Signalized*	A	0.31	B	0.47
Dixie Road/ Courtneypark Drive E *Signalized*	C	0.71	E	1.05
Kennedy Road / Derry Road E *Signalized*	E	1.03	E	1.20
Hwy 410 West Terminal / Derry Road E *Signalized*	C	0.73	B	0.80
Hwy 410 East Terminal / Derry Road E *Signalized*	E	1.17	C	0.97
Tomken Road / Derry Road E *Signalized*	D	0.87	E	1.08
Dixie Road / Derry Road E *Signalized*	E	1.03	E	1.03

Of the Courtneypark Drive East intersections, the Kennedy Road at Courtneypark Drive East intersection operates above capacity in the a.m. peak hour, the Dixie Road at Courtneypark

Drive East intersection operates above capacity in the p.m. peak hour, and the Tomken Road at Courtneypark Drive East intersection operates above capacity in both peak hours.

The Derry Road East intersections generally operate above capacity in both the a.m. and p.m. peak hours but with moderate reductions in the v/c ratio compared to Alternative 1.

7.2 FREEWAY ANALYSIS

The results of the freeway analysis are shown in **Table 18**.

Table 18
2031 Widening of Courtneypark Drive with Full I/C Scenario
Peak Hour Conditions Freeway LOS Analysis

Highway 410 Freeway Sections	Direction of Travel		LOS	
			AM	PM
Highway 401/403 I/C – Courtneypark Drive I/C	NB	Collector	LOS E	LOS C
		HOV	LOS B	LOS B
		Express	LOS D	LOS D
	SB	Collector	LOS C	LOS C
		HOV	LOS A	LOS A
Courtneypark Drive I/C – Derry Road I/C	NB	Collector	LOS E	LOS D
		HOV	LOS A	LOS B
	SB	Collector	LOS C	LOS C
		HOV	LOS A	LOS A

In the a.m. peak hour, the northbound collector lanes on both analysis sections of Highway 410 operate at LOS E. In the p.m. peak hour, all lane sections operate at acceptable levels of service.

7.2.1 Travel Times

Vehicle travel times output from the model for the freeway sections are summarized in **Table 19**.

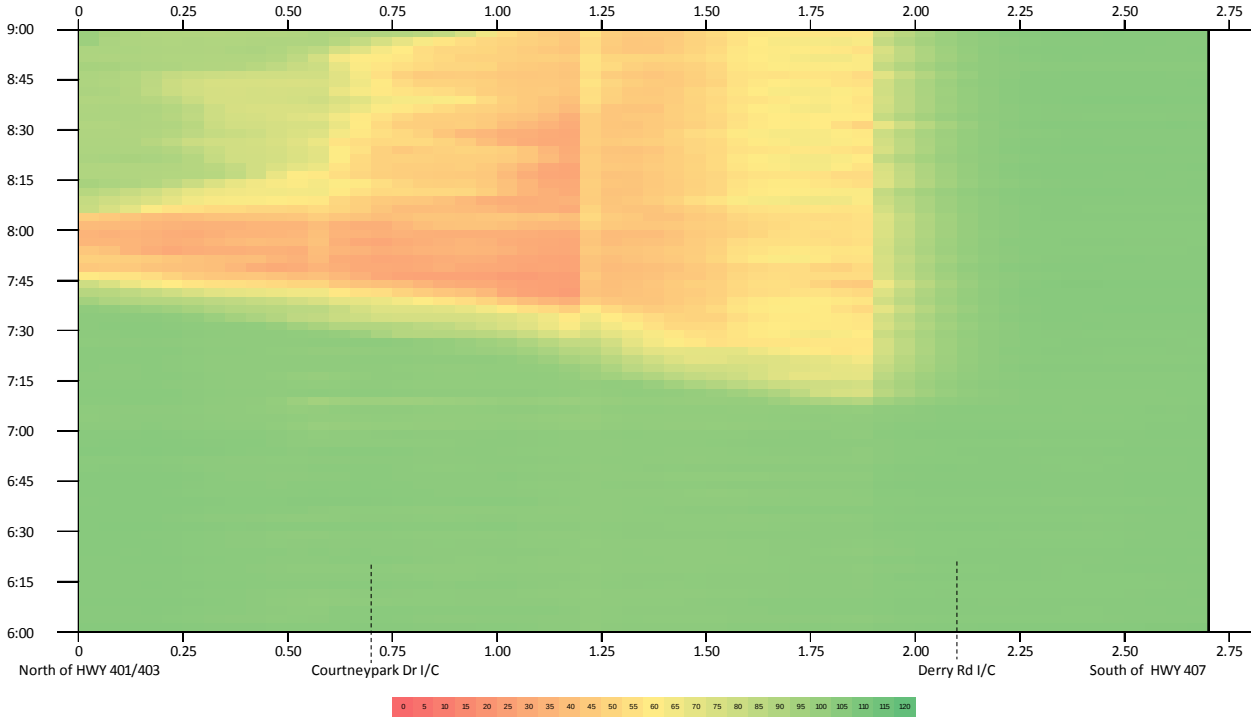
Table 19 2031 Widening of Courtneypark Drive with Full I/C Scenario Peak Hour Travel Time			
Highway 410 Road Section		**AM Peak Hour**	**PM Peak Hour**
NB Direction			
Highway 401/403 I/C – Courtneypark Drive I/C	Collector	1:57	0:46
	HOV	0:44	0:44
	Express	0:45	0:45
Courtneypark Drive I/C – Derry Road I/C	Collector	1:25	0.53
	HOV	0:51	0:50
SB Direction			
Derry Road I/C – Courtneypark Drive I/C	Collector	0:54	0:50
	HOV	0:50	0:50
Courtneypark Drive I/C – Highway 401/403 I/C	Collector	0:37	0:37
	HOV	0:37	0:37

7.2.2 Speed Contours

In order to assist in illustrating freeway operations for both the a.m. and p.m. three-hour simulation periods, vehicle speeds through the freeway Study Area have been plotted based on time and location to develop speed contour graphs. Individual lane speeds throughout the Study Area corridor were also plotted at individual lane level of detail for the a.m. and p.m. peak hour. As previously noted, the following results are based on the reduced speed area value of 18 km/h versus the 25 km/h reduced speed area value identified in the speed study.

The speed contours prepared for this scenario are as follows:

- Figure 15 – AM Peak Period NB and SB Speed Contours – Collector Lanes;
- Figure 16 – AM Peak Period NB and SB Speed Contours – HOV Lanes;
- Figure 17 – AM Peak Period NB Speed Contour – Express Lanes;
- Figure 18 – AM Peak Hour NB and SB Lane Speeds;
- Figure 19 – PM Peak Period NB and SB Speed Contours – Collector Lanes;
- Figure 20 – PM Peak Period NB and SB Speed Contours – HOV Lanes;
- Figure 21 – PM Peak Period NB Speed Contour – Express Lanes; and
- Figure 22 – PM Peak Hour NB and SB Lane Speeds.



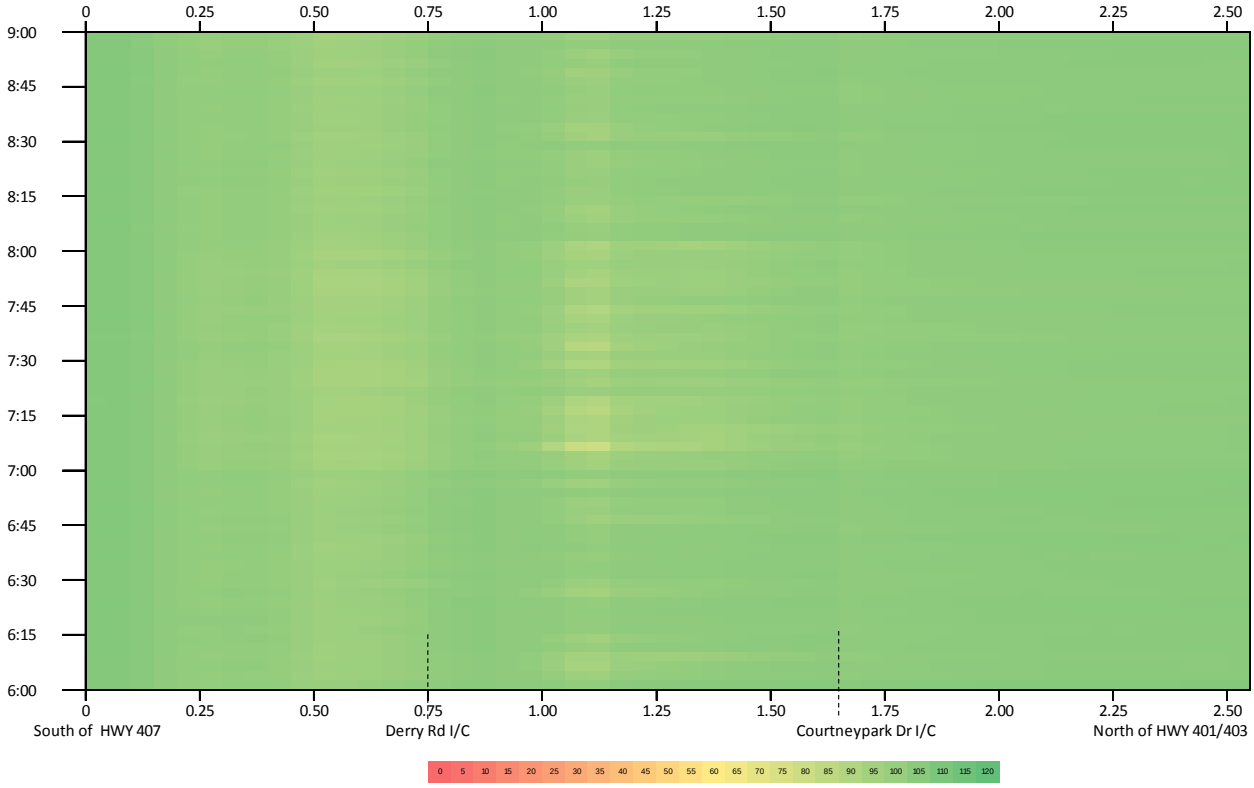


Figure 15 – AM Peak Period NB (Top) & SB (Bottom) Speed Contours – Collector Lanes

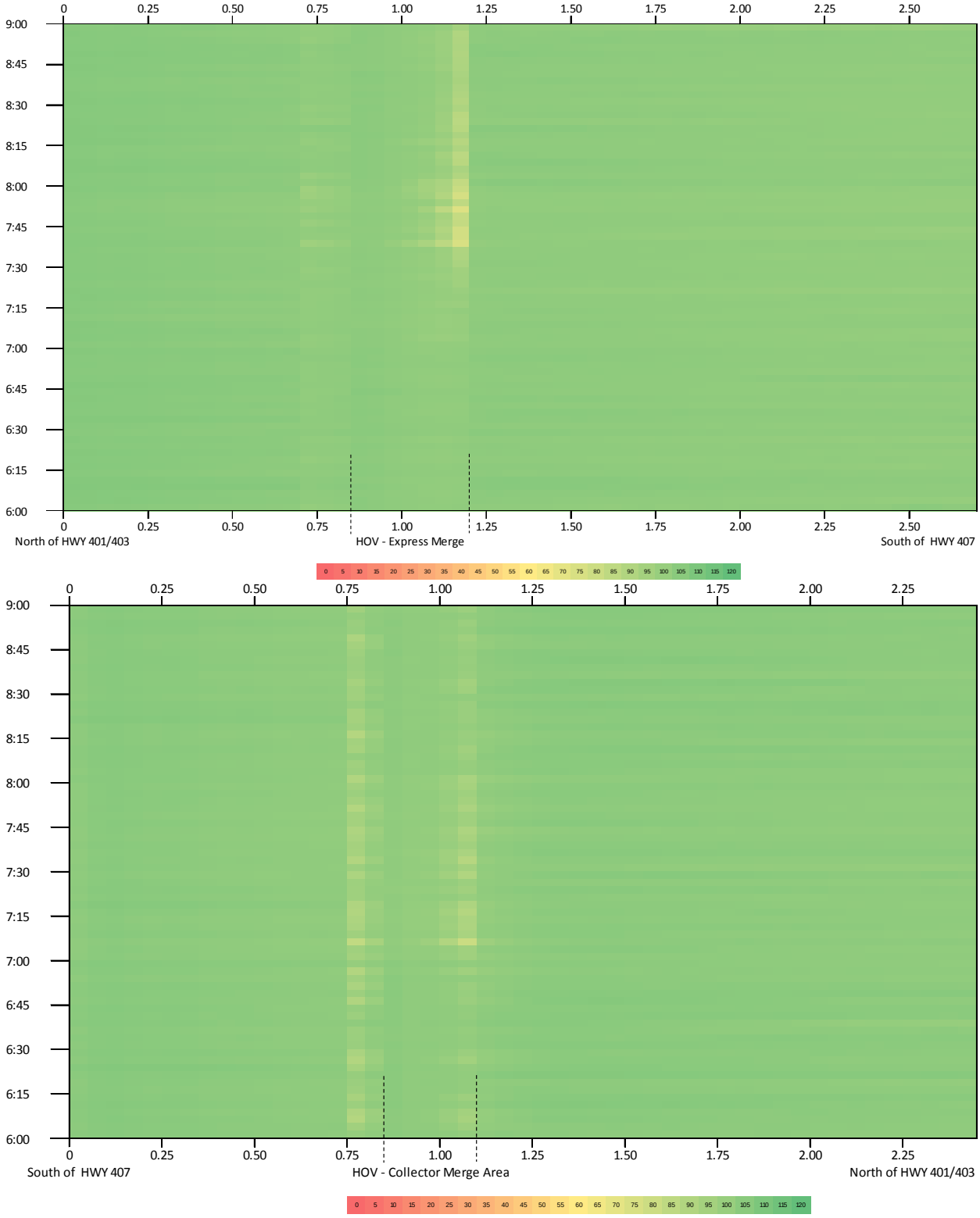


Figure 16 – AM Peak Period NB (Top) & SB (Bottom) Speed Contours – HOV Lanes

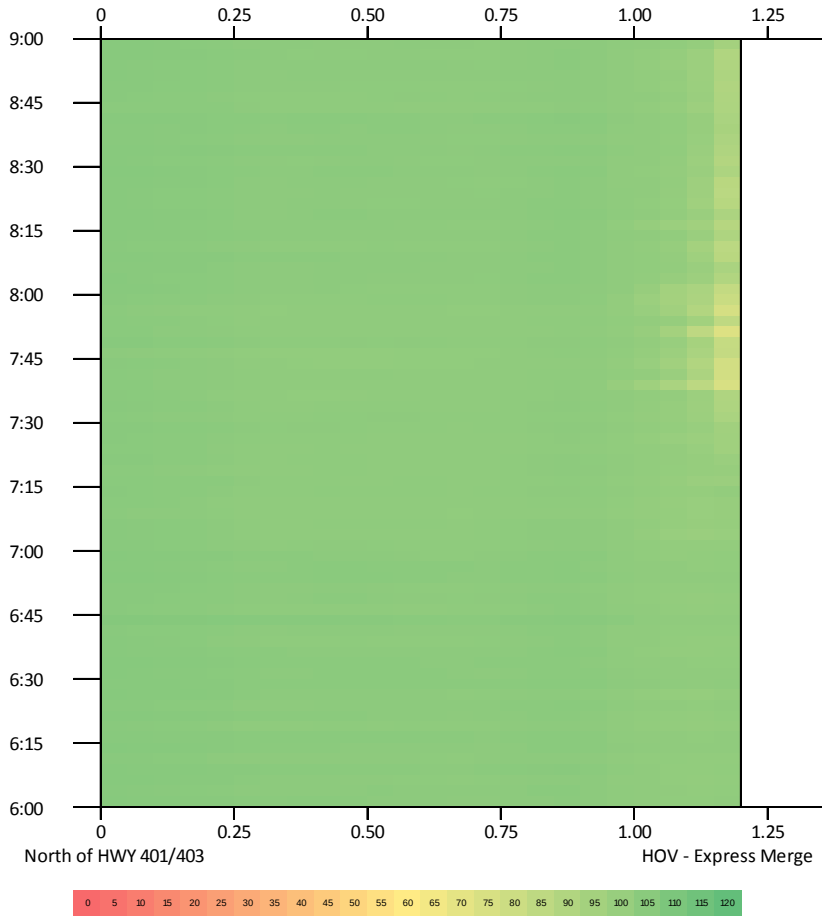


Figure 17 – AM Peak Period NB Speed Contour – Express Lanes

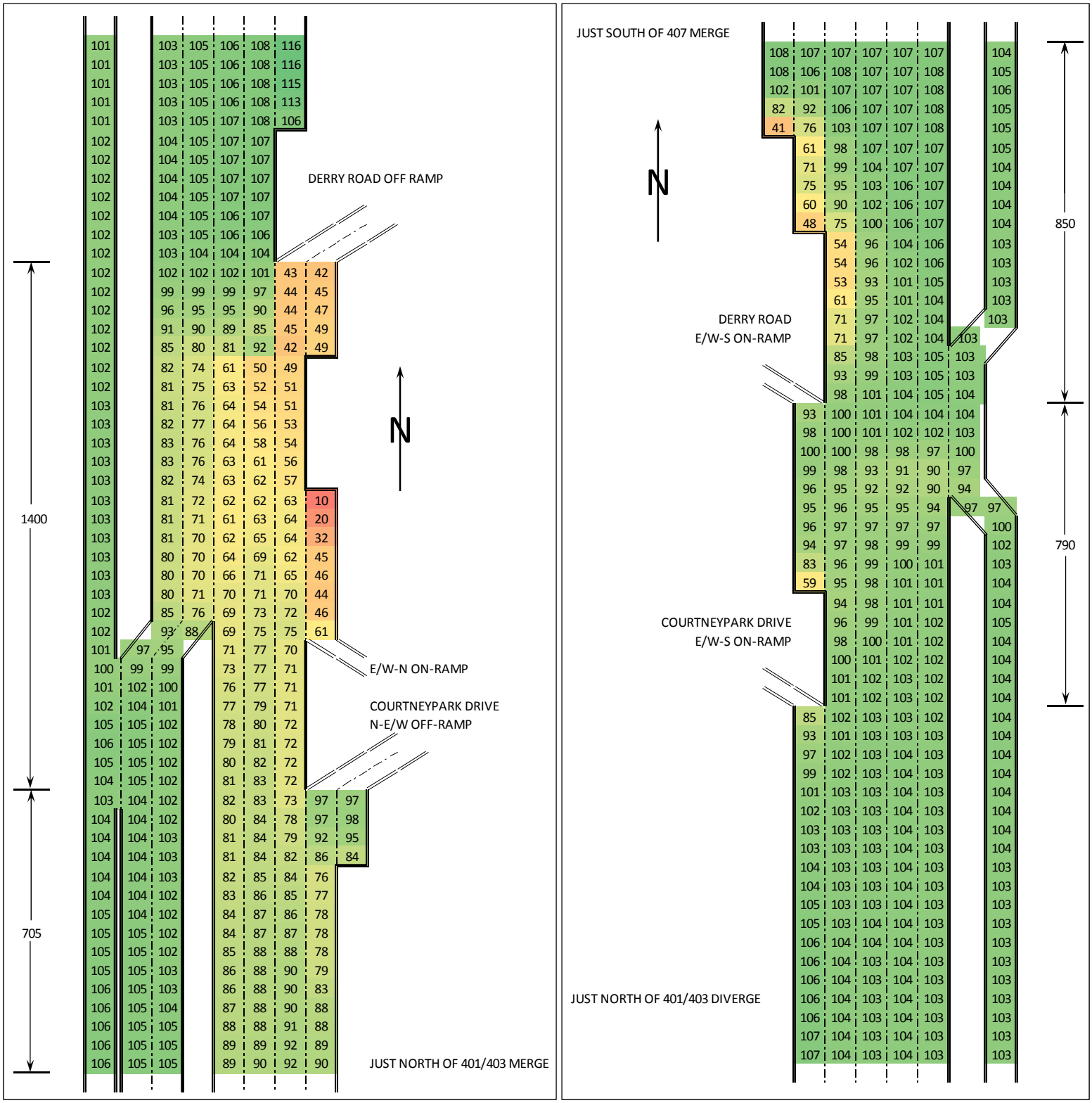
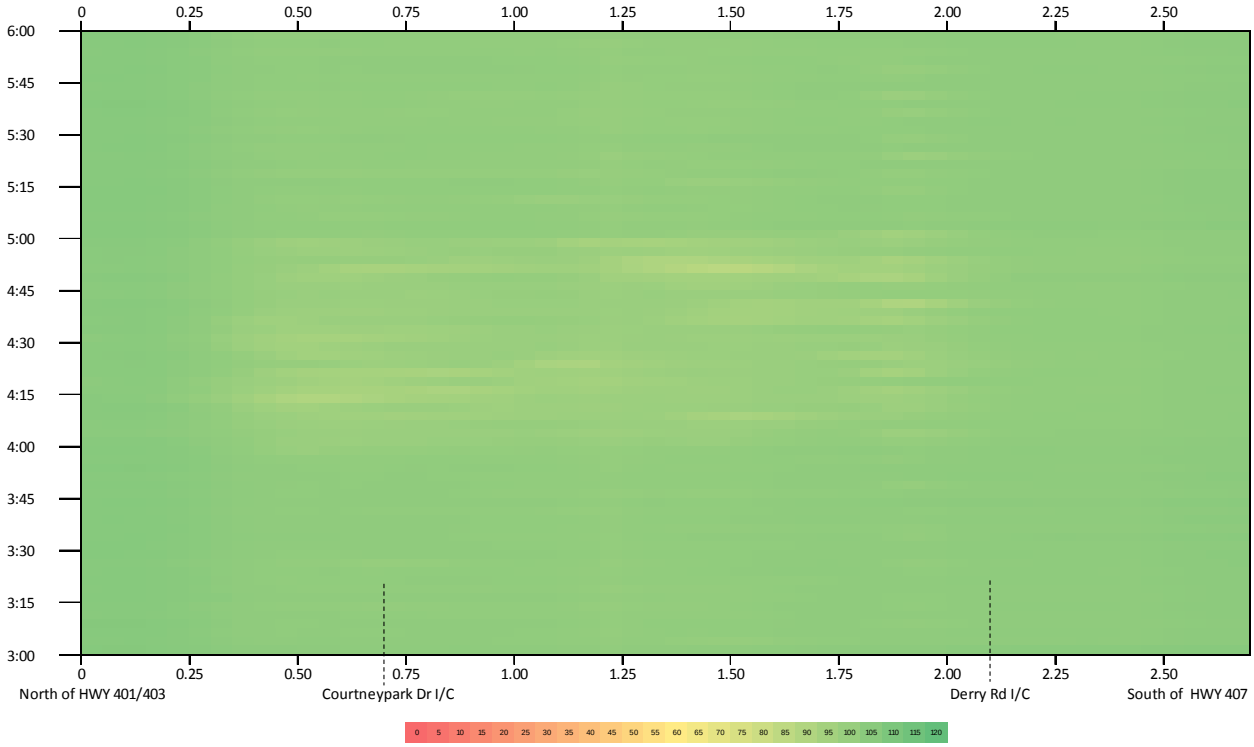


Figure 18 – AM Peak Hour NB (Left) & SB (Right) Lane Speeds



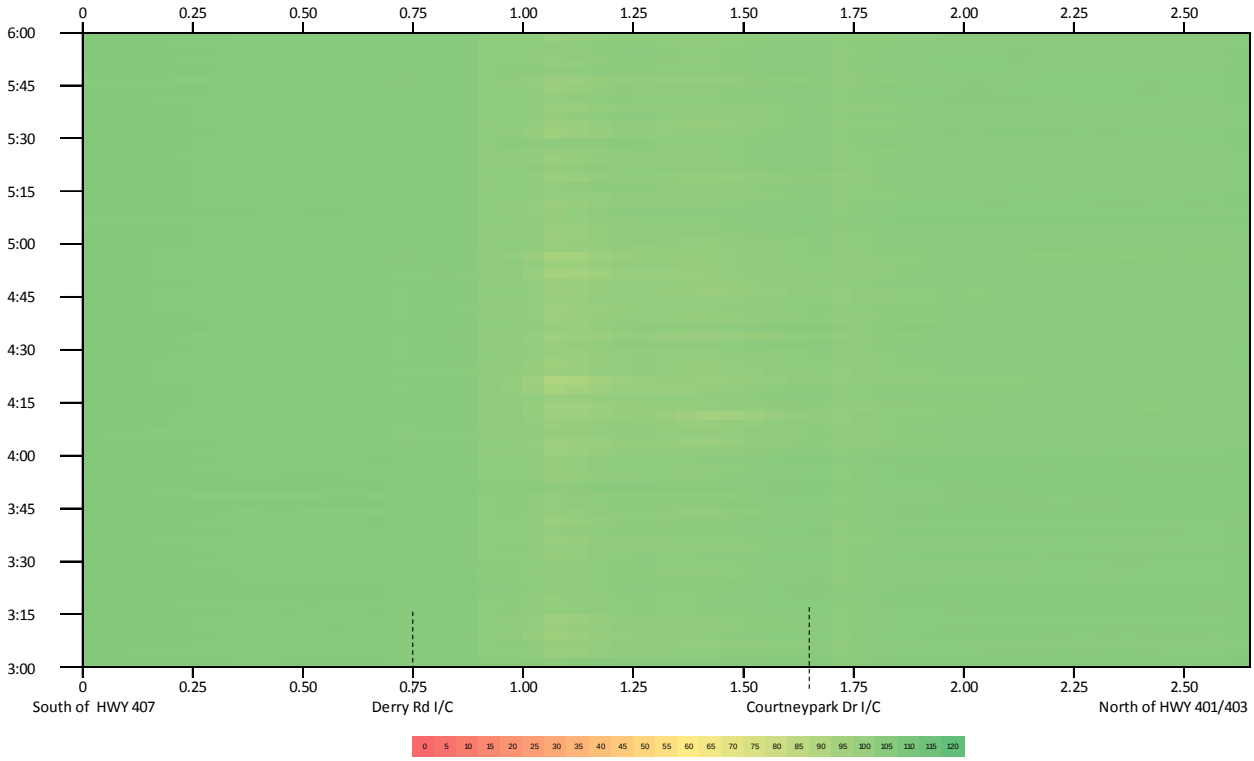


Figure 19 – PM Peak Period NB (Top) & SB (Bottom) Speed Contours – Collector Lanes

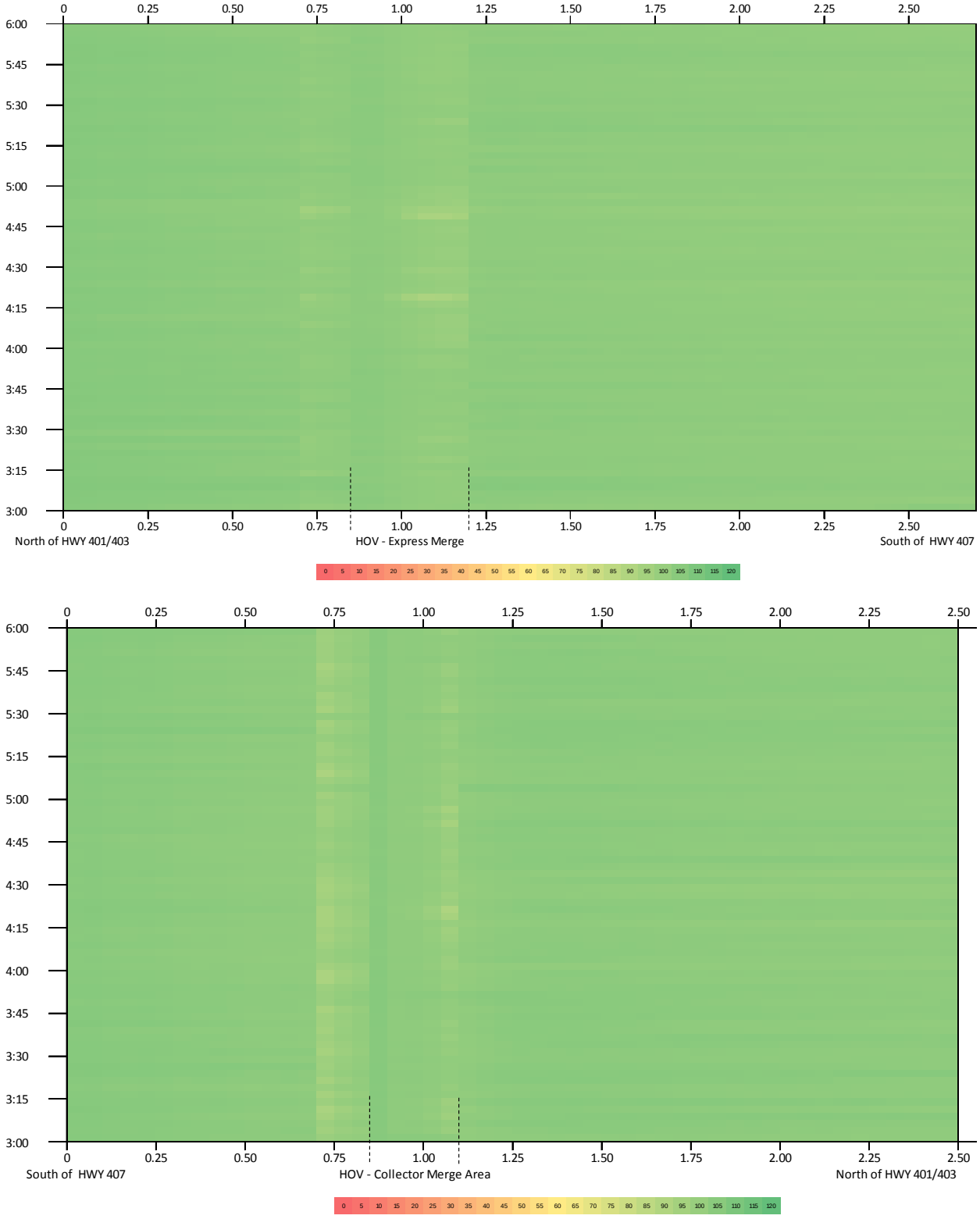


Figure 20 – PM Peak Period NB (Top) & SB (Bottom) Speed Contours – HOV Lanes

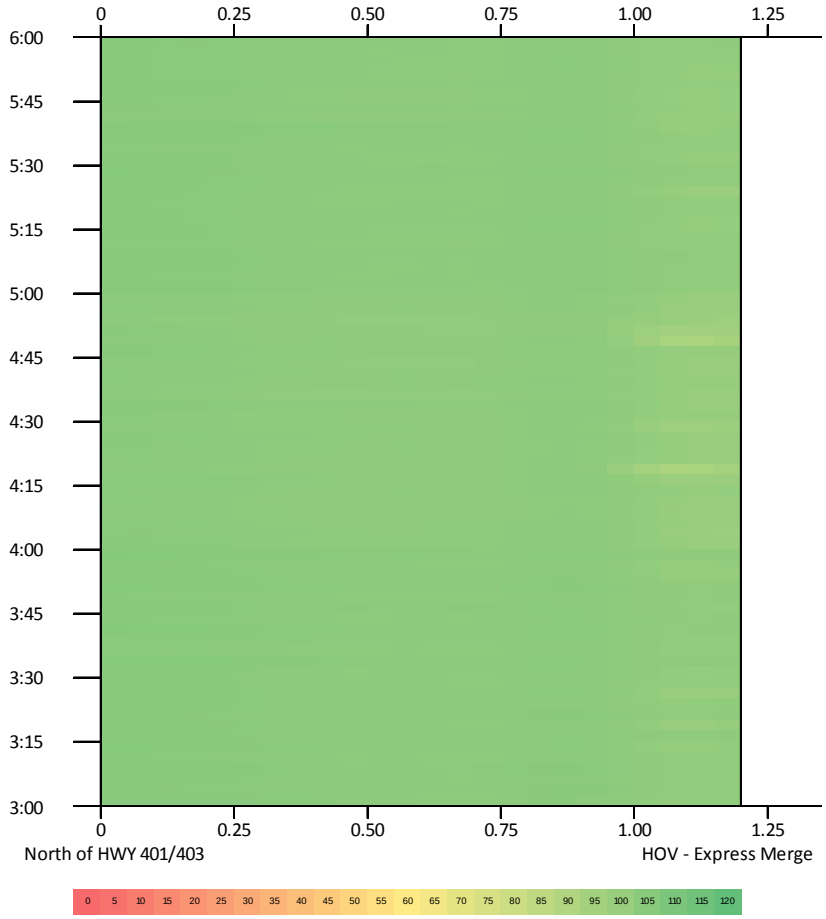


Figure 21 – PM Peak Period NB Speed Contour – Express Lanes

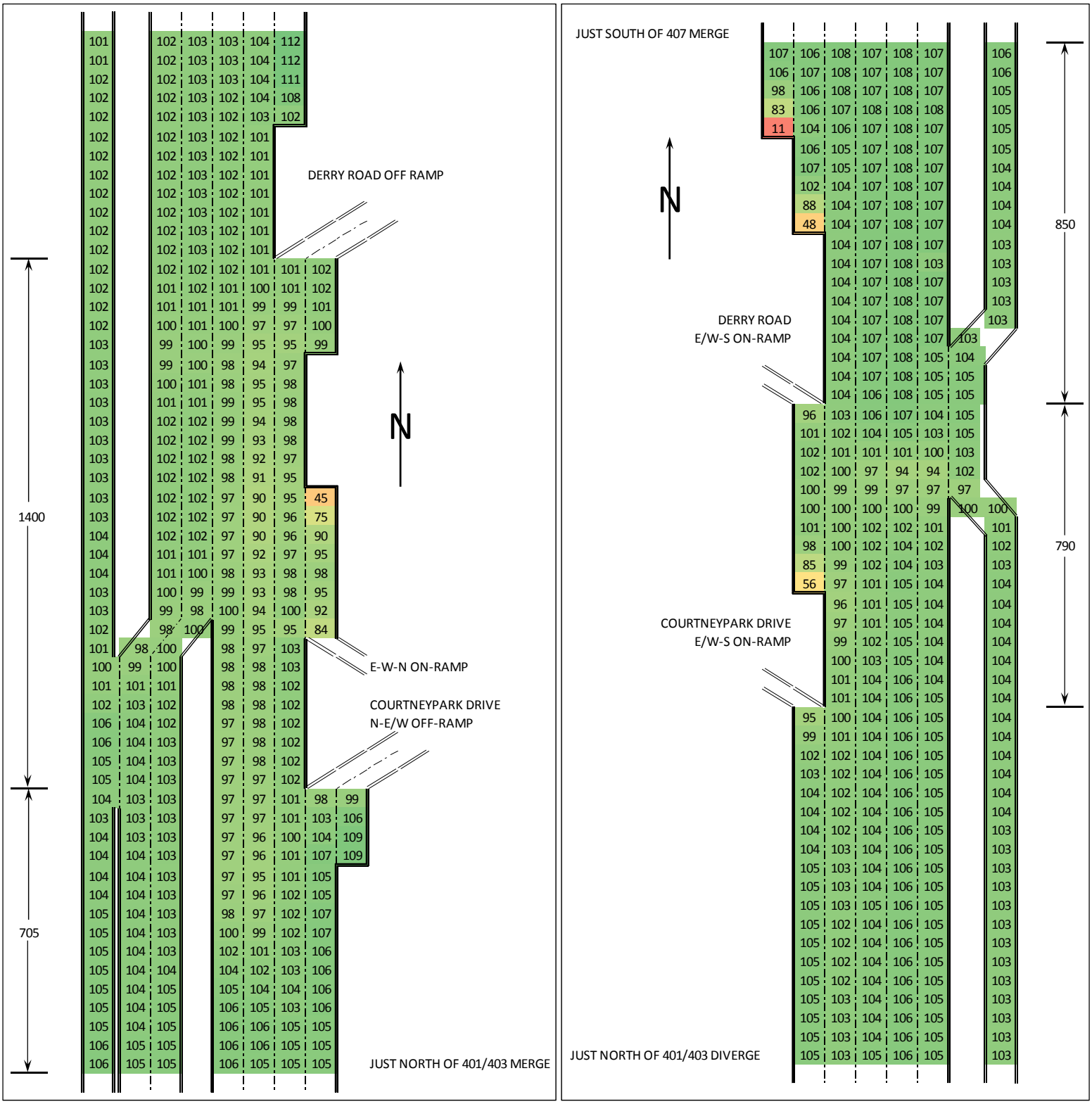


Figure 22 – PM Peak Hour NB (Left) & SB (Right) Lane Speeds

Key conclusions from the speed contours include:

- In the a.m. peak period in the northbound direction, speed reductions begin at 7:15 a.m. due to queuing at the Highway 410 northbound off-ramp at Derry Road. The effect of these reduced speeds continues to grow with slow speeds reaching the southern limits of the model for a 20 minute period. The queues then begin to decrease with speeds gradually increasing although free-flow speeds are not achieved before the end of the analysis period. During the peak hour, speeds between the Derry Road and Courtneypark Drive East off-ramps range from 50-83 km/h. In the southbound direction, minimal reductions in speeds are experienced throughout the analysis period at the Highway 410 lane drops before the Derry Road on-ramp;

- In the a.m. peak period, the speeds in the HOV and express lanes are generally good with minimal delays through the merge areas; and

- In the p.m. peak period, in the collector, HOV and express lanes, there are minimal reductions in speeds at the merge and weave areas.

7.2.3 Weaving Analysis

A weaving analysis was completed on the northbound Highway 410 mainline, between the Courtneypark Drive East and Derry Road interchanges. MTO identified a concern with vehicles merging onto Highway 410 from Courtneypark Drive East and exiting from Highway 410 to Derry Road. As the Courtneypark Drive East on-ramp is not connected to the Derry Road off-ramp by an auxiliary lane, this is not considered a weaving segment by the HCM methodology. However, the weaving analysis was undertaken in order to satisfy MTO's request.

The level of service (LOS) criteria for weaving segments is based on vehicle density. The LOS criteria are summarized in **Table 20**. A single LOS is used to characterize total flow in the weaving segment, although it is recognized that in some situations (particularly in cases of constrained operations) non-weaving vehicles may achieve higher-quality operations than weaving vehicles.

Table 20 LOS Criteria for Weaving Segments	
LOS	Density (pc/km/ln)
	Multilane and Collector-Distributor Weaving Segments
A	≤ 8.0
B	> 8.0 – 15.0
C	> 15.0 – 20.0
D	> 20.0 – 23.0
E	> 23.0 – 25.0
F	> 25.0

The weaving analysis for the subject weaving segment for Alternative 2 was completed using HCS+ which applies the methodology of the HCM 2000. The analysis indicated that the weaving segment would operate at LOS C and LOS E, during the AM and PM peak hours, respectively. Analysis outputs are provided for reference in **Appendix J**. No weaving issues were observed in the VISSIM microsimulation animation.

8.0 Alternative Evaluation and Implementation

8.1 INTERSECTION COMPARISON

With a full interchange at Courtneypark Drive East, traffic volumes would divert from Derry Road East to Courtneypark Drive East. This results in reduced delays along Derry Road East and increased delays on Courtneypark Drive East. In order to assess the net intersection operational impact of providing the full interchange, the total time that vehicles were delayed at each of the Study Area intersections along Courtneypark Drive and Derry Road (between Kennedy Road and Dixie Road) were tabulated and compared for Alternatives 1 and 2. These delay values were based on the total volume entering and the vehicle delay as calculated by Synchro at each of the Study Area intersections. The results of this comparison are summarized in **Table 21**.

Table 21
Partial versus Full Interchange Comparison
Total Vehicle Delay

Road Corridor	Total Delay (Hours)			
	AM Peak Hour		PM Peak Hour	
	Alt 1	Alt 2	Alt 1	Alt 2
Courtneypark Drive E	210.3	302.4	300.8	467.6
	+92.1 (+44%)		*+166.8 (+55%)*	
Derry Road E	602.0	452.2	632.6	451.7
	-149.8 (-25%)		*-180.9 (-29%)*	
Total	**812.3**	**754.5**	**933.4**	**919.3**
	-57.7 (-7%)		***-14.1 (-2%)***	

With the full interchange (Alternative 2), the following conclusions can be reached:

- For the Courtneypark Drive East corridor, the total delay increases by 92.1 hours (44%) and 166.8 hours (55%) in the a.m. and p.m. peak hours respectively;
- For the Derry Road corridor, the total delay decreases by 149.8 hours (-25%) and 180.9 hours (-29%) in the a.m. and p.m. peak hours respectively; and
- Combined, the total delay along the two corridors decreases by 57.7 hours (-7%) and 14.1 hours (-2%) in the a.m. and p.m. peak hours respectively.

While these changes in delay may seem minor, it is important to note that these reductions in delay are experienced by each of the approximately 30,000 vehicle movements (approximately 35,000 people movements based on a vehicle occupancy of 1.14 from TTS data) in both the a.m. and p.m. peak hours. Further delay reductions, albeit not to this extent, would also be

experienced in the hours adjacent to the peak hours. This translates to a reduction in delay of over 20,000 person hours per year in these two corridors combined, with the full interchange.

8.2 FREEWAY COMPARISON

8.2.1 Level of Service

The peak hour level of service experienced on Highway 410 has been compared between the partial and full interchange alternatives. The results are summarized in **Table 22**.

Table 22
Partial versus Full Interchange Comparison
Peak Hour Conditions Freeway LOS Analysis

Highway 410 Freeway Sections	Direction of Travel		LOS			
			AM Peak Hour		PM Peak Hour	
			Alt 1	Alt 2	Alt 1	Alt 2
Highway 401/403 I/C – Courtneypark Drive I/C	NB	Collector	LOS E	LOS E	LOS C	LOS C
		HOV	LOS B	LOS B	LOS B	LOS B
		Express	LOS D	LOS D	LOS D	LOS D
	SB	Collector	LOS C	LOS C	LOS C	LOS C
		HOV	LOS A	LOS A	LOS A	LOS A
Courtneypark Drive I/C – Derry Road I/C	NB	Collector	LOS E	LOS E	LOS D	LOS D
		HOV	LOS A	LOS A	LOS B	LOS B
	SB	Collector	LOS C	LOS C	LOS C	LOS C
		HOV	LOS A	LOS A	LOS A	LOS A

Between Alternative 1, Partial Interchange and Alternative 2, Full Interchange scenarios, there are no differences in the freeway level of service.

8.2.2 Travel Time

The travel times along Highway 410 have been compared between the partial and full interchange alternatives. The results are summarized in **Table 23**.

Table 23
Partial versus Full Interchange Comparison
Peak Hour Travel Time Comparison

Highway 410 Road Section		AM Peak Hour		PM Peak Hour	
		Alt 1	Alt 2	Alt 1	Alt 2
NB Direction					
Highway 401/403 I/C – Courtneypark Drive I/C	Collector	1:48	1:57	0:47	0:46
		+0:09 +8%		-0:01 -2%	
	HOV	0:44	0:44	0:44	0:44
		+/-0:00 No Change		+-/0:00 No Change	
	Express	0:45	0:45	0:45	0:45
		+/-0:00 No Change		+/-0:00 No Change	
Courtneypark Drive I/C – Derry Road I/C	Collector	1:21	1:25	0:52	0:53
		+0:04 +5%		+0:01 +2%	
	HOV	0:50	0:51	0:51	0:50
		+0:01 +2%		-0:01 -2%	
SB Direction					
Derry Road I/C – Courtneypark Drive I/C	Collector	0:56	0:54	0:50	0:50
		-0:02 -4%		+/-0:00 No Change	
	HOV	0:50	0:50	0:50	0:50
		+/-0:00 No Change		+/-0:00 No Change	
Courtneypark Drive I/C – Highway 401/403 I/C	Collector	0:37	0:37	0:37	0:37
		+/-0:00 No Change		+/-0:00 No Change	
	HOV	0:37	0:37	0:37	0:37
		+/-0:00 No Change		+/-0:00 No Change	

In the northbound direction of Highway 410 in the a.m. peak hour, there would be a modest increase (9 seconds, 8%) in the travel time between the Highway 401/Highway 403 interchange to the Courtneypark Drive East interchange and a minor increase (4 seconds, 5%) in the travel time between the Courtneypark Drive East interchange and the Derry Road interchange. In the southbound direction, there would be effectively no change in the travel time.

In the p.m. peak hour, there would be effectively no change in the travel time in both directions.

8.2.3 Delay

The system delay output from the microsimulation model was compared between the two alternatives. The total system delay is the delay experienced by all vehicles that have been processed through the microsimulation model, Highway 410 mainline and ramp terminals. A summary of this comparison includes breakdown by mainline and ramp terminal delay (as provided by VISSIM) is shown in **Table 24**.

Table 24
Partial versus Full Interchange Comparison
Total System Delay

Road Corridor	Total Delay (Hours)			
	AM Peak Hour		PM Peak Hour	
	Alt 1	Alt 2	Alt 1	Alt 2
Mainline and Ramp Delays	***361***	***329***	***57***	***23***
	-32		***-34***	
	-9%		***-60%***	
Courtneypark Drive E (Highway 410 East & West Terminals)	35	55	27	56
	+20		+29	
Derry Road (Highway 410 East & West Terminals)	171	110	98	75
	-61		-23	
Total Ramp Terminal Delay	***206***	***165***	***125***	***131***
	-41		***+6***	
	-20%		***+5%***	
Total System Delay	***567***	***494***	***182***	***154***
	-73		***-28***	
	-13%		***-15%***	

With the full interchange (Alternative 2):

- In the a.m. peak hour, the total system delay is reduced by 13%; and
- In the p.m. peak hour, the total system delay is reduced by 15%.

8.3 OTHER BENEFITS

In addition to the improved traffic operations and reduced delays documented in the preceding sections, the full interchange at Highway 410 and Courtneypark Drive East would provide other benefits such as:

- Improved access to the industrial and commercial land uses along the Courtneypark Drive East corridor as workers and customers/clients will have more direct access to/from Highway 410;

- Improved access to Courtneypark Drive East and Highway 410 for emergency services (fire, EMS, and police), which allows for better response times;
- Improved goods movement and access along Courtneypark Drive between the airport and Highway 410. It is expected that by 2031, over 400 trucks per day would be able to travel through the Study Area more efficiently and safely, i.e. take a more direct, shorter route with fewer turns; and
- Improved goods movement access to Highway 410 and the provincial highway network.

8.4 SUMMARY OF IMPROVEMENTS

A summary of the proposed improvements for Alternative 2, with Full Interchange is shown in **Table 25**.

Table 25
Alternative 2 with Full Interchange Improvements

Intersection	Intersection Improvements
Kennedy Road/ Courtneypark Drive E	• EB Auxiliary Right-Turn Lane • WB Auxiliary Right-Turn Lane • NB Auxiliary Right-Turn Lane • SB Auxiliary Right-Turn Lane • Additional EB Through Lane • Additional WB Through Lane
Highway 410 West Terminal/ Courtneypark Drive E	• Signalization • EB Auxiliary Left-Turn Lane • Additional EB Through Lane • Additional WB Through Lane
Highway 410 East Terminal/ Courtneypark Drive E	• WB Auxiliary Left-Turn Lane • Additional EB Through Lane • Additional WB Through Lane
Tomken Road/ Courtneypark Drive E	• EB Auxiliary Right-Turn Lane • Additional EB Through Lane • Additional WB Through Lane
Ordan Drive-Shawson Drive/ Courtneypark Drive E	• Additional EB Through Lane • Additional WB Through Lane
Vipond Drive/ Courtneypark Drive E	• Additional EB Through Lane • Additional WB Through Lane
Ordan Drive/ Courtneypark Drive E	• Additional EB Through Lane • Additional WB Through Lane
Dixie Road/ Courtneypark Drive E	• Dual NB Left-Turn Lane • Additional EB Through Lane • Additional WB Through Lane

8.5 PREFERRED ALTERNATIVE IMPLEMENTATION AND PHASING

8.5.1 Interim 5-Lane Cross-Section Structure

Based on the preceding analysis, the widening of Courtneypark Drive East with a full interchange provides the greatest transportation benefit to the broader area of interest. However, as previously noted, these improvements would require the widening of the Courtneypark Drive East structure over Highway 410. As this represents a substantial and complex construction effort, further investigation was done to determine whether an interim alternative could be implemented that would not require widening of the structure before the 2031 horizon year, but still provide transportation benefits.

Therefore an analysis of the ramp terminal intersections was conducted for the 2021 and 2031 horizon years with improvements that did not require a widening of the Courtneypark Drive East structure, i.e. maintained the existing 5-lane cross-section. The 2021 traffic forecasts were developed by applying the same growth rates used to develop the 2031 traffic forecasts, except for a 7 year period versus a 17 year period. A conceptual diagram of the intersections and lane configurations is shown in **Figure 23**.

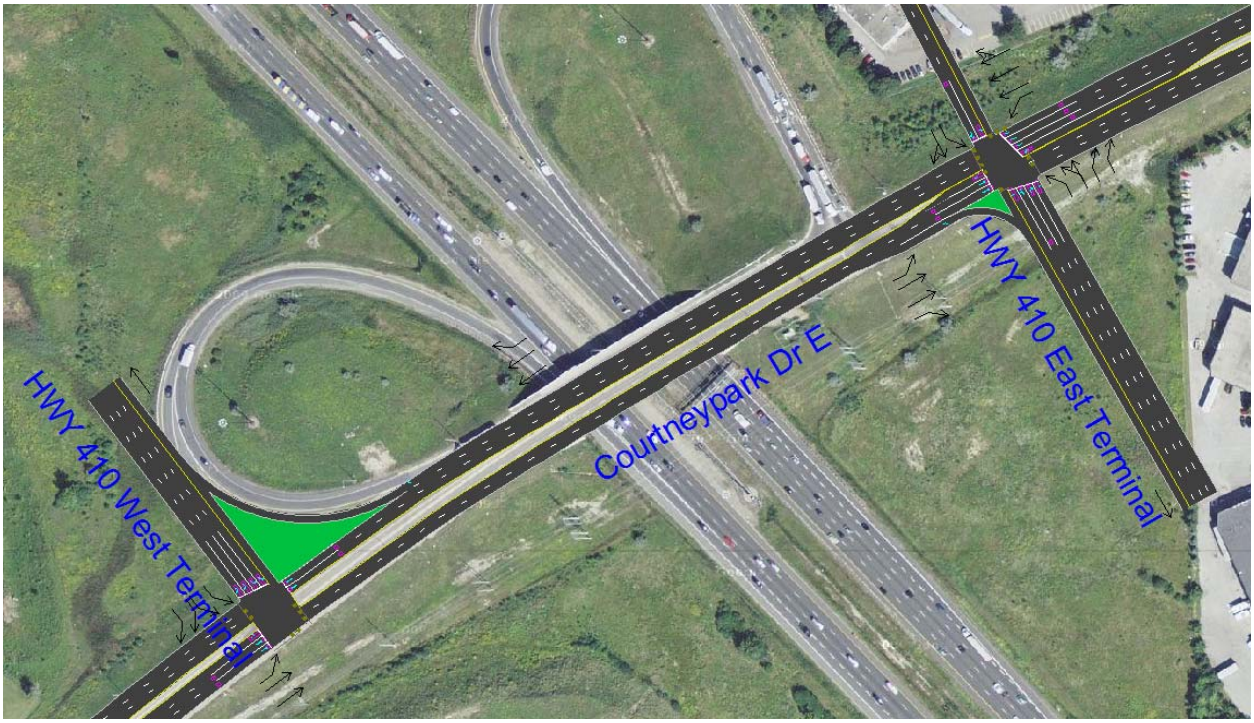


Figure 23 – Interim 5-Lane Bridge Alternative Concept

The results of the intersection analysis are presented in **Table 26** and **Table 27** for the 2021 and 2031 horizon years, respectively. Intersections/movements with v/c ratios greater than 0.85, i.e.

at critical levels have been highlighted. Synchro analysis output worksheets for this scenario are provided for reference in **Appendix K**.

Table 26
Interim 5-Lane Bridge Alternative Concept
2021 Peak Hour Intersection Level of Service

Intersection	Appr/Movement		AM				PM			
			LOS	Delay	v/c	Queue	LOS	Delay	v/c	Queue
Highway 410 West Terminal/ Courtneypark Drive E	EB	Left	D	35	0.70	51	D	37	0.82	105
		Dual Thru	C	32	0.66	227	A	1	0.32	3
	WB	Dual Thru	B	18	0.51	84	C	27	0.88	190
		Right	D	37	0.21	22	B	17	0.44	39
	SB	Dual Left	E	57	0.54	57	E	76	0.48	17
		Dual Right	D	52	0.17	16	E	65	0.09	15
	Overall Intersection		***C***	***33***	***0.68***	**-**	***C***	***24***	***0.84***	**-**
Highway 410 East Terminal/ Courtneypark Drive E	EB	Dual Thru	C	25	0.87	152	C	24	0.51	73
		Right	B	18	0.20	26	B	18	0.22	19
	WB	Left	D	53	0.66	24	C	34	0.89	133
		Triple Thru	A	7	0.23	21	B	16	0.57	123
	NB	Dual Left	D	54	0.76	109	E	66	0.64	46
		Dual Right	E	59	0.83	114	D	53	0.08	11
	Overall Intersection		***C***	***33***	***0.84***	**-**	***C***	***24***	***0.87***	**-**

All movements generally operate at acceptable levels of service and within capacity.

Table 27
Interim 5-Lane Bridge Alternative Concept
2031 Peak Hour Intersection Level of Service

Intersection	Appr/Movement		AM				PM			
			LOS	Delay	v/c	Queue	LOS	Delay	v/c	Queue
Highway 410 West Terminal/ Courtneypark Drive E	EB	Left	B	20	0.78	3	E	63	0.96	142
		Dual Thru	A	8	0.70	60	A	1	0.34	3
	WB	Dual Thru	C	29	0.59	148	C	31	0.94	221
		Right	E	69	0.26	44	B	17	0.56	58
	SB	Dual Left	E	60	0.59	58	F	133	0.84	24
		Dual Right	D	52	0.17	16	E	69	0.09	20
	Overall Intersection		***C***	***27***	***0.76***	**-**	***C***	***29***	***0.98***	**-**
Highway 410 East Terminal/ Courtneypark Drive E	EB	Dual Thru	C	24	0.94	261	C	27	0.60	78
		Right	A	4	0.20	8	B	18	0.24	20
	WB	Left	F	88	0.80	30	C	34	0.91	139
		Triple Thru	A	8	0.26	24	B	17	0.64	144
	NB	Dual Left	E	57	0.84	128	E	68	0.71	53
		Dual Right	F	81	0.99	165	D	53	0.09	12
	Overall Intersection		***D***	***38***	***0.95***	**-**	***C***	***26***	***0.89***	**-**

All movements are generally within capacity although many are approaching capacity. Additionally, some movements experience long delays such as the westbound left turn and northbound right turn movement at the east ramp terminal in the a.m. peak hour, and the southbound left turn at the west ramp terminal in the p.m. peak hour.

Therefore, this interim alternative concept would be able to serve the corridor up to and beyond the 2021 horizon year. However, shortly before 2031, some movements would begin to reach capacity and vehicles would experience long delays resulting in the need for full implementation of the preferred alternative including the widening of the Courtneypark Drive East structure over Highway 410.

8.5.2 Ultimate 6-Lane Cross-Section Structure

Another alternative examined was that of a 6-lane cross-section structure instead of an ultimate 8-lane cross-section structure. This would allow for the additional through lanes on Courtneypark Drive, but would preclude the deceleration lanes to the Highway 410 on-ramps. This tradeoff would permit a narrower and less costly structure expansion.

An analysis of the ramp terminal intersections was conducted for the 2021 and 2031 horizon years with improvements that only required a 6-lane cross-section. A conceptual diagram of the intersections and lane configurations is shown in **Figure 24**.

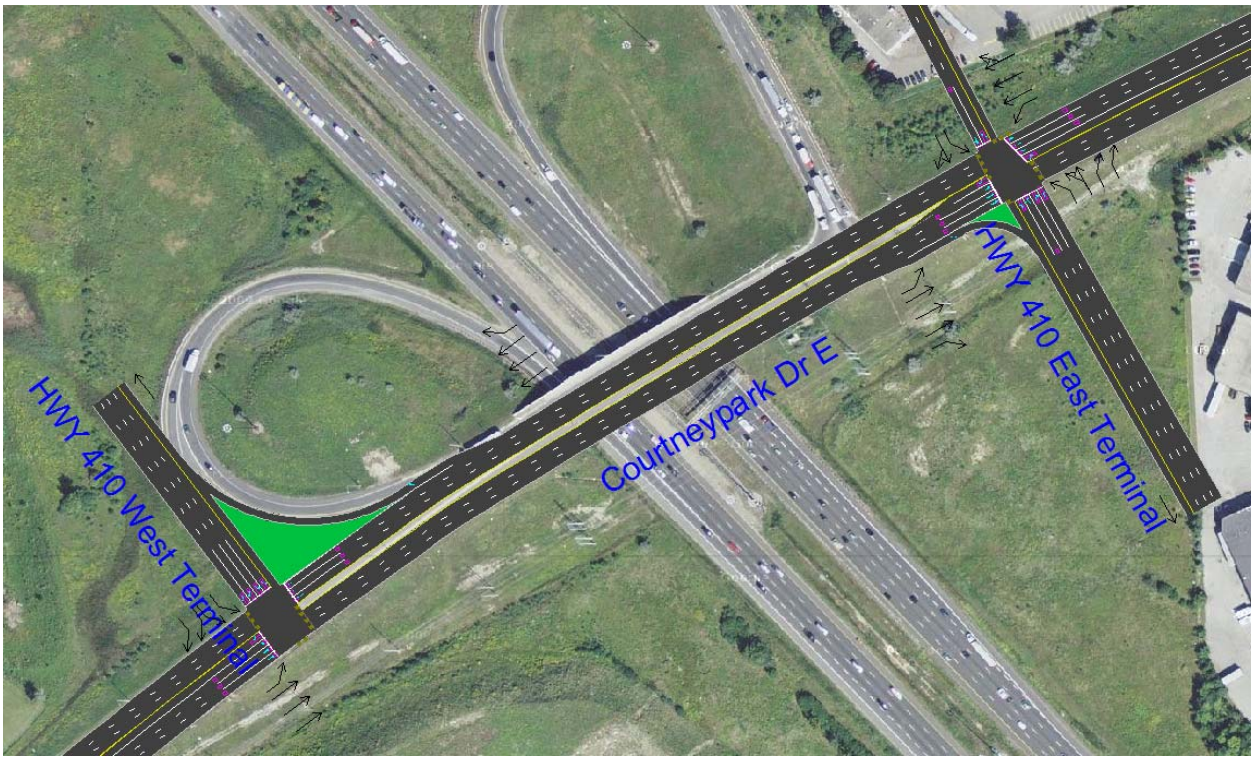


Figure 24 – Ultimate 6-Lane Bridge Alternative Concept

The results of the intersection analysis are presented in **Table 28** and **Table 29** for the 2021 and 2031 horizon years, respectively. Intersections/movements with v/c ratios greater than 0.85, i.e. at critical levels have been highlighted. Synchro analysis output worksheets for this scenario are provided for reference in **Appendix K**.

Table 28
Ultimate 6-Lane Bridge Alternative Concept
2021 Peak Hour Intersection Level of Service

Intersection	Appr/Movement		AM				PM			
			LOS	Delay	v/c	Queue	LOS	Delay	v/c	Queue
Highway 410 West Terminal/ Courtneypark Drive E	EB	Left	B	20	0.70	50	C	22	0.65	33
		Triple Thru	B	18	0.49	133	A	1	0.24	2
	WB	Triple Thru	C	21	0.39	69	C	32	0.72	136
		Right	D	47	0.21	26	E	61	0.41	62
	SB	Dual Left	D	50	0.43	54	E	63	0.28	17
		Dual Right	D	45	0.17	15	E	60	0.09	15
	Overall Intersection		***C***	***27***	***0.65***	***-***	***C***	***31***	***0.65***	***-***
Highway 410 East Terminal/ Courtneypark Drive E	EB	Triple Thru	B	12	0.68	74	C	34	0.37	64
		Right	A	6	0.20	10	E	67	0.18	26
	WB	Left	D	39	0.51	23	C	29	0.88	128
		Triple Thru	B	11	0.25	29	B	20	0.58	145
	NB	Dual Left	D	44	0.64	101	E	62	0.58	46
		Dual Right	D	45	0.63	88	D	52	0.08	11
	Overall Intersection		***C***	***23***	***0.65***	***-***	***C***	***30***	***0.85***	***-***

All movements generally operate at acceptable levels of service and within capacity.

Table 29
Ultimate 6-Lane Bridge Alternative Concept
2031 Peak Hour Intersection Level of Service

Intersection	Appr/Movement		AM				PM			
			LOS	Delay	v/c	Queue	LOS	Delay	v/c	Queue
Highway 410 West Terminal/ Courtneypark Drive E	EB	Left	B	16	0.78	57	C	27	0.71	50
		Triple Thru	B	16	0.51	141	A	1	0.25	4
	WB	Triple Thru	C	21	0.43	78	D	44	0.84	188
		Right	D	46	0.24	31	E	60	0.56	95
	SB	Dual Left	D	54	0.50	56	E	63	0.28	17
		Dual Right	D	49	0.17	16	E	60	0.09	15
	Overall Intersection		***C***	***26***	***0.73***	***-***	***D***	***37***	***0.74***	***-***
Highway 410 East Terminal/ Courtneypark Drive E	EB	Triple Thru	B	17	0.78	90	C	31	0.42	67
		Right	A	10	0.21	14	D	44	0.18	20
	WB	Left	D	41	0.59	25	C	31	0.89	137
		Triple Thru	B	19	0.29	39	C	21	0.65	167
	NB	Dual Left	D	43	0.68	116	E	63	0.65	52
		Dual Right	D	45	0.72	113	D	51	0.09	12
	Overall Intersection		***C***	***27***	***0.74***	***-***	***C***	***29***	***0.87***	***-***

All movements are generally operating at acceptable levels of service and within capacity.

This alternative provides sufficient capacity at the ramp terminals up to the 2031 horizon year, but with virtually no deceleration lanes for Highway 410 on-ramps. Further discussion will be required with the MTO to determine if this configuration would be acceptable.

In the p.m. peak hour, the westbound left-turn movement at the Highway 410 east ramp terminal operates with a v/c ratio over the 0.85 threshold. As further optimization of the signal timing at this intersection is not possible (due to incurring delays beyond acceptable thresholds on other movements), there are essentially only three physical improvements that could be implemented:

1. Provide an additional westbound left-turn lane resulting in a dual left-turn lane;

2. Provide an additional eastbound through lane resulting in four eastbound through lanes; and

3. Provide an additional northbound off-ramp lane resulting in a total of five northbound lanes from the Highway 410 northbound off-ramp.

However, each of these potential improvements has substantial challenges and would likely have a negative impact on traffic operations at the intersection.

The addition of a westbound left-turn lane would require the addition of a receiving lane on the Highway 410 northbound on-ramp which would then require the merging of three lanes into one lane along a loop ramp. This would also impact the alignment of the through lanes on the north and south approaches.

The addition of the eastbound through lane would theoretically divide the eastbound traffic flow into four lanes instead of three which would create additional gaps in which the westbound left turning vehicles could turn. However, unless the additional through lane was extended to the upstream and downstream intersections, it is expected that lane utilization would be low resulting in a lesser benefit being realized. This would also require a costly widening of the bridge structure.

The addition of an off-ramp lane would allow more green time to be allocated to the east-west approaches from the north-south approaches. However this would create an extremely wide off-ramp approach, wider than typically provided at Ontario off-ramps. The potential for sideswipe conflicts would also be higher with three side-by-side turning movements and an additional off-ramp lane would impact the alignment of the north-south through lanes

The eastbound and westbound through movement queues at the easterly and westerly ramp terminal intersections, respectively, were checked to determine whether they would block access to the Highway 410 on-ramps. This information is summarized in **Table 30.**

Table 30
Ultimate 6-Lane Bridge Alternative Concept
2031 Peak Hour Queues

Intersection		AM				PM			
		50th Queue	95th Queue	Distance	Blockage ?	50th Queue	95th Queue	Distance	Blockage ?
Highway 410 West Terminal/ Courtneypark Drive E	WBT	57 m	78 m	120 m	No	170 m	188 m	120 m	Yes
Highway 410 East Terminal/ Courtneypark Drive E	EBT	65 m	90 m	110 m	No	41 m	67 m	110 m	No

With the 6-lane alternative, at the west ramp terminal, both the westbound through movement 50th percentile queue and 95th percentile queue would block access to the west to south

Highway 410 on-ramp. This implies that access to this ramp would be blocked greater than 50% of the time during the p.m. peak hour. In the critical a.m. peak hour at the east ramp terminal, the eastbound through movement 95th percentile queue would not block access to the Highway 410 on-ramp.

With the ultimate 8-lane alternative, the westbound through movement queue would need to be 330 m in order to block access to the on-ramp which is substantially larger than the expected 95th percentile queue of 188 m.

9.0 Conclusions

The conclusions of the Transportation and Traffic Analysis Report are as follows:

a) Existing conditions in the Courtneypark Drive East corridor are characterized by at capacity conditions and moderate to long delays.

b) Existing conditions along Highway 410 can generally be characterized as approaching capacity.

c) With the expected traffic growth within the Study Area by 2031, there is a need to provide additional capacity along Courtneypark Drive East.

d) A widening of Courtneypark Drive East could provide this additional capacity and would be part of the reconfiguration of the interchange at Highway 410 which could remain a partial interchange, or expanded to become a full interchange.

e) Converting the Highway 410 ramp terminals at Courtneypark Drive East to roundabout control with additional auxiliary lanes would not provide the required intersection capacity or remove the need for a widening of Courtneypark Drive East structure over Highway 410.

f) A widening of Courtneypark Drive East with a reconfigured partial interchange would substantially improve the traffic operations along Courtneypark Drive East.

g) A widening of Courtneypark Drive East with a full interchange would result in a net reduction in delay along the Courtneypark Drive East and Derry Road corridors (as modelled in Synchro), and a net reduction in delay in the mainline and ramp terminals (as modelled in VISSIM).

h) A full interchange compared to a partial interchange would:

    a. Result in no change to the freeway level of service in the a.m. and p.m. peak hours

    b. Result in a modest increase in the northbound travel time in the a.m. peak hour between the Highway 401/Highway 403 interchange and the Derry Road interchange (no change in the p.m. peak hour, no change for the southbound direction in the a.m. and p.m. peak hours)

    c. If considered as weaving segment (which it is not as defined by HCM), the Highway 410 mainline between Courtneypark Drive East and Derry Road would result in a weaving LOS C in the a.m. peak hour and LOS E in the p.m. peak hour

i) A full interchange also has other benefits including improved access to the industrial and commercial land uses along Courtneypark Drive East, improved goods movement, and improved access to Courtneypark Drive East and Highway 410 for emergency services.

j) A widening of Courtneypark Drive East with a full interchange is the preferred alternative from a transportation perspective.

k) In order to defer the ultimate requirement of the widening of the Courtneypark Drive East structure across Highway 410, an interim alternative could be implemented as part of a phased improvement strategy that would allow for acceptable traffic operations up to and beyond 2021 until a time shortly before 2031. The interim alternative would involve intersection improvements at the Highway 410 east and west ramp terminals at Courtneypark Drive East, but could be accommodated within the width of the existing bridge structure.

l) A 6-lane bridge structure has been reviewed as an alternative to the ultimate 8-lane bridge structure by not providing deceleration ramps for the Highway 410 On-Ramps. While it provides sufficient capacity at the ramp terminals for the 2031 horizon year, further discussion with the MTO will be required to determine if this configuration is acceptable as some blockage of access to the on-ramps is expected during the p.m. peak hour.

Appendix A
Traffic Data

Dixie Road & Courtneypark Drive East

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 0000005608
Intersection: Dixie Road & Courtneypark Drive Ea
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Dixie Road runs N/S

North Leg Total:	2987
North Entering:	1936
North Peds:	23
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	38	191	19	248
Cars	290	1067	331	1688
Totals	328	1258	350	

Cyclists	0
Trucks	246
Cars	805
Totals	1051

East Leg Total:	1027
East Entering:	220
East Peds:	20
Peds Cross:	⋈

Dixie Road

Cyclists	Trucks	Cars	Totals
0	81	454	535

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
71	33	0	104
66	25	0	91
16	9	0	25
153	67	0	

N
W E
S

Cyclists	Trucks	Cars	Totals
0	42	101	143
0	34	345	379
0	28	75	103
0	104	521	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
750	57	0	807

Dixie Road

Peds Cross:	⋈
West Peds:	4
West Entering:	625
West Leg Total:	1160

Cars	1158
Trucks	228
Cyclists	0
Totals	1386

Cars	98	633	74	805
Trucks	18	171	4	193
Cyclists	0	0	0	0
Totals	116	804	78	

Peds Cross:	⋈
South Peds:	5
South Entering:	998
South Leg Total:	2384

Comments

Dixie Road & Courtneypark Drive East

Mid-day Peak Diagram

Specified Period
From: 11:30:00
To: 13:30:00

One Hour Peak
From: 12:15:00
To: 13:15:00

Municipality: Mississauga
Site #: 0000005608
Intersection: Dixie Road & Courtneypark Drive Ea
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Dixie Road runs N/S

North Leg Total:	2627
North Entering:	1199
North Peds:	8
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	40	184	34	258
Cars	110	644	187	941
Totals	150	828	221	

Cyclists	0
Trucks	244
Cars	1184
Totals	1428

East Leg Total:	879
East Entering:	412
East Peds:	3
Peds Cross:	⧗

Dixie Road

Cyclists	Trucks	Cars	Totals
0	102	354	456

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
142	34	0	176
119	30	0	149
70	17	0	87
331	81	0	

N
W E
S

Cyclists	Trucks	Cars	Totals
0	57	129	186
0	38	152	190
0	30	120	150
0	125	401	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
390	77	0	467

Dixie Road

Peds Cross:	⧗
West Peds:	0
West Entering:	526
West Leg Total:	982

Cars	834
Trucks	231
Cyclists	0
Totals	1065

Cars	125	913	51	1089
Trucks	32	153	5	190
Cyclists	0	0	0	0
Totals	157	1066	56	

Peds Cross:	⋈
South Peds:	1
South Entering:	1279
South Leg Total:	2344

Comments

Dixie Road & Courtneypark Drive East

Afternoon Peak Diagram

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

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Mississauga
Site #: 0000005608
Intersection: Dixie Road & Courtneypark Drive Ea
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Dixie Road runs N/S

North Leg Total: 3834
North Entering: 1118
North Peds: 7
Peds Cross: ⋈

Cyclists	0	0	0	0
Trucks	24	119	34	177
Cars	108	713	120	941
Totals	132	832	154	

Dixie Road

Cyclists	0
Trucks	249
Cars	2467
Totals	2716

East Leg Total: 1432
East Entering: 1069
East Peds: 13
Peds Cross: ⧗

Cyclists	Trucks	Cars	Totals
0	65	689	754

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
517	29	0	546
417	22	0	439
76	8	0	84
1010	59	0	

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Cyclists	Trucks	Cars	Totals
0	40	325	365
0	23	156	179
0	21	125	146
0	84	606	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
299	64	0	363

Dixie Road

Peds Cross: ⧗
West Peds: 3
West Entering: 690
West Leg Total: 1444

Cars	914
Trucks	148
Cyclists	0
Totals	1062

Cars	164	1625	23	1812
Trucks	19	180	7	206
Cyclists	0	0	0	0
Totals	183	1805	30	

Peds Cross: ⋈
South Peds: 11
South Entering: 2018
South Leg Total: 3080

Comments

Dixie Road & Courtneypark Drive East

Total Count Diagram

Municipality: Mississauga
Site #: 0000005608
Intersection: Dixie Road & Courtneypark Drive Ea
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Dixie Road runs N/S

North Leg Total:	23241
North Entering:	10414
North Peds:	81
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	273	1307	243	1823
Cars	1222	5875	1494	8591
Totals	1495	7182	1737	

Cyclists	0
Trucks	2058
Cars	10769
Totals	12827

East Leg Total:	8042
East Entering:	3945
East Peds:	67
Peds Cross:	⋈

Dixie Road

Cyclists	Trucks	Cars	Totals
0	688	3537	4225

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	329	1325	1654
0	277	1650	1927
0	182	767	949
0	788	3742	

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Cars	Trucks	Cyclists	Totals
1583	258	0	1841
1397	232	0	1629
385	90	0	475
3365	580	0	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
3526	571	0	4097

Dixie Road

Peds Cross:	⋈
West Peds:	28
West Entering:	4530
West Leg Total:	8755

Cars	7027
Trucks	1579
Cyclists	0
Totals	8606

Cars	918	7861	382	9161
Trucks	183	1471	51	1705
Cyclists	0	0	0	0
Totals	1101	9332	433	

Peds Cross:	⋈
South Peds:	42
South Entering:	10866
South Leg Total:	19472

Comments

Dixie Road & Courtneypark Drive East
Traffic Count Summary

Intersection: Dixie Road & Courtneypark Drive E | **Count Date:** 12-Nov-2013 | **Municipality:** Mississauga

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	315	1059	297	1671	22	2605
9:00:00	333	1220	327	1880	19	2876
10:00:00	273	887	171	1331	8	2260
12:00:00	93	390	71	554	3	1124
13:00:00	205	839	145	1189	7	2473
15:00:00	119	385	84	588	2	1238
16:00:00	139	795	154	1088	4	2734
17:00:00	142	842	145	1129	7	3159
18:00:00	118	765	101	984	9	2811
Totals:	1737	7182	1495	10414	81	21280

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	96	754	84	934	2
9:00:00	124	804	68	996	5
10:00:00	116	741	72	929	7
12:00:00	56	496	18	570	1
13:00:00	157	1070	57	1284	1
15:00:00	73	549	28	650	1
16:00:00	141	1462	43	1646	5
17:00:00	178	1816	36	2030	10
18:00:00	160	1640	27	1827	10
	1101	9332	433	10866	42

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	39	83	76	198	12	856
9:00:00	17	96	108	221	14	835
10:00:00	41	103	132	276	8	806
12:00:00	36	38	71	145	0	347
13:00:00	73	142	189	404	1	932
15:00:00	39	74	98	211	5	429
16:00:00	73	325	282	680	8	1221
17:00:00	73	425	536	1034	10	1623
18:00:00	84	343	349	776	9	1426
Totals:	475	1629	1841	3945	67	8475

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	150	418	90	658	6
9:00:00	141	372	101	614	5
10:00:00	155	252	123	530	10
12:00:00	82	69	51	202	1
13:00:00	189	181	158	528	0
15:00:00	95	85	38	218	0
16:00:00	229	184	128	541	1
17:00:00	303	143	143	589	5
18:00:00	310	223	117	650	0
	1654	1927	949	4530	28

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	10:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	631	554	463	451	222	636	818	756

Courtneypark Drive East & Ordan Drive

Morning Peak Diagram

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

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Mississauga
Site #: 0000005607
Intersection: Courtneypark Drive East & Ordan D
TFR File #: 4
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total: 118
North Entering: 34
North Peds: 3
Peds Cross: ⋈

Cyclists	0	0	0	0
Trucks	4	2	17	23
Cars	2	3	6	11
Totals	6	5	23	

Cyclists	0
Trucks	17
Cars	67
Totals	84

East Leg Total: 1131
East Entering: 430
East Peds: 0
Peds Cross: ⧗

Ordan Drive

Cyclists	Trucks	Cars	Totals
0	66	285	351

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
52	16	0	68
274	62	0	336
25	1	0	26
351	79	0	

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Cyclists	Trucks	Cars	Totals
0	1	10	11
0	93	572	665
0	3	88	91
0	97	670	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
588	113	0	701

Ordan Drive

Peds Cross: ⧗
West Peds: 0
West Entering: 767
West Leg Total: 1118

Cars	116
Trucks	6
Cyclists	0
Totals	122

Cars	9	5	10	24
Trucks	0	0	3	3
Cyclists	0	0	0	0
Totals	9	5	13	

Peds Cross: ⋈
South Peds: 2
South Entering: 27
South Leg Total: 149

Comments

Courtneypark Drive East & Ordan Drive

Mid-day Peak Diagram

Specified Period
From: 11:30:00
To: 13:30:00

One Hour Peak
From: 12:15:00
To: 13:15:00

Municipality: Mississauga
Site #: 0000005607
Intersection: Courtneypark Drive East & Ordan D
TFR File #: 4
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	87
North Entering:	43
North Peds:	6
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	1	1	10	12
Cars	4	4	23	31
Totals	5	5	33	

Cyclists	0
Trucks	12
Cars	32
Totals	44

East Leg Total:	888
East Entering:	415
East Peds:	6
Peds Cross:	⋈

Ordan Drive

Cyclists	Trucks	Cars	Totals
0	80	319	399

Cars	Trucks	Cyclists	Totals
21	10	0	31
294	77	0	371
11	2	0	13
326	89	0	

Courtneypark Drive East

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Cyclists	Trucks	Cars	Totals
0	2	7	9
0	98	324	422
0	3	31	34
0	103	362	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
363	110	0	473

Ordan Drive

Peds Cross:	⋈
West Peds:	7
West Entering:	465
West Leg Total:	864

Cars	46
Trucks	6
Cyclists	0
Totals	52

Cars	21	4	16	41
Trucks	2	0	2	4
Cyclists	0	0	0	0
Totals	23	4	18	

Peds Cross:	⋈
South Peds:	0
South Entering:	45
South Leg Total:	97

Comments

Courtneypark Drive East & Ordan Drive

Afternoon Peak Diagram

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

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Mississauga
Site #: 0000005607
Intersection: Courtneypark Drive East & Ordan D
TFR File #: 4
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total: 109
North Entering: 91
North Peds: 5
Peds Cross: ⋈

Cyclists	0	0	0	0
Trucks	2	1	11	14
Cars	12	14	51	77
Totals	14	15	62	

Cyclists	0
Trucks	6
Cars	12
Totals	18

East Leg Total: 1341
East Entering: 724
East Peds: 0
Peds Cross: ⧗

Ordan Drive

Cyclists	Trucks	Cars	Totals
0	59	698	757

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
11	5	0	16
633	54	0	687
18	3	0	21
662	62	0	

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Cyclists	Trucks	Cars	Totals
0	1	1	2
0	64	437	501
0	3	25	28
0	68	463	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
539	78	0	617

Ordan Drive

Peds Cross: ⧗
West Peds: 1
West Entering: 531
West Leg Total: 1288

Cars	57
Trucks	7
Cyclists	0
Totals	64

Cars	53	0	51	104
Trucks	3	0	3	6
Cyclists	0	0	0	0
Totals	56	0	54	

Peds Cross: ⋈
South Peds: 0
South Entering: 110
South Leg Total: 174

Comments

Courtneypark Drive East & Ordan Drive

Total Count Diagram

Municipality: Mississauga
Site #: 0000005607
Intersection: Courtneypark Drive East & Ordan D
TFR File #: 4
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	874
North Entering:	406
North Peds:	38
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	22	12	94	128
Cars	54	38	186	278
Totals	76	50	280	

Cyclists	0
Trucks	112
Cars	356
Totals	468

East Leg Total:	8350
East Entering:	3958
East Peds:	7
Peds Cross:	⧗

Ordan Drive

Cyclists	Trucks	Cars	Totals
0	562	3128	3690

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
284	89	0	373
2931	521	0	3452
111	22	0	133
3326	632	0	

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Cyclists	Trucks	Cars	Totals
0	19	43	62
0	624	3326	3950
0	30	325	355
0	673	3694	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
3652	740	0	4392

Ordan Drive

Peds Cross:	⧗
West Peds:	15
West Entering:	4367
West Leg Total:	8057

Cars	474
Trucks	64
Cyclists	0
Totals	538

Cars	143	29	140	312
Trucks	19	4	22	45
Cyclists	0	0	0	0
Totals	162	33	162	

Peds Cross:	⋈
South Peds:	4
South Entering:	357
South Leg Total:	895

Comments

Courtneypark Drive East & Ordan Drive
Traffic Count Summary

Intersection: Courtneypark Drive East & Ordan | **Count Date:** 12-Nov-2013 | **Municipality:** Mississauga

North Approach Totals						North/South Total Approaches	South Approach Totals					
	Includes Cars, Trucks, & Cyclists							Includes Cars, Trucks, & Cyclists				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	22	3	9	34	5	63	8:00:00	8	11	10	29	1
9:00:00	23	5	6	34	3	61	9:00:00	9	5	13	27	2
10:00:00	35	2	10	47	2	71	10:00:00	9	8	7	24	0
12:00:00	17	2	7	26	0	43	12:00:00	6	0	11	17	0
13:00:00	29	8	6	43	7	82	13:00:00	19	4	16	39	0
15:00:00	18	1	4	23	3	39	15:00:00	8	2	6	16	0
16:00:00	41	10	8	59	8	100	16:00:00	19	3	19	41	1
17:00:00	53	11	15	79	7	160	17:00:00	41	0	40	81	0
18:00:00	42	8	11	61	3	144	18:00:00	43	0	40	83	0
Totals:	280	50	76	406	38	763		162	33	162	357	4

East Approach Totals						East/West Total Approaches	West Approach Totals					
	Includes Cars, Trucks, & Cyclists							Includes Cars, Trucks, & Cyclists				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	17	311	105	433	0	1095	8:00:00	11	590	61	662	1
9:00:00	26	336	68	430	0	1197	9:00:00	11	665	91	767	0
10:00:00	23	274	50	347	0	922	10:00:00	13	497	65	575	0
12:00:00	8	134	14	156	0	350	12:00:00	1	185	8	194	0
13:00:00	16	355	35	406	5	878	13:00:00	9	431	32	472	7
15:00:00	3	186	13	202	1	409	15:00:00	5	183	19	207	5
16:00:00	10	569	48	627	0	1155	16:00:00	7	487	34	528	0
17:00:00	19	688	22	729	1	1199	17:00:00	3	443	24	470	2
18:00:00	11	599	18	628	0	1120	18:00:00	2	469	21	492	0
Totals:	133	3452	373	3958	7	8325		62	3950	355	4367	15

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	10:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	42	37	52	68	34	70	108	93

Courtneypark Drive East & Vipond Drive

Morning Peak Diagram

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

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Mississauga
Site #: 0000005606
Intersection: Courtneypark Drive East & Vipond D
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total: 157
North Entering: 19
North Peds: 3
Peds Cross: ⋈

Cyclists	0	0	0	0
Trucks	1	1	0	2
Cars	12	1	4	17
Totals	13	2	4	

Cyclists	0
Trucks	2
Cars	136
Totals	138

East Leg Total: 1149
East Entering: 353
East Peds: 1
Peds Cross: ⧗

Vipond Drive

Cyclists	Trucks	Cars	Totals
0	69	231	300

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	1	95	96
0	88	678	766
0	5	69	74
0	94	842	

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Cars	Trucks	Cyclists	Totals
32	1	0	33
211	64	0	275
40	5	0	45
283	70	0	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
703	93	0	796

Vipond Drive

Peds Cross: ⧗
West Peds: 5
West Entering: 936
West Leg Total: 1236

Cars	110
Trucks	11
Cyclists	0
Totals	121

Cars	8	9	21	38
Trucks	4	0	5	9
Cyclists	0	0	0	0
Totals	12	9	26	

Peds Cross: ⋈
South Peds: 1
South Entering: 47
South Leg Total: 168

Comments

Courtneypark Drive East & Vipond Drive

Mid-day Peak Diagram

Specified Period
From: 11:30:00
To: 13:30:00

One Hour Peak
From: 12:15:00
To: 13:15:00

Municipality: Mississauga
Site #: 0000005606
Intersection: Courtneypark Drive East & Vipond D
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	69
North Entering:	38
North Peds:	7
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	4	1	0	5
Cars	18	4	11	33
Totals	22	5	11	

Cyclists	0
Trucks	3
Cars	28
Totals	31

East Leg Total:	897
East Entering:	423
East Peds:	1
Peds Cross:	⧗

Vipond Drive

Cyclists	Trucks	Cars	Totals
0	75	354	429

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
6	2	0	8
321	70	0	391
15	9	0	24
342	81	0	

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Cyclists	Trucks	Cars	Totals
0	0	18	18
0	99	338	437
0	10	28	38
0	109	384	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
369	105	0	474

Vipond Drive

Peds Cross:	⧗
West Peds:	0
West Entering:	493
West Leg Total:	922

Cars	47
Trucks	20
Cyclists	0
Totals	67

Cars	15	4	20	39
Trucks	1	1	6	8
Cyclists	0	0	0	0
Totals	16	5	26	

Peds Cross:	⋈
South Peds:	2
South Entering:	47
South Leg Total:	114

Comments

Courtneypark Drive East & Vipond Drive

Afternoon Peak Diagram

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

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Mississauga
Site #: 0000005606
Intersection: Courtneypark Drive East & Vipond D
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	142
North Entering:	125
North Peds:	6
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	0	0	1	1
Cars	88	13	23	124
Totals	88	13	24	

Cyclists	0
Trucks	3
Cars	14
Totals	17

East Leg Total:	1332
East Entering:	844
East Peds:	6
Peds Cross:	⧗

Vipond Drive

Cyclists	Trucks	Cars	Totals
0	50	900	950

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
1	2	0	3
756	49	0	805
28	8	0	36
785	59	0	

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Cyclists	Trucks	Cars	Totals
0	0	9	9
0	63	365	428
0	6	16	22
0	69	390	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
422	66	0	488

Vipond Drive

Peds Cross:	⧗
West Peds:	7
West Entering:	459
West Leg Total:	1409

Cars	57
Trucks	14
Cyclists	0
Totals	71

Cars	56	4	34	94
Trucks	1	1	2	4
Cyclists	0	0	0	0
Totals	57	5	36	

Peds Cross:	⋈
South Peds:	6
South Entering:	98
South Leg Total:	169

Comments

Courtneypark Drive East & Vipond Drive

Total Count Diagram

Municipality: Mississauga
Site #: 0000005606
Intersection: Courtneypark Drive East & Vipond D
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	744
North Entering:	354
North Peds:	31
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	21	4	11	36
Cars	220	29	69	318
Totals	241	33	80	

Cyclists	0
Trucks	39
Cars	351
Totals	390

East Leg Total:	8338
East Entering:	3953
East Peds:	18
Peds Cross:	⧗

Vipond Drive

Cyclists	Trucks	Cars	Totals
0	563	3486	4049

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
88	14	0	102
3111	521	0	3632
180	39	0	219
3379	574	0	

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Cyclists	Trucks	Cars	Totals
0	19	226	245
1	618	3503	4122
0	51	270	321
1	688	3999	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
3718	666	1	4385

Vipond Drive

Peds Cross:	⧗
West Peds:	23
West Entering:	4688
West Leg Total:	8737

Cars	479
Trucks	94
Cyclists	0
Totals	573

Cars	155	37	146	338
Trucks	21	6	37	64
Cyclists	0	0	0	0
Totals	176	43	183	

Peds Cross:	⋈
South Peds:	31
South Entering:	402
South Leg Total:	975

Comments

Courtneypark Drive East & Vipond Drive
Traffic Count Summary

Intersection: Courtneypark Drive East & Vipond | **Count Date:** 12-Nov-2013 | **Municipality:** Mississauga

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	3	1	4	8	3	35
9:00:00	4	2	13	19	3	66
10:00:00	4	3	11	18	0	55
12:00:00	2	0	3	5	0	21
13:00:00	16	6	27	49	11	96
15:00:00	4	2	11	17	3	39
16:00:00	11	3	28	42	3	95
17:00:00	12	10	78	100	4	206
18:00:00	24	6	66	96	4	143
Totals:	80	33	241	354	31	756

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	11	5	11	27	11
9:00:00	12	9	26	47	1
10:00:00	10	9	18	37	0
12:00:00	4	3	9	16	0
13:00:00	14	5	28	47	2
15:00:00	10	2	10	22	1
16:00:00	24	3	26	53	6
17:00:00	67	5	34	106	6
18:00:00	24	2	21	47	4
	176	43	183	402	31

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	33	271	17	321	5	1133
9:00:00	45	275	33	353	1	1289
10:00:00	31	247	19	297	0	929
12:00:00	11	131	4	146	0	344
13:00:00	26	375	6	407	1	887
15:00:00	11	214	7	232	0	480
16:00:00	10	624	5	639	3	1168
17:00:00	27	786	5	818	5	1244
18:00:00	25	709	6	740	3	1166
Totals:	219	3632	102	3953	18	8640

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	54	686	72	812	1
9:00:00	96	766	74	936	5
10:00:00	27	579	26	632	5
12:00:00	5	183	10	198	0
13:00:00	19	432	29	480	0
15:00:00	12	213	23	248	0
16:00:00	16	463	50	529	3
17:00:00	7	395	24	426	3
18:00:00	9	404	13	426	6
	245	4121	321	4687	23

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	10:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	25	31	28	37	16	44	97	63

Courtneypark Drive East & Ordan Dr / Shawson Dr

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 0000005605
Intersection: Courtneypark Drive East & Ordan D
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	192
North Entering:	42
North Peds:	3
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	10	1	1	12
Cars	26	1	3	30
Totals	36	2	4	

Cyclists	0
Trucks	13
Cars	137
Totals	150

East Leg Total:	1224
East Entering:	283
East Peds:	0
Peds Cross:	⧗

Ordan Drive

Cyclists	Trucks	Cars	Totals
0	70	213	283

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
4	1	0	5
180	54	0	234
36	8	0	44
220	63	0	

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Cyclists	Trucks	Cars	Totals
0	11	125	136
0	76	840	916
0	10	79	89
0	97	1044	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
857	84	0	941

Shawson Drive

Peds Cross:	⧗
West Peds:	3
West Entering:	1141
West Leg Total:	1424

Cars	116
Trucks	19
Cyclists	0
Totals	135

Cars	7	8	14	29
Trucks	6	1	7	14
Cyclists	0	0	0	0
Totals	13	9	21	

Peds Cross:	⋈
South Peds:	0
South Entering:	43
South Leg Total:	178

Comments

Courtneypark Drive East & Ordan Dr / Shawson Dr

Mid-day Peak Diagram

Specified Period
From: 11:30:00
To: 13:30:00

One Hour Peak
From: 12:30:00
To: 13:30:00

Municipality: Mississauga
Site #: 0000005605
Intersection: Courtneypark Drive East & Ordan D
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	108
North Entering:	47
North Peds:	6
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	9	2	2	13
Cars	23	7	4	34
Totals	32	9	6	

Cyclists	0
Trucks	10
Cars	51
Totals	61

East Leg Total:	923
East Entering:	448
East Peds:	2
Peds Cross:	⋈

Ordan Drive

Cyclists	Trucks	Cars	Totals
0	91	379	470

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	3	36	39
0	104	319	423
0	11	27	38
0	118	382	

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Cars	Trucks	Cyclists	Totals
6	3	0	9
324	74	0	398
36	5	0	41
366	82	0	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
360	115	0	475

Shawson Drive

Peds Cross:	⋈
West Peds:	2
West Entering:	500
West Leg Total:	970

Cars	70
Trucks	18
Cyclists	0
Totals	88

Cars	32	9	37	78
Trucks	8	4	9	21
Cyclists	0	0	0	0
Totals	40	13	46	

Peds Cross:	⋈
South Peds:	0
South Entering:	99
South Leg Total:	187

Comments

Courtneypark Drive East & Ordan Dr / Shawson Dr

Afternoon Peak Diagram

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

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Mississauga
Site #: 0000005605
Intersection: Courtneypark Drive East & Ordan D
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	177
North Entering:	142
North Peds:	1
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	6	2	0	8
Cars	119	9	6	134
Totals	125	11	6	

Cyclists	0
Trucks	14
Cars	21
Totals	35

East Leg Total:	1389
East Entering:	950
East Peds:	3
Peds Cross:	⋈

Ordan Drive

Cyclists	Trucks	Cars	Totals
0	63	1078	1141

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
1	1	0	2
850	45	0	895
49	4	0	53
900	50	0	

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Cyclists	Trucks	Cars	Totals
0	11	16	27
0	66	314	380
0	18	30	48
0	95	360	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
364	75	0	439

Shawson Drive

Peds Cross:	⋈
West Peds:	1
West Entering:	455
West Leg Total:	1596

Cars	88
Trucks	24
Cyclists	0
Totals	112

Cars	109	4	44	157
Trucks	12	2	9	23
Cyclists	0	0	0	0
Totals	121	6	53	

Peds Cross:	⋈
South Peds:	0
South Entering:	180
South Leg Total:	292

Comments

Courtneypark Drive East & Ordan Dr / Shawson Dr

Total Count Diagram

Municipality: Mississauga
Site #: 0000005605
Intersection: Courtneypark Drive East & Ordan D
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	1085
North Entering:	557
North Peds:	18
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	87	15	13	115
Cars	369	39	34	442
Totals	456	54	47	

Cyclists	0
Trucks	118
Cars	410
Totals	528

East Leg Total:	8703
East Entering:	4033
East Peds:	11
Peds Cross:	⋈

Ordan Drive

Cyclists	Trucks	Cars	Totals
1	674	3836	4511

Cars	Trucks	Cyclists	Totals
23	16	0	39
3144	512	1	3657
278	59	0	337
3445	587	1	

Courtneypark Drive East

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Cyclists	Trucks	Cars	Totals
0	86	358	444
0	656	3659	4315
0	89	365	454
0	831	4382	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
3947	723	0	4670

Shawson Drive

Peds Cross:	⋈
West Peds:	14
West Entering:	5213
West Leg Total:	9724

Cars	682
Trucks	163
Cyclists	0
Totals	845

Cars	323	29	254	606
Trucks	75	16	54	145
Cyclists	0	0	0	0
Totals	398	45	308	

Peds Cross:	⋈
South Peds:	0
South Entering:	751
South Leg Total:	1596

Comments

Courtneypark Drive East & Ordan Dr / Shawson Dr
Traffic Count Summary

Intersection: Courtneypark Drive East & Ordan D | **Count Date:** 12-Nov-2013 | **Municipality:** Mississauga

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	4	3	26	33	4	70
9:00:00	5	4	37	46	4	85
10:00:00	6	5	29	40	1	104
12:00:00	3	2	24	29	0	56
13:00:00	7	11	42	60	5	140
15:00:00	3	4	14	21	3	77
16:00:00	8	8	87	103	0	229
17:00:00	6	7	107	120	0	284
18:00:00	5	10	90	105	1	263
Totals:	47	54	456	557	18	1308

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	12	5	20	37	0
9:00:00	12	5	22	39	0
10:00:00	28	3	33	64	0
12:00:00	13	0	14	27	0
13:00:00	36	9	35	80	0
15:00:00	20	4	32	56	0
16:00:00	68	5	53	126	0
17:00:00	100	7	57	164	0
18:00:00	109	7	42	158	0
	398	45	308	751	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	49	219	6	274	0	1247
9:00:00	47	238	4	289	0	1416
10:00:00	34	228	6	268	0	1015
12:00:00	21	122	2	145	0	382
13:00:00	27	362	7	396	5	908
15:00:00	22	229	4	255	0	508
16:00:00	42	625	5	672	0	1214
17:00:00	48	910	2	960	3	1381
18:00:00	47	724	3	774	3	1175
Totals:	337	3657	39	4033	11	9246

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	101	806	66	973	2
9:00:00	119	915	93	1127	5
10:00:00	63	605	79	747	1
12:00:00	21	187	29	237	0
13:00:00	33	438	41	512	2
15:00:00	21	211	21	253	2
16:00:00	40	455	47	542	1
17:00:00	29	348	44	421	1
18:00:00	17	350	34	401	0
	444	4315	454	5213	14

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	10:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	23	27	40	61	29	85	117	127

Tomken Road & Courtneypark Drive East

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 0000005604
Intersection: Tomken Road & Courtneypark Drive
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Tomken Road runs N/S

North Leg Total: 2001
North Entering: 1358
North Peds: 4
Peds Cross: ⋈

Cyclists	0	0	0	0
Trucks	60	84	15	159
Cars	107	909	183	1199
Totals	167	993	198	

Cyclists	0
Trucks	111
Cars	532
Totals	643

East Leg Total: 1494
East Entering: 285
East Peds: 9
Peds Cross: ⧗

Tomken Road

Cyclists	Trucks	Cars	Totals
0	158	345	503

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
31	25	0	56
154	64	0	218
9	2	0	11
194	91	0	

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Cyclists	Trucks	Cars	Totals
0	17	214	231
1	57	906	964
0	44	682	726
1	118	1802	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
1126	82	1	1209

Tomken Road

Peds Cross: ⧗
West Peds: 3
West Entering: 1921
West Leg Total: 2424

Cars	1600
Trucks	130
Cyclists	0
Totals	1730

Cars	84	287	37	408
Trucks	34	69	10	113
Cyclists	0	0	0	0
Totals	118	356	47	

Peds Cross: ⋈
South Peds: 7
South Entering: 521
South Leg Total: 2251

Comments

Tomken Road & Courtneypark Drive East

Mid-day Peak Diagram

Specified Period
From: 11:30:00
To: 13:30:00

One Hour Peak
From: 12:00:00
To: 13:00:00

Municipality: Mississauga
Site #: 0000005604
Intersection: Tomken Road & Courtneypark Drive
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Tomken Road runs N/S

North Leg Total: 1510
North Entering: 825
North Peds: 0
Peds Cross: ⋈

Cyclists	0	0	0	0
Trucks	43	97	14	154
Cars	191	398	82	671
Totals	234	495	96	

Cyclists	0
Trucks	135
Cars	550
Totals	685

East Leg Total: 1033
East Entering: 505
East Peds: 0
Peds Cross: ⧗

Tomken Road

Cyclists	Trucks	Cars	Totals
1	159	659	819

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
58	28	0	86
313	66	1	380
32	7	0	39
403	101	1	

N
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Cyclists	Trucks	Cars	Totals
0	33	113	146
0	97	296	393
0	51	227	278
0	181	636	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
410	118	0	528

Tomken Road

Peds Cross: ⧗
West Peds: 1
West Entering: 817
West Leg Total: 1636

Cars	657
Trucks	155
Cyclists	0
Totals	812

Cars	155	379	32	566
Trucks	50	74	7	131
Cyclists	0	0	0	0
Totals	205	453	39	

Peds Cross: ⋈
South Peds: 0
South Entering: 697
South Leg Total: 1509

Comments

Tomken Road & Courtneypark Drive East

Afternoon Peak Diagram

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

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Mississauga
Site #: 0000005604
Intersection: Tomken Road & Courtneypark Drive
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Tomken Road runs N/S

North Leg Total:	2572
North Entering:	1078
North Peds:	1
Peds Cross:	⋈

Cyclists	0	1	0	1
Trucks	35	68	10	113
Cars	392	512	60	964
Totals	427	581	70	

Cyclists	0
Trucks	122
Cars	1372
Totals	1494

East Leg Total:	1626
East Entering:	1190
East Peds:	10
Peds Cross:	⧗

Tomken Road

Cyclists	Trucks	Cars	Totals
0	104	1742	1846

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	36	62	98
1	70	266	337
0	35	97	132
1	141	425	

Cars	Trucks	Cyclists	Totals
141	18	0	159
969	39	0	1008
20	3	0	23
1130	60	0	

N
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S

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
345	90	1	436

Tomken Road

Peds Cross:	⧗
West Peds:	6
West Entering:	567
West Leg Total:	2413

Cars	629
Trucks	106
Cyclists	1
Totals	736

Cars	381	1169	19	1569
Trucks	30	68	10	108
Cyclists	0	0	0	0
Totals	411	1237	29	

Peds Cross:	⋈
South Peds:	6
South Entering:	1677
South Leg Total:	2413

Comments

Tomken Road & Courtneypark Drive East

Total Count Diagram

Municipality: Mississauga
Site #: 0000005604
Intersection: Tomken Road & Courtneypark Drive
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Tomken Road runs N/S

North Leg Total:	15000
North Entering:	8095
North Peds:	20
Peds Cross:	⋈

Cyclists	1	4	0	5
Trucks	322	669	132	1123
Cars	1673	4482	812	6967
Totals	1996	5155	944	

Cyclists	1
Trucks	985
Cars	5919
Totals	6905

East Leg Total:	10489
East Entering:	5059
East Peds:	83
Peds Cross:	⋈

Tomken Road

Cyclists	Trucks	Cars	Totals
4	1149	6777	7930

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
617	164	0	781
3554	523	3	4080
168	30	0	198
4339	717	3	

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Cyclists	Trucks	Cars	Totals
0	228	958	1186
5	624	3555	4184
0	332	2429	2761
5	1184	6942	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
4576	849	5	5430

Tomken Road

Peds Cross:	⋈
West Peds:	24
West Entering:	8131
West Leg Total:	16061

Cars	7079
Trucks	1031
Cyclists	4
Totals	8114

Cars	1550	4344	209	6103
Trucks	304	593	93	990
Cyclists	0	1	0	1
Totals	1854	4938	302	

Peds Cross:	⋈
South Peds:	32
South Entering:	7094
South Leg Total:	15208

Comments

Tomken Road & Courtneypark Drive East
Traffic Count Summary

Intersection: Tomken Road & Courtneypark Driv | **Count Date:** 12-Nov-2013 | **Municipality:** Mississauga

North Approach Totals						North/South Total Approaches	South Approach Totals					
	Includes Cars, Trucks, & Cyclists							Includes Cars, Trucks, & Cyclists				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	176	898	141	1215	9	1670	8:00:00	113	307	35	455	9
9:00:00	189	1023	174	1386	4	1868	9:00:00	93	340	49	482	3
10:00:00	153	626	147	926	0	1373	10:00:00	115	286	46	447	1
12:00:00	54	266	120	440	0	744	12:00:00	88	204	12	304	0
13:00:00	96	495	234	825	0	1522	13:00:00	205	453	39	697	0
15:00:00	43	236	111	390	0	713	15:00:00	82	217	24	323	0
16:00:00	102	524	286	912	3	2173	16:00:00	360	857	44	1261	4
17:00:00	66	537	424	1027	4	2629	17:00:00	415	1157	30	1602	10
18:00:00	65	550	359	974	0	2497	18:00:00	383	1117	23	1523	5
Totals:	944	5155	1996	8095	20	15189		1854	4938	302	7094	32

East Approach Totals						East/West Total Approaches	West Approach Totals					
	Includes Cars, Trucks, & Cyclists							Includes Cars, Trucks, & Cyclists				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	14	194	43	251	25	2029	8:00:00	235	861	682	1778	3
9:00:00	21	246	45	312	2	2071	9:00:00	177	969	613	1759	5
10:00:00	24	249	60	333	1	1448	10:00:00	130	557	428	1115	1
12:00:00	9	139	44	192	2	579	12:00:00	75	185	127	387	0
13:00:00	39	380	86	505	0	1322	13:00:00	146	393	278	817	1
15:00:00	13	234	41	288	0	709	15:00:00	81	198	142	421	0
16:00:00	29	760	133	922	34	1670	16:00:00	135	372	241	748	4
17:00:00	28	1050	183	1261	8	1812	17:00:00	101	323	127	551	8
18:00:00	21	827	146	994	11	1547	18:00:00	104	326	123	553	2
Totals:	198	4079	781	5058	83	13187		1184	4184	2761	8129	24

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	10:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	1128	1174	712	578	328	931	1193	957

Courtneypark Drive East & Hwy-410 East Ramps

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 0000005603
Intersection: Courtneypark Drive East & Hwy-41
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total: 1185
North Entering: 1185
North Peds: 0
Peds Cross: ⋈

Cyclists	0	0	0
Trucks	47	40	87
Cars	515	583	1098
Totals	562	623	

Cyclists	0
Trucks	0
Cars	0
Totals	0

East Leg Total: 2333
East Entering: 519
East Peds: 0
Peds Cross: ⧗

Hwy-410 East Ramps

Cyclists	Trucks	Cars	Totals
2	207	872	1081

Cars	Trucks	Cyclists	Totals
0	0	0	0
357	160	2	519
357	160	2	

Courtneypark Drive East

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Cyclists	Trucks	Cars	Totals
0	0	0	0
2	82	1107	1191
2	82	1107	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
1690	122	2	1814

Peds Cross: ⧗
West Peds: 0
West Entering: 1191
West Leg Total: 2272

Comments

Courtneypark Drive East & Hwy-410 East Ramps

Mid-day Peak Diagram

Specified Period
From: 11:30:00
To: 13:30:00

One Hour Peak
From: 12:00:00
To: 13:00:00

Municipality: Mississauga
Site #: 0000005603
Intersection: Courtneypark Drive East & Hwy-41
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total: 621
North Entering: 621
North Peds: 0
Peds Cross: ⋈

Cyclists	0	0	0
Trucks	83	105	188
Cars	210	223	433
Totals	293	328	

Cyclists	0
Trucks	0
Cars	0
Totals	0

East Leg Total: 1685
East Entering: 855
East Peds: 0
Peds Cross: ⧗

Hwy-410 East Ramps

Cyclists	Trucks	Cars	Totals
0	250	898	1148

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	0	0	0
0	88	414	502
0	88	414	

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Cars	Trucks	Cyclists	Totals
0	0	0	0
688	167	0	855
688	167	0	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
637	193	0	830

Peds Cross: ⧗
West Peds: 0
West Entering: 502
West Leg Total: 1650

Comments

Courtneypark Drive East & Hwy-410 East Ramps

Afternoon Peak Diagram

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

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Mississauga
Site #: 0000005603
Intersection: Courtneypark Drive East & Hwy-41
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	335
North Entering:	335
North Peds:	0
Peds Cross:	⋈

Cyclists	0	0	0
Trucks	63	47	110
Cars	134	91	225
Totals	197	138	

Cyclists	0
Trucks	0
Cars	0
Totals	0

East Leg Total:	2549
East Entering:	1895
East Peds:	0
Peds Cross:	⧗

Hwy-410 East Ramps

Cyclists	Trucks	Cars	Totals
1	167	1924	2092

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	0	0	0
1	107	408	516
1	107	408	

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Cars	Trucks	Cyclists	Totals
0	0	0	0
1790	104	1	1895
1790	104	1	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
499	154	1	654

Peds Cross:	⧗
West Peds:	0
West Entering:	516
West Leg Total:	2608

Comments

Courtneypark Drive East & Hwy-410 East Ramps

Total Count Diagram

Municipality: Mississauga
Site #: 0000005603
Intersection: Courtneypark Drive East & Hwy-41
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	5611
North Entering:	5611
North Peds:	0
Peds Cross:	⋈

Cyclists	0	0	0
Trucks	585	496	1081
Cars	2205	2325	4530
Totals	2790	2821	

Cyclists	0
Trucks	0
Cars	0
Totals	0

East Leg Total:	16194
East Entering:	8128
East Peds:	6
Peds Cross:	⧗

Hwy-410 East Ramps

Cyclists	Trucks	Cars	Totals
5	1779	9134	10918

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	0	0	0
9	743	4493	5245
9	743	4493	

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Cars	Trucks	Cyclists	Totals
0	0	0	0
6929	1194	5	8128
6929	1194	5	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
6818	1239	9	8066

Peds Cross:	⧗
West Peds:	0
West Entering:	5245
West Leg Total:	16163

Comments

Courtneypark Drive East & Hwy-410 East Ramps
Traffic Count Summary

Intersection: Courtneypark Drive East & Hwy-41 **Count Date:** 12-Nov-2013 **Municipality:** Mississauga

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	540	0	506	1046	0	1046
9:00:00	674	0	567	1241	0	1241
10:00:00	461	0	396	857	0	857
12:00:00	177	0	163	340	0	340
13:00:00	328	0	293	621	0	621
15:00:00	153	0	164	317	0	317
16:00:00	220	0	293	513	0	513
17:00:00	147	0	235	382	0	382
18:00:00	121	0	173	294	0	294
Totals:	2821	0	2790	5611	0	5611

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0
9:00:00	0	0	0	0	0
10:00:00	0	0	0	0	0
12:00:00	0	0	0	0	0
13:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0
	0	0	0	0	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	0	464	0	464	0	1626
9:00:00	0	531	0	531	0	1583
10:00:00	0	524	0	524	1	1162
12:00:00	0	355	0	355	0	564
13:00:00	0	855	0	855	0	1357
15:00:00	0	444	0	444	0	689
16:00:00	0	1413	0	1413	5	1928
17:00:00	0	1902	0	1902	0	2344
18:00:00	0	1640	0	1640	0	2120
Totals:	0	8128	0	8128	6	13373

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	1162	0	1162	0
9:00:00	0	1052	0	1052	0
10:00:00	0	638	0	638	0
12:00:00	0	209	0	209	0
13:00:00	0	502	0	502	0
15:00:00	0	245	0	245	0
16:00:00	0	515	0	515	0
17:00:00	0	442	0	442	0
18:00:00	0	480	0	480	0
	0	5245	0	5245	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	10:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	540	674	462	328	153	225	147	121

Courtneypark Drive East & Hwy-410 West Ramps

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 0000005602
Intersection: Courtneypark Drive East & Hwy-410
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	395
North Entering:	0
North Peds:	0
Peds Cross:	⋈

Cyclists	0	0	0
Trucks	0	0	0
Cars	0	0	0
Totals	0	0	

Cyclists	0
Trucks	159
Cars	236
Totals	395

East Leg Total:	2256
East Entering:	1054
East Peds:	0
Peds Cross:	⋈

Hwy-410 West Ramps

Cyclists	Trucks	Cars	Totals
2	120	730	852

Cars	Trucks	Cyclists	Totals
118	84	0	202
730	120	2	852
848	204	2	

Courtneypark Drive East

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Cyclists	Trucks	Cars	Totals
0	75	118	193
3	86	1113	1202
3	161	1231	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
1113	86	3	1202

Peds Cross:	⋈
West Peds:	0
West Entering:	1395
West Leg Total:	2247

Comments

Courtneypark Drive East & Hwy-410 West Ramps

Mid-day Peak Diagram

Specified Period
From: 11:30:00
To: 13:30:00

One Hour Peak
From: 12:30:00
To: 13:30:00

Municipality: Mississauga
Site #: 0000005602
Intersection: Courtneypark Drive East & Hwy-41(
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total: 582
North Entering: 0
North Peds: 0
Peds Cross: ⋈

Cyclists	0	0	0
Trucks	0	0	0
Cars	0	0	0
Totals	0	0	

Cyclists	0
Trucks	178
Cars	404
Totals	582

East Leg Total: 1680
East Entering: 1161
East Peds: 0
Peds Cross: ⧗

Hwy-410 West Ramps

Cyclists	Trucks	Cars	Totals
0	185	617	802

Cars	Trucks	Cyclists	Totals
257	102	0	359
617	185	0	802
874	287	0	

Courtneypark Drive East

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Cyclists	Trucks	Cars	Totals
0	76	147	223
0	96	423	519
0	172	570	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
423	96	0	519

Peds Cross: ⧗
West Peds: 0
West Entering: 742
West Leg Total: 1544

Comments

Courtneypark Drive East & Hwy-410 West Ramps

Afternoon Peak Diagram

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

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Mississauga
Site #: 0000005602
Intersection: Courtneypark Drive East & Hwy-410
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	735
North Entering:	0
North Peds:	0
Peds Cross:	⋈

Cyclists	0	0	0
Trucks	0	0	0
Cars	0	0	0
Totals	0	0	

Cyclists	0
Trucks	57
Cars	678
Totals	735

East Leg Total:	2575
East Entering:	2077
East Peds:	0
Peds Cross:	⧗

Hwy-410 West Ramps

Cyclists	Trucks	Cars	Totals
3	157	1456	1616

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	38	236	274
2	103	393	498
2	141	629	

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Cars	Trucks	Cyclists	Totals
442	19	0	461
1456	157	3	1616
1898	176	3	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
393	103	2	498

Peds Cross:	⧗
West Peds:	0
West Entering:	772
West Leg Total:	2388

Comments

Courtneypark Drive East & Hwy-410 West Ramps

Total Count Diagram

Municipality: Mississauga
Site #: 0000005602
Intersection: Courtneypark Drive East & Hwy-410
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total: 4450
North Entering: 0
North Peds: 0
Peds Cross: ⋈

Cyclists	0	0	0
Trucks	0	0	0
Cars	0	0	0
Totals	0	0	

Cyclists	0
Trucks	1051
Cars	3399
Totals	4450

East Leg Total: 15928
East Entering: 10648
East Peds: 0
Peds Cross: ⧗

Hwy-410 West Ramps

Cyclists	Trucks	Cars	Totals
6	1214	6860	8080

Cars	Trucks	Cyclists	Totals
2038	530	0	2568
6860	1214	6	8080
8898	1744	6	

Courtneypark Drive East

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Cyclists	Trucks	Cars	Totals
0	521	1361	1882
10	736	4534	5280
10	1257	5895	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
4534	736	10	5280

Peds Cross: ⧗
West Peds: 0
West Entering: 7162
West Leg Total: 15242

Comments

Courtneypark Drive East & Hwy-410 West Ramps
Traffic Count Summary

Intersection: Courtneypark Drive East & Hwy-41 | **Count Date:** 12-Nov-2013 | **Municipality:** Mississauga

North Approach Totals						North/South Total Approaches	South Approach Totals					
	Includes Cars, Trucks, & Cyclists							Includes Cars, Trucks, & Cyclists				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0	0	8:00:00	0	0	0	0	0
9:00:00	0	0	0	0	0	0	9:00:00	0	0	0	0	0
10:00:00	0	0	0	0	0	0	10:00:00	0	0	0	0	0
12:00:00	0	0	0	0	0	0	12:00:00	0	0	0	0	0
13:00:00	0	0	0	0	0	0	13:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0	0	17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0	0	18:00:00	0	0	0	0	0
Totals:	0	0	0	0	0	0		0	0	0	0	0

East Approach Totals						East/West Total Approaches	West Approach Totals					
	Includes Cars, Trucks, & Cyclists							Includes Cars, Trucks, & Cyclists				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	726	201	927	0	2296	8:00:00	206	1163	0	1369	0
9:00:00	0	891	199	1090	0	2316	9:00:00	181	1045	0	1226	0
10:00:00	0	664	213	877	0	1766	10:00:00	249	640	0	889	0
12:00:00	0	354	166	520	0	850	12:00:00	111	219	0	330	0
13:00:00	0	808	328	1136	0	1861	13:00:00	204	521	0	725	0
15:00:00	0	400	184	584	0	966	15:00:00	128	254	0	382	0
16:00:00	0	1170	473	1643	0	2476	16:00:00	321	512	0	833	0
17:00:00	0	1609	516	2125	0	2827	17:00:00	238	464	0	702	0
18:00:00	0	1457	288	1745	0	2451	18:00:00	244	462	0	706	0
Totals:	0	8079	2568	10647	0	17809		1882	5280	0	7162	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	10:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	0	0	0	0	0	0	0	0

Kennedy Road & Courtneypark Drive East

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 0000005601
Intersection: Kennedy Road & Courtneypark Driv
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Kennedy Road runs N/S

North Leg Total:	1926
North Entering:	1318
North Peds:	7
Peds Cross:	⋈

Cyclists	0	1	0	1
Trucks	14	68	33	115
Cars	41	924	237	1202
Totals	55	993	270	

Cyclists	1
Trucks	74
Cars	533
Totals	608

East Leg Total:	2209
East Entering:	823
East Peds:	5
Peds Cross:	⧗

Kennedy Road

Cyclists	Trucks	Cars	Totals
1	67	525	593

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
133	30	1	164
420	43	1	464
150	45	0	195
703	118	2	

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Cyclists	Trucks	Cars	Totals
0	8	66	74
1	73	845	919
0	8	76	84
1	89	987	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
1237	148	1	1386

Kennedy Road

Peds Cross:	⧗
West Peds:	34
West Entering:	1077
West Leg Total:	1670

Cars	1150
Trucks	121
Cyclists	1
Totals	1272

Cars	64	334	155	553
Trucks	10	36	42	88
Cyclists	0	0	0	0
Totals	74	370	197	

Peds Cross:	⋈
South Peds:	10
South Entering:	641
South Leg Total:	1913

Comments

Kennedy Road & Courtneypark Drive East

Mid-day Peak Diagram

Specified Period
From: 11:30:00
To: 13:30:00

One Hour Peak
From: 12:00:00
To: 13:00:00

Municipality: Mississauga
Site #: 0000005601
Intersection: Kennedy Road & Courtneypark Driv
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Kennedy Road runs N/S

North Leg Total:	1235
North Entering:	602
North Peds:	2
Peds Cross:	⋈

Cyclists	0	0	0	0
Trucks	10	74	27	111
Cars	50	331	110	491
Totals	60	405	137	

Cyclists	0
Trucks	112
Cars	521
Totals	633

East Leg Total:	1457
East Entering:	765
East Peds:	1
Peds Cross:	⧗

Kennedy Road

Cyclists	Trucks	Cars	Totals
1	91	499	591

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
100	26	0	126
358	65	1	424
142	73	0	215
600	164	1	

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Cyclists	Trucks	Cars	Totals
0	9	66	75
0	65	287	352
0	12	71	83
0	86	424	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
539	153	0	692

Kennedy Road

Peds Cross:	⧗
West Peds:	10
West Entering:	510
West Leg Total:	1101

Cars	544
Trucks	159
Cyclists	0
Totals	703

Cars	91	355	142	588
Trucks	16	77	61	154
Cyclists	0	0	0	0
Totals	107	432	203	

Peds Cross:	⋈
South Peds:	1
South Entering:	742
South Leg Total:	1445

Comments

Kennedy Road & Courtneypark Drive East

Afternoon Peak Diagram

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

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Mississauga
Site #: 0000005601
Intersection: Kennedy Road & Courtneypark Driv
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Kennedy Road runs N/S

North Leg Total:	2125
North Entering:	837
North Peds:	9
Peds Cross:	⋈

Cyclists	0	0	1	1
Trucks	9	52	16	77
Cars	78	574	107	759
Totals	87	626	124	

Cyclists	1
Trucks	104
Cars	1183
Totals	1288

East Leg Total:	2124
East Entering:	1475
East Peds:	2
Peds Cross:	⧗

Kennedy Road

Cyclists	Trucks	Cars	Totals
0	79	1209	1288

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
187	26	0	213
1019	62	0	1081
130	51	0	181
1336	139	0	

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Cyclists	Trucks	Cars	Totals
0	7	148	155
0	69	360	429
0	16	85	101
0	92	593	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
527	121	1	649

Kennedy Road

Peds Cross:	⧗
West Peds:	28
West Entering:	685
West Leg Total:	1973

Cars	789
Trucks	119
Cyclists	0
Totals	908

Cars	112	848	60	1020
Trucks	8	71	36	115
Cyclists	0	1	0	1
Totals	120	920	96	

Peds Cross:	⋈
South Peds:	8
South Entering:	1136
South Leg Total:	2044

Comments

Kennedy Road & Courtneypark Drive East

Total Count Diagram

Municipality: Mississauga
Site #: 0000005601
Intersection: Kennedy Road & Courtneypark Driv
TFR File #: 3
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Kennedy Road runs N/S

North Leg Total:	12982
North Entering:	6825
North Peds:	41
Peds Cross:	⋈

Cyclists	0	4	3	7
Trucks	99	563	230	892
Cars	416	4384	1126	5926
Totals	515	4951	1359	

Cyclists	7
Trucks	860
Cars	5290
Totals	6157

East Leg Total:	14706
East Entering:	7815
East Peds:	13
Peds Cross:	⋈

Kennedy Road

Cyclists	Trucks	Cars	Totals
5	636	5550	6191

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
1045	280	1	1326
4469	441	4	4914
1089	486	0	1575
6603	1207	5	

N
W E
S

Cyclists	Trucks	Cars	Totals
0	74	685	759
6	561	3627	4194
1	107	620	728
7	742	4932	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
5694	1188	9	6891

Kennedy Road

Peds Cross:	⋈
West Peds:	199
West Entering:	5681
West Leg Total:	11872

Cars	6093
Trucks	1156
Cyclists	5
Totals	7254

Cars	665	3560	941	5166
Trucks	96	506	397	999
Cyclists	1	6	0	7
Totals	762	4072	1338	

Peds Cross:	⋈
South Peds:	38
South Entering:	6172
South Leg Total:	13426

Comments

Kennedy Road & Courtneypark Drive East
Traffic Count Summary

Intersection: Kennedy Road & Courtneypark Dri | **Count Date:** 12-Nov-2013 | **Municipality:** Mississauga

North Approach Totals						North/South Total Approaches	South Approach Totals					
	Includes Cars, Trucks, & Cyclists							Includes Cars, Trucks, & Cyclists				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	260	817	47	1124	9	1703	8:00:00	58	349	172	579	9
9:00:00	233	1001	59	1293	8	1976	9:00:00	86	385	212	683	4
10:00:00	184	607	67	858	4	1431	10:00:00	70	325	178	573	2
12:00:00	77	194	25	296	0	558	12:00:00	48	124	90	262	0
13:00:00	137	405	60	602	2	1344	13:00:00	107	432	203	742	1
15:00:00	69	189	33	291	0	638	15:00:00	47	197	103	347	4
16:00:00	142	534	58	734	6	1670	16:00:00	127	642	167	936	3
17:00:00	124	581	73	778	2	1738	17:00:00	96	751	113	960	6
18:00:00	133	623	93	849	10	1938	18:00:00	123	867	99	1089	9
Totals:	1359	4951	515	6825	41	12996		762	4072	1337	6171	38

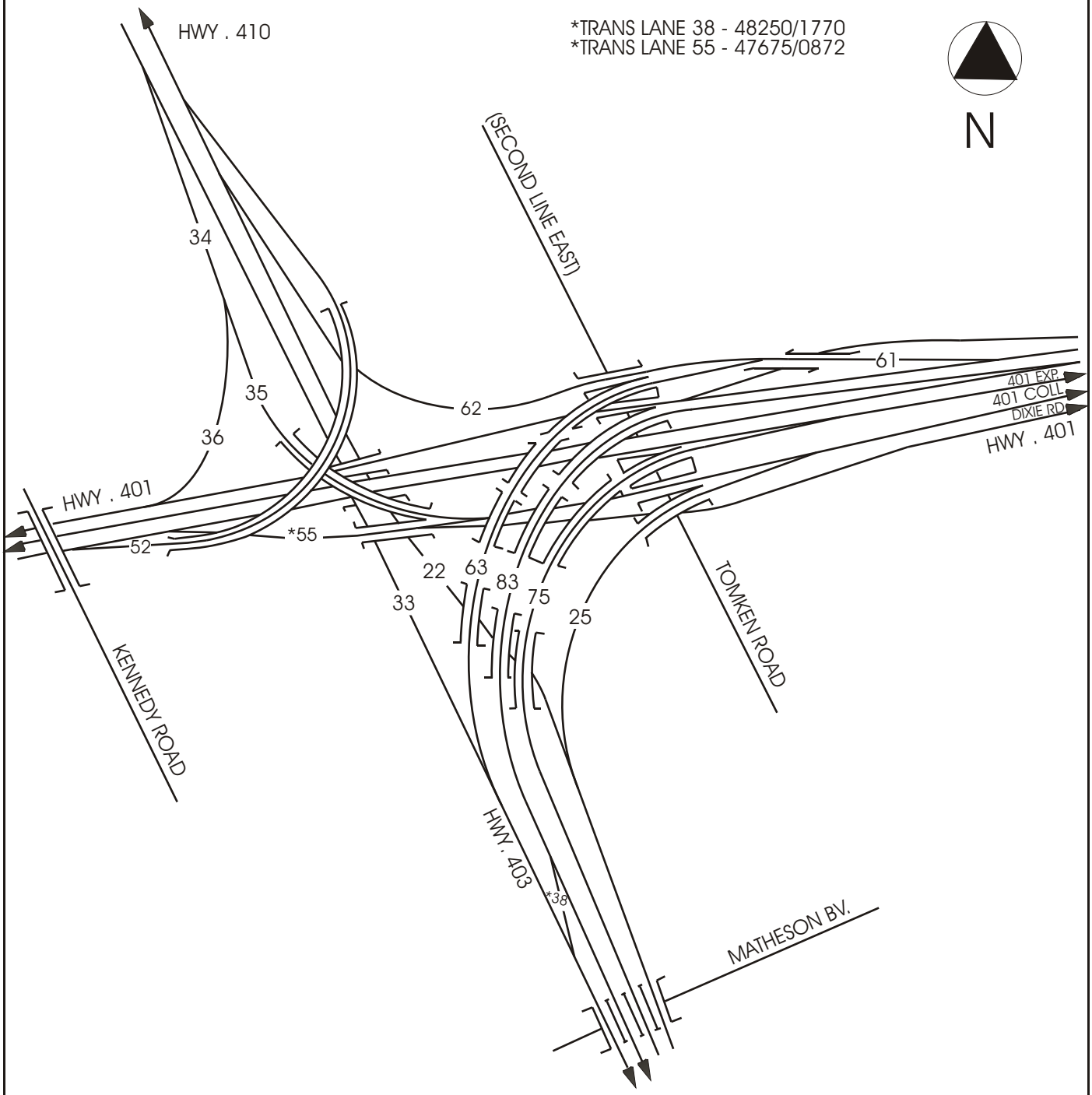
East Approach Totals						East/West Total Approaches	West Approach Totals					
	Includes Cars, Trucks, & Cyclists							Includes Cars, Trucks, & Cyclists				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	171	357	138	666	5	1763	8:00:00	84	940	73	1097	28
9:00:00	209	506	163	878	1	1872	9:00:00	57	819	118	994	37
10:00:00	184	340	138	662	0	1328	10:00:00	49	509	108	666	41
12:00:00	102	174	80	356	0	584	12:00:00	34	160	34	228	5
13:00:00	215	424	126	765	1	1275	13:00:00	75	352	83	510	10
15:00:00	106	195	73	374	0	653	15:00:00	39	199	41	279	8
16:00:00	189	772	195	1156	3	1822	16:00:00	128	459	79	666	28
17:00:00	190	1138	214	1542	2	2178	17:00:00	168	353	115	636	19
18:00:00	208	1005	199	1412	1	2015	18:00:00	125	401	77	603	23
Totals:	1574	4911	1326	7811	13	13490		759	4192	728	5679	199

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	10:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	1213	1097	748	717	348	1098	1504	1357

MINISTRY OF TRANSPORTATION
INTERCHANGE FILE

HWY.	401 IC 344	KEYPOINT NUMBER	47675/000
AT	HWYS. 403 & 410	M.T.O. DISTRICT	TORONTO
		O.P.P. DISTRICT	5 AURORA



UPDATED 04 - 09 - 21 PROGRAM DEVELOPMENT & EVALUATION OFFICE 78 - 11 - 01

DATE

Traffic Engineering Software

Weekly Volume Summary

Mon, Nov 07, 2011

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: NB **Report Dates:** Sep 29, 2011 **to** Oct 5, 2011

Hour Interval	Thu 11/09/29	Fri 30	Sat 1	Sun 2	Mon 3	Tue 4	Wed 5	Thu 6
0:00- 1:00		1,458	1,997	1,788	937	1,172	899	1,412
1:00- 2:00		861	1,292	1,847	646	723	547	827
2:00- 3:00		718	1,056	1,338	496	585	452	744
3:00- 4:00		769	954	1,127	498	605	469	722
4:00- 5:00		996	847	780	871	956	684	1,059
5:00- 6:00		2,632	1,040	796	2,440	2,562	1,938	2,672
6:00- 7:00		5,048	1,821	887	4,890	5,139	4,127	5,108
7:00- 8:00		6,483	2,661	1,342	6,455	6,719	5,397	6,773
8:00- 9:00		6,787	2,984	1,773	6,339	6,748	5,095	6,510
9:00-10:00		5,152	3,584	2,249	4,594	4,931	3,935	4,985
10:00-11:00		4,741	3,758	2,951	4,215	3,768	3,456	4,598
11:00-12:00		4,983	4,276	3,474	4,349	3,396	3,446	4,784
AM Total	0	40,628	26,270	20,352	36,730	37,304	30,445	40,194
12:00-13:00	4,917	5,423	4,737	3,769	4,811	3,513	3,838	
13:00-14:00	5,473	5,796	4,655	4,051	5,095	4,021	4,036	
14:00-15:00	6,577	6,888	4,142	4,547	6,429	4,992	4,811	
15:00-16:00	6,992	6,828	3,788	4,595	7,003	5,491	5,603	
16:00-17:00	5,975	4,107	3,629	4,455	6,290	4,564	4,780	
17:00-18:00	4,632	4,377	3,515	4,262	4,980	3,542	4,476	
18:00-19:00	5,945	5,405	3,647	4,279	5,224	4,191	3,971	
19:00-20:00	5,070	5,048	3,193	3,874	4,598	3,640	3,766	
20:00-21:00	4,175	4,511	2,644	3,286	3,561	2,955	3,119	
21:00-22:00	3,903	3,877	2,223	2,891	3,205	2,648	3,490	
22:00-23:00	2,982	3,152	2,109	2,371	2,440	2,062	2,929	
23:00-24:00	2,376	2,768	2,081	1,602	1,906	1,564	2,355	
PM Total	59,017	58,180	40,363	43,982	55,542	43,183	47,174	0
24 Hr. Total	59,017	98,808	66,633	64,334	92,272	80,487	77,619	40,194
Noon - Noon	99,645	84,450	60,715	80,712	92,846	73,628	87,368	

Traffic Engineering Software

Weekly Volume Summary

Mon, Nov 07, 2011

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: SB **Report Dates:** Sep 29, 2011 **to** Oct 5, 2011

Hour Interval	Thu 11/09/29	Fri 30	Sat 1	Sun 2	Mon 3	Tue 4	Wed 5	Thu 6
0:00- 1:00		1,000	1,544	1,901	641	852	918	970
1:00- 2:00		704	935	1,124	432	571	605	646
2:00- 3:00		584	726	725	415	531	552	599
3:00- 4:00		694	612	526	514	568	638	661
4:00- 5:00		1,395	733	506	1,278	1,372	1,354	1,412
5:00- 6:00		3,920	1,403	765	3,910	4,238	4,250	4,255
6:00- 7:00		5,949	2,439	1,334	4,688	5,814	5,951	5,900
7:00- 8:00		6,115	3,156	1,611	5,905	5,888	6,074	5,998
8:00- 9:00		5,967	4,054	2,217	5,651	5,889	5,970	5,740
9:00-10:00		5,449	4,487	3,175	5,202	5,648	5,579	5,589
10:00-11:00		5,102	4,697	3,879	4,692	4,912	5,043	4,943
11:00-12:00		5,312	5,178	4,275	4,796	4,991	5,006	5,258
AM Total	0	42,191	29,964	22,038	38,124	41,274	41,940	41,971
12:00-13:00	5,175	5,546	5,362	4,579	4,956	5,030	5,219	
13:00-14:00	5,148	5,574	5,466	4,926	4,889	5,171	5,068	
14:00-15:00	5,873	5,820	5,658	4,778	5,738	5,789	5,814	
15:00-16:00	6,066	5,942	5,575	4,776	5,991	5,882	5,961	
16:00-17:00	5,594	5,155	5,442	4,879	5,970	5,958	5,936	
17:00-18:00	4,257	4,712	5,323	4,440	4,973	5,214	5,242	
18:00-19:00	4,911	4,836	5,165	4,112	4,239	4,775	4,842	
19:00-20:00	4,245	4,622	4,311	3,756	3,702	4,271	4,184	
20:00-21:00	3,523	3,603	3,468	3,169	2,911	3,386	3,447	
21:00-22:00	3,048	3,203	3,051	2,667	2,495	2,839	2,936	
22:00-23:00	2,380	2,915	2,777	1,952	2,076	2,290	2,489	
23:00-24:00	1,972	2,473	2,517	1,155	1,611	1,717	1,723	
PM Total	52,192	54,401	54,115	45,189	49,551	52,322	52,861	0
24 Hr. Total	52,192	96,592	84,079	67,227	87,675	93,596	94,801	41,971
Noon - Noon	94,383	84,365	76,153	83,313	90,825	94,262	94,832	

Traffic Engineering Software

Weekly Volume Summary

Mon, Nov 07, 2011

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: NB/SB **Report Dates:** Sep 29, 2011 **to** Oct 5, 2011

Hour Interval	Thu 11/09/29	Fri 30	Sat 1	Sun 2	Mon 3	Tue 4	Wed 5	Thu 6
0:00- 1:00		2,458	3,541	3,689	1,578	2,024	1,817	2,382
1:00- 2:00		1,565	2,227	2,971	1,078	1,294	1,152	1,473
2:00- 3:00		1,302	1,782	2,063	911	1,116	1,004	1,343
3:00- 4:00		1,463	1,566	1,653	1,012	1,173	1,107	1,383
4:00- 5:00		2,391	1,580	1,286	2,149	2,328	2,038	2,471
5:00- 6:00		6,552	2,443	1,561	6,350	6,800	6,188	6,927
6:00- 7:00		10,997	4,260	2,221	9,578	10,953	10,078	11,008
7:00- 8:00		12,598	5,817	2,953	12,360	12,607	11,471	12,771
8:00- 9:00		12,754	7,038	3,990	11,990	12,637	11,065	12,250
9:00-10:00		10,601	8,071	5,424	9,796	10,579	9,514	10,574
10:00-11:00		9,843	8,455	6,830	8,907	8,680	8,499	9,541
11:00-12:00		10,295	9,454	7,749	9,145	8,387	8,452	10,042
AM Total	0	82,819	56,234	42,390	74,854	78,578	72,385	82,165
12:00-13:00	10,092	10,969	10,099	8,348	9,767	8,543	9,057	
13:00-14:00	10,621	11,370	10,121	8,977	9,984	9,192	9,104	
14:00-15:00	12,450	12,708	9,800	9,325	12,167	10,781	10,625	
15:00-16:00	13,058	12,770	9,363	9,371	12,994	11,373	11,564	
16:00-17:00	11,569	9,262	9,071	9,334	12,260	10,522	10,716	
17:00-18:00	8,889	9,089	8,838	8,702	9,953	8,756	9,718	
18:00-19:00	10,856	10,241	8,812	8,391	9,463	8,966	8,813	
19:00-20:00	9,315	9,670	7,504	7,630	8,300	7,911	7,950	
20:00-21:00	7,698	8,114	6,112	6,455	6,472	6,341	6,566	
21:00-22:00	6,951	7,080	5,274	5,558	5,700	5,487	6,426	
22:00-23:00	5,362	6,067	4,886	4,323	4,516	4,352	5,418	
23:00-24:00	4,348	5,241	4,598	2,757	3,517	3,281	4,078	
PM Total	111,209	112,581	94,478	89,171	105,093	95,505	100,035	0
24 Hr. Total	111,209	195,400	150,712	131,561	179,947	174,083	172,420	82,165
Noon - Noon	194,028	168,815	136,868	164,025	183,671	167,890	182,200	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
171,071	181,947	167,650	162,418	177,709	190,029	157,591	17,100

Traffic Engineering Software

Weekly Volume Summary

Mon, Nov 07, 2011

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: NB **Report Dates:** Oct 4, 2011 **to** Oct 10, 2011

Hour Interval	Tue 11/10/04	Wed 5	Thu 6	Fri 7	Sat 8	Sun 9	Mon 10	Tue 11
0:00- 1:00		899	1,412	1,563	2,013	2,141	1,998	1,056
1:00- 2:00		547	827	938	1,435	1,548	1,189	660
2:00- 3:00		452	744	729	1,217	1,191	829	519
3:00- 4:00		469	722	759	1,045	1,032	753	551
4:00- 5:00		684	1,059	1,030	841	715	638	992
5:00- 6:00		1,938	2,672	2,467	1,081	569	707	2,649
6:00- 7:00		4,127	5,108	5,104	1,712	877	910	5,152
7:00- 8:00		5,397	6,773	6,623	2,389	1,251	1,181	6,719
8:00- 9:00		5,095	6,510	6,583	2,858	1,624	1,398	6,571
9:00-10:00		3,935	4,985	4,957	3,706	2,355	1,895	4,941
10:00-11:00		3,456	4,598	4,775	4,307	3,382	2,716	4,387
11:00-12:00		3,446	4,784	4,992	4,827	3,910	3,363	4,602
AM Total	0	30,445	40,194	40,520	27,431	20,595	17,577	38,799
12:00-13:00	3,513	3,838	5,006	5,431	5,161	4,502	3,942	
13:00-14:00	4,021	4,036	5,457	6,041	5,426	4,816	4,228	
14:00-15:00	4,992	4,811	6,252	6,711	5,135	5,376	4,190	
15:00-16:00	5,491	5,603	6,974	6,998	5,166	5,195	4,254	
16:00-17:00	4,564	4,780	5,883	6,265	5,213	4,763	3,825	
17:00-18:00	3,542	4,476	5,175	5,121	4,962	4,123	3,764	
18:00-19:00	4,191	3,971	5,853	5,478	5,013	4,311	3,951	
19:00-20:00	3,640	3,766	5,007	5,627	4,417	4,131	3,793	
20:00-21:00	2,955	3,119	4,422	4,695	3,603	3,700	3,598	
21:00-22:00	2,648	3,490	3,621	4,077	3,133	3,440	3,131	
22:00-23:00	2,062	2,929	3,153	3,473	2,952	3,029	2,597	
23:00-24:00	1,564	2,355	2,611	2,884	2,809	2,702	1,849	
PM Total	43,183	47,174	59,414	62,801	52,990	50,088	43,122	0
24 Hr. Total	43,183	77,619	99,608	103,321	80,421	70,683	60,699	38,799
Noon - Noon	73,628	87,368	99,934	90,232	73,585	67,665	81,921	

Traffic Engineering Software

Weekly Volume Summary

Mon, Nov 07, 2011

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: SB **Report Dates:** Oct 4, 2011 **to** Oct 10, 2011

Hour Interval	Tue 11/10/04	Wed 5	Thu 6	Fri 7	Sat 8	Sun 9	Mon 10	Tue 11
0:00- 1:00		918	970	1,067	1,573	1,865	1,770	650
1:00- 2:00		605	646	723	993	1,135	946	441
2:00- 3:00		552	599	571	798	766	596	393
3:00- 4:00		638	661	754	613	565	419	556
4:00- 5:00		1,354	1,412	1,345	781	483	464	1,347
5:00- 6:00		4,250	4,255	4,022	1,359	730	800	4,239
6:00- 7:00		5,951	5,900	5,963	2,299	1,239	1,310	5,735
7:00- 8:00		6,074	5,998	6,000	2,680	1,457	1,241	5,079
8:00- 9:00		5,970	5,740	5,842	3,604	1,929	1,500	5,835
9:00-10:00		5,579	5,589	5,519	4,239	3,148	1,989	5,579
10:00-11:00		5,043	4,943	5,251	4,573	3,964	2,924	5,203
11:00-12:00		5,006	5,258	5,476	4,773	4,177	3,887	4,809
AM Total	0	41,940	41,971	42,533	28,285	21,458	17,846	39,866
12:00-13:00	5,030	5,219	5,338	5,455	5,090	4,545	4,623	
13:00-14:00	5,171	5,068	5,367	5,576	5,013	4,935	5,165	
14:00-15:00	5,789	5,814	5,879	5,934	5,366	5,380	5,261	
15:00-16:00	5,882	5,961	6,037	5,991	5,110	5,116	5,224	
16:00-17:00	5,958	5,936	5,540	5,642	4,875	4,869	5,180	
17:00-18:00	5,214	5,242	5,085	4,859	4,789	4,540	4,950	
18:00-19:00	4,775	4,842	4,800	5,074	4,623	4,096	4,764	
19:00-20:00	4,271	4,184	4,369	4,894	4,159	4,388	4,784	
20:00-21:00	3,386	3,447	3,415	3,860	3,550	4,400	4,165	
21:00-22:00	2,839	2,936	2,913	3,322	3,228	3,992	3,173	
22:00-23:00	2,290	2,489	2,603	3,117	3,134	3,606	2,091	
23:00-24:00	1,717	1,723	2,006	2,551	2,564	2,656	1,127	
PM Total	52,322	52,861	53,352	56,275	51,501	52,523	50,507	0
24 Hr. Total	52,322	94,801	95,323	98,808	79,786	73,981	68,353	39,866
Noon - Noon	94,262	94,832	95,885	84,560	72,959	70,369	90,373	

Traffic Engineering Software

Weekly Volume Summary

Mon, Nov 07, 2011

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: NB/SB **Report Dates:** Oct 4, 2011 **to** Oct 10, 2011

Hour Interval	Tue 11/10/04	Wed 5	Thu 6	Fri 7	Sat 8	Sun 9	Mon 10	Tue 11
0:00- 1:00		1,817	2,382	2,630	3,586	4,006	3,768	1,706
1:00- 2:00		1,152	1,473	1,661	2,428	2,683	2,135	1,101
2:00- 3:00		1,004	1,343	1,300	2,015	1,957	1,425	912
3:00- 4:00		1,107	1,383	1,513	1,658	1,597	1,172	1,107
4:00- 5:00		2,038	2,471	2,375	1,622	1,198	1,102	2,339
5:00- 6:00		6,188	6,927	6,489	2,440	1,299	1,507	6,888
6:00- 7:00		10,078	11,008	11,067	4,011	2,116	2,220	10,887
7:00- 8:00		11,471	12,771	12,623	5,069	2,708	2,422	11,798
8:00- 9:00		11,065	12,250	12,425	6,462	3,553	2,898	12,406
9:00-10:00		9,514	10,574	10,476	7,945	5,503	3,884	10,520
10:00-11:00		8,499	9,541	10,026	8,880	7,346	5,640	9,590
11:00-12:00		8,452	10,042	10,468	9,600	8,087	7,250	9,411
AM Total	0	72,385	82,165	83,053	55,716	42,053	35,423	78,665
12:00-13:00	8,543	9,057	10,344	10,886	10,251	9,047	8,565	
13:00-14:00	9,192	9,104	10,824	11,617	10,439	9,751	9,393	
14:00-15:00	10,781	10,625	12,131	12,645	10,501	10,756	9,451	
15:00-16:00	11,373	11,564	13,011	12,989	10,276	10,311	9,478	
16:00-17:00	10,522	10,716	11,423	11,907	10,088	9,632	9,005	
17:00-18:00	8,756	9,718	10,260	9,980	9,751	8,663	8,714	
18:00-19:00	8,966	8,813	10,653	10,552	9,636	8,407	8,715	
19:00-20:00	7,911	7,950	9,376	10,521	8,576	8,519	8,577	
20:00-21:00	6,341	6,566	7,837	8,555	7,153	8,100	7,763	
21:00-22:00	5,487	6,426	6,534	7,399	6,361	7,432	6,304	
22:00-23:00	4,352	5,418	5,756	6,590	6,086	6,635	4,688	
23:00-24:00	3,281	4,078	4,617	5,435	5,373	5,358	2,976	
PM Total	95,505	100,035	112,766	119,076	104,491	102,611	93,629	0
24 Hr. Total	95,505	172,420	194,931	202,129	160,207	144,664	129,052	78,665
Noon - Noon	167,890	182,200	195,819	174,792	146,544	138,034	172,294	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
168,225	179,551	164,860	159,800	174,752	186,966	154,969	16,816

Traffic Engineering Software

Weekly Volume Summary

Mon, Nov 07, 2011

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: NB **Report Dates:** Oct 11, 2011 **to** Oct 17, 2011

Hour Interval	Tue 11/10/11	Wed 12	Thu 13	Fri 14	Sat 15	Sun 16	Mon 17	Tue 18
0:00- 1:00		1,249	1,189	1,416	2,129	2,144	968	1,376
1:00- 2:00		831	723	911	1,523	1,523	635	841
2:00- 3:00		630	614	722	1,144	1,241	523	704
3:00- 4:00		676	668	740	1,037	1,066	578	679
4:00- 5:00		959	1,026	1,033	845	697	887	1,086
5:00- 6:00		2,640	2,631	2,624	1,318	742	2,565	2,776
6:00- 7:00		5,281	5,109	5,017	1,814	960	5,097	5,265
7:00- 8:00		6,586	6,646	6,667	2,441	1,395	6,719	6,875
8:00- 9:00		6,868	6,508	6,286	3,142	1,733	6,526	6,759
9:00-10:00		5,300	4,932	5,119	3,624	2,393	4,944	4,941
10:00-11:00		4,562	4,572	4,547	4,055	3,297	4,441	4,459
11:00-12:00		4,662	4,702	4,943	4,393	3,904	4,686	4,545
AM Total	0	40,244	39,320	40,025	27,465	21,095	38,569	40,306
12:00-13:00	4,956	4,873	5,047	5,122	4,833	4,278	4,797	
13:00-14:00	5,375	5,222	5,499	5,626	5,024	4,809	4,975	
14:00-15:00	6,405	5,906	6,503	6,536	5,141	4,707	6,321	
15:00-16:00	6,884	5,627	7,235	7,021	5,298	4,813	7,009	
16:00-17:00	6,376	5,545	6,711	6,216	5,299	4,731	6,223	
17:00-18:00	5,413	4,205	5,844	5,774	5,245	4,632	5,083	
18:00-19:00	5,396	4,759	5,529	5,473	5,245	4,366	5,669	
19:00-20:00	4,666	4,316	5,030	5,151	3,838	3,766	4,463	
20:00-21:00	3,984	3,866	4,249	4,304	3,064	3,285	3,689	
21:00-22:00	4,001	3,430	3,863	3,646	2,716	2,734	3,245	
22:00-23:00	2,843	2,731	2,902	3,213	2,945	2,259	3,193	
23:00-24:00	2,098	1,968	2,258	2,779	2,698	1,640	2,399	
PM Total	58,397	52,448	60,670	60,861	51,346	46,020	57,066	0
24 Hr. Total	58,397	92,692	99,990	100,886	78,811	67,115	95,635	40,306
Noon - Noon	98,641	91,768	100,695	88,326	72,441	84,589	97,372	

Traffic Engineering Software

Weekly Volume Summary

Mon, Nov 07, 2011

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: SB **Report Dates:** Oct 11, 2011 **to** Oct 17, 2011

Hour Interval	Tue 11/10/11	Wed 12	Thu 13	Fri 14	Sat 15	Sun 16	Mon 17	Tue 18
0:00- 1:00		928	859	993	1,584	1,526	623	853
1:00- 2:00		626	733	725	1,144	1,036	390	579
2:00- 3:00		545	527	587	720	662	413	516
3:00- 4:00		654	631	632	571	469	510	589
4:00- 5:00		1,332	1,370	1,402	740	534	1,263	1,398
5:00- 6:00		4,260	4,121	3,881	1,346	831	4,155	4,201
6:00- 7:00		5,977	5,703	5,815	2,313	1,382	5,887	5,869
7:00- 8:00		6,182	5,966	5,965	3,084	1,519	5,783	6,170
8:00- 9:00		5,889	6,019	5,493	4,148	2,268	5,515	5,891
9:00-10:00		5,554	5,376	5,430	4,654	3,462	5,509	5,523
10:00-11:00		5,127	5,119	5,219	4,593	4,168	4,908	5,049
11:00-12:00		4,954	5,141	5,047	4,944	4,335	4,958	4,924
AM Total	0	42,028	41,565	41,189	29,841	22,192	39,914	41,562
12:00-13:00	5,176	4,786	5,182	5,272	5,358	4,822	4,989	
13:00-14:00	5,266	4,959	5,212	5,292	5,301	5,098	5,040	
14:00-15:00	5,715	5,342	5,978	5,920	5,400	5,066	5,707	
15:00-16:00	5,955	5,329	5,700	6,037	5,245	4,814	6,032	
16:00-17:00	5,904	5,236	5,100	5,834	5,096	4,853	5,974	
17:00-18:00	5,349	4,340	5,124	5,039	4,867	4,619	5,135	
18:00-19:00	4,868	3,844	4,865	5,079	4,593	4,191	4,661	
19:00-20:00	4,000	4,364	4,101	4,641	3,674	3,596	3,590	
20:00-21:00	3,087	3,015	3,452	3,648	2,933	3,087	2,912	
21:00-22:00	2,752	2,556	2,994	3,251	2,501	2,413	2,482	
22:00-23:00	2,185	2,124	2,487	2,907	2,616	1,899	2,160	
23:00-24:00	1,732	1,627	1,778	2,446	2,199	1,082	1,607	
PM Total	51,989	47,522	51,973	55,366	49,783	45,540	50,289	0
24 Hr. Total	51,989	89,550	93,538	96,555	79,624	67,732	90,203	41,562
Noon - Noon	94,017	89,087	93,162	85,207	71,975	85,454	91,851	

Traffic Engineering Software

Weekly Volume Summary

Mon, Nov 07, 2011

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: NB/SB **Report Dates:** Oct 11, 2011 **to** Oct 17, 2011

Hour Interval	Tue 11/10/11	Wed 12	Thu 13	Fri 14	Sat 15	Sun 16	Mon 17	Tue 18
0:00- 1:00		2,177	2,048	2,409	3,713	3,670	1,591	2,229
1:00- 2:00		1,457	1,456	1,636	2,667	2,559	1,025	1,420
2:00- 3:00		1,175	1,141	1,309	1,864	1,903	936	1,220
3:00- 4:00		1,330	1,299	1,372	1,608	1,535	1,088	1,268
4:00- 5:00		2,291	2,396	2,435	1,585	1,231	2,150	2,484
5:00- 6:00		6,900	6,752	6,505	2,664	1,573	6,720	6,977
6:00- 7:00		11,258	10,812	10,832	4,127	2,342	10,984	11,134
7:00- 8:00		12,768	12,612	12,632	5,525	2,914	12,502	13,045
8:00- 9:00		12,757	12,527	11,779	7,290	4,001	12,041	12,650
9:00-10:00		10,854	10,308	10,549	8,278	5,855	10,453	10,464
10:00-11:00		9,689	9,691	9,766	8,648	7,465	9,349	9,508
11:00-12:00		9,616	9,843	9,990	9,337	8,239	9,644	9,469
AM Total	0	82,272	80,885	81,214	57,306	43,287	78,483	81,868
12:00-13:00	10,132	9,659	10,229	10,394	10,191	9,100	9,786	
13:00-14:00	10,641	10,181	10,711	10,918	10,325	9,907	10,015	
14:00-15:00	12,120	11,248	12,481	12,456	10,541	9,773	12,028	
15:00-16:00	12,839	10,956	12,935	13,058	10,543	9,627	13,041	
16:00-17:00	12,280	10,781	11,811	12,050	10,395	9,584	12,197	
17:00-18:00	10,762	8,545	10,968	10,813	10,112	9,251	10,218	
18:00-19:00	10,264	8,603	10,394	10,552	9,838	8,557	10,330	
19:00-20:00	8,666	8,680	9,131	9,792	7,512	7,362	8,053	
20:00-21:00	7,071	6,881	7,701	7,952	5,997	6,372	6,601	
21:00-22:00	6,753	5,986	6,857	6,897	5,217	5,147	5,727	
22:00-23:00	5,028	4,855	5,389	6,120	5,561	4,158	5,353	
23:00-24:00	3,830	3,595	4,036	5,225	4,897	2,722	4,006	
PM Total	110,386	99,970	112,643	116,227	101,129	91,560	107,355	0
24 Hr. Total	110,386	182,242	193,528	197,441	158,435	134,847	185,838	81,868
Noon - Noon	192,658	180,855	193,857	173,533	144,416	170,043	189,223	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
177,798	189,148	176,295	169,761	186,873	198,621	165,717	17,982

Traffic Engineering Software

Weekly Volume Summary

Thu, Jan 05, 2012

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: NB **Report Dates:** Aug 16, 2011 **to** Aug 22, 2011

Hour Interval	Tue 11/08/16	Wed 17	Thu 18	Fri 19	Sat 20	Sun 21	Mon 22	Tue 23
0:00- 1:00		1,637	1,626	1,782	2,828	2,756	1,459	1,506
1:00- 2:00		1,094	1,107	1,069	1,882	1,951	972	1,090
2:00- 3:00		842	957	1,041	1,535	1,650	741	865
3:00- 4:00		874	933	1,029	1,175	1,221	883	931
4:00- 5:00		1,755	1,806	1,810	1,133	820	1,729	1,796
5:00- 6:00		4,995	4,968	4,587	1,910	997	4,718	5,011
6:00- 7:00		7,278	7,480	7,177	3,078	1,490	7,048	7,435
7:00- 8:00		7,939	8,026	7,597	3,589	1,864	7,785	8,360
8:00- 9:00		7,219	7,352	7,066	4,346	2,392	6,879	6,813
9:00-10:00		5,863	5,806	5,459	4,699	3,372	5,490	5,499
10:00-11:00		5,650	5,806	5,584	5,178	4,330	5,368	5,366
11:00-12:00		6,063	5,971	6,299	5,771	4,916	5,755	5,721
AM Total	0	51,209	51,838	50,500	37,124	27,759	48,827	50,393
12:00-13:00	6,337	6,370	6,159	7,194	5,890	5,458	5,893	
13:00-14:00	7,097	7,042	6,973	7,591	6,101	5,439	6,599	
14:00-15:00	8,319	8,278	8,372	8,430	6,426	5,097	7,594	
15:00-16:00	8,472	8,430	8,224	8,280	6,369	5,625	8,421	
16:00-17:00	7,096	7,128	7,239	7,182	6,242	5,440	7,064	
17:00-18:00	6,882	6,944	6,517	7,035	6,485	5,468	6,704	
18:00-19:00	6,652	6,595	6,484	6,875	6,188	5,156	6,231	
19:00-20:00	5,700	5,945	6,131	6,233	5,419	4,984	5,700	
20:00-21:00	5,502	5,354	5,655	5,708	4,429	4,574	5,052	
21:00-22:00	4,623	4,697	4,913	4,928	4,329	4,378	4,215	
22:00-23:00	3,624	3,452	4,103	4,372	4,251	3,589	3,604	
23:00-24:00	2,809	2,626	3,096	3,611	3,628	2,372	2,519	
PM Total	73,113	72,861	73,866	77,439	65,757	57,580	69,596	0
24 Hr. Total	73,113	124,070	125,704	127,939	102,881	85,339	118,423	50,393
Noon - Noon	124,322	124,699	124,366	114,563	93,516	106,407	119,989	

Traffic Engineering Software

Weekly Volume Summary

Thu, Jan 05, 2012

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: SB **Report Dates:** Aug 16, 2011 **to** Aug 22, 2011

Hour Interval	Tue 11/08/16	Wed 17	Thu 18	Fri 19	Sat 20	Sun 21	Mon 22	Tue 23
0:00- 1:00		1,060	1,175	1,147	1,673	1,841	943	1,009
1:00- 2:00		721	764	748	1,105	1,212	541	692
2:00- 3:00		575	621	592	765	816	455	600
3:00- 4:00		616	621	625	638	508	703	614
4:00- 5:00		1,247	1,279	1,228	766	503	1,238	1,332
5:00- 6:00		3,823	3,836	3,652	1,422	798	3,799	3,849
6:00- 7:00		5,924	5,929	5,748	2,534	1,303	5,937	5,972
7:00- 8:00		6,100	5,875	5,982	2,852	1,547	6,126	6,206
8:00- 9:00		5,907	5,654	5,788	3,884	2,131	5,824	6,018
9:00-10:00		5,578	5,204	5,555	4,662	3,143	5,278	5,548
10:00-11:00		5,399	5,248	5,386	4,793	4,135	4,933	5,153
11:00-12:00		5,383	5,367	5,474	5,044	4,487	5,142	5,259
AM Total	0	42,333	41,573	41,925	30,138	22,424	40,919	42,252
12:00-13:00	5,229	5,265	5,489	5,621	5,527	4,827	5,123	
13:00-14:00	5,217	5,280	5,277	5,616	5,351	5,067	5,119	
14:00-15:00	5,575	5,620	5,697	5,747	5,311	4,617	5,696	
15:00-16:00	5,891	5,922	5,841	5,867	5,190	4,815	5,712	
16:00-17:00	5,995	5,916	5,879	5,678	4,820	4,717	5,915	
17:00-18:00	5,395	5,503	5,407	5,191	4,508	4,306	5,270	
18:00-19:00	4,742	4,822	4,791	4,947	4,541	4,140	4,476	
19:00-20:00	4,170	4,295	4,517	4,660	3,998	3,953	4,157	
20:00-21:00	3,547	3,876	3,748	3,866	3,210	3,547	3,436	
21:00-22:00	3,235	3,255	3,515	3,573	3,199	3,278	2,923	
22:00-23:00	2,768	2,786	2,708	3,195	3,093	2,675	2,681	
23:00-24:00	1,963	2,028	2,120	2,493	2,673	1,641	1,791	
PM Total	53,727	54,568	54,989	56,454	51,421	47,583	52,299	0
24 Hr. Total	53,727	96,901	96,562	98,379	81,559	70,007	93,218	42,252
Noon - Noon		96,060	96,141	96,914	86,592	73,845	88,502	94,551

Traffic Engineering Software

Weekly Volume Summary

Thu, Jan 05, 2012

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: NB/SB **Report Dates:** Aug 16, 2011 **to** Aug 22, 2011

Hour Interval	Tue 11/08/16	Wed 17	Thu 18	Fri 19	Sat 20	Sun 21	Mon 22	Tue 23
0:00- 1:00		2,697	2,801	2,929	4,501	4,597	2,402	2,515
1:00- 2:00		1,815	1,871	1,817	2,987	3,163	1,513	1,782
2:00- 3:00		1,417	1,578	1,633	2,300	2,466	1,196	1,465
3:00- 4:00		1,490	1,554	1,654	1,813	1,729	1,586	1,545
4:00- 5:00		3,002	3,085	3,038	1,899	1,323	2,967	3,128
5:00- 6:00		8,818	8,804	8,239	3,332	1,795	8,517	8,860
6:00- 7:00		13,202	13,409	12,925	5,612	2,793	12,985	13,407
7:00- 8:00		14,039	13,901	13,579	6,441	3,411	13,911	14,566
8:00- 9:00		13,126	13,006	12,854	8,230	4,523	12,703	12,831
9:00-10:00		11,441	11,010	11,014	9,361	6,515	10,768	11,047
10:00-11:00		11,049	11,054	10,970	9,971	8,465	10,301	10,519
11:00-12:00		11,446	11,338	11,773	10,815	9,403	10,897	10,980
AM Total	0	93,542	93,411	92,425	67,262	50,183	89,746	92,645
12:00-13:00	11,566	11,635	11,648	12,815	11,417	10,285	11,016	
13:00-14:00	12,314	12,322	12,250	13,207	11,452	10,506	11,718	
14:00-15:00	13,894	13,898	14,069	14,177	11,737	9,714	13,290	
15:00-16:00	14,363	14,352	14,065	14,147	11,559	10,440	14,133	
16:00-17:00	13,091	13,044	13,118	12,860	11,062	10,157	12,979	
17:00-18:00	12,277	12,447	11,924	12,226	10,993	9,774	11,974	
18:00-19:00	11,394	11,417	11,275	11,822	10,729	9,296	10,707	
19:00-20:00	9,870	10,240	10,648	10,893	9,417	8,937	9,857	
20:00-21:00	9,049	9,230	9,403	9,574	7,639	8,121	8,488	
21:00-22:00	7,858	7,952	8,428	8,501	7,528	7,656	7,138	
22:00-23:00	6,392	6,238	6,811	7,567	7,344	6,264	6,285	
23:00-24:00	4,772	4,654	5,216	6,104	6,301	4,013	4,310	
PM Total	126,840	127,429	128,855	133,893	117,178	105,163	121,895	0
24 Hr. Total	126,840	220,971	222,266	226,318	184,440	155,346	211,641	92,645
Noon - Noon	220,382	220,840	221,280	201,155	167,361	194,909	214,540	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
205,781	219,261	193,434	190,757	205,040	223,185	181,828	19,730

Traffic Engineering Software

Weekly Volume Summary

Thu, Jan 19, 2012

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: NB **Report Dates:** Apr 27, 2011 **to** May 3, 2011

Hour Interval	Wed 11/04/27	Thu 28	Fri 29	Sat 30	Sun 1	Mon 2	Tue 3	Wed 4
0:00- 1:00		884	978	1,404	1,628	677	840	819
1:00- 2:00		546	575	996	1,404	426	513	557
2:00- 3:00		447	543	798	909	388	359	417
3:00- 4:00		417	513	664	638	354	417	421
4:00- 5:00		701	723	550	455	661	724	746
5:00- 6:00		2,056	2,082	782	487	1,943	1,963	2,125
6:00- 7:00		4,113	4,187	1,425	694	4,057	4,153	4,198
7:00- 8:00		5,061	5,291	2,076	949	4,949	5,020	5,208
8:00- 9:00		4,982	4,656	2,511	1,088	4,713	4,658	5,122
9:00-10:00		3,572	3,898	2,863	1,568	3,550	3,535	3,479
10:00-11:00		3,024	3,458	3,154	2,083	3,176	3,115	3,358
11:00-12:00		3,484	3,556	3,340	2,592	3,328	3,406	3,340
AM Total	0	29,287	30,460	20,563	14,495	28,222	28,703	29,790
12:00-13:00	3,677	3,621	3,995	3,649	2,915	3,427	3,420	
13:00-14:00	3,904	4,078	4,340	3,728	3,069	3,850	3,861	
14:00-15:00	5,049	5,024	4,960	4,064	3,273	4,582	4,613	
15:00-16:00	5,114	5,142	5,145	4,002	3,148	5,307	4,814	
16:00-17:00	3,214	4,680	4,772	3,892	3,348	4,614	3,791	
17:00-18:00	4,071	4,207	4,583	3,887	3,196	3,892	3,311	
18:00-19:00	4,198	3,874	4,221	3,829	2,964	3,867	3,923	
19:00-20:00	3,039	3,272	3,807	3,350	2,553	3,092	3,088	
20:00-21:00	2,766	2,946	3,194	2,426	2,156	2,459	2,617	
21:00-22:00	2,573	2,571	2,896	2,271	1,972	2,195	2,514	
22:00-23:00	2,125	2,056	2,432	1,903	1,562	1,768	1,856	
23:00-24:00	1,463	1,434	2,016	1,698	1,019	1,329	1,371	
PM Total	41,193	42,905	46,361	38,699	31,175	40,382	39,179	0
24 Hr. Total	41,193	72,192	76,821	59,262	45,670	68,604	67,882	29,790
Noon - Noon	70,480	73,365	66,924	53,194	59,397	69,085	68,969	

Traffic Engineering Software

Weekly Volume Summary

Thu, Jan 19, 2012

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

Count Direction: SB **Report Dates:** Apr 27, 2011 **to** May 3, 2011

Hour Interval	Wed 11/04/27	Thu 28	Fri 29	Sat 30	Sun 1	Mon 2	Tue 3	Wed 4
0:00- 1:00		1,074	1,143	1,853	2,176	775	1,065	1,005
1:00- 2:00		714	762	1,146	1,485	451	714	671
2:00- 3:00		622	641	826	943	446	557	529
3:00- 4:00		582	646	597	560	560	511	520
4:00- 5:00		1,081	1,151	653	513	1,092	1,024	1,062
5:00- 6:00		3,223	3,124	1,247	745	3,202	3,220	3,327
6:00- 7:00		5,982	5,821	2,357	1,345	5,946	5,668	5,848
7:00- 8:00		5,789	6,173	3,101	1,571	5,949	6,016	6,453
8:00- 9:00		5,630	6,159	4,367	2,126	5,435	5,565	6,231
9:00-10:00		5,417	5,623	4,878	3,173	5,205	5,185	5,572
10:00-11:00		5,070	5,211	4,895	3,994	4,633	4,817	4,824
11:00-12:00		4,871	5,438	5,145	4,194	4,669	4,813	4,940
AM Total	0	40,055	41,892	31,065	22,825	38,363	39,155	40,982
12:00-13:00	5,245	4,957	5,456	5,547	4,539	4,944	4,893	
13:00-14:00	5,214	5,114	5,437	5,384	4,909	4,948	4,918	
14:00-15:00	5,796	5,777	5,779	5,627	4,864	5,833	5,327	
15:00-16:00	5,771	6,307	6,110	5,515	4,501	6,220	5,348	
16:00-17:00	5,383	6,028	6,082	5,290	4,278	6,085	5,447	
17:00-18:00	5,267	5,415	5,482	5,027	4,286	5,374	5,121	
18:00-19:00	4,696	4,678	5,006	4,782	3,948	4,296	4,354	
19:00-20:00	3,912	4,024	4,714	4,227	3,411	3,628	3,765	
20:00-21:00	3,176	3,402	3,787	3,576	2,986	3,111	3,099	
21:00-22:00	2,993	3,062	3,645	3,156	2,599	2,621	2,768	
22:00-23:00	2,512	2,519	3,078	2,857	2,061	2,174	2,268	
23:00-24:00	1,955	2,015	2,804	2,390	1,230	1,801	1,836	
PM Total	51,920	53,298	57,380	53,378	43,612	51,035	49,144	0
24 Hr. Total	51,920	93,353	99,272	84,443	66,437	89,398	88,299	40,982
Noon - Noon	91,975	95,190	88,445	76,203	81,975	90,190	90,126	

Traffic Engineering Software

Weekly Volume Summary

Thu, Jan 19, 2012

Location: Hwy 410 - 1.5km N OF HWY 401 / 403 IC.

LHRS/Offset: 49050 / 1.50 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410100

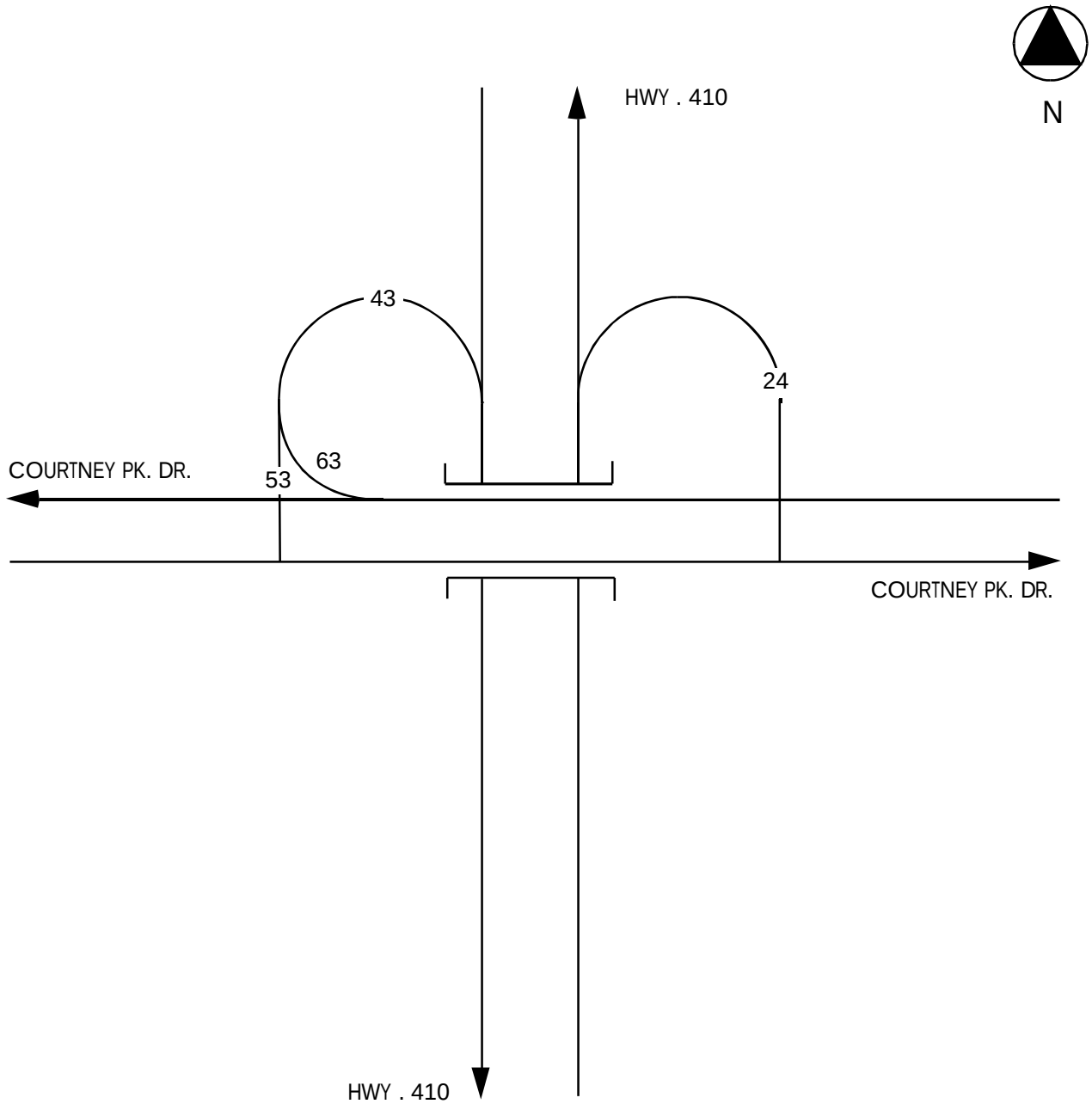
Count Direction: NB/SB **Report Dates:** Apr 27, 2011 **to** May 3, 2011

Hour Interval	Wed 11/04/27	Thu 28	Fri 29	Sat 30	Sun 1	Mon 2	Tue 3	Wed 4
0:00- 1:00		1,958	2,121	3,257	3,804	1,452	1,905	1,824
1:00- 2:00		1,260	1,337	2,142	2,889	877	1,227	1,228
2:00- 3:00		1,069	1,184	1,624	1,852	834	916	946
3:00- 4:00		999	1,159	1,261	1,198	914	928	941
4:00- 5:00		1,782	1,874	1,203	968	1,753	1,748	1,808
5:00- 6:00		5,279	5,206	2,029	1,232	5,145	5,183	5,452
6:00- 7:00		10,095	10,008	3,782	2,039	10,003	9,821	10,046
7:00- 8:00		10,850	11,464	5,177	2,520	10,898	11,036	11,661
8:00- 9:00		10,612	10,815	6,878	3,214	10,148	10,223	11,353
9:00-10:00		8,989	9,521	7,741	4,741	8,755	8,720	9,051
10:00-11:00		8,094	8,669	8,049	6,077	7,809	7,932	8,182
11:00-12:00		8,355	8,994	8,485	6,786	7,997	8,219	8,280
AM Total	0	69,342	72,352	51,628	37,320	66,585	67,858	70,772
12:00-13:00	8,922	8,578	9,451	9,196	7,454	8,371	8,313	
13:00-14:00	9,118	9,192	9,777	9,112	7,978	8,798	8,779	
14:00-15:00	10,845	10,801	10,739	9,691	8,137	10,415	9,940	
15:00-16:00	10,885	11,449	11,255	9,517	7,649	11,527	10,162	
16:00-17:00	8,597	10,708	10,854	9,182	7,626	10,699	9,238	
17:00-18:00	9,338	9,622	10,065	8,914	7,482	9,266	8,432	
18:00-19:00	8,894	8,552	9,227	8,611	6,912	8,163	8,277	
19:00-20:00	6,951	7,296	8,521	7,577	5,964	6,720	6,853	
20:00-21:00	5,942	6,348	6,981	6,002	5,142	5,570	5,716	
21:00-22:00	5,566	5,633	6,541	5,427	4,571	4,816	5,282	
22:00-23:00	4,637	4,575	5,510	4,760	3,623	3,942	4,124	
23:00-24:00	3,418	3,449	4,820	4,088	2,249	3,130	3,207	
PM Total	93,113	96,203	103,741	92,077	74,787	91,417	88,323	0
24 Hr. Total	93,113	165,545	176,093	143,705	112,107	158,002	156,181	70,772
Noon - Noon	162,455	168,555	155,369	129,397	141,372	159,275	159,095	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
153,645	162,345	149,482	151,840	158,450	150,322	140,513	15,247

MINISTRY OF TRANSPORTATION
INTERCHANGE FILE

HWY.	410 IC	KEYPOINT NUMBER	49055/000
AT	COURTNEY PARK DR.	M.T.O. DISTRICT	TORONTO
		O.P.P. DISTRICT	5 AURORA



UPDATED 90 - 09 - 25

PROGRAM DEVELOPMENT & EVALUATION OFFICE

88 - 11 - 25
DATE

Traffic Engineering Software

Weekly Volume Summary

Mon, May 07, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: NB **Report Dates:** Apr 11, 2012 **to** Apr 17, 2012

Hour Interval	Wed 12/04/11	Thu 12	Fri 13	Sat 14	Sun 15	Mon 16	Tue 17	Wed 18
0:00- 1:00		1,213	1,292	1,946	2,048	781	1,416	1,149
1:00- 2:00		765	738	1,401	1,658	482	937	814
2:00- 3:00		684	629	1,104	1,286	424	735	686
3:00- 4:00		710	634	966	1,004	460	743	652
4:00- 5:00		1,098	1,034	788	663	853	1,097	1,012
5:00- 6:00		2,805	2,773	1,277	619	2,348	2,931	2,816
6:00- 7:00		5,631	5,574	1,968	921	4,980	5,542	5,709
7:00- 8:00		6,573	7,055	2,772	1,431	6,319	7,244	7,130
8:00- 9:00		6,801	6,494	3,393	1,801	5,040	6,619	6,505
9:00-10:00		4,999	4,896	4,046	2,345	3,568	4,843	4,999
10:00-11:00		4,449	4,883	4,223	2,999	3,294	4,116	4,622
11:00-12:00		4,747	5,047	4,590	3,483	3,338	3,597	4,713
AM Total	0	40,475	41,049	28,474	20,258	31,887	39,820	40,807
12:00-13:00	4,855	5,195	5,646	5,012	3,996	3,615	4,387	
13:00-14:00	5,445	5,561	5,171	5,162	4,105	3,937	5,092	
14:00-15:00	6,409	6,499	6,284	5,567	3,556	5,008	6,202	
15:00-16:00	7,208	7,281	6,890	5,497	3,570	6,817	6,771	
16:00-17:00	6,192	6,131	5,793	5,727	3,335	5,912	5,724	
17:00-18:00	4,962	5,562	4,656	5,216	3,797	5,159	5,023	
18:00-19:00	5,473	5,594	6,029	5,203	3,487	4,794	5,260	
19:00-20:00	4,478	4,754	5,155	4,424	3,070	4,122	4,413	
20:00-21:00	3,823	4,150	4,533	3,667	2,488	3,460	3,845	
21:00-22:00	3,764	3,790	4,130	3,215	2,277	3,311	3,580	
22:00-23:00	2,846	2,918	3,601	2,893	1,815	2,812	3,008	
23:00-24:00	2,054	2,249	2,870	2,525	1,271	2,369	2,092	
PM Total	57,509	59,684	60,758	54,108	36,767	51,316	55,397	0
24 Hr. Total	57,509	100,159	101,807	82,582	57,025	83,203	95,217	40,807
Noon - Noon	97,984	100,733	89,232	74,366	68,654	91,136	96,204	

Traffic Engineering Software

Weekly Volume Summary

Mon, May 07, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: SB **Report Dates:** Apr 11, 2012 **to** Apr 17, 2012

Hour Interval	Wed 12/04/11	Thu 12	Fri 13	Sat 14	Sun 15	Mon 16	Tue 17	Wed 18
0:00- 1:00		1,096	1,171	1,694	1,697	696	1,040	1,010
1:00- 2:00		652	710	1,043	1,136	434	648	630
2:00- 3:00		562	592	804	763	405	595	594
3:00- 4:00		570	630	614	513	493	523	539
4:00- 5:00		1,115	1,114	616	518	998	1,070	1,012
5:00- 6:00		3,294	3,108	1,109	709	3,219	3,299	3,224
6:00- 7:00		5,997	5,897	2,127	1,188	6,126	6,178	6,118
7:00- 8:00		6,191	6,207	3,108	1,581	6,233	6,352	6,357
8:00- 9:00		6,258	5,900	4,089	1,956	6,200	6,187	6,002
9:00-10:00		5,813	5,687	4,569	3,037	5,593	5,752	4,988
10:00-11:00		5,148	5,146	4,856	3,902	4,795	5,067	4,971
11:00-12:00		5,273	5,357	5,072	4,147	4,797	4,912	5,105
AM Total	0	41,969	41,519	29,701	21,147	39,989	41,623	40,550
12:00-13:00	4,974	5,184	5,370	5,335	4,620	5,035	4,998	
13:00-14:00	4,993	5,083	5,295	5,379	4,867	5,054	5,050	
14:00-15:00	5,527	5,680	5,860	5,768	4,791	5,568	5,636	
15:00-16:00	6,170	6,118	6,100	5,636	4,671	6,022	6,149	
16:00-17:00	6,068	6,124	5,894	5,186	4,465	5,739	5,819	
17:00-18:00	5,404	5,323	5,084	4,991	4,149	5,210	5,030	
18:00-19:00	4,676	4,640	4,928	4,759	4,013	4,120	4,820	
19:00-20:00	3,969	4,156	4,605	4,078	3,379	3,524	3,967	
20:00-21:00	3,258	3,469	4,013	3,339	3,051	3,021	3,222	
21:00-22:00	2,903	3,259	3,487	3,203	2,642	2,752	2,972	
22:00-23:00	2,372	2,562	3,138	2,906	2,027	2,124	2,336	
23:00-24:00	1,902	2,124	2,781	2,597	1,148	1,750	1,822	
PM Total	52,216	53,722	56,555	53,177	43,823	49,919	51,821	0
24 Hr. Total	52,216	95,691	98,074	82,878	64,970	89,908	93,444	40,550
Noon - Noon	94,185	95,241	86,256	74,324	83,812	91,542	92,371	

Traffic Engineering Software

Weekly Volume Summary

Mon, May 07, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: NB/SB **Report Dates:** Apr 11, 2012 **to** Apr 17, 2012

Hour Interval	Wed 12/04/11	Thu 12	Fri 13	Sat 14	Sun 15	Mon 16	Tue 17	Wed 18
0:00- 1:00		2,309	2,463	3,640	3,745	1,477	2,456	2,159
1:00- 2:00		1,417	1,448	2,444	2,794	916	1,585	1,444
2:00- 3:00		1,246	1,221	1,908	2,049	829	1,330	1,280
3:00- 4:00		1,280	1,264	1,580	1,517	953	1,266	1,191
4:00- 5:00		2,213	2,148	1,404	1,181	1,851	2,167	2,024
5:00- 6:00		6,099	5,881	2,386	1,328	5,567	6,230	6,040
6:00- 7:00		11,628	11,471	4,095	2,109	11,106	11,720	11,827
7:00- 8:00		12,764	13,262	5,880	3,012	12,552	13,596	13,487
8:00- 9:00		13,059	12,394	7,482	3,757	11,240	12,806	12,507
9:00-10:00		10,812	10,583	8,615	5,382	9,161	10,595	9,987
10:00-11:00		9,597	10,029	9,079	6,901	8,089	9,183	9,593
11:00-12:00		10,020	10,404	9,662	7,630	8,135	8,509	9,818
AM Total	0	82,444	82,568	58,175	41,405	71,876	81,443	81,357
12:00-13:00	9,829	10,379	11,016	10,347	8,616	8,650	9,385	
13:00-14:00	10,438	10,644	10,466	10,541	8,972	8,991	10,142	
14:00-15:00	11,936	12,179	12,144	11,335	8,347	10,576	11,838	
15:00-16:00	13,378	13,399	12,990	11,133	8,241	12,839	12,920	
16:00-17:00	12,260	12,255	11,687	10,913	7,800	11,651	11,543	
17:00-18:00	10,366	10,885	9,740	10,207	7,946	10,369	10,053	
18:00-19:00	10,149	10,234	10,957	9,962	7,500	8,914	10,080	
19:00-20:00	8,447	8,910	9,760	8,502	6,449	7,646	8,380	
20:00-21:00	7,081	7,619	8,546	7,006	5,539	6,481	7,067	
21:00-22:00	6,667	7,049	7,617	6,418	4,919	6,063	6,552	
22:00-23:00	5,218	5,480	6,739	5,799	3,842	4,936	5,344	
23:00-24:00	3,956	4,373	5,651	5,122	2,419	4,119	3,914	
PM Total	109,725	113,406	117,313	107,285	80,590	101,235	107,218	0
24 Hr. Total	109,725	195,850	199,881	165,460	121,995	173,111	188,661	81,357
Noon - Noon	192,169	195,974	175,488	148,690	152,466	182,678	188,575	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
176,577	189,849	179,753	182,297	190,538	180,475	168,968	18,335

Traffic Engineering Software

Weekly Volume Summary

Mon, May 07, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: NB **Report Dates:** Apr 16, 2012 **to** Apr 22, 2012

Hour Interval	Mon 12/04/16	Tue 17	Wed 18	Thu 19	Fri 20	Sat 21	Sun 22	Mon 23
0:00- 1:00		1,416	1,149	1,280	1,308	1,899	2,081	1,084
1:00- 2:00		937	814	844	884	1,339	1,747	644
2:00- 3:00		735	686	604	712	1,055	1,223	532
3:00- 4:00		743	652	660	722	888	1,091	571
4:00- 5:00		1,097	1,012	1,075	1,103	753	693	928
5:00- 6:00		2,931	2,816	2,824	2,664	1,167	782	2,708
6:00- 7:00		5,542	5,709	5,502	5,400	1,818	936	5,452
7:00- 8:00		7,244	7,130	6,889	7,172	2,451	1,367	6,785
8:00- 9:00		6,619	6,505	6,546	6,556	3,186	1,658	6,459
9:00-10:00		4,843	4,999	5,078	4,914	3,697	2,339	4,679
10:00-11:00		4,116	4,622	4,587	4,696	3,942	3,157	4,218
11:00-12:00		3,597	4,713	4,834	4,868	4,462	3,849	4,423
AM Total	0	39,820	40,807	40,723	40,999	26,657	20,923	38,483
12:00-13:00	3,615	4,387	4,836	5,154	5,275	5,110	4,345	
13:00-14:00	3,937	5,092	5,281	5,718	5,718	5,304	4,590	
14:00-15:00	5,008	6,202	6,184	6,767	6,855	5,309	4,805	
15:00-16:00	6,817	6,771	7,179	7,101	6,765	5,549	4,980	
16:00-17:00	5,912	5,724	6,190	5,938	6,050	5,567	4,895	
17:00-18:00	5,159	5,023	5,283	4,884	5,524	5,600	4,576	
18:00-19:00	4,794	5,260	5,477	5,700	5,752	5,376	4,253	
19:00-20:00	4,122	4,413	4,629	4,745	5,193	4,426	3,906	
20:00-21:00	3,460	3,845	4,006	4,157	4,393	3,421	3,391	
21:00-22:00	3,311	3,580	3,673	3,612	3,807	3,292	2,929	
22:00-23:00	2,812	3,008	2,899	2,691	3,422	2,842	2,436	
23:00-24:00	2,369	2,092	2,185	2,274	2,815	2,584	1,984	
PM Total	51,316	55,397	57,822	58,741	61,569	54,380	47,090	0
24 Hr. Total	51,316	95,217	98,629	99,464	102,568	81,037	68,013	38,483
Noon - Noon	91,136	96,204	98,545	99,740	88,226	75,303	85,573	

Traffic Engineering Software

Weekly Volume Summary

Mon, May 07, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: SB **Report Dates:** Apr 16, 2012 **to** Apr 22, 2012

Hour Interval	Mon 12/04/16	Tue 17	Wed 18	Thu 19	Fri 20	Sat 21	Sun 22	Mon 23
0:00- 1:00		1,040	1,010	1,101	1,109	1,725	1,836	757
1:00- 2:00		648	630	677	730	1,006	1,259	500
2:00- 3:00		595	594	573	617	829	752	424
3:00- 4:00		523	539	576	619	592	521	478
4:00- 5:00		1,070	1,012	1,054	1,132	588	516	1,014
5:00- 6:00		3,299	3,224	3,165	3,071	1,062	687	3,123
6:00- 7:00		6,178	6,118	6,002	5,589	2,102	1,315	6,009
7:00- 8:00		6,352	6,357	6,257	6,158	2,899	1,497	6,155
8:00- 9:00		6,187	6,002	5,833	6,288	4,077	2,147	6,038
9:00-10:00		5,752	4,988	5,887	5,526	4,557	3,182	5,213
10:00-11:00		5,067	4,971	5,132	5,292	4,736	4,059	4,589
11:00-12:00		4,912	5,105	5,136	5,391	5,030	4,220	4,808
AM Total	0	41,623	40,550	41,393	41,522	29,203	21,991	39,108
12:00-13:00	5,035	4,998	4,993	5,290	5,375	5,671	4,871	
13:00-14:00	5,054	5,050	5,136	5,192	5,557	5,537	4,950	
14:00-15:00	5,568	5,636	5,850	5,661	5,917	5,734	4,897	
15:00-16:00	6,022	6,149	5,957	6,024	6,067	5,316	4,592	
16:00-17:00	5,739	5,819	6,015	5,758	5,874	5,280	4,637	
17:00-18:00	5,210	5,030	5,421	5,278	5,342	4,928	4,279	
18:00-19:00	4,120	4,820	4,635	4,750	5,028	4,766	4,136	
19:00-20:00	3,524	3,967	3,972	4,253	4,649	4,164	3,638	
20:00-21:00	3,021	3,222	3,407	3,595	3,911	3,384	3,236	
21:00-22:00	2,752	2,972	3,017	2,984	3,247	3,043	3,037	
22:00-23:00	2,124	2,336	2,519	2,614	2,937	2,769	2,337	
23:00-24:00	1,750	1,822	1,972	1,905	2,672	2,599	1,293	
PM Total	49,919	51,821	52,894	53,304	56,576	53,191	45,903	0
24 Hr. Total	49,919	93,444	93,444	94,697	98,098	82,394	67,894	39,108
Noon - Noon	91,542	92,371	94,287	94,826	85,779	75,182	85,011	

Traffic Engineering Software

Weekly Volume Summary

Mon, May 07, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: NB/SB **Report Dates:** Apr 16, 2012 **to** Apr 22, 2012

Hour Interval	Mon 12/04/16	Tue 17	Wed 18	Thu 19	Fri 20	Sat 21	Sun 22	Mon 23
0:00- 1:00		2,456	2,159	2,381	2,417	3,624	3,917	1,841
1:00- 2:00		1,585	1,444	1,521	1,614	2,345	3,006	1,144
2:00- 3:00		1,330	1,280	1,177	1,329	1,884	1,975	956
3:00- 4:00		1,266	1,191	1,236	1,341	1,480	1,612	1,049
4:00- 5:00		2,167	2,024	2,129	2,235	1,341	1,209	1,942
5:00- 6:00		6,230	6,040	5,989	5,735	2,229	1,469	5,831
6:00- 7:00		11,720	11,827	11,504	10,989	3,920	2,251	11,461
7:00- 8:00		13,596	13,487	13,146	13,330	5,350	2,864	12,940
8:00- 9:00		12,806	12,507	12,379	12,844	7,263	3,805	12,497
9:00-10:00		10,595	9,987	10,965	10,440	8,254	5,521	9,892
10:00-11:00		9,183	9,593	9,719	9,988	8,678	7,216	8,807
11:00-12:00		8,509	9,818	9,970	10,259	9,492	8,069	9,231
AM Total	0	81,443	81,357	82,116	82,521	55,860	42,914	77,591
12:00-13:00	8,650	9,385	9,829	10,444	10,650	10,781	9,216	
13:00-14:00	8,991	10,142	10,417	10,910	11,275	10,841	9,540	
14:00-15:00	10,576	11,838	12,034	12,428	12,772	11,043	9,702	
15:00-16:00	12,839	12,920	13,136	13,125	12,832	10,865	9,572	
16:00-17:00	11,651	11,543	12,205	11,696	11,924	10,847	9,532	
17:00-18:00	10,369	10,053	10,704	10,162	10,866	10,528	8,855	
18:00-19:00	8,914	10,080	10,112	10,450	10,780	10,142	8,389	
19:00-20:00	7,646	8,380	8,601	8,998	9,842	8,590	7,544	
20:00-21:00	6,481	7,067	7,413	7,752	8,304	6,805	6,627	
21:00-22:00	6,063	6,552	6,690	6,596	7,054	6,335	5,966	
22:00-23:00	4,936	5,344	5,418	5,305	6,359	5,611	4,773	
23:00-24:00	4,119	3,914	4,157	4,179	5,487	5,183	3,277	
PM Total	101,235	107,218	110,716	112,045	118,145	107,571	92,993	0
24 Hr. Total	101,235	188,661	192,073	194,161	200,666	163,431	135,907	77,591
Noon - Noon	182,678	188,575	192,832	194,566	174,005	150,485	170,584	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
179,104	189,663	177,312	180,180	187,951	178,378	166,674	18,086

Traffic Engineering Software

Weekly Volume Summary

Tue, Dec 18, 2012

Location: Hwy 410 Sta 043 Rmp 43 - Courtney Pk Dr to Hwy410 SB

LHRS/Offset: 49055 / 0.0 **Region:** Central

Pattern Type: n/a **PCS#:** n/a **Hwy. TVIS#:** 49055043

Count Direction: N/A **Report Dates:** Nov 14, 2012 **to** Nov 20, 2012

Hour Interval	Wed 12/11/14	Thu 15	Fri 16	Sat 17	Sun 18	Mon 19	Tue 20	Wed 21
0:00- 1:00		123	147	225	123	52	135	154
1:00- 2:00		93	86	178	101	41	90	116
2:00- 3:00		97	99	111	79	51	87	83
3:00- 4:00		62	64	69	29	40	58	81
4:00- 5:00		117	130	53	21	67	111	129
5:00- 6:00		166	130	65	22	125	163	171
6:00- 7:00		336	285	119	39	291	321	301
7:00- 8:00		449	469	137	71	448	443	471
8:00- 9:00		527	474	171	82	466	486	452
9:00-10:00		588	509	212	92	496	570	499
10:00-11:00		590	499	234	137	502	562	511
11:00-12:00		598	640	274	169	579	613	606
AM Total	0	3,746	3,532	1,848	965	3,158	3,639	3,574
12:00-13:00	640	612	668	333	167	589	644	
13:00-14:00	619	669	676	291	198	675	648	
14:00-15:00	734	739	732	290	206	707	741	
15:00-16:00	882	905	840	309	194	904	910	
16:00-17:00	871	909	820	244	182	890	893	
17:00-18:00	817	774	742	199	161	761	822	
18:00-19:00	491	507	435	173	155	466	543	
19:00-20:00	377	393	377	117	112	371	405	
20:00-21:00	291	275	269	107	118	261	292	
21:00-22:00	207	200	210	110	84	184	215	
22:00-23:00	245	214	261	102	84	209	216	
23:00-24:00	216	209	261	138	116	185	249	
PM Total	6,390	6,406	6,291	2,413	1,777	6,202	6,578	0
24 Hr. Total	6,390	10,152	9,823	4,261	2,742	9,360	10,217	3,574
Noon - Noon	10,136	9,938	8,139	3,378	4,935	9,841	10,152	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
8,074	10,017						

Traffic Engineering Software

Weekly Volume Summary

Tue, Dec 18, 2012

Location: Hwy 410 Sta 024 Rmp 24 - Hwy410 NB to Courtney Pk Dr

LHRS/Offset: 49055 / 0.0 **Region:** Central

Pattern Type: n/a **PCS#:** n/a **Hwy. TVIS#:** 49055024

Count Direction: N/A **Report Dates:** Nov 14, 2012 **to** Nov 20, 2012

Hour Interval	Wed 12/11/14	Thu 15	Fri 16	Sat 17	Sun 18	Mon 19	Tue 20	Wed 21
0:00- 1:00		78	69	204	59	35	77	65
1:00- 2:00		55	53	101	39	32	58	69
2:00- 3:00		58	48	57	34	27	49	75
3:00- 4:00		82	67	43	26	63	70	84
4:00- 5:00		152	134	52	25	132	144	164
5:00- 6:00		426	402	122	62	390	398	388
6:00- 7:00		989	949	245	94	957	987	985
7:00- 8:00		1,153	1,131	272	92	1,139	1,034	1,082
8:00- 9:00		1,332	1,204	266	120	1,335	1,244	1,259
9:00-10:00		878	836	324	125	912	946	891
10:00-11:00		650	690	297	169	645	707	719
11:00-12:00		631	624	276	160	559	629	640
AM Total	0	6,484	6,207	2,259	1,005	6,226	6,343	6,421
12:00-13:00	621	661	710	245	146	629	622	
13:00-14:00	669	681	682	266	205	634	672	
14:00-15:00	691	696	657	247	181	690	688	
15:00-16:00	561	500	559	226	178	560	577	
16:00-17:00	389	429	411	198	158	415	436	
17:00-18:00	343	351	410	223	169	297	332	
18:00-19:00	362	419	394	207	147	470	379	
19:00-20:00	246	242	542	137	121	535	235	
20:00-21:00	197	217	269	152	156	224	217	
21:00-22:00	194	175	265	133	101	196	181	
22:00-23:00	275	165	304	89	105	148	177	
23:00-24:00	119	108	268	65	59	93	108	
PM Total	4,667	4,644	5,471	2,188	1,726	4,891	4,624	0
24 Hr. Total	4,667	11,128	11,678	4,447	2,731	11,117	10,967	6,421
Noon - Noon	11,151	10,851	7,730	3,193	7,952	11,234	11,045	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
9,022	11,070						

Traffic Engineering Software

Weekly Volume Summary

Thu, Aug 23, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: NB **Report Dates:** Jul 10, 2012 **to** Jul 16, 2012

Hour Interval	Tue 12/07/10	Wed 11	Thu 12	Fri 13	Sat 14	Sun 15	Mon 16	Tue 17
0:00- 1:00		1,354	1,474	1,602	2,163	2,315	1,729	1,641
1:00- 2:00		923	889	979	1,520	1,731	984	1,119
2:00- 3:00		680	763	877	1,282	1,306	713	854
3:00- 4:00		725	696	843	1,030	1,002	799	876
4:00- 5:00		1,112	1,144	1,139	913	677	1,268	1,385
5:00- 6:00		3,041	3,169	3,096	1,467	777	3,737	3,906
6:00- 7:00		5,685	5,696	5,574	2,356	1,111	6,781	7,067
7:00- 8:00		6,011	6,270	6,345	2,642	1,462	7,732	8,109
8:00- 9:00		6,125	6,149	5,982	3,384	1,917	7,377	7,567
9:00-10:00		4,809	4,858	4,816	4,040	2,506	5,846	6,144
10:00-11:00		4,456	4,731	4,700	4,372	3,219	5,524	5,548
11:00-12:00		4,786	4,681	5,038	4,617	3,850	5,946	6,323
AM Total	0	39,707	40,520	40,991	29,786	21,873	48,436	50,539
12:00-13:00	4,452	5,075	5,142	5,471	5,067	4,413	5,787	
13:00-14:00	5,153	5,649	5,673	6,010	5,057	4,666	6,717	
14:00-15:00	6,117	6,436	6,385	6,891	5,187	4,663	7,595	
15:00-16:00	6,788	6,665	6,564	6,087	5,222	5,328	8,448	
16:00-17:00	4,717	6,217	5,647	5,960	4,922	5,935	5,971	
17:00-18:00	5,061	5,025	5,392	5,547	4,954	5,738	6,304	
18:00-19:00	5,667	5,139	5,186	5,448	5,120	5,737	6,308	
19:00-20:00	4,605	4,827	5,080	5,127	4,271	5,486	5,728	
20:00-21:00	3,977	4,240	4,602	4,418	3,602	4,729	5,013	
21:00-22:00	3,812	4,170	4,183	3,986	3,793	4,707	4,682	
22:00-23:00	3,105	3,327	3,420	3,412	3,418	3,724	3,643	
23:00-24:00	2,320	2,516	2,725	2,967	3,194	2,842	2,773	
PM Total	55,774	59,286	59,999	61,324	53,807	57,968	68,969	0
24 Hr. Total	55,774	98,993	100,519	102,315	83,593	79,841	117,405	50,539
Noon - Noon	95,481	99,806	100,990	91,110	75,680	106,404	119,508	

Traffic Engineering Software

Weekly Volume Summary

Thu, Aug 23, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: SB **Report Dates:** Jul 10, 2012 **to** Jul 16, 2012

Hour Interval	Tue 12/07/10	Wed 11	Thu 12	Fri 13	Sat 14	Sun 15	Mon 16	Tue 17
0:00- 1:00		1,144	1,299	1,382	1,923	2,342	1,070	1,065
1:00- 2:00		742	786	782	1,171	1,411	571	625
2:00- 3:00		603	620	642	760	826	463	601
3:00- 4:00		527	582	686	592	642	558	566
4:00- 5:00		1,150	1,136	1,207	666	498	1,069	1,127
5:00- 6:00		3,400	3,398	3,260	1,225	727	3,331	3,513
6:00- 7:00		5,891	5,854	5,885	2,277	1,321	5,843	5,809
7:00- 8:00		5,898	6,088	6,028	2,807	1,629	6,034	6,113
8:00- 9:00		5,473	5,929	5,806	3,684	2,143	5,988	5,456
9:00-10:00		5,722	5,718	5,464	4,284	3,072	5,486	5,668
10:00-11:00		5,165	5,180	5,254	4,984	4,193	4,976	4,988
11:00-12:00		5,162	5,327	5,337	5,379	4,384	5,039	5,033
AM Total	0	40,877	41,917	41,733	29,752	23,188	40,428	40,564
12:00-13:00	4,708	5,215	5,285	5,258	5,422	4,764	5,063	
13:00-14:00	4,850	5,394	5,268	5,527	5,356	5,082	5,070	
14:00-15:00	5,573	5,770	5,607	5,673	5,219	5,143	5,636	
15:00-16:00	5,766	5,826	5,857	5,752	5,131	4,590	5,628	
16:00-17:00	5,480	5,794	5,843	5,622	4,677	4,888	5,693	
17:00-18:00	5,473	5,200	5,440	5,195	4,700	4,421	5,335	
18:00-19:00	4,713	5,122	4,663	4,994	4,748	4,498	4,311	
19:00-20:00	4,150	4,196	4,367	4,796	4,258	4,226	3,825	
20:00-21:00	3,794	3,595	3,843	3,967	3,672	3,866	3,349	
21:00-22:00	3,353	3,300	3,529	3,581	3,556	3,761	3,164	
22:00-23:00	2,870	3,008	3,193	3,349	3,527	3,091	2,617	
23:00-24:00	2,122	2,323	2,429	3,077	3,001	1,984	1,903	
PM Total	52,852	54,743	55,324	56,791	53,267	50,314	51,594	0
24 Hr. Total	52,852	95,620	97,241	98,524	83,019	73,502	92,022	40,564
Noon - Noon	93,729	96,660	97,057	86,543	76,455	90,742	92,158	

Traffic Engineering Software

Weekly Volume Summary

Thu, Aug 23, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: NB/SB **Report Dates:** Jul 10, 2012 **to** Jul 16, 2012

Hour Interval	Tue 12/07/10	Wed 11	Thu 12	Fri 13	Sat 14	Sun 15	Mon 16	Tue 17
0:00- 1:00		2,498	2,773	2,984	4,086	4,657	2,799	2,706
1:00- 2:00		1,665	1,675	1,761	2,691	3,142	1,555	1,744
2:00- 3:00		1,283	1,383	1,519	2,042	2,132	1,176	1,455
3:00- 4:00		1,252	1,278	1,529	1,622	1,644	1,357	1,442
4:00- 5:00		2,262	2,280	2,346	1,579	1,175	2,337	2,512
5:00- 6:00		6,441	6,567	6,356	2,692	1,504	7,068	7,419
6:00- 7:00		11,576	11,550	11,459	4,633	2,432	12,624	12,876
7:00- 8:00		11,909	12,358	12,373	5,449	3,091	13,766	14,222
8:00- 9:00		11,598	12,078	11,788	7,068	4,060	13,365	13,023
9:00-10:00		10,531	10,576	10,280	8,324	5,578	11,332	11,812
10:00-11:00		9,621	9,911	9,954	9,356	7,412	10,500	10,536
11:00-12:00		9,948	10,008	10,375	9,996	8,234	10,985	11,356
AM Total	0	80,584	82,437	82,724	59,538	45,061	88,864	91,103
12:00-13:00	9,160	10,290	10,427	10,729	10,489	9,177	10,850	
13:00-14:00	10,003	11,043	10,941	11,537	10,413	9,748	11,787	
14:00-15:00	11,690	12,206	11,992	12,564	10,406	9,806	13,231	
15:00-16:00	12,554	12,491	12,421	11,839	10,353	9,918	14,076	
16:00-17:00	10,197	12,011	11,490	11,582	9,599	10,823	11,664	
17:00-18:00	10,534	10,225	10,832	10,742	9,654	10,159	11,639	
18:00-19:00	10,380	10,261	9,849	10,442	9,868	10,235	10,619	
19:00-20:00	8,755	9,023	9,447	9,923	8,529	9,712	9,553	
20:00-21:00	7,771	7,835	8,445	8,385	7,274	8,595	8,362	
21:00-22:00	7,165	7,470	7,712	7,567	7,349	8,468	7,846	
22:00-23:00	5,975	6,335	6,613	6,761	6,945	6,815	6,260	
23:00-24:00	4,442	4,839	5,154	6,044	6,195	4,826	4,676	
PM Total	108,626	114,029	115,323	118,115	107,074	108,282	120,563	0
24 Hr. Total	108,626	194,613	197,760	200,839	166,612	153,343	209,427	91,103
Noon - Noon	189,210	196,466	198,047	177,653	152,135	197,146	211,666	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
188,903	198,847	183,009	181,352	193,989	179,539	172,028	18,667

Traffic Engineering Software

Weekly Volume Summary

Thu, Aug 23, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: NB **Report Dates:** Jul 17, 2012 **to** Jul 23, 2012

Hour Interval	Tue 12/07/17	Wed 18	Thu 19	Fri 20	Sat 21	Sun 22	Mon 23	Tue 24
0:00- 1:00		1,847	2,069	1,923	2,885	3,068	1,616	1,558
1:00- 2:00		1,082	1,254	1,197	2,013	2,427	1,027	973
2:00- 3:00		822	903	1,081	1,606	1,789	748	710
3:00- 4:00		878	960	1,124	1,370	1,366	717	723
4:00- 5:00		1,300	1,403	1,364	1,126	852	1,312	1,131
5:00- 6:00		3,724	3,851	3,573	1,684	1,018	3,630	3,831
6:00- 7:00		6,784	7,165	6,897	2,846	1,405	6,864	6,968
7:00- 8:00		7,901	8,171	8,072	3,786	2,061	7,694	7,773
8:00- 9:00		7,590	7,687	7,629	4,328	2,455	7,793	7,648
9:00-10:00		5,964	6,091	6,053	4,924	3,217	5,720	6,130
10:00-11:00		5,722	5,601	5,838	5,747	4,121	5,353	5,614
11:00-12:00		5,948	6,212	6,475	5,894	4,769	6,009	5,740
AM Total	0	49,562	51,367	51,226	38,209	28,548	48,483	48,799
12:00-13:00	6,705	6,477	6,545	7,022	6,292	5,416	6,087	
13:00-14:00	6,959	7,021	7,356	7,581	6,563	5,728	6,834	
14:00-15:00	8,264	7,820	7,907	8,269	6,565	6,074	7,650	
15:00-16:00	8,479	8,539	8,508	8,398	6,379	6,045	8,454	
16:00-17:00	7,437	7,234	6,510	7,049	6,429	5,506	7,153	
17:00-18:00	6,577	6,541	5,743	6,543	6,297	5,933	6,288	
18:00-19:00	6,422	6,564	7,301	6,816	6,477	5,746	6,299	
19:00-20:00	5,840	6,233	6,465	6,432	5,573	5,102	5,597	
20:00-21:00	4,886	5,429	5,644	5,977	4,721	4,699	4,692	
21:00-22:00	4,690	5,273	5,166	5,252	4,677	4,262	4,307	
22:00-23:00	3,718	4,424	4,110	4,620	4,399	3,893	3,625	
23:00-24:00	2,770	3,375	3,157	3,947	4,011	2,724	2,843	
PM Total	72,747	74,930	74,412	77,906	68,383	61,128	69,829	0
24 Hr. Total	72,747	124,492	125,779	129,132	106,592	89,676	118,312	48,799
Noon - Noon	122,309	126,297	125,638	116,115	96,931	109,611	118,628	

Traffic Engineering Software

Weekly Volume Summary

Thu, Aug 23, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: SB **Report Dates:** Jul 17, 2012 **to** Jul 23, 2012

Hour Interval	Tue 12/07/17	Wed 18	Thu 19	Fri 20	Sat 21	Sun 22	Mon 23	Tue 24
0:00- 1:00		1,095	1,245	1,252	1,871	2,007	996	1,076
1:00- 2:00		702	708	738	1,108	1,368	550	670
2:00- 3:00		586	638	655	818	864	472	593
3:00- 4:00		554	641	714	677	590	501	535
4:00- 5:00		1,120	1,076	1,204	652	570	1,098	1,198
5:00- 6:00		3,306	3,489	3,243	1,264	751	3,368	3,410
6:00- 7:00		5,899	6,095	5,852	2,225	1,250	5,963	6,118
7:00- 8:00		6,070	6,062	6,080	2,757	1,574	5,889	6,200
8:00- 9:00		6,009	5,991	5,902	3,681	2,060	5,851	6,172
9:00-10:00		5,413	5,621	5,371	4,252	3,109	5,364	5,622
10:00-11:00		5,104	5,238	5,087	4,775	3,925	4,946	5,054
11:00-12:00		5,170	5,161	5,269	5,248	4,303	4,956	5,098
AM Total	0	41,028	41,965	41,367	29,328	22,371	39,954	41,746
12:00-13:00	5,243	5,310	5,231	5,494	5,379	4,533	5,059	
13:00-14:00	5,199	5,274	5,415	5,724	5,311	4,975	5,271	
14:00-15:00	5,623	5,587	5,283	5,836	5,280	5,004	5,657	
15:00-16:00	5,046	5,853	5,688	5,816	5,038	4,782	5,765	
16:00-17:00	5,585	5,835	5,667	5,613	4,725	4,567	5,646	
17:00-18:00	4,455	5,589	5,443	5,113	4,637	4,529	5,161	
18:00-19:00	4,567	4,802	4,720	4,872	4,418	4,521	4,356	
19:00-20:00	3,854	4,106	4,339	4,632	3,981	4,265	3,600	
20:00-21:00	3,577	3,512	3,876	3,970	3,475	4,153	3,318	
21:00-22:00	3,306	3,402	3,484	3,602	3,317	3,693	2,845	
22:00-23:00	2,683	2,924	2,861	3,278	3,444	3,028	2,438	
23:00-24:00	1,863	2,053	2,189	2,837	2,836	1,974	1,733	
PM Total	51,001	54,247	54,196	56,787	51,841	50,024	50,849	0
24 Hr. Total	51,001	95,275	96,161	98,154	81,169	72,395	90,803	41,746
Noon - Noon	92,029	96,212	95,563	86,115	74,212	89,978	92,595	

Traffic Engineering Software

Weekly Volume Summary

Thu, Aug 23, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: NB/SB **Report Dates:** Jul 17, 2012 **to** Jul 23, 2012

Hour Interval	Tue 12/07/17	Wed 18	Thu 19	Fri 20	Sat 21	Sun 22	Mon 23	Tue 24
0:00- 1:00		2,942	3,314	3,175	4,756	5,075	2,612	2,634
1:00- 2:00		1,784	1,962	1,935	3,121	3,795	1,577	1,643
2:00- 3:00		1,408	1,541	1,736	2,424	2,653	1,220	1,303
3:00- 4:00		1,432	1,601	1,838	2,047	1,956	1,218	1,258
4:00- 5:00		2,420	2,479	2,568	1,778	1,422	2,410	2,329
5:00- 6:00		7,030	7,340	6,816	2,948	1,769	6,998	7,241
6:00- 7:00		12,683	13,260	12,749	5,071	2,655	12,827	13,086
7:00- 8:00		13,971	14,233	14,152	6,543	3,635	13,583	13,973
8:00- 9:00		13,599	13,678	13,531	8,009	4,515	13,644	13,820
9:00-10:00		11,377	11,712	11,424	9,176	6,326	11,084	11,752
10:00-11:00		10,826	10,839	10,925	10,522	8,046	10,299	10,668
11:00-12:00		11,118	11,373	11,744	11,142	9,072	10,965	10,838
AM Total	0	90,590	93,332	92,593	67,537	50,919	88,437	90,545
12:00-13:00	11,948	11,787	11,776	12,516	11,671	9,949	11,146	
13:00-14:00	12,158	12,295	12,771	13,305	11,874	10,703	12,105	
14:00-15:00	13,887	13,407	13,190	14,105	11,845	11,078	13,307	
15:00-16:00	13,525	14,392	14,196	14,214	11,417	10,827	14,219	
16:00-17:00	13,022	13,069	12,177	12,662	11,154	10,073	12,799	
17:00-18:00	11,032	12,130	11,186	11,656	10,934	10,462	11,449	
18:00-19:00	10,989	11,366	12,021	11,688	10,895	10,267	10,655	
19:00-20:00	9,694	10,339	10,804	11,064	9,554	9,367	9,197	
20:00-21:00	8,463	8,941	9,520	9,947	8,196	8,852	8,010	
21:00-22:00	7,996	8,675	8,650	8,854	7,994	7,955	7,152	
22:00-23:00	6,401	7,348	6,971	7,898	7,843	6,921	6,063	
23:00-24:00	4,633	5,428	5,346	6,784	6,847	4,698	4,576	
PM Total	123,748	129,177	128,608	134,693	120,224	111,152	120,678	0
24 Hr. Total	123,748	219,767	221,940	227,286	187,761	162,071	209,115	90,545
Noon - Noon	214,338	222,509	221,201	202,230	171,143	199,589	211,223	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
206,033	217,318	187,490	193,413	198,740	191,479	176,241	19,124

Traffic Engineering Software

Weekly Volume Summary

Thu, Aug 23, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: NB **Report Dates:** Jul 23, 2012 **to** Jul 29, 2012

Hour Interval	Mon 12/07/23	Tue 24	Wed 25	Thu 26	Fri 27	Sat 28	Sun 29	Mon 30
0:00- 1:00		1,558	1,883	1,783	2,042	2,808	3,553	1,851
1:00- 2:00		973	1,134	1,013	1,320	2,014	2,679	1,004
2:00- 3:00		710	948	845	1,153	1,626	2,103	745
3:00- 4:00		723	820	931	1,018	1,222	1,474	808
4:00- 5:00		1,131	1,340	1,365	1,425	1,020	980	1,307
5:00- 6:00		3,831	3,729	3,702	3,642	1,577	1,204	3,696
6:00- 7:00		6,968	6,862	6,837	6,887	2,708	1,772	6,667
7:00- 8:00		7,773	7,750	7,749	8,044	3,536	2,356	7,928
8:00- 9:00		7,648	7,671	7,549	7,651	4,189	2,976	7,922
9:00-10:00		6,130	6,152	5,953	6,049	4,807	4,046	5,985
10:00-11:00		5,614	5,759	5,587	6,037	5,231	4,826	5,440
11:00-12:00		5,740	6,035	5,831	6,388	5,609	5,128	5,732
AM Total	0	48,799	50,083	49,145	51,656	36,347	33,097	49,085
12:00-13:00	6,087	6,294	6,383	6,500	7,067	6,120	5,715	
13:00-14:00	6,834	6,807	7,014	7,267	7,488	6,467	5,858	
14:00-15:00	7,650	7,769	7,895	8,025	8,588	6,708	5,812	
15:00-16:00	8,454	8,557	8,572	8,699	8,182	6,504	5,931	
16:00-17:00	7,153	6,838	7,091	7,243	7,124	6,513	5,743	
17:00-18:00	6,288	6,704	6,189	6,640	6,715	6,487	5,782	
18:00-19:00	6,299	6,610	6,937	6,827	6,771	6,314	5,688	
19:00-20:00	5,597	5,970	6,035	6,197	6,128	5,488	5,367	
20:00-21:00	4,692	5,310	5,435	5,482	5,479	4,764	4,990	
21:00-22:00	4,307	4,868	4,916	5,178	5,056	4,701	4,969	
22:00-23:00	3,625	4,259	3,879	4,348	4,867	4,750	4,076	
23:00-24:00	2,843	3,240	3,055	3,189	4,447	4,770	2,999	
PM Total	69,829	73,226	73,401	75,595	77,912	69,586	62,930	0
24 Hr. Total	69,829	122,025	123,484	124,740	129,568	105,933	96,027	49,085
Noon - Noon	118,628	123,309	122,546	127,251	114,259	102,683	112,015	

Traffic Engineering Software

Weekly Volume Summary

Thu, Aug 23, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: SB **Report Dates:** Jul 23, 2012 **to** Jul 29, 2012

Hour Interval	Mon 12/07/23	Tue 24	Wed 25	Thu 26	Fri 27	Sat 28	Sun 29	Mon 30
0:00- 1:00		1,076	1,103	1,123	1,288	1,716	1,988	993
1:00- 2:00		670	712	692	745	1,088	1,193	590
2:00- 3:00		593	592	602	617	815	750	481
3:00- 4:00		535	562	549	628	617	517	534
4:00- 5:00		1,198	1,147	1,126	1,126	706	518	1,048
5:00- 6:00		3,410	3,316	3,235	3,175	1,178	712	3,251
6:00- 7:00		6,118	5,998	5,760	4,945	2,193	1,217	5,886
7:00- 8:00		6,200	6,065	5,945	5,078	2,706	1,391	6,077
8:00- 9:00		6,172	6,162	5,965	5,842	3,420	1,854	5,915
9:00-10:00		5,622	5,525	5,627	5,285	4,138	2,930	5,473
10:00-11:00		5,054	5,006	5,173	5,088	4,636	3,906	5,032
11:00-12:00		5,098	5,021	5,299	5,409	5,047	4,221	4,925
AM Total	0	41,746	41,209	41,096	39,226	28,260	21,197	40,205
12:00-13:00	5,059	5,057	5,188	5,239	5,560	5,076	4,472	
13:00-14:00	5,271	5,289	5,183	5,294	5,601	5,097	4,739	
14:00-15:00	5,657	5,487	5,624	5,634	5,820	5,024	4,758	
15:00-16:00	5,765	5,855	5,795	5,844	5,947	4,941	4,490	
16:00-17:00	5,646	5,703	5,828	5,861	5,518	4,667	4,454	
17:00-18:00	5,161	5,455	4,748	5,287	5,297	4,443	4,427	
18:00-19:00	4,356	4,535	4,859	4,692	4,851	4,440	4,349	
19:00-20:00	3,600	4,037	4,095	4,137	4,519	4,142	4,082	
20:00-21:00	3,318	3,512	3,625	3,629	3,916	3,441	4,041	
21:00-22:00	2,845	3,199	3,115	3,259	3,393	3,417	3,690	
22:00-23:00	2,438	2,787	2,579	2,921	3,043	3,190	3,165	
23:00-24:00	1,733	1,955	1,686	2,108	2,527	2,664	1,922	
PM Total	50,849	52,871	52,325	53,905	55,992	50,542	48,589	0
24 Hr. Total	50,849	94,617	93,534	95,001	95,218	78,802	69,786	40,205
Noon - Noon	92,595	94,080	93,421	93,131	84,252	71,739	88,794	

Traffic Engineering Software

Weekly Volume Summary

Thu, Aug 23, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: NB/SB **Report Dates:** Jul 23, 2012 **to** Jul 29, 2012

Hour Interval	Mon 12/07/23	Tue 24	Wed 25	Thu 26	Fri 27	Sat 28	Sun 29	Mon 30
0:00- 1:00		2,634	2,986	2,906	3,330	4,524	5,541	2,844
1:00- 2:00		1,643	1,846	1,705	2,065	3,102	3,872	1,594
2:00- 3:00		1,303	1,540	1,447	1,770	2,441	2,853	1,226
3:00- 4:00		1,258	1,382	1,480	1,646	1,839	1,991	1,342
4:00- 5:00		2,329	2,487	2,491	2,551	1,726	1,498	2,355
5:00- 6:00		7,241	7,045	6,937	6,817	2,755	1,916	6,947
6:00- 7:00		13,086	12,860	12,597	11,832	4,901	2,989	12,553
7:00- 8:00		13,973	13,815	13,694	13,122	6,242	3,747	14,005
8:00- 9:00		13,820	13,833	13,514	13,493	7,609	4,830	13,837
9:00-10:00		11,752	11,677	11,580	11,334	8,945	6,976	11,458
10:00-11:00		10,668	10,765	10,760	11,125	9,867	8,732	10,472
11:00-12:00		10,838	11,056	11,130	11,797	10,656	9,349	10,657
AM Total	0	90,545	91,292	90,241	90,882	64,607	54,294	89,290
12:00-13:00	11,146	11,351	11,571	11,739	12,627	11,196	10,187	
13:00-14:00	12,105	12,096	12,197	12,561	13,089	11,564	10,597	
14:00-15:00	13,307	13,256	13,519	13,659	14,408	11,732	10,570	
15:00-16:00	14,219	14,412	14,367	14,543	14,129	11,445	10,421	
16:00-17:00	12,799	12,541	12,919	13,104	12,642	11,180	10,197	
17:00-18:00	11,449	12,159	10,937	11,927	12,012	10,930	10,209	
18:00-19:00	10,655	11,145	11,796	11,519	11,622	10,754	10,037	
19:00-20:00	9,197	10,007	10,130	10,334	10,647	9,630	9,449	
20:00-21:00	8,010	8,822	9,060	9,111	9,395	8,205	9,031	
21:00-22:00	7,152	8,067	8,031	8,437	8,449	8,118	8,659	
22:00-23:00	6,063	7,046	6,458	7,269	7,910	7,940	7,241	
23:00-24:00	4,576	5,195	4,741	5,297	6,974	7,434	4,921	
PM Total	120,678	126,097	125,726	129,500	133,904	120,128	111,519	0
24 Hr. Total	120,678	216,642	217,018	219,741	224,786	184,735	165,813	89,290
Noon - Noon	211,223	217,389	215,967	220,382	198,511	174,422	200,809	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
205,529	216,240	187,031	192,454	198,253	190,529	175,810	19,077

Traffic Engineering Software

Weekly Volume Summary

Wed, Nov 14, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: NB **Report Dates:** Sep 19, 2012 **to** Sep 25, 2012

Hour Interval	Wed 12/09/19	Thu 20	Fri 21	Sat 22	Sun 23	Mon 24	Tue 25	Wed 26
0:00- 1:00		1,819	2,101	2,779	2,951	1,491	1,766	1,691
1:00- 2:00		974	1,211	1,855	2,615	756	1,000	1,043
2:00- 3:00		833	1,056	1,509	1,869	620	741	759
3:00- 4:00		836	1,002	1,292	1,420	661	753	780
4:00- 5:00		1,240	1,449	1,032	927	1,018	1,144	1,154
5:00- 6:00		3,254	3,332	1,537	895	3,176	3,335	3,194
6:00- 7:00		6,402	6,514	2,292	1,180	6,404	6,618	6,516
7:00- 8:00		8,563	8,498	3,314	1,878	8,196	8,628	8,713
8:00- 9:00		8,316	8,187	4,103	2,346	8,215	8,486	8,664
9:00-10:00		6,440	6,544	4,696	2,933	6,572	6,435	6,037
10:00-11:00		5,630	5,713	5,224	3,962	5,298	5,707	5,296
11:00-12:00		5,833	6,240	5,776	4,811	5,741	5,941	5,668
AM Total	0	50,140	51,847	35,409	27,787	48,148	50,554	49,515
12:00-13:00	6,138	6,204	6,767	6,077	5,714	6,242	6,350	
13:00-14:00	6,632	6,737	6,693	6,653	5,985	6,509	7,102	
14:00-15:00	6,673	7,380	7,972	7,173	6,266	7,953	8,051	
15:00-16:00	6,541	6,703	8,158	7,081	6,482	8,339	8,584	
16:00-17:00	7,811	5,765	7,522	7,174	6,055	7,916	7,424	
17:00-18:00	6,676	5,214	6,909	7,228	6,007	6,648	6,669	
18:00-19:00	6,995	6,459	7,380	7,032	5,961	7,012	6,850	
19:00-20:00	6,388	6,454	6,367	5,966	5,565	6,248	6,704	
20:00-21:00	5,613	5,789	6,265	5,038	4,694	5,080	5,591	
21:00-22:00	5,046	5,093	5,189	4,280	3,776	4,527	4,782	
22:00-23:00	4,145	4,267	4,385	4,052	3,064	3,603	3,947	
23:00-24:00	2,774	3,569	3,903	3,634	2,256	2,581	2,717	
PM Total	71,432	69,634	77,510	71,388	61,825	72,658	74,771	0
24 Hr. Total	71,432	119,774	129,357	106,797	89,612	120,806	125,325	49,515
Noon - Noon	121,572	121,481	112,919	99,175	109,973	123,212	124,286	

Traffic Engineering Software

Weekly Volume Summary

Wed, Nov 14, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

Count Direction: SB **Report Dates:** Sep 19, 2012 **to** Sep 25, 2012

Hour Interval	Wed 12/09/19	Thu 20	Fri 21	Sat 22	Sun 23	Mon 24	Tue 25	Wed 26
0:00- 1:00		1,147	1,238	1,731	1,948	793	1,063	1,089
1:00- 2:00		717	776	1,034	1,440	486	651	644
2:00- 3:00		600	623	746	874	407	567	554
3:00- 4:00		626	666	619	548	499	547	574
4:00- 5:00		1,238	1,332	700	489	1,143	1,144	1,201
5:00- 6:00		3,603	3,514	1,245	778	3,569	3,719	3,665
6:00- 7:00		6,132	5,889	2,259	1,269	5,787	3,917	5,948
7:00- 8:00		6,168	6,192	2,921	1,587	5,055	5,933	6,172
8:00- 9:00		6,132	6,175	3,971	2,198	5,868	5,991	5,932
9:00-10:00		5,697	5,618	4,401	3,291	5,647	5,633	5,310
10:00-11:00		5,251	5,114	4,654	4,318	4,788	5,035	4,947
11:00-12:00		5,104	5,275	5,067	4,461	4,861	5,080	4,927
AM Total	0	42,415	42,412	29,348	23,201	38,903	39,280	40,963
12:00-13:00	5,012	5,088	5,269	5,512	5,001	4,979	5,283	
13:00-14:00	5,077	5,155	5,319	5,546	5,428	4,913	5,054	
14:00-15:00	5,569	5,100	5,663	5,634	5,382	5,571	5,594	
15:00-16:00	5,793	5,596	5,997	5,598	5,098	6,026	6,055	
16:00-17:00	5,882	5,895	5,823	5,362	4,914	5,519	6,018	
17:00-18:00	5,076	5,171	5,188	5,166	4,517	5,332	4,974	
18:00-19:00	4,925	4,706	4,974	5,161	4,437	4,648	4,989	
19:00-20:00	4,265	4,248	4,836	4,310	4,124	3,964	4,352	
20:00-21:00	3,637	3,632	4,194	3,658	3,651	3,303	3,540	
21:00-22:00	3,078	3,084	3,401	3,173	2,999	2,827	3,080	
22:00-23:00	2,659	2,665	3,117	3,076	2,439	2,280	2,282	
23:00-24:00	2,091	2,035	2,751	2,736	1,449	1,817	1,887	
PM Total	53,064	52,375	56,532	54,932	49,439	51,179	53,108	0
24 Hr. Total	53,064	94,790	98,944	84,280	72,640	90,082	92,388	40,963
Noon - Noon	95,479	94,787	85,880	78,133	88,342	90,459	94,071	

Traffic Engineering Software

Weekly Volume Summary

Wed, Nov 14, 2012

Location: Hwy 410 - 0.70km N OF COURTNEY PARK DR IC

LHRS/Offset: 49055 / 0.70 **Region:** Central

Pattern Type: Urban Commuter **PCS#:** 34 **Hwy. TVIS#:** 410105

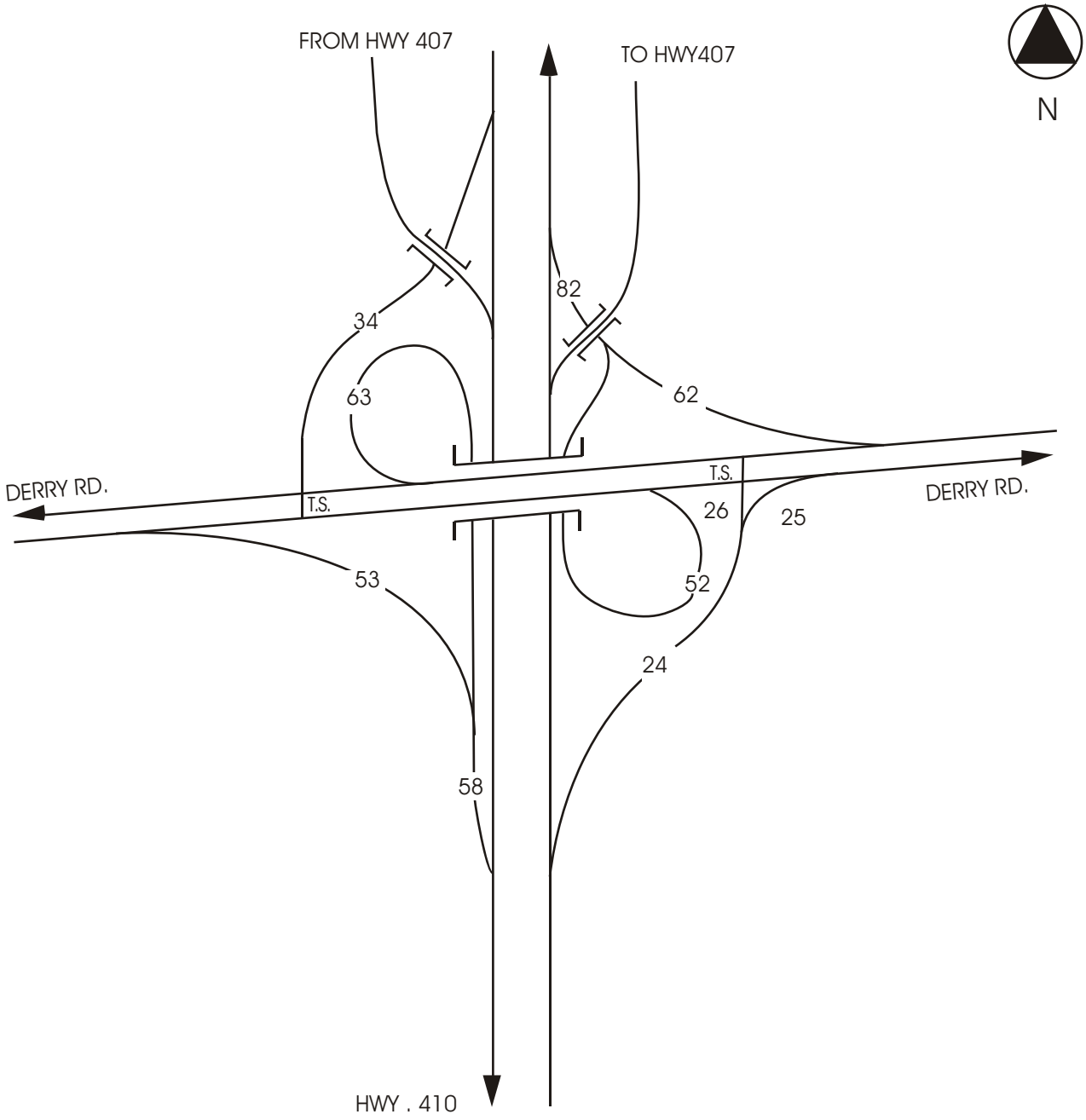
Count Direction: NB/SB **Report Dates:** Sep 19, 2012 **to** Sep 25, 2012

Hour Interval	Wed 12/09/19	Thu 20	Fri 21	Sat 22	Sun 23	Mon 24	Tue 25	Wed 26
0:00- 1:00		2,966	3,339	4,510	4,899	2,284	2,829	2,780
1:00- 2:00		1,691	1,987	2,889	4,055	1,242	1,651	1,687
2:00- 3:00		1,433	1,679	2,255	2,743	1,027	1,308	1,313
3:00- 4:00		1,462	1,668	1,911	1,968	1,160	1,300	1,354
4:00- 5:00		2,478	2,781	1,732	1,416	2,161	2,288	2,355
5:00- 6:00		6,857	6,846	2,782	1,673	6,745	7,054	6,859
6:00- 7:00		12,534	12,403	4,551	2,449	12,191	10,535	12,464
7:00- 8:00		14,731	14,690	6,235	3,465	13,251	14,561	14,885
8:00- 9:00		14,448	14,362	8,074	4,544	14,083	14,477	14,596
9:00-10:00		12,137	12,162	9,097	6,224	12,219	12,068	11,347
10:00-11:00		10,881	10,827	9,878	8,280	10,086	10,742	10,243
11:00-12:00		10,937	11,515	10,843	9,272	10,602	11,021	10,595
AM Total	0	92,555	94,259	64,757	50,988	87,051	89,834	90,478
12:00-13:00	11,150	11,292	12,036	11,589	10,715	11,221	11,633	
13:00-14:00	11,709	11,892	12,012	12,199	11,413	11,422	12,156	
14:00-15:00	12,242	12,480	13,635	12,807	11,648	13,524	13,645	
15:00-16:00	12,334	12,299	14,155	12,679	11,580	14,365	14,639	
16:00-17:00	13,693	11,660	13,345	12,536	10,969	13,435	13,442	
17:00-18:00	11,752	10,385	12,097	12,394	10,524	11,980	11,643	
18:00-19:00	11,920	11,165	12,354	12,193	10,398	11,660	11,839	
19:00-20:00	10,653	10,702	11,203	10,276	9,689	10,212	11,056	
20:00-21:00	9,250	9,421	10,459	8,696	8,345	8,383	9,131	
21:00-22:00	8,124	8,177	8,590	7,453	6,775	7,354	7,862	
22:00-23:00	6,804	6,932	7,502	7,128	5,503	5,883	6,229	
23:00-24:00	4,865	5,604	6,654	6,370	3,705	4,398	4,604	
PM Total	124,496	122,009	134,042	126,320	111,264	123,837	127,879	0
24 Hr. Total	124,496	214,564	228,301	191,077	162,252	210,888	217,713	90,478
Noon - Noon	217,051	216,268	198,799	177,308	198,315	213,671	218,357	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
205,681	216,337	201,568	203,357	213,662	201,323	189,474	20,560

MINISTRY OF TRANSPORTATION
INTERCHANGE FILE

HWY.	410 IC	KEYPOINT NUMBER	49062/000
AT	DERRY RD. - PEEL RD. 5	M.T.O. DISTRICT	TORONTO
		O.P.P. DISTRICT	5 AURORA



UPDATED 06- 06- 27

PROGRAM DEVELOPMENT & EVALUATION OFFICE

88 - 08 - 22
DATE

Traffic Engineering Software

Weekly Volume Summary

Tue, Dec 18, 2012

Location: Hwy 410 Sta 062 Rmp 62 - Derry Rd WB to Hwy 410 SB

LHRS/Offset: 49062 / 0.0 **Region:** Central

Pattern Type: n/a **PCS#:** n/a **Hwy. TVIS#:** 49062063

Count Direction: N/A **Report Dates:** Nov 14, 2012 **to** Nov 20, 2012

Hour Interval	Wed 12/11/14	Thu 15	Fri 16	Sat 17	Sun 18	Mon 19	Tue 20	Wed 21
0:00- 1:00		168	357	226	235	192	168	163
1:00- 2:00		159	184	168	326	131	134	125
2:00- 3:00		150	110	243	283	227	111	165
3:00- 4:00		125	325	232	160	145	104	152
4:00- 5:00		180	324	215	324	162	162	210
5:00- 6:00		270	331	112	274	153	160	177
6:00- 7:00		251	425	291	238	258	288	272
7:00- 8:00		362	363	292	168	358	373	368
8:00- 9:00		420	416	285	138	404	382	385
9:00-10:00		350	381	264	187	338	347	373
10:00-11:00		376	412	227	158	359	430	434
11:00-12:00		473	463	336	201	423	464	404
AM Total	0	3,284	4,091	2,891	2,692	3,150	3,123	3,228
12:00-13:00	455	479	473	358	225	487	468	
13:00-14:00	491	584	570	372	284	473	473	
14:00-15:00	511	526	486	344	263	497	506	
15:00-16:00	708	587	517	343	244	548	533	
16:00-17:00	639	649	570	280	218	613	687	
17:00-18:00	537	425	527	280	335	442	476	
18:00-19:00	478	459	398	318	201	367	469	
19:00-20:00	421	410	357	238	152	345	341	
20:00-21:00	316	345	303	201	211	298	303	
21:00-22:00	272	357	300	224	295	292	372	
22:00-23:00	241	294	281	268	276	232	274	
23:00-24:00	230	394	212	345	156	232	214	
PM Total	5,299	5,509	4,994	3,571	2,860	4,826	5,116	0
24 Hr. Total	5,299	8,793	9,085	6,462	5,552	7,976	8,239	3,228
Noon - Noon	8,583	9,600	7,885	6,263	6,010	7,949	8,344	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
7,805	8,619						

Traffic Engineering Software

Weekly Volume Summary

Tue, Dec 18, 2012

Location: Hwy 410 & Derrd Rd - On ramp From Deery Rd EB to 410 SB

LHRS/Offset: 49062 / 0.0 **Region:** Central

Pattern Type: n/a **PCS#:** n/a **Hwy. TVIS#:** 49062053

Count Direction: N/A **Report Dates:** Nov 14, 2012 **to** Nov 20, 2012

Hour Interval	Wed 12/11/14	Thu 15	Fri 16	Sat 17	Sun 18	Mon 19	Tue 20	Wed 21
0:00- 1:00		112	110	123	114	48	89	84
1:00- 2:00		51	61	72	81	31	41	53
2:00- 3:00		43	49	46	43	28	43	41
3:00- 4:00		47	43	52	31	36	38	30
4:00- 5:00		82	80	41	31	67	82	76
5:00- 6:00		209	191	85	53	178	208	194
6:00- 7:00		347	312	136	75	358	339	356
7:00- 8:00		523	488	138	93	528	487	518
8:00- 9:00		548	498	201	121	542	565	541
9:00-10:00		394	342	273	214	338	395	377
10:00-11:00		307	314	275	238	300	305	304
11:00-12:00		311	317	277	295	249	301	315
AM Total	0	2,974	2,805	1,719	1,389	2,703	2,893	2,889
12:00-13:00	326	293	308	276	316	279	313	
13:00-14:00	293	311	363	273	301	318	358	
14:00-15:00	352	364	392	323	278	373	374	
15:00-16:00	415	457	454	295	254	447	457	
16:00-17:00	414	433	427	278	218	409	432	
17:00-18:00	351	334	302	270	219	322	344	
18:00-19:00	279	261	262	261	205	266	254	
19:00-20:00	252	248	259	219	188	220	268	
20:00-21:00	204	214	191	162	165	206	206	
21:00-22:00	226	218	201	161	206	205	203	
22:00-23:00	200	206	198	142	158	203	223	
23:00-24:00	150	153	157	115	99	139	158	
PM Total	3,462	3,492	3,514	2,775	2,607	3,387	3,590	0
24 Hr. Total	3,462	6,466	6,319	4,494	3,996	6,090	6,483	2,889
Noon - Noon	6,436	6,297	5,233	4,164	5,310	6,280	6,479	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
5,743	6,373						

Traffic Engineering Software

Weekly Volume Summary

Tue, Dec 18, 2012

Location: Hwy 410 Sta 024 Rmp 24 - Hwy 410 NB to Derry Rd

LHRS/Offset: 49062 / 0.0 **Region:** Central

Pattern Type: n/a **PCS#:** n/a **Hwy. TVIS#:** 49062024

Count Direction: N/A **Report Dates:** Nov 14, 2012 **to** Nov 20, 2012

Hour Interval	Wed 12/11/14	Thu 15	Fri 16	Sat 17	Sun 18	Mon 19	Tue 20	Wed 21
0:00- 1:00		140	137	303	157	103	104	138
1:00- 2:00		108	113	147	176	66	88	94
2:00- 3:00		73	77	129	122	69	64	80
3:00- 4:00		106	106	99	88	105	106	105
4:00- 5:00		184	182	122	50	152	202	176
5:00- 6:00		587	543	192	92	508	609	551
6:00- 7:00		1,114	1,106	324	132	1,110	1,034	1,107
7:00- 8:00		1,260	1,274	406	190	1,197	1,141	1,175
8:00- 9:00		1,227	1,274	499	237	1,278	1,305	1,269
9:00-10:00		955	905	610	374	913	967	931
10:00-11:00		780	779	613	475	745	787	797
11:00-12:00		748	791	537	463	728	811	818
AM Total	0	7,282	7,287	3,981	2,556	6,974	7,218	7,241
12:00-13:00	654	825	887	601	558	802	837	
13:00-14:00	849	799	1,076	613	503	851	844	
14:00-15:00	877	934	928	552	486	894	944	
15:00-16:00	924	929	928	561	498	941	945	
16:00-17:00	791	946	841	530	487	970	928	
17:00-18:00	824	847	929	502	523	875	823	
18:00-19:00	866	960	946	547	473	882	958	
19:00-20:00	561	577	962	572	472	1,142	604	
20:00-21:00	415	454	513	301	342	424	425	
21:00-22:00	387	377	368	218	256	371	410	
22:00-23:00	377	281	476	208	189	248	305	
23:00-24:00	229	233	418	175	142	220	203	
PM Total	7,754	8,162	9,272	5,380	4,929	8,620	8,226	0
24 Hr. Total	7,754	15,444	16,559	9,361	7,485	15,594	15,444	7,241
Noon - Noon	15,036	15,449	13,253	7,936	11,903	15,838	15,467	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
13,555	15,448						

Traffic Engineering Software

Weekly Volume Summary

Tue, Dec 18, 2012

Location: Hwy 410 Sta 034 Rmp 34 - Hwy 410 SB to Derry Rd

LHRS/Offset: 49062 / 0.0 **Region:** Central

Pattern Type: n/a **PCS#:** n/a **Hwy. TVIS#:** 49062034

Count Direction: N/A **Report Dates:** Nov 14, 2012 **to** Nov 20, 2012

Hour Interval	Wed 12/11/14	Thu 15	Fri 16	Sat 17	Sun 18	Mon 19	Tue 20	Wed 21
0:00- 1:00		93	105	215	136	65	106	93
1:00- 2:00		50	68	161	111	61	67	72
2:00- 3:00		78	95	116	61	91	86	92
3:00- 4:00		114	143	84	67	129	128	124
4:00- 5:00		314	322	161	121	300	305	301
5:00- 6:00		878	847	350	217	814	852	863
6:00- 7:00		1,375	1,394	600	269	1,410	1,328	1,335
7:00- 8:00		1,490	1,511	534	247	1,460	1,169	1,395
8:00- 9:00		1,320	1,623	580	255	1,576	1,055	1,499
9:00-10:00		1,285	1,040	736	427	1,025	1,179	1,010
10:00-11:00		745	778	641	628	773	774	729
11:00-12:00		709	736	583	548	638	672	673
AM Total	0	8,451	8,662	4,761	3,087	8,342	7,721	8,186
12:00-13:00	669	685	732	585	460	694	676	
13:00-14:00	770	805	832	617	583	760	768	
14:00-15:00	983	936	1,049	622	555	922	890	
15:00-16:00	939	971	1,036	558	508	922	940	
16:00-17:00	839	805	826	497	424	936	825	
17:00-18:00	681	831	675	453	431	1,027	676	
18:00-19:00	595	542	636	535	447	534	529	
19:00-20:00	466	454	536	441	320	395	432	
20:00-21:00	320	386	469	320	271	333	352	
21:00-22:00	321	286	395	239	205	281	298	
22:00-23:00	326	383	451	214	247	347	336	
23:00-24:00	216	227	383	193	140	214	228	
PM Total	7,125	7,311	8,020	5,274	4,591	7,365	6,950	0
24 Hr. Total	7,125	15,762	16,682	10,035	7,678	15,707	14,671	8,186
Noon - Noon	15,576	15,973	12,781	8,361	12,933	15,086	15,136	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
13,692	15,443						

Traffic Engineering Software

Weekly Volume Summary

Tue, Dec 18, 2012

Location: Hwy 410 Sta 052 Rmp 52 - Derry Rd EB to Hwy 410 NB

LHRS/Offset: 49062 / 0.0 **Region:** Central

Pattern Type: n/a **PCS#:** n/a **Hwy. TVIS#:** 49062052

Count Direction: N/A **Report Dates:** Nov 14, 2012 **to** Nov 20, 2012

Hour Interval	Wed 12/11/14	Thu 15	Fri 16	Sat 17	Sun 18	Mon 19	Tue 20	Wed 21
0:00- 1:00		118	132	188	137	58	137	157
1:00- 2:00		70	67	131	104	34	66	104
2:00- 3:00		62	64	101	83	28	46	67
3:00- 4:00		37	35	47	37	31	50	39
4:00- 5:00		53	82	41	22	39	64	87
5:00- 6:00		102	103	53	18	89	93	112
6:00- 7:00		226	200	80	35	174	193	217
7:00- 8:00		316	288	94	49	287	306	323
8:00- 9:00		256	243	80	51	251	250	257
9:00-10:00		219	203	144	83	189	221	247
10:00-11:00		158	185	156	115	160	164	178
11:00-12:00		210	221	199	152	175	204	212
AM Total	0	1,827	1,823	1,314	886	1,515	1,794	2,000
12:00-13:00	167	244	254	206	189	225	236	
13:00-14:00	255	257	269	238	217	245	240	
14:00-15:00	419	455	427	305	196	363	424	
15:00-16:00	624	578	596	324	266	588	635	
16:00-17:00	708	692	596	271	202	682	676	
17:00-18:00	647	675	579	278	205	700	647	
18:00-19:00	358	342	321	221	180	274	350	
19:00-20:00	268	265	239	149	114	186	258	
20:00-21:00	250	220	241	129	120	199	214	
21:00-22:00	203	201	172	147	144	192	186	
22:00-23:00	256	200	265	134	184	185	218	
23:00-24:00	248	246	291	133	109	234	283	
PM Total	4,403	4,375	4,250	2,535	2,126	4,073	4,367	0
24 Hr. Total	4,403	6,202	6,073	3,849	3,012	5,588	6,161	2,000
Noon - Noon	6,230	6,198	5,564	3,421	3,641	5,867	6,367	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
5,327	6,166						

Traffic Engineering Software

Weekly Volume Summary

Tue, Dec 18, 2012

Location: Hwy 410 Sta 058 Rmp 58 - Derry Rd to Hwy 410 SB

LHRS/Offset: 49062 / 0.0 **Region:** Central

Pattern Type: n/a **PCS#:** n/a **Hwy. TVIS#:** 49062058

Count Direction: N/A **Report Dates:** Nov 14, 2012 **to** Nov 20, 2012

Hour Interval	Wed 12/11/14	Thu 15	Fri 16	Sat 17	Sun 18	Mon 19	Tue 20	Wed 21
0:00- 1:00		278	341	307	409	149	219	247
1:00- 2:00		213	365	193	495	121	140	218
2:00- 3:00		136	302	318	265	328	147	192
3:00- 4:00		196	268	219	112	140	105	124
4:00- 5:00		214	377	389	396	158	194	231
5:00- 6:00		390	509	246	199	347	367	371
6:00- 7:00		578	743	555	389	637	575	626
7:00- 8:00		847	854	455	301	908	829	884
8:00- 9:00		962	992	504	222	922	915	883
9:00-10:00		742	681	498	447	753	703	706
10:00-11:00		816	806	550	496	800	845	840
11:00-12:00		908	777	586	498	666	848	787
AM Total	0	6,280	7,015	4,820	4,229	5,929	5,887	6,109
12:00-13:00	775	833	822	639	541	851	750	
13:00-14:00	786	843	935	643	589	756	831	
14:00-15:00	1,004	888	903	666	536	861	882	
15:00-16:00	1,005	1,071	961	636	499	1,001	987	
16:00-17:00	1,029	1,255	1,002	584	500	1,071	1,137	
17:00-18:00	995	767	861	586	547	693	840	
18:00-19:00	847	722	755	613	623	697	825	
19:00-20:00	687	648	679	458	373	566	640	
20:00-21:00	527	525	644	333	377	474	558	
21:00-22:00	514	524	630	389	516	498	505	
22:00-23:00	409	447	452	379	343	468	391	
23:00-24:00	401	576	411	429	244	294	369	
PM Total	8,979	9,099	9,055	6,355	5,688	8,230	8,715	0
24 Hr. Total	8,979	15,379	16,070	11,175	9,917	14,159	14,602	6,109
Noon - Noon	15,259	16,114	13,875	10,584	11,617	14,117	14,824	

ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
13,770	15,079						

Traffic Engineering Software

Weekly Volume Summary

Tue, Dec 18, 2012

Location: Hwy 410 Sta 062 Rmp 62 - Derry Rd WB to Hwy 410 NB

LHRS/Offset: 49062 / 0.0 **Region:** Central

Pattern Type: n/a **PCS#:** n/a **Hwy. TVIS#:** 49062062

Count Direction: N/A **Report Dates:** Nov 14, 2012 **to** Nov 20, 2012

Hour Interval	Wed 12/11/14	Thu 15	Fri 16	Sat 17	Sun 18	Mon 19	Tue 20	Wed 21
0:00- 1:00		218	249	232	124	73	221	220
1:00- 2:00		110	128	145	96	36	97	113
2:00- 3:00		89	101	133	101	38	87	87
3:00- 4:00		50	58	78	75	36	61	62
4:00- 5:00		61	66	104	112	39	52	42
5:00- 6:00		72	84	64	31	52	66	74
6:00- 7:00		137	147	91	49	165	155	149
7:00- 8:00		264	244	134	92	231	245	241
8:00- 9:00		225	213	159	70	198	197	206
9:00-10:00		257	246	158	92	203	240	210
10:00-11:00		259	292	247	131	255	258	263
11:00-12:00		309	338	334	188	308	300	344
AM Total	0	2,051	2,166	1,879	1,161	1,634	1,979	2,011
12:00-13:00	248	379	441	432	216	444	380	
13:00-14:00	405	424	426	445	357	406	435	
14:00-15:00	522	596	538	427	363	545	583	
15:00-16:00	771	798	783	411	335	736	787	
16:00-17:00	953	946	884	440	296	944	929	
17:00-18:00	873	869	826	365	232	870	868	
18:00-19:00	593	556	529	340	230	545	661	
19:00-20:00	443	443	437	214	196	386	428	
20:00-21:00	315	308	338	171	170	303	351	
21:00-22:00	298	291	332	180	167	306	286	
22:00-23:00	260	298	282	163	145	217	238	
23:00-24:00	271	296	338	203	136	271	270	
PM Total	5,952	6,204	6,154	3,791	2,843	5,973	6,216	0
24 Hr. Total	5,952	8,255	8,320	5,670	4,004	7,607	8,195	2,011
Noon - Noon	8,003	8,370	8,033	4,952	4,477	7,952	8,227	

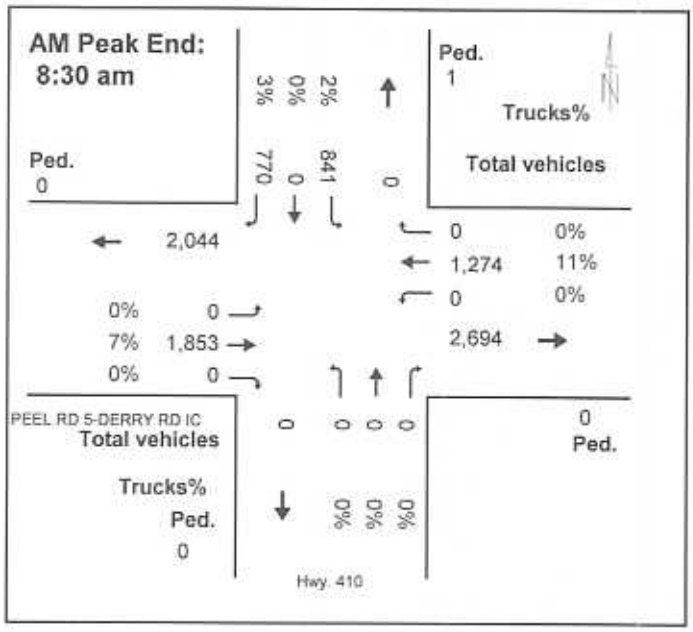
ADT	AWD	AADT	AAWD	SADT	SAWDT	WADT	DHV
7,145	8,138						

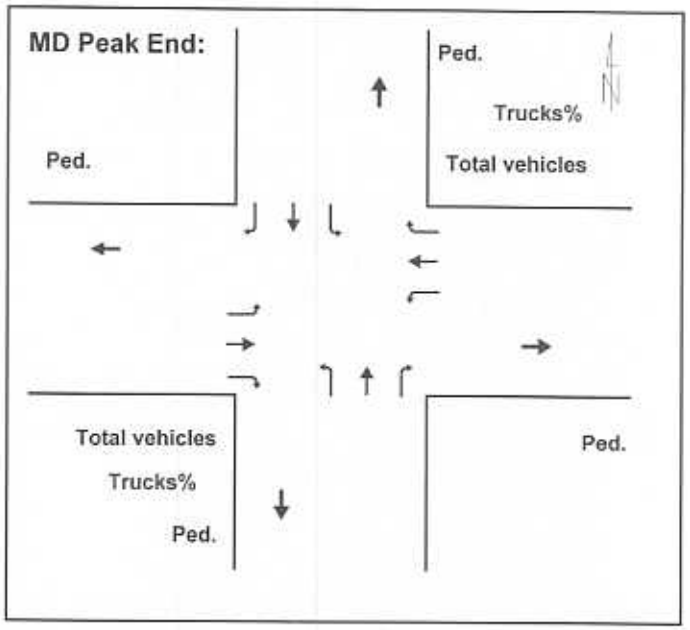
Ontario

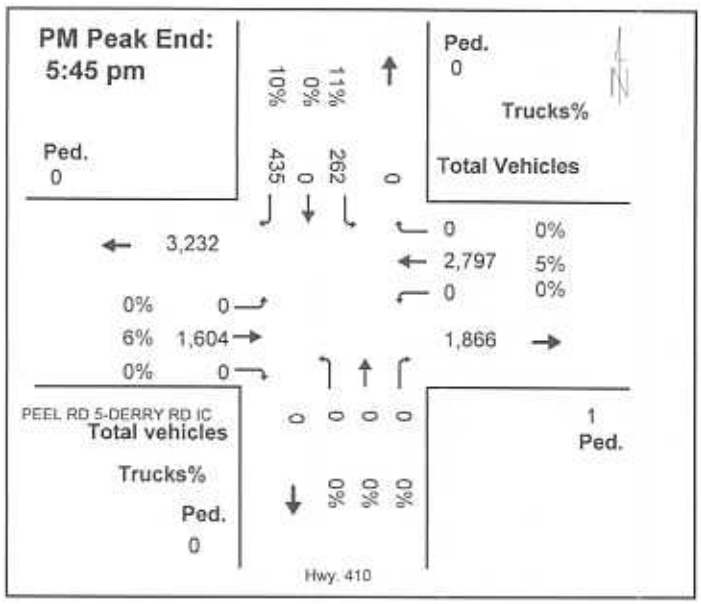
Hwy. 410 @ PEEL RD 5-DERRY RD IC

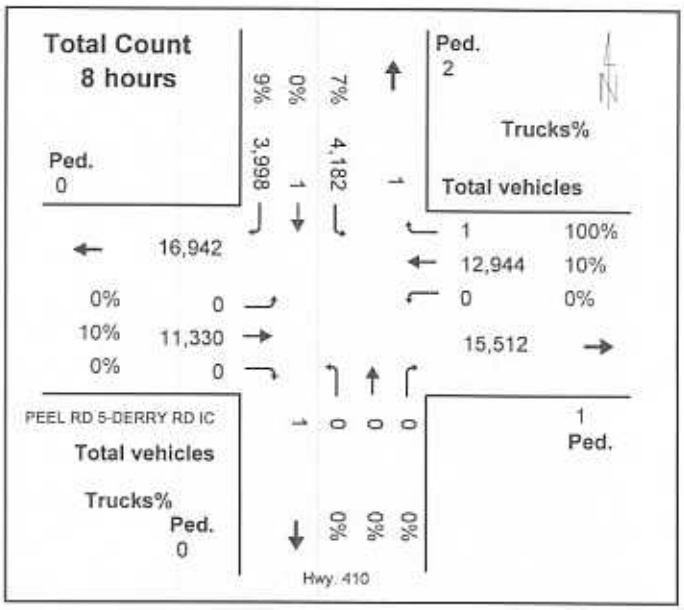
Central

Intersection ID:490620000(--W--) | Count Day:Wednesday | Count Date: 30-Mar-2011









Traffic
Engineering
Software

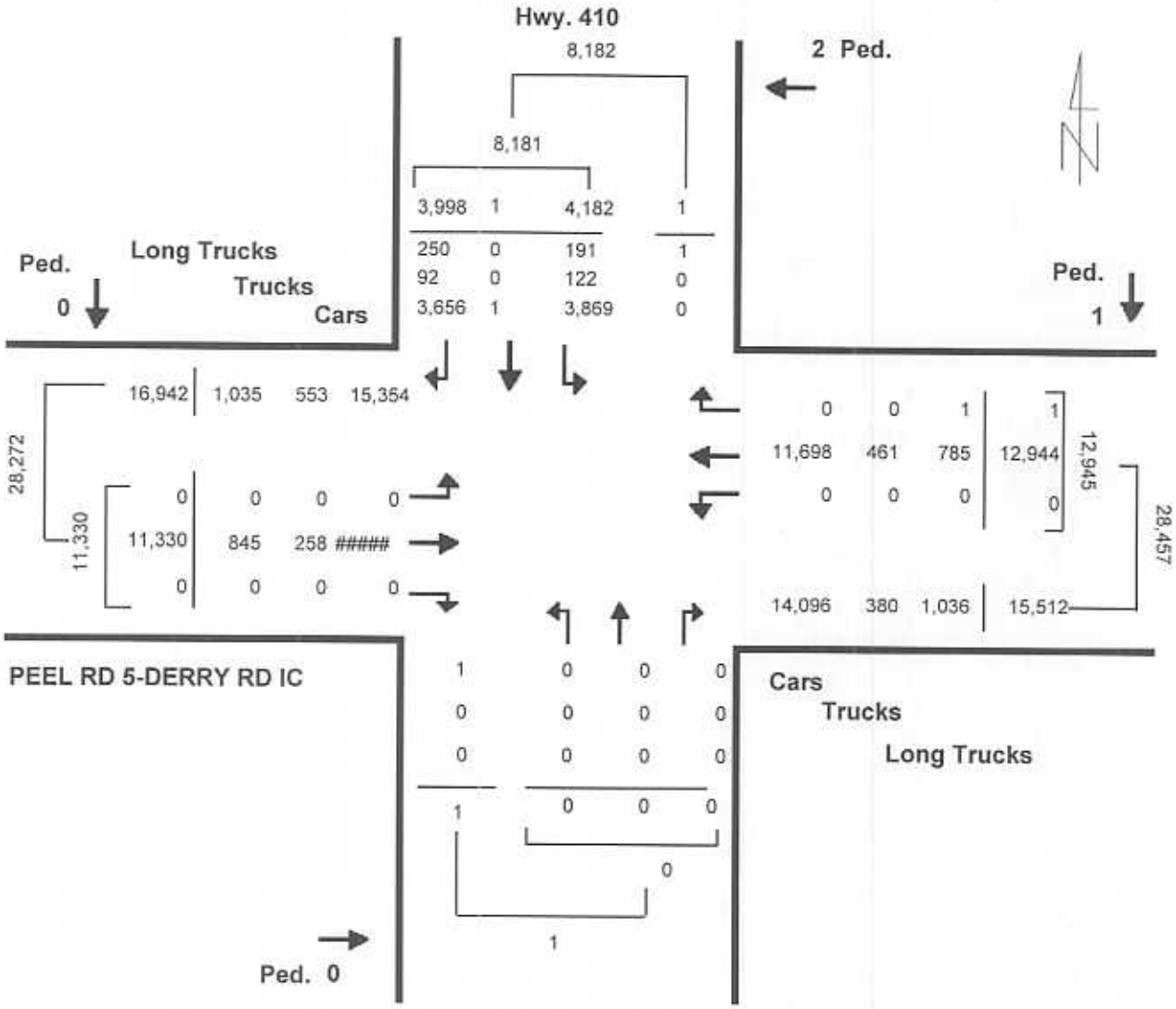
COUNT TOTAL

Hwy. 410 @ PEEL RD 5-DERRY RD IC

Central

Intersection ID:490620000(--W--)

Date: 30-Mar-2011



15 MIN REPORT

Intersection ID:490620000(--W--) Hwy. 410 @ PEEL RD 5-DERRY RD IC **Municipality: Central** **Date: 30-Mar-2011**

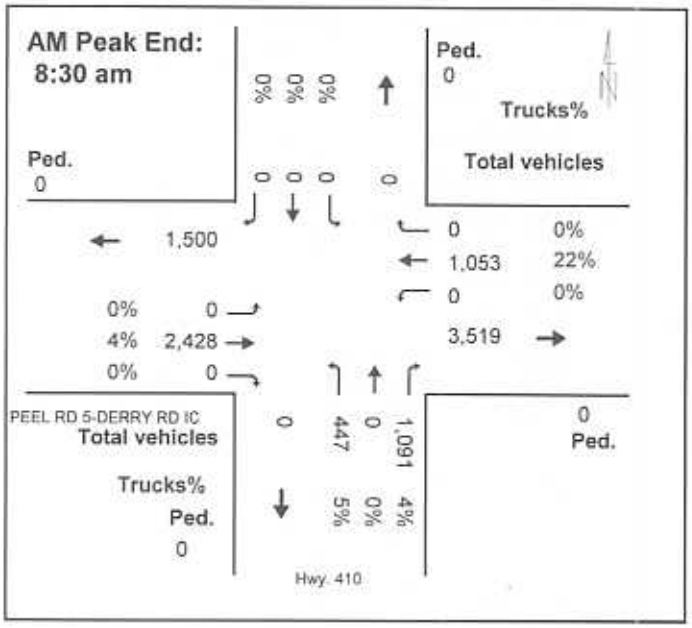
	NORTH APPROACH										EAST APPROACH										SOUTH APPROACH										WEST APPROACH									
Time	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Period1																																									
7:15	172	0	140	0	0	2	1	0	5	0	0	227	0	0	11	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	378	0	0	8	0	0	12	0	0	972
7:30	239	0	151	3	0	0	4	0	8	0	0	237	0	0	8	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	420	0	0	6	0	0	19	0	0	1109
7:45	208	0	202	2	0	1	1	0	2	0	0	242	0	0	8	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	443	0	0	5	0	0	30	0	0	1166
8:00	239	0	188	3	0	2	6	0	3	1	0	302	0	0	12	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	493	0	0	1	0	0	22	0	0	1293
8:15	178	0	165	0	0	3	1	0	8	0	0	298	0	0	16	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	364	0	0	5	0	0	26	0	0	1083
8:30	197	0	193	3	0	0	3	0	3	0	0	293	0	0	20	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	432	0	0	8	0	0	24	0	0	1197
8:45	189	0	193	7	0	3	2	0	6	0	0	260	0	0	19	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	377	0	0	4	0	0	26	0	0	1117
9:00	174	0	183	3	0	2	7	0	5	0	0	359	0	0	23	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	410	0	0	12	0	0	37	0	0	1247
9:15	234	0	179	5	0	4	6	0	10	0	0	212	0	0	20	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	304	0	0	13	0	0	34	0	0	1037
9:30	115	0	90	3	0	4	7	0	17	0	0	188	0	0	16	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	257	0	0	9	0	0	34	0	0	763
9:45	127	0	80	7	0	1	9	0	9	0	0	179	0	0	15	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	201	0	0	14	0	0	32	0	0	692
10:00	110	0	77	6	0	2	8	0	5	0	0	189	0	0	16	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	187	0	0	10	0	0	36	0	0	672
10:15	105	0	54	2	0	3	4	0	6	0	0	129	0	0	13	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	169	0	0	10	0	0	28	0	0	545
10:30	91	0	41	7	0	3	13	0	6	0	0	156	0	0	16	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	177	0	0	11	0	0	25	0	0	571
10:45	90	0	65	5	0	4	8	0	9	0	0	180	0	0	11	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	182	0	0	10	0	0	29	0	0	618
11:00	88	1	52	6	0	1	14	0	9	0	0	170	0	0	14	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	155	0	0	10	0	0	27	0	0	575
Period2																																									
14:15	94	0	82	7	0	7	8	0	7	0	0	278	0	0	11	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	214	0	0	10	0	0	28	0	0	775
14:30	111	0	105	4	0	2	6	0	12	0	0	338	0	0	16	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	269	0	0	15	0	0	19	0	0	917
14:45	104	0	115	3	0	9	5	0	14	0	0	329	0	0	23	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	305	0	0	7	0	0	27	0	0	965
15:00	92	0	127	6	0	3	11	0	10	0	0	353	0	0	18	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	273	0	0	14	0	0	28	0	0	953
15:15	123	0	111	1	0	5	6	0	9	0	0	390	0	0	15	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	328	0	0	11	0	0	28	0	0	1056
15:30	87	0	78	4	0	3	7	0	9	0	0	451	0	0	16	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	323	0	0	14	0	0	23	0	0	1044
15:45	112	0	114	6	0	6	9	0	13	1	0	443	0	0	16	0	0	31	1	0	0	0	0	0	0	0	0	0	0	0	0	340	0	0	1	0	0	36	0	0	1129
16:00	92	0	103	5	0	3	5	0	3	0	0	549	0	0	23	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	335	0	0	9	0	0	31	0	0	1176
16:15	76	0	100	4	0	2	5	0	6	0	0	548	0	0	13	0	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	349	0	0	11	0	0	25	0	0	1186
16:30	70	0	112	3	0	0	5	0	9	0	0	561	0	0	16	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	360	0	0	4	0	0	25	0	0	1189
16:45	60	0	87	1	0	2	10	0	11	0	0	572	0	0	6	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	400	0	0	5	0	0	28	0	0	1202
17:00	70	0	105	5	0	2	3	0	10	0	0	675	0	0	16	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	336	0	0	4	0	0	25	0	0	1287
17:15	52	0	110	4	0	2	2	0	7	0	0	638	0	0	6	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	384	0	0	4	0	0	22	0	0	1252
17:30	62	0	96	1	0	1	6	0	6	0	0	644	0	0	9	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	425	0	0	5	0	0	24	0	0	1310
17:45	50	0	81	2	0	9	5	0	6	0	0	688	0	0	7	0	0	26	0	1	0	0	0	0	0	0	0	0	0	0	0	357	0	0	5	0	0	13	0	0	1250
18:00	58	0	77	4	0	1	4	0	7	0	0	620	0	0	12	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	280	0	0	3	0	0	22	0	0	1111

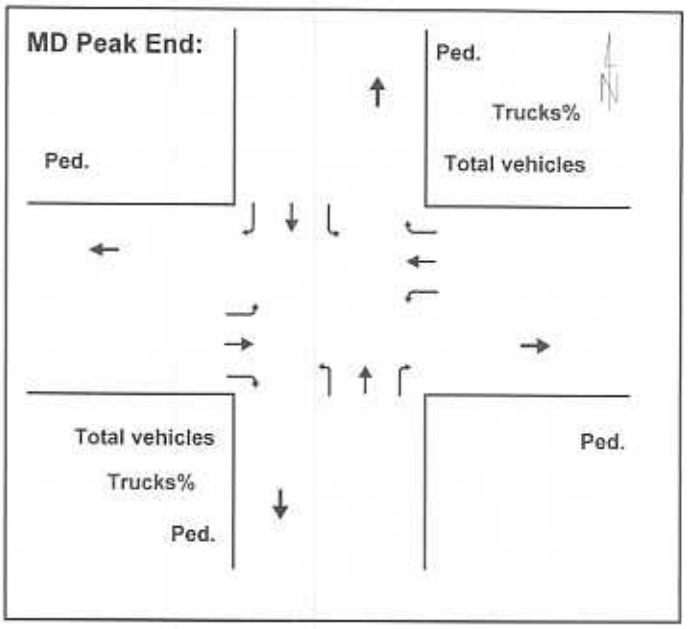
Ontario

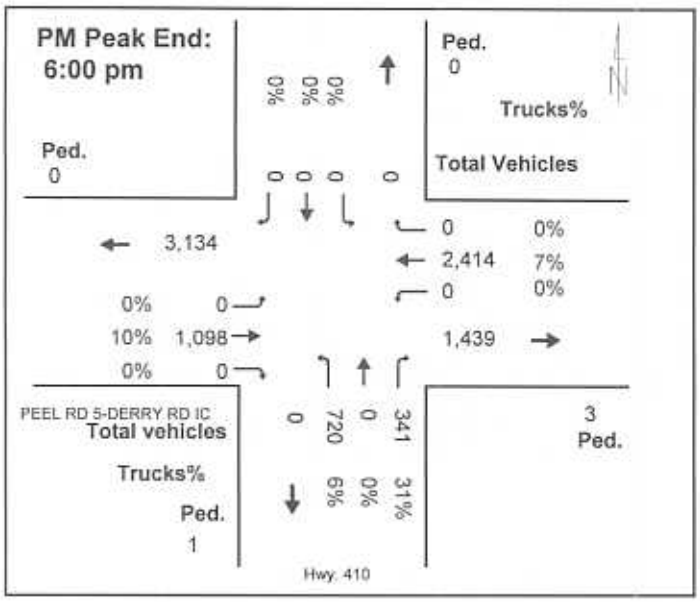
Hwy. 410 @ PEEL RD 5-DERRY RD IC

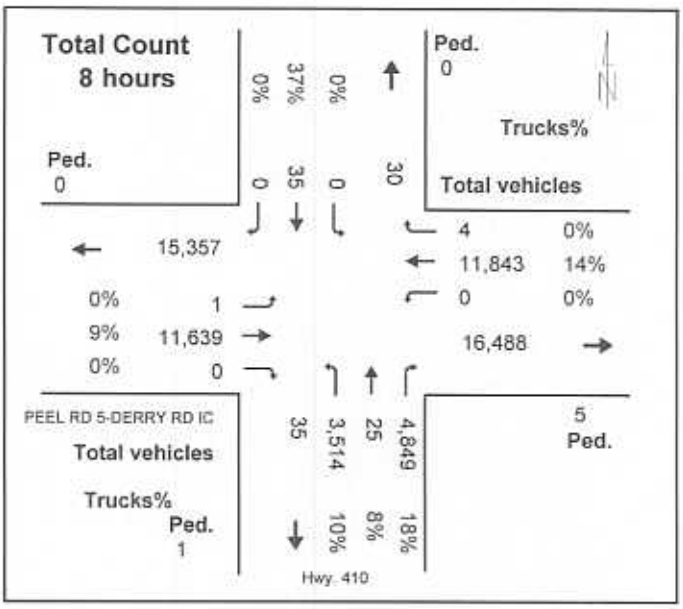
Central

Intersection ID:490620000(--E--) | Count Day:Wednesday | Count Date: 30-Mar-2011









Traffic
Engineering
Software

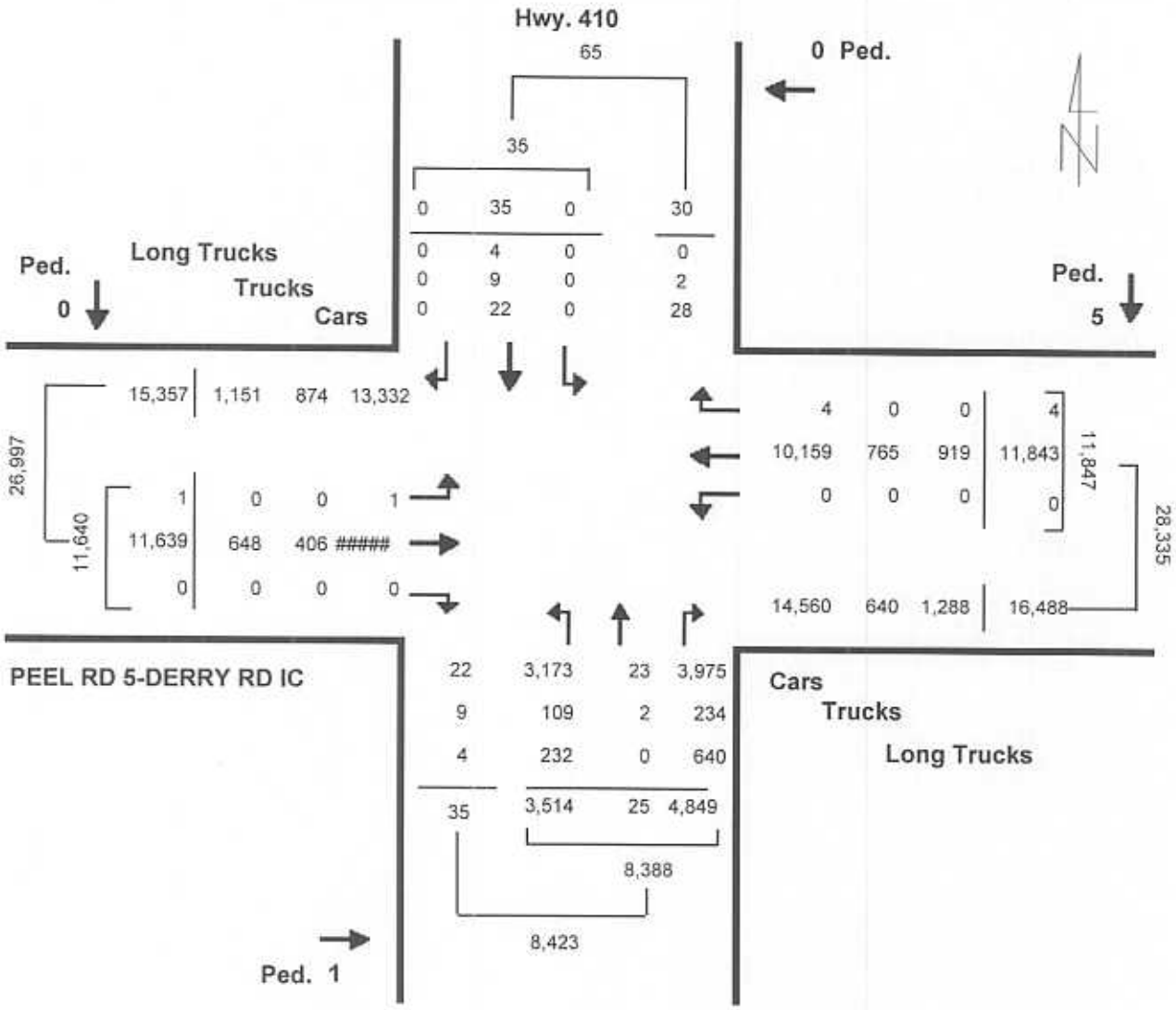
COUNT TOTAL

Hwy. 410 @ PEEL RD 5-DERRY RD IC

Central

Intersection ID:490620000(--E--)

Date: 30-Mar-2011



15 MIN REPORT

Intersection ID:490620000(--E--) **Hwy. 410 @ PEEL RD 5-DERRY RD IC** **Municipality: Central** **Date: 30-Mar-2011**

	NORTH APPROACH										EAST APPROACH										SOUTH APPROACH										WEST APPROACH										
Time	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Period1																																									
7:15	0	0	0	0	0	0	0	0	0	0	0	199	3	0	18	0	0	24	0	0	56	0	200	1	0	4	7	0	9	0	0	468	0	0	5	0	0	9	0	0	1003
7:30	0	0	0	0	0	0	0	0	0	0	0	197	0	0	22	0	0	31	0	0	82	0	183	2	0	4	5	0	7	0	0	605	0	0	7	0	0	14	0	0	1159
7:45	0	0	0	0	0	0	0	0	0	0	0	191	0	0	27	0	0	30	0	0	85	0	263	1	0	2	6	0	13	0	0	572	0	0	9	0	0	14	0	0	1213
8:00	0	0	0	0	0	0	0	0	0	0	0	219	0	0	28	0	0	31	0	0	64	0	232	0	0	2	5	0	10	0	0	717	0	0	6	0	0	24	0	0	1338
8:15	0	0	0	0	0	0	0	0	0	0	0	211	0	0	21	0	0	29	0	0	127	0	241	4	0	3	2	0	8	0	0	484	0	0	6	0	0	16	0	0	1152
8:30	0	0	0	0	0	0	0	0	0	0	0	202	0	0	30	0	0	34	0	0	148	0	306	3	0	5	2	0	6	0	0	551	0	0	12	0	0	17	0	0	1316
8:45	0	0	0	0	0	0	0	0	0	0	0	183	0	0	33	0	0	46	0	0	115	0	219	1	0	3	4	0	10	0	0	476	0	0	11	0	0	15	0	0	1116
9:00	0	0	0	0	0	0	0	0	0	0	0	181	0	0	30	0	0	43	0	0	128	0	203	1	0	11	5	0	12	0	1	508	0	0	8	0	0	32	0	0	1163
9:15	0	0	0	0	0	0	0	0	0	0	0	144	0	0	27	0	0	31	0	0	41	11	114	3	0	8	3	0	21	0	0	488	0	0	20	0	0	22	0	0	933
9:30	0	0	0	0	0	0	0	0	0	0	0	146	0	0	27	0	0	38	0	0	52	0	161	1	0	6	3	0	26	0	0	331	0	0	11	0	0	27	0	0	829
9:45	0	0	0	0	0	0	0	0	0	0	0	156	0	0	22	0	0	21	0	0	21	0	142	5	0	5	3	0	21	0	0	155	0	0	7	0	0	14	0	0	572
10:00	0	0	0	0	0	0	0	0	0	0	0	128	0	0	20	0	0	45	0	0	43	7	130	7	2	6	6	0	15	0	0	249	0	0	12	0	0	25	0	0	695
10:15	0	9	0	0	8	0	0	4	0	0	0	118	0	0	21	0	0	37	0	0	42	0	85	2	0	12	5	0	31	0	0	215	0	0	16	0	0	17	0	0	622
10:30	0	2	0	0	1	0	0	0	0	0	0	123	1	0	29	0	0	32	0	1	63	5	109	4	0	9	7	0	28	0	0	205	0	0	16	0	0	19	0	0	654
10:45	0	8	0	0	0	0	0	0	0	0	0	170	0	0	24	0	0	40	0	0	48	0	106	5	0	10	6	0	22	0	0	190	0	0	19	0	0	25	0	0	673
11:00	0	3	0	0	0	0	0	0	0	0	0	155	0	0	31	0	0	36	0	0	65	0	122	2	0	8	14	0	21	0	0	208	0	0	15	0	0	33	0	0	713
Period2																																									
14:15	0	0	0	0	0	0	0	0	0	0	0	308	0	0	20	0	0	29	0	0	77	0	92	6	0	7	15	0	29	0	0	237	0	0	20	0	0	23	0	0	863
14:30	0	0	0	0	0	0	0	0	0	0	0	299	0	0	20	0	0	23	0	0	76	0	102	5	0	14	4	0	24	0	0	279	0	0	19	0	0	17	0	0	882
14:45	0	0	0	0	0	0	0	0	0	0	0	324	0	0	27	0	0	29	0	0	77	0	130	6	0	13	9	0	22	0	0	328	0	0	14	0	0	23	0	0	1002
15:00	0	0	0	0	0	0	0	0	0	0	0	303	0	0	26	0	0	30	0	0	107	0	109	5	0	15	7	0	31	0	0	262	0	0	15	0	0	29	0	0	939
15:15	0	0	0	0	0	0	0	0	0	0	0	406	0	0	16	0	0	26	0	0	93	0	85	9	0	10	10	0	26	0	0	255	0	0	15	0	0	19	0	0	970
15:30	0	0	0	0	0	0	0	0	0	0	0	417	0	0	22	0	0	20	0	0	176	0	93	5	0	8	13	0	17	0	0	298	0	0	21	0	0	23	0	0	1113
15:45	0	0	0	0	0	0	0	0	0	0	0	513	0	0	18	0	0	28	0	0	100	0	63	8	0	8	7	0	23	0	0	278	0	0	13	0	0	32	0	0	1091
16:00	0	0	0	0	0	0	0	0	0	0	0	419	0	0	27	0	0	16	0	1	154	0	64	5	0	6	6	0	30	0	0	275	0	0	22	0	0	20	0	0	1045
16:15	0	0	0	0	0	0	0	0	0	0	0	543	0	0	22	0	0	31	0	0	102	0	51	2	0	9	20	0	26	0	0	277	0	0	17	0	0	18	0	0	1118
16:30	0	0	0	0	0	0	0	0	0	0	0	486	0	0	33	0	0	21	0	0	114	0	44	6	0	10	4	0	29	0	0	272	0	0	10	0	0	18	0	0	1047
16:45	0	0	0	0	0	0	0	0	0	0	0	557	0	0	10	0	0	20	0	0	123	0	59	2	0	8	9	0	25	0	0	200	0	0	9	0	0	19	0	0	1041
17:00	0	0	0	0	0	0	0	0	0	0	0	611	0	0	24	0	0	24	0	0	116	0	31	1	0	4	10	0	17	0	0	211	0	0	13	0	0	15	0	0	1077
17:15	0	0	0	0	0	0	0	0	0	0	0	533	0	0	49	0	0	11	0	3	213	0	54	1	0	6	7	0	19	1	0	231	0	0	9	0	0	18	0	0	1155
17:30	0	0	0	0	0	0	0	0	0	0	0	634	0	0	15	0	0	26	0	0	125	0	58	3	0	3	8	0	21	0	0	286	0	0	10	0	0	23	0	0	1212
17:45	0	0	0	0	0	0	0	0	0	0	0	552	0	0	11	0	0	16	0	0	185	0	54	1	0	6	11	0	18	0	0	258	0	0	7	0	0	10	0	0	1129
18:00	0	0	0	0	0	0	0	0	0	0	0	531	0	0	15	0	0	21	0	0	155	0	70	2	0	9	9	0	23	0	0	216	0	0	12	0	0	18	0	0	1081

Courtneypark Drive East & Hwy-410 West Ramps

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 0000005602
Intersection: Courtneypark Drive East & Hwy-410
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	395
North Entering:	0
North Peds:	0
Peds Cross:	⋈

Cyclists	0	0	0
Trucks	0	0	0
Cars	0	0	0
Totals	0	0	

Cyclists	0
Trucks	159
Cars	236
Totals	395

East Leg Total:	2256
East Entering:	1054
East Peds:	0
Peds Cross:	⋈

Hwy-410 West Ramps

Cyclists	Trucks	Cars	Totals
2	120	730	852

Cars	Trucks	Cyclists	Totals
118	84	0	202
730	120	2	852
848	204	2	

Courtneypark Drive East

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Cyclists	Trucks	Cars	Totals
0	75	118	193
3	86	1113	1202
3	161	1231	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
1113	86	3	1202

Peds Cross:	⋈
West Peds:	0
West Entering:	1395
West Leg Total:	2247

Comments

Courtneypark Drive East & Hwy-410 West Ramps

Mid-day Peak Diagram

Specified Period
From: 11:30:00
To: 13:30:00

One Hour Peak
From: 12:30:00
To: 13:30:00

Municipality: Mississauga
Site #: 0000005602
Intersection: Courtneypark Drive East & Hwy-41(
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total: 582
North Entering: 0
North Peds: 0
Peds Cross: ⋈

Cyclists	0	0	0
Trucks	0	0	0
Cars	0	0	0
Totals	0	0	

Cyclists	0
Trucks	178
Cars	404
Totals	582

East Leg Total: 1680
East Entering: 1161
East Peds: 0
Peds Cross: ⧗

Hwy-410 West Ramps

Cyclists	Trucks	Cars	Totals
0	185	617	802

Cars	Trucks	Cyclists	Totals
257	102	0	359
617	185	0	802
874	287	0	

Courtneypark Drive East

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Cyclists	Trucks	Cars	Totals
0	76	147	223
0	96	423	519
0	172	570	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
423	96	0	519

Peds Cross: ⧗
West Peds: 0
West Entering: 742
West Leg Total: 1544

Comments

Courtneypark Drive East & Hwy-410 West Ramps

Afternoon Peak Diagram

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

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Mississauga
Site #: 0000005602
Intersection: Courtneypark Drive East & Hwy-410
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	735
North Entering:	0
North Peds:	0
Peds Cross:	⋈

Cyclists	0	0	0
Trucks	0	0	0
Cars	0	0	0
Totals	0	0	

Cyclists	0
Trucks	57
Cars	678
Totals	735

East Leg Total:	2575
East Entering:	2077
East Peds:	0
Peds Cross:	⧗

Hwy-410 West Ramps

Cyclists	Trucks	Cars	Totals
3	157	1456	1616

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	38	236	274
2	103	393	498
2	141	629	

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Cars	Trucks	Cyclists	Totals
442	19	0	461
1456	157	3	1616
1898	176	3	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
393	103	2	498

Peds Cross:	⧗
West Peds:	0
West Entering:	772
West Leg Total:	2388

Comments

Courtneypark Drive East & Hwy-410 West Ramps

Total Count Diagram

Municipality: Mississauga
Site #: 0000005602
Intersection: Courtneypark Drive East & Hwy-410
TFR File #: 1
Count date: 12-Nov-2013

Weather conditions:
Clear
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total: 4450
North Entering: 0
North Peds: 0
Peds Cross: ⋈

Cyclists	0	0	0
Trucks	0	0	0
Cars	0	0	0
Totals	0	0	

Cyclists	0
Trucks	1051
Cars	3399
Totals	4450

East Leg Total: 15928
East Entering: 10648
East Peds: 0
Peds Cross: ⧗

Hwy-410 West Ramps

Cyclists	Trucks	Cars	Totals
6	1214	6860	8080

Cars	Trucks	Cyclists	Totals
2038	530	0	2568
6860	1214	6	8080
8898	1744	6	

Courtneypark Drive East

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Cyclists	Trucks	Cars	Totals
0	521	1361	1882
10	736	4534	5280
10	1257	5895	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
4534	736	10	5280

Peds Cross: ⧗
West Peds: 0
West Entering: 7162
West Leg Total: 15242

Comments

Courtneypark Drive East & Hwy-410 West Ramps
Traffic Count Summary

Intersection: Courtneypark Drive East & Hwy-41 | **Count Date:** 12-Nov-2013 | **Municipality:** Mississauga

North Approach Totals						North/South Total Approaches	South Approach Totals					
	Includes Cars, Trucks, & Cyclists							Includes Cars, Trucks, & Cyclists				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0	0	8:00:00	0	0	0	0	0
9:00:00	0	0	0	0	0	0	9:00:00	0	0	0	0	0
10:00:00	0	0	0	0	0	0	10:00:00	0	0	0	0	0
12:00:00	0	0	0	0	0	0	12:00:00	0	0	0	0	0
13:00:00	0	0	0	0	0	0	13:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0	0	17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0	0	18:00:00	0	0	0	0	0
Totals:	0	0	0	0	0	0		0	0	0	0	0

East Approach Totals						East/West Total Approaches	West Approach Totals					
	Includes Cars, Trucks, & Cyclists							Includes Cars, Trucks, & Cyclists				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	726	201	927	0	2296	8:00:00	206	1163	0	1369	0
9:00:00	0	891	199	1090	0	2316	9:00:00	181	1045	0	1226	0
10:00:00	0	664	213	877	0	1766	10:00:00	249	640	0	889	0
12:00:00	0	354	166	520	0	850	12:00:00	111	219	0	330	0
13:00:00	0	808	328	1136	0	1861	13:00:00	204	521	0	725	0
15:00:00	0	400	184	584	0	966	15:00:00	128	254	0	382	0
16:00:00	0	1170	473	1643	0	2476	16:00:00	321	512	0	833	0
17:00:00	0	1609	516	2125	0	2827	17:00:00	238	464	0	702	0
18:00:00	0	1457	288	1745	0	2451	18:00:00	244	462	0	706	0
Totals:	0	8079	2568	10647	0	17809		1882	5280	0	7162	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	10:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	0	0	0	0	0	0	0	0

Courtneypark Drive East & Hwy-410 East Ramps

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 0000005603
Intersection: Courtneypark Drive East & Hwy-41
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total: 1185
North Entering: 1185
North Peds: 0
Peds Cross: ⋈

Cyclists	0	0	0
Trucks	47	40	87
Cars	515	583	1098
Totals	562	623	

Cyclists	0
Trucks	0
Cars	0
Totals	0

East Leg Total: 2333
East Entering: 519
East Peds: 0
Peds Cross: ⧗

Hwy-410 East Ramps

Cyclists	Trucks	Cars	Totals
2	207	872	1081

Cars	Trucks	Cyclists	Totals
0	0	0	0
357	160	2	519
357	160	2	

Courtneypark Drive East

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Cyclists	Trucks	Cars	Totals
0	0	0	0
2	82	1107	1191
2	82	1107	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
1690	122	2	1814

Peds Cross: ⧗
West Peds: 0
West Entering: 1191
West Leg Total: 2272

Comments

Courtneypark Drive East & Hwy-410 East Ramps

Mid-day Peak Diagram

Specified Period
From: 11:30:00
To: 13:30:00

One Hour Peak
From: 12:00:00
To: 13:00:00

Municipality: Mississauga
Site #: 0000005603
Intersection: Courtneypark Drive East & Hwy-41
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total: 621
North Entering: 621
North Peds: 0
Peds Cross: ⋈

Cyclists	0	0	0
Trucks	83	105	188
Cars	210	223	433
Totals	293	328	

Cyclists	0
Trucks	0
Cars	0
Totals	0

East Leg Total: 1685
East Entering: 855
East Peds: 0
Peds Cross: ⧗

Hwy-410 East Ramps

Cyclists	Trucks	Cars	Totals
0	250	898	1148

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	0	0	0
0	88	414	502
0	88	414	

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Cars	Trucks	Cyclists	Totals
0	0	0	0
688	167	0	855
688	167	0	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
637	193	0	830

Peds Cross: ⧗
West Peds: 0
West Entering: 502
West Leg Total: 1650

Comments

Courtneypark Drive East & Hwy-410 East Ramps

Afternoon Peak Diagram

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

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Mississauga
Site #: 0000005603
Intersection: Courtneypark Drive East & Hwy-41
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	335
North Entering:	335
North Peds:	0
Peds Cross:	⋈

Cyclists	0	0	0
Trucks	63	47	110
Cars	134	91	225
Totals	197	138	

Cyclists	0
Trucks	0
Cars	0
Totals	0

East Leg Total:	2549
East Entering:	1895
East Peds:	0
Peds Cross:	⧗

Hwy-410 East Ramps

Cyclists	Trucks	Cars	Totals
1	167	1924	2092

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	0	0	0
1	107	408	516
1	107	408	

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Cars	Trucks	Cyclists	Totals
0	0	0	0
1790	104	1	1895
1790	104	1	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
499	154	1	654

Peds Cross:	⧗
West Peds:	0
West Entering:	516
West Leg Total:	2608

Comments

Courtneypark Drive East & Hwy-410 East Ramps

Total Count Diagram

Municipality: Mississauga
Site #: 0000005603
Intersection: Courtneypark Drive East & Hwy-41
TFR File #: 2
Count date: 12-Nov-2013

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Courtneypark Drive East runs W/E

North Leg Total:	5611
North Entering:	5611
North Peds:	0
Peds Cross:	⋈

Cyclists	0	0	0
Trucks	585	496	1081
Cars	2205	2325	4530
Totals	2790	2821	

Cyclists	0
Trucks	0
Cars	0
Totals	0

East Leg Total:	16194
East Entering:	8128
East Peds:	6
Peds Cross:	⧗

Hwy-410 East Ramps

Cyclists	Trucks	Cars	Totals
5	1779	9134	10918

Courtneypark Drive East

Cyclists	Trucks	Cars	Totals
0	0	0	0
9	743	4493	5245
9	743	4493	

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Cars	Trucks	Cyclists	Totals
0	0	0	0
6929	1194	5	8128
6929	1194	5	

Courtneypark Drive East

Cars	Trucks	Cyclists	Totals
6818	1239	9	8066

Peds Cross:	⧗
West Peds:	0
West Entering:	5245
West Leg Total:	16163

Comments

Courtneypark Drive East & Hwy-410 East Ramps
Traffic Count Summary

Intersection: Courtneypark Drive East & Hwy-41 **Count Date:** 12-Nov-2013 **Municipality:** Mississauga

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	540	0	506	1046	0	1046
9:00:00	674	0	567	1241	0	1241
10:00:00	461	0	396	857	0	857
12:00:00	177	0	163	340	0	340
13:00:00	328	0	293	621	0	621
15:00:00	153	0	164	317	0	317
16:00:00	220	0	293	513	0	513
17:00:00	147	0	235	382	0	382
18:00:00	121	0	173	294	0	294
Totals:	2821	0	2790	5611	0	5611

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0
9:00:00	0	0	0	0	0
10:00:00	0	0	0	0	0
12:00:00	0	0	0	0	0
13:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0
	0	0	0	0	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	0	464	0	464	0	1626
9:00:00	0	531	0	531	0	1583
10:00:00	0	524	0	524	1	1162
12:00:00	0	355	0	355	0	564
13:00:00	0	855	0	855	0	1357
15:00:00	0	444	0	444	0	689
16:00:00	0	1413	0	1413	5	1928
17:00:00	0	1902	0	1902	0	2344
18:00:00	0	1640	0	1640	0	2120
Totals:	0	8128	0	8128	6	13373

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	0	1162	0	1162	0
9:00:00	0	1052	0	1052	0
10:00:00	0	638	0	638	0
12:00:00	0	209	0	209	0
13:00:00	0	502	0	502	0
15:00:00	0	245	0	245	0
16:00:00	0	515	0	515	0
17:00:00	0	442	0	442	0
18:00:00	0	480	0	480	0
	0	5245	0	5245	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	10:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	540	674	462	328	153	225	147	121

08:59 USER 2/12 PRINT DAILY INT REP, INT 417 420 421 610 613 627 712, AS 1-3

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

INT	TIME	SELECTION PLANS IN USE						ALTERNATES					
		MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC	MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC
417	00:00	/	/	/	/	/	/	LO	101	2	2	2	
417	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1062
417	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
417	15:00	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
417	17:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1062
417	17:30	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
417	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
420	00:00	/	/	/	/	/	/	LO	101	2	2	2	
420	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1062
420	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
420	15:00	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
420	17:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1062
420	17:30	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
420	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
421	00:00	/	/	/	/	/	/	LO	101	2	2	4	
421	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	
421	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	
421	15:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	
421	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	
610	00:00	/	/	/	/	/	/	LO	101	2	2	2	
610	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1062
610	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
610	15:00	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
610	17:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1062
610	17:30	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
610	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
613	00:00	/	/	/	/	/	/	LO	101	2	2	2	
613	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1062
613	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
613	15:00	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
613	17:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1062
613	17:30	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
613	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
627	00:00	/	/	/	/	/	/	LO	101	2	2	2	
627	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1062
627	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
627	15:00	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
627	17:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1062
627	17:30	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
627	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
712	00:00	/	/	/	/	/	/	LO	101	2	2	2	
712	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1062
712	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
712	15:00	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
712	17:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1062
712	17:30	1/1	/	/	/	1/1	/	CC	140	5	5	5	1062
712	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062

DAILY INTERSECTION REPORT FOR ACT SCH 2 (SAT)

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
417	00:00	/	/	/	/	/	/	LO	101	2	2	2	
417	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
420	00:00	/	/	/	/	/	/	LO	101	2	2	2	
420	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
421	00:00	/	/	/	/	/	/	LO	101	2	2	4	
421	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	
610	00:00	/	/	/	/	/	/	LO	101	2	2	2	
610	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
613	00:00	/	/	/	/	/	/	LO	101	2	2	2	
613	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
627	00:00	/	/	/	/	/	/	LO	101	2	2	2	
627	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
712	00:00	/	/	/	/	/	/	LO	101	2	2	2	
712	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062

DAILY INTERSECTION REPORT FOR ACT SCH 3 (SUN HOL)

417	00:00	/	/	/	/	/	/	LO	101	2	2	2	
417	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
417	23:00	/	/	/	/	/	/	LO	101	2	2	2	1062
420	00:00	/	/	/	/	/	/	LO	101	2	2	2	
420	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
420	23:00	/	/	/	/	/	/	LO	101	2	2	2	1062
421	00:00	/	/	/	/	/	/	LO	101	2	2	4	
421	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	
421	23:00	/	/	/	/	/	/	LO	101	2	2	4	
610	00:00	/	/	/	/	/	/	LO	101	2	2	2	
610	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
610	23:00	/	/	/	/	/	/	LO	101	2	2	2	1062
613	00:00	/	/	/	/	/	/	LO	101	2	2	2	
613	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
613	23:00	/	/	/	/	/	/	LO	101	2	2	2	1062
627	00:00	/	/	/	/	/	/	LO	101	2	2	2	
627	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
627	23:00	/	/	/	/	/	/	LO	101	2	2	2	1062
712	00:00	/	/	/	/	/	/	LO	101	2	2	2	
712	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1062
712	23:00	/	/	/	/	/	/	LO	101	2	2	2	1062

09:01 USER 2/12 PRINT SPLIT 1-32, INT 417 420 421 610 613 627 712

SPLIT TABLE

INTERSECTION 417 COURTNEY PK@SHAWSON

TABLE	(SPLIT) PHASE NUMBER								(MAX SPLIT) PHASE NUMBER							
NO.	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
		EW		NS												
1		74		26						0		0				
2		68		32						0		0				
3		74		26						0		0				
4		0		0						0		0				
5		74		26						0		0				
6		0		0						0		0				
7		0		0						0		0				
8		0		0						0		0				
9		0		0						0		0				
10		0		0						0		0				
11		0		0						0		0				
12		0		0						0		0				
13		0		0						0		0				
14		0		0						0		0				
15		0		0						0		0				
16		0		0						0		0				
17		0		0						0		0				
18		0		0						0		0				
19		0		0						0		0				
20		0		0						0		0				
21		0		0						0		0				
22		0		0						0		0				
23		0		0						0		0				
24		0		0						0		0				
25		0		0						0		0				
26		0		0						0		0				
27		0		0						0		0				
28		0		0						0		0				
29		0		0						0		0				
30		0		0						0		0				
31		0		0						0		0				
32		0		0						0		0				

INTERSECTION 420 TOMKEN @ COURTNEY PK

	NBL	SB	EBL	WB	SBL	NB	WBL	EB							
1	15	34	20	31	0	49		51	23	0	0	0	0	0	0
2	15	37	10	38	0	52		48	20	0	0	0	0	0	0
3	18	33	10	39	8	43		49	28	0	0	0	14	0	0
4	0	0	0	0	0	0		0	0	0	0	0	0	0	0
5	18	30	10	42	8	40		52	28	0	0	0	14	0	0
6	0	0	0	0	0	0		0	0	0	0	0	0	0	0
7	0	0	0	0	0	0		0	0	0	0	0	0	0	0
8	0	0	0	0	0	0		0	0	0	0	0	0	0	0
9	0	0	0	0	0	0		0	0	0	0	0	0	0	0
10	0	0	0	0	0	0		0	0	0	0	0	0	0	0
11	0	0	0	0	0	0		0	0	0	0	0	0	0	0
12	0	0	0	0	0	0		0	0	0	0	0	0	0	0
13	0	0	0	0	0	0		0	0	0	0	0	0	0	0

SPLIT TABLE

INTERSECTION 420 TOMKEN @ COURTNEY PK

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
14	0	0	0	0	0	0		0	0	0	0	0	0	0		0
15	0	0	0	0	0	0		0	0	0	0	0	0	0		0
16	0	0	0	0	0	0		0	0	0	0	0	0	0		0
17	0	0	0	0	0	0		0	0	0	0	0	0	0		0
18	0	0	0	0	0	0		0	0	0	0	0	0	0		0
19	0	0	0	0	0	0		0	0	0	0	0	0	0		0
20	0	0	0	0	0	0		0	0	0	0	0	0	0		0
21	0	0	0	0	0	0		0	0	0	0	0	0	0		0
22	0	0	0	0	0	0		0	0	0	0	0	0	0		0
23	0	0	0	0	0	0		0	0	0	0	0	0	0		0
24	0	0	0	0	0	0		0	0	0	0	0	0	0		0
25	0	0	0	0	0	0		0	0	0	0	0	0	0		0
26	0	0	0	0	0	0		0	0	0	0	0	0	0		0
27	0	0	0	0	0	0		0	0	0	0	0	0	0		0
28	0	0	0	0	0	0		0	0	0	0	0	0	0		0
29	0	0	0	0	0	0		0	0	0	0	0	0	0		0
30	0	0	0	0	0	0		0	0	0	0	0	0	0		0
31	0	0	0	0	0	0		0	0	0	0	0	0	0		0
32	0	0	0	0	0	0		0	0	0	0	0	0	0		0

INTERSECTION 421 DIXIE @ COURTNEY

	NBL	SB	EBL	WB	SBL	NB	WBL	EB								
1	0	56	14	30	14	42	9	35	0	0	0	0	0	0	0	0
2	0	48	17	35	12	36	9	43	0	0	0	0	0	0	0	0
3	8	46	16	30	9	45	10	36	15	0	0	0	16	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SPLIT TABLE

INTERSECTION 421 DIXIE @ COURTNEY

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
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

INTERSECTION 610 KENNEDY @ COURTNEY P

	NBL	SB	EBL	WB	SBL	NB	WBL	EB								
1	8	42	0	50	18	32	15	35	14	0	0	0	28	0	0	0
2	0	50	11	39	16	34	17	33	0	0	0	0	22	0	0	0
3	11	37	9	43	11	37	12	40	18	0	0	0	18	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	11	28	9	52	11	28	15	46	18	0	0	0	18	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

INTERSECTION 613 COURTNEY@410 E TERM

	EW	SB		
1	54	46	0	0
2	58	42	0	0
3	70	30	0	0
4	0	0	0	0
5	70	30	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0

SPLIT TABLE

INTERSECTION 613 COURTNEY@410 E TERM

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

INTERSECTION 627 COURTNEYPARK@VIPOND

	WBL EW	NBL NS		
1	76	24	0	0
2	71	29	0	0
3	71	29	0	0
4	0	0	0	0
5	71	29	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0

SPLIT TABLE

INTERSECTION 627 COURTNEYPARK@VIPOND

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
25		0		0						0		0				
26		0		0						0		0				
27		0		0						0		0				
28		0		0						0		0				
29		0		0						0		0				
30		0		0						0		0				
31		0		0						0		0				
32		0		0						0		0				

INTERSECTION 712 COURTNEYPARK @ ORDAN

	WBL	EW	SBL	NS												
1		77		23						0		0				
2		71		29						0		0				
3		76		24						0		0				
4		0		0						0		0				
5		76		24						0		0				
6		0		0						0		0				
7		0		0						0		0				
8		0		0						0		0				
9		0		0						0		0				
10		0		0						0		0				
11		0		0						0		0				
12		0		0						0		0				
13		0		0						0		0				
14		0		0						0		0				
15		0		0						0		0				
16		0		0						0		0				
17		0		0						0		0				
18		0		0						0		0				
19		0		0						0		0				
20		0		0						0		0				
21		0		0						0		0				
22		0		0						0		0				
23		0		0						0		0				
24		0		0						0		0				
25		0		0						0		0				
26		0		0						0		0				
27		0		0						0		0				
28		0		0						0		0				
29		0		0						0		0				
30		0		0						0		0				
31		0		0						0		0				
32		0		0						0		0				

09:02 USER 2/12 PRINT SPF 1-32, INT 417 420 421 610 613 627 712

SPECIAL FUNCTIONS

INTERSECTION 417 COURTNEY PK@SHAWSON

SPECIAL IN(Y)/OUT(N)

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

INTERSECTION 420 TOMKEN @ COURTNEY PK

	SBL	EBL	CAL	PHASE OMIT
1	Y	N	N	
2	Y	N	N	
3	N	N	N	
4	N	N	N	
5	N	N	N	
6	N	N	N	
7	N	N	N	
8	N	N	N	
9	N	N	N	
10	N	N	N	
11	N	N	N	
12	N	N	N	
13	N	N	N	

SPECIAL FUNCTIONS

INTERSECTION 420 TOMKEN @ COURTNEY PK

SPECIAL FUNCTION #	IN(Y)/OUT(N) 1	2	3
14	N	N	N
15	N	N	N
16	N	N	N
17	N	N	N
18	N	N	N
19	N	N	N
20	N	N	N
21	N	N	N
22	N	N	N
23	N	N	N
24	N	N	N
25	N	N	N
26	N	N	N
27	N	N	N
28	N	N	N
29	N	N	N
30	N	N	N
31	N	N	N
32	N	N	N

INTERSECTION 421 DIXIE @ COURTNEY

	NIU	WBL	NBL	PHASE OMIT
1	N	N	Y	
2	N	N	Y	
3	N	N	N	
4	N	Y	Y	
5	N	N	N	
6	N	N	N	
7	N	N	N	
8	N	N	N	
9	N	N	N	
10	N	N	N	
11	Y	Y	Y	
12	N	N	N	
13	N	N	N	
14	N	N	N	
15	N	N	N	
16	N	N	N	
17	N	N	N	
18	N	N	N	
19	N	N	N	
20	N	N	N	
21	N	Y	Y	
22	Y	Y	Y	
23	N	N	N	
24	Y	Y	Y	
25	N	N	N	
26	N	N	N	
27	N	N	N	
28	N	N	N	

SPECIAL FUNCTIONS

INTERSECTION 421 DIXIE @ COURTNEY

SPECIAL FUNCTION #	IN(Y)/OUT(N) 1	2	3
29	N	N	N
30	N	N	N
31	N	N	N
32	N	N	N

INTERSECTION 610 KENNEDY @ COURTNEY P

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

INTERSECTION 613 COURTNEY@410 E TERM

	NA	NA	CAL	PHASE OMIT
1	Y	N	N	
2	Y	N	N	
3	Y	N	N	
4	Y	N	N	
5	N	N	N	
6	N	N	N	
7	N	N	N	
8	N	N	N	
9	N	N	N	

SPECIAL FUNCTIONS

INTERSECTION 613 COURTNEY@410 E TERM

SPECIAL FUNCTION #	IN(Y)/OUT(N) 1	2	3
10	N	N	N
11	N	N	N
12	N	N	N
13	N	N	N
14	N	N	N
15	N	N	N
16	N	N	N
17	N	N	N
18	N	N	N
19	N	N	N
20	N	N	N
21	Y	Y	N
22	Y	Y	N
23	Y	Y	N
24	Y	Y	N
25	N	N	N
26	N	N	N
27	N	N	N
28	N	N	N
29	N	N	N
30	N	N	N
31	Y	Y	N
32	N	N	N

INTERSECTION 627 COURTNEYPARK@VIPOND

	NA	PED	CAL
1	Y	N	N
2	Y	N	N
3	Y	N	N
4	N	N	N
5	N	N	N
6	N	N	N
7	N	N	N
8	N	N	N
9	N	N	N
10	N	N	N
11	N	N	N
12	N	N	N
13	N	N	N
14	N	N	N
15	N	N	N
16	N	N	N
17	N	N	N
18	N	N	N
19	N	N	N
20	N	N	N
21	N	N	N
22	N	N	N
23	N	N	N
24	N	N	N

PHASE OMIT BUT SPF2 Y=ON

SPECIAL FUNCTIONS

INTERSECTION 627 COURTNEYPARK@VIPOND

SPECIAL FUNCTION #	IN(Y)/OUT(N) 1	2	3
25	N	N	N
26	N	N	N
27	N	N	N
28	N	N	N
29	N	N	N
30	N	N	N
31	Y	N	N
32	N	N	N

INTERSECTION 712 COURTNEYPARK @ ORDAN

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

09:03 USER 2/12 PRINT OFFSET 1-32, INT 417 420 421 610 613 627 712

OFFSET TABLE

INTERSECTION 417 COURTNEY PK@SHAWSON

OFFSET #	OFFSET %
1	19
2	92
3	24
4	0
5	24
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

INTERSECTION 420 TOMKEN @ COURTNEY PK

1	67
2	61
3	99
4	0
5	99
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0

OFFSET TABLE

INTERSECTION 420 TOMKEN @ COURTNEY PK

OFFSET #	OFFSET %
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

INTERSECTION 421 DIXIE @ COURTNEY

1	31
2	48
3	28
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

OFFSET TABLE

INTERSECTION 610 KENNEDY @ COURTNEY P

OFFSET #	OFFSET %
1	81
2	19
3	29
4	0
5	29
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

INTERSECTION 613 COURTNEY@410 E TERM

1	51
2	7
3	35
4	0
5	35
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0

OFFSET TABLE

INTERSECTION 613 COURTNEY@410 E TERM

OFFSET #	OFFSET %
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

INTERSECTION 627 COURTNEYPARK@VIPOND

1	21
2	0
3	69
4	0
5	69
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

OFFSET TABLE

INTERSECTION 712 COURTNEYPARK @ ORDAN

OFFSET #	OFFSET %
1	7
2	12
3	67
4	0
5	67
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0

09:04 USER 2/12 PRINT CDT 417 420 421 610 613 627 712

CYCLE DEFINITION TABLE: 417

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1							1		
2	EW		10	15	5	2	1	C	COURTNEY PK DR
3							1		
4	NS		11	16	4	2	1		SHAWSON DR
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

CYCLE DEFINITION TABLE: 420

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1	NBL	5			3	2	1		TOMKEN RD
2	SB		14	20	4	3	1	C	TOMKEN RD
3	EBL	5			3		1		COURTNEYPARK DR
4	WB		13	19	5	3	1		COURTNEYPARK DR
5	SBL	5			3		1		TOMKEN RD
6	NB		14	20	4	3	1	C	TOMKEN RD
7	WBL						1		COURTNEYPARK DR
8	EB		13	19	5	3	1		COURTNEYPARK DR

VALID SPECIAL FUNCTIONS(Y/N)

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

CYCLE DEFINITION TABLE: 421

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1	NBL	5			3		1		DIXIE RD
2	SB		8	13	5	2	1	C	DIXIE RD
3	EBL	8			3	3	1		COURTNEYPARK DR
4	WB	8	12	19	5	3	1		COURTNEYPARK DR
5	SBL	8			3	2	1		DIXIE RD
6	NB		8	13	5	2	1	C	DIXIE RD
7	WBL	5			3		1		COURTNEYPARK DR
8	EB	8	12	19	5	3	1		COURTNEYPARK DR

VALID SPECIAL FUNCTIONS(Y/N)

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

CYCLE DEFINITION TABLE: 610

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1	NBL	5			3		1		KENNEDY RD
2	SB		12	18	5	2	1	C	KENNEDY RD
3	EBL	5			3		1		COURTNEYPARK DR
4	WB		11	17	5	2	1		COURTNEYPARK DR
5	SBL	5			3		1		KENNEDY RD
6	NB		12	18	5	2	1	C	KENNEDY RD
7	WBL	5			3		1		COURTNEYPARK DR

CYCLE DEFINITION TABLE: 610

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
8	EB		11	17	5	2	1		COURTNEYPARK DR

VALID SPECIAL FUNCTIONS(Y/N)

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

CYCLE DEFINITION TABLE: 613

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1							1		
2	EW		8	12	5	3	1	C	COURTNEYPARK DR
3							1		
4	SB	8			4	3	1		410 EAST TERM
5							1		
6							1		
7							1		
8							1		

VALID SPECIAL FUNCTIONS(Y/N)

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

CYCLE DEFINITION TABLE: 627

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1	WBL						1		COURTNEYPARK
2	EW		9	13	5	2	1	C	COURTNEYPARK
3	NBL						1		VIPOND
4	NS		10	13	4	3	1		VIPOND
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

CYCLE DEFINITION TABLE: 712

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1	WBL						1		COURTNEYPARK DR
2	EW		10	15	5	2	1	C	COURTNEYPARK DR
3	SBL						1		ORDAN DR
4	NS		10	14	4	2	1		ORDAN DR
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

Region of Peel
Working for you

Timing Chart/Programming Data

Intersection Name	OTI Number	System Number
Derry Rd. @ Highway 410 NB OR	*00508528*	*576*

Controller Make	Model	Type of Operation
Eagle	*EPAC 380*	*3 Phase Semi*

No	Date Y	M	D	Revision Description	Field Changes By	Checked By	Approved By
3	09	03	12	Installed New 8 Ph.Traffic Signal Controller	Guild	RL	JA

Ø1	*Not In Use*	Ø5	*Not In Use*
Ø2	*Derry Road - E/B*	Ø6	*Derry Road - W/B*
Ø3	*Not In Use*	Ø7	*Not In Use*
Ø4	*Highway 410 NB OR*	Ø8	*Computer Phase*

	Min.	Pass.	Ped. Walk	Ped. Cl.	Max I	Max II	Amber	All Red
Ø1								
Ø2	**12**	**5**	**9**	**14**	**40**	**40**	**4.2**	**2**
Ø3								
Ø4	**8**	**5**			**35**	**35**	**4**	**2.5**
Ø5								
Ø6	**12**	**5**	**9**	**14**	**40**	**40**	**4.2**	**2**
Ø7								
Ø8	**8**	**5**			**35**	**35**	**4**	**2.5**

Turn on Date	Y	M	D
	88	11	21
Time			
Final	X		
Temporary			

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	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Phases In Use		X		X		X		X
Min. Recall								
Max. Recall		X				X		
Ped. Recall								
Ped. Enhanced Recall		X				X		
NL/L Memory				NL				NL
C.NA. I		X				X		
C. NA. II								
ST. UP - Yellow		X				X		
ST. UP - Red								
ST. UP FL. Time (Sec.)		5				5		
Dual Entry								
Backup Prevent		X				X		
Prot. Walk CL.		X				X		
O/Lap - A								
O/Lap - B								

Notes:

1. For actuated phase loop failure, remove the detector amplifier's fuse.
2. For pedestrian button failures, switch recall to pedestrian.
3. Volume density settings to inhibit this feature. Set "added initial" and "minimum gap" to 0". Set "time before reduction" and "time to reduce to" to 99".
4. With ped. enhanced recall, true max. equals max. I + ped. clearance settings.

Comments: 1. No pedestrian crossing for N-S direction

Approved by: _____

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REGION OF PEEL / CITY OF MISSISSAUGA INTERSECTION DATABASE SUMMARY

INTERSECTION NAME:	DERRY RD @ HWY #410 NB O/R (E. TERM.)	T2000'C' PICK UP DATE:		APPROVED BY:	RL JA
SYSTEM NUMBER:	576	DATE:	July 26, 1999	COMPLETED BY:	RL
T.R.I. #:	00508528	TIME:	12:00 hrs	REVISION #:	15
CONTROLLER TYPE:	EPAC 380	Control Area:	DERRY #17	DATE:	March 12, 2009
				NEW DATA IMPLEMENTED:	March 12, 2009

CDT #: 576

PHASE	DIRECTION	VEH. MIN. (sec.)	PED. WALK (sec.)	PED. CLEAR.	AMBER (sec.)	ALL RED (sec.)	COMM. DELAY	MINS. (SS + 2 sec) V	MINS. (SS + 2 sec) P	SPECIAL FEATURE
1	NOT IN USE						0	0	0	
2	EW GREEN		9	14	5	2	1	31	31	C
3	NOT IN USE						0	2	2	
4	NB GREEN	8			4	3	1	18	10	
5	NOT IN USE						0	0	0	
6	WB GREEN		9	14	5	2	1	31	31	C
7	NOT IN USE						0	0	0	
8	Computer Ph.	8			4	3	1	18	10	

SPLIT TABLE

SPLIT #	PHASE 1 NIU	2 EB	3 NIU	4 NB	5 NIU	6 WB	7 NIU	8 CPH
1	0	63	0	37	0	63	0	37
2	0	72	0	28	0	72	0	28
3	0	64	0	36	0	64	0	36

OFFSET TABLE

OFFSET #	%
1	20
2	19
3	50

ACTIVITY SCHEDULE INFORMATION

ACT. SCH. NO.	DAY OF WEEK	TIME PERIOD	MODE	CYCLE (sec.)	OFFSET #	SPLIT #	SPF #
1	MON. - FRI.	00:00	LO	101	2	2	2
1	MON. - FRI.	06:00	CC	140	1	1	1
1	MON. - FRI.	09:30	CC	125	2	2	2
1	MON. - FRI.	15:00	CC	140	3	3	3
1	MON. - FRI.	19:30	CC	125	2	2	2
2	SATURDAY	00:00	LO	101	2	2	2
2	SATURDAY	07:00	CC	125	2	2	2
3	SUN./HOL.	00:00	LO	101	2	2	2
3	SUN./HOL.	08:00	CC	125	2	2	2
3	SUN./HOL.	23:00	LO	101	2	2	2

SPECIAL FUNCTION OMIT STATUS

SPF #	1 NA	2 NA	3 CAL
1	Y	Y	N
2	Y	Y	N
3	Y	Y	N
31	N	N	N

PHASE OMIT OPERATION SPECIAL FUNCTIONS ASSIGNMENTS

1	NA
2	NA
3	CAL = CALL ALL PHASES

COMMENTS:

Convert database to 8 Ph. From 4 Ph.
Changed CDT Table,
Change Controller Type To D
Activity Schedule & Offset Table Stay the Same

Region of Peel
Working for you

Timing Chart/Programming Data

Intersection Name	OTI Number	System Number
Derry Rd. @ Highway 410 SB Off Ramp	*00508899*	*577*

Controller Make	Model	Type of Operation
Eagle	*EPAC 380*	*3 Phase Semi*

No	Date Y	M	D	Revision Description	Field Changes By	Checked By	Approved By
3	09	03	12	Installed New 8 Ph.Traffic Signal Controller	Guild	RL	JA

Ø1	*Not In Use*	Ø5	*Not In Use*
Ø2	*Derry Road - E/B*	Ø6	*Derry Road - W/B*
Ø3	*Not In Use*	Ø7	*Not In Use*
Ø4	*Computer Phase*	Ø8	*Highway 410 SB Off Ramp*

	Min.	Pass.	Ped. Walk	Ped. Cl.	Max I	Max II	Amber	All Red
Ø1								
Ø2	**12**	**5**	**8**	**12**	**30**	**30**	**4.2**	**2**
Ø3								
Ø4	**8**	**5**			**30**	**30**	**4**	**2.8**
Ø5								
Ø6	**12**	**5**	**8**	**12**	**30**	**30**	**4.2**	**2**
Ø7								
Ø8	**8**	**5**			**30**	**30**	**4**	**2.8**

Turn on Date	Y	M	D
	88	11	21
Time			
Final	X		
Temporary			

f:\traffic\tss\mc\timecard\

	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Phases In Use		X		X		X		X
Min. Recall								
Max. Recall		X				X		
Ped. Recall								
Ped. Enhanced Recall		X				X		
NL/L Memory				NL				NL
C.NA. I		X				X		
C. NA. II								
ST. UP - Yellow		X				X		
ST. UP - Red								
ST. UP FL. Time (Sec.)		5				5		
Dual Entry								
Backup Prevent		X				X		
Prot. Walk CL.		X				X		
O/Lap - A								
O/Lap - B								

Notes:

1. For actuated phase loop failure, remove the detector amplifier's fuse.
2. For pedestrian button failures, switch recall to pedestrian.
3. Volume density settings to inhibit this feature. Set "added initial" and "minimum gap" to 0". Set "time before reduction" and "time to reduce to" to 99".
4. With ped. enhanced recall, true max. equals max. I + ped. clearance settings.

Comments: 1. No pedestrian crossing for N-S direction

Approved by: _____

REGION OF PEEL / CITY OF MISSISSAUGA INTERSECTION DATABASE SUMMARY

INTERSECTION NAME:	DERRY RD @ HWY #410 SB O/R (E. TERM.)	T2000'C' PICK UP DATE:		APPROVED BY:	RL VJ
SYSTEM NUMBER:	577	DATE:	July 26, 1999	COMPLETED BY:	RL
T.R.I. #:	'00508899	TIME:	12:00 hrs	REVISION #:	13
CONTROLLER TYPE:	EPAC 380	Control Area:	DERRY #17	DATE:	March 12, 2009
				NEW DATA IMPLEMENTED:	March 12, 2009

CDT #: 577

PHASE	DIRECTION	VEH. MIN. (sec.)	PED. WALK (sec.)	PED. CLEAR.	AMBER (sec.)	ALL RED (sec.)	COMM. DELAY	MINS. (SS + 2 sec) V	MINS. (SS + 2 sec) P	SPECIAL FEATURE
1	NOT IN USE						0	0	0	
2	EW GREEN		9	14	5	2	1	31	31	C
3	NOT IN USE						0	2	2	
4	Computer Ph.	8			4	3	1	18	10	
5	NOT IN USE						0	0	0	
6	WB GREEN		9	14	5	2	1	31	31	C
7	NOT IN USE						0	0	0	
8	SB GREEN	8			4	3	1	18	10	

SPLIT TABLE

SPLIT #	PHASE 1 NIU	2 EB	3 NIU	4 CPh.	5 NIU	6 WB	7 NIU	8 SB
1	0	66	0	34	0	66	0	34
2	0	70	0	30	0	70	0	30
3	0	77	0	23	0	77	0	23

OFFSET TABLE

OFFSET #	%
1	3
2	18
3	92

ACTIVITY SCHEDULE INFORMATION

ACT. SCH. NO.	DAY OF WEEK	TIME PERIOD	MODE	CYCLE (sec.)	OFFSET #	SPLIT #	SPF #
1	MON. - FRI.	00:00	LO	101	2	2	2
1	MON. - FRI.	06:00	CC	140	1	1	1
1	MON. - FRI.	09:30	CC	125	2	2	2
1	MON. - FRI.	15:00	CC	140	3	3	3
1	MON. - FRI.	19:30	CC	125	2	2	2
1	MON. - FRI.	00:00,	LO	101	2	2	2
2	SATURDAY	00:00	LO	101	2	2	2
2	SATURDAY	07:00	CC	125	2	2	2
2	SATURDAY	00:00,	LO	101	2	2	2
3	SUN./HOL.	00:00	LO	101	2	2	2
3	SUN./HOL.	08:00	CC	125	2	2	2
3	SUN./HOL.	23:00	LO	101	2	2	2

SPECIAL FUNCTION OMIT STATUS

SPF #	1 NA	2 NA	3 CAL
1	Y	Y	N
2	Y	Y	N
3	Y	Y	N
31	N	N	N

PHASE OMIT OPERATION SPECIAL FUNCTIONS ASSIGNMENTS

1	NA
2	NA
3	CAL = CALL ALL PHASES

COMMENTS:

Convert database to 8 Ph. From 4 Ph.
Changed CDT Table,
Change Controller Type To D
Activity Schedule & Offset Table Stay the Same

[Raw] Volume Report

HI-Star ID: 4625	Begin: Nov/13/12 00:00	End: Nov/14/12 00:00
Street: Tomken Rd - NB	Lane: NB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 60	Raw Count: 13181
County: btwn Derry & Pacific Gate	AADT Factor: 1	AADT Count: 13,181

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Tue,Nov/13/12						
[00:00-01:00]	159	68KM/H	7 C	---		0
[01:00-02:00]	70	63KM/H	7 C	---		0
[02:00-03:00]	51	67KM/H	6 C	---		0
[03:00-04:00]	37	63KM/H	6 C	---		0
[04:00-05:00]	66	66KM/H	6 C	---		0
[05:00-06:00]	207	63KM/H	6 C	---		1
[06:00-07:00]	402	61KM/H	6 C	---		2
[07:00-08:00]	587	63KM/H	6 C	---		3
[08:00-09:00]	633	61KM/H	6 C	---		4
[09:00-10:00]	603	61KM/H	6 C	---		4
[10:00-11:00]	740	60KM/H	8 C	---		5
[11:00-12:00]	734	61KM/H	9 C	---		4
[12:00-13:00]	852	61KM/H	9 C	---		6
[13:00-14:00]	828	61KM/H	8 C	---		5
[14:00-15:00]	968	58KM/H	8 C	---		6
[15:00-16:00]	1305	59KM/H	8 C	---		8
[16:00-17:00]	1644	56KM/H	8 C	---		10
[17:00-18:00]	1563	55KM/H	7 C	---		10
[18:00-19:00]	719	62KM/H	6 C	---		4
[19:00-20:00]	326	65KM/H	6 C	---		1
[20:00-21:00]	206	65KM/H	6 C	---		0
[21:00-22:00]	178	66KM/H	6 C	---		0
[22:00-23:00]	156	66KM/H	6 C	---		0
[23:00-00:00]	147	63KM/H	6 C	---		0
	13181	62 KM/H	7 C			

[Raw] Volume Report

HI-Star ID: 4645	Begin: Nov/13/12 00:00	End: Nov/14/12 00:00
Street: Tomken Rd - SB	Lane: SB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 60	Raw Count: 13458
County: btwn Derry & Pacific Gate	AADT Factor: 1	AADT Count: 13,458

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Tue,Nov/13/12						
[00:00-01:00]	61	60KM/H	7 C	---		0
[01:00-02:00]	46	61KM/H	7 C	---		0
[02:00-03:00]	33	62KM/H	6 C	---		0
[03:00-04:00]	31	63KM/H	6 C	---		0
[04:00-05:00]	109	65KM/H	6 C	---		0
[05:00-06:00]	287	67KM/H	6 C	---		1
[06:00-07:00]	836	64KM/H	6 C	---		4
[07:00-08:00]	1406	61KM/H	6 C	---		8
[08:00-09:00]	1586	53KM/H	6 C	---		11
[09:00-10:00]	1113	43KM/H	7 C	---		9
[10:00-11:00]	811	59KM/H	8 C	---		6
[11:00-12:00]	805	60KM/H	9 C	---		5
[12:00-13:00]	822	61KM/H	11 C	---		6
[13:00-14:00]	916	60KM/H	8 C	---		6
[14:00-15:00]	861	60KM/H	8 C	---		6
[15:00-16:00]	883	60KM/H	8 C	---		5
[16:00-17:00]	1003	60KM/H	8 C	---		6
[17:00-18:00]	747	61KM/H	7 C	---		4
[18:00-19:00]	348	64KM/H	6 C	---		2
[19:00-20:00]	206	62KM/H	6 C	---		0
[20:00-21:00]	177	61KM/H	6 C	---		1
[21:00-22:00]	116	61KM/H	6 C	---		0
[22:00-23:00]	153	62KM/H	6 C	---		0
[23:00-00:00]	102	65KM/H	6 C	---		0
	13458	61 KM/H	7 C			

[Raw] Volume Report

HI-Star ID: 4738	Begin: Nov/13/12 00:00	End: Nov/14/12 00:00
Street: Tomken Rd - NB	Lane: NB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 60	Raw Count: 11116
County: btwn Meyerside & Verbena	AADT Factor: 1	AADT Count: 11,116

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Tue,Nov/13/12						
[00:00-01:00]	129	67KM/H	7 C	---		0
[01:00-02:00]	66	68KM/H	6 C	---		0
[02:00-03:00]	46	64KM/H	6 C	---		0
[03:00-04:00]	29	65KM/H	6 C	---		0
[04:00-05:00]	56	65KM/H	6 C	---		0
[05:00-06:00]	137	63KM/H	6 C	---		0
[06:00-07:00]	472	65KM/H	6 C	---		2
[07:00-08:00]	658	64KM/H	6 C	---		4
[08:00-09:00]	680	64KM/H	6 C	---		4
[09:00-10:00]	504	65KM/H	6 C	---		3
[10:00-11:00]	643	63KM/H	8 C	---		4
[11:00-12:00]	662	62KM/H	11 C	---		4
[12:00-13:00]	735	64KM/H	11 C	---		4
[13:00-14:00]	739	65KM/H	9 C	---		4
[14:00-15:00]	870	63KM/H	9 C	---		5
[15:00-16:00]	1075	63KM/H	8 C	---		6
[16:00-17:00]	1263	60KM/H	8 C	---		8
[17:00-18:00]	1001	49KM/H	7 C	---		8
[18:00-19:00]	580	64KM/H	6 C	---		2
[19:00-20:00]	249	65KM/H	6 C	---		1
[20:00-21:00]	175	67KM/H	6 C	---		0
[21:00-22:00]	135	65KM/H	6 C	---		0
[22:00-23:00]	125	67KM/H	6 C	---		0
[23:00-00:00]	87	67KM/H	6 C	---		0
	11116	64 KM/H	7 C			

[Raw] Volume Report

HI-Star ID: 4751	Begin: Nov/13/12 00:00	End: Nov/14/12 00:00
Street: Tomken Rd - SB	Lane: SB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 60	Raw Count: 11661
County: btwn Meyerside & Verbena	AADT Factor: 1	AADT Count: 11,661

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Tue,Nov/13/12						
[00:00-01:00]	59	64KM/H	6 C	---		0
[01:00-02:00]	29	66KM/H	6 C	---		0
[02:00-03:00]	29	65KM/H	6 C	---		0
[03:00-04:00]	29	64KM/H	6 C	---		0
[04:00-05:00]	66	67KM/H	6 C	---		0
[05:00-06:00]	242	67KM/H	6 C	---		0
[06:00-07:00]	673	66KM/H	6 C	---		3
[07:00-08:00]	1038	64KM/H	6 C	---		5
[08:00-09:00]	1332	63KM/H	6 C	---		7
[09:00-10:00]	961	63KM/H	6 C	---		6
[10:00-11:00]	635	62KM/H	8 C	---		4
[11:00-12:00]	688	62KM/H	11 C	---		4
[12:00-13:00]	707	62KM/H	11 C	---		4
[13:00-14:00]	700	62KM/H	9 C	---		4
[14:00-15:00]	725	62KM/H	9 C	---		4
[15:00-16:00]	818	64KM/H	8 C	---		4
[16:00-17:00]	968	62KM/H	8 C	---		5
[17:00-18:00]	840	63KM/H	6 C	---		4
[18:00-19:00]	382	63KM/H	6 C	---		2
[19:00-20:00]	251	63KM/H	6 C	---		1
[20:00-21:00]	160	61KM/H	6 C	---		0
[21:00-22:00]	124	65KM/H	6 C	---		0
[22:00-23:00]	105	64KM/H	6 C	---		0
[23:00-00:00]	100	64KM/H	4 C	---		0
	11661	63 KM/H	7 C			

[Raw] Volume Report

HI-Star ID: 4630	Begin: Nov/01/12 00:00	End: Nov/02/12 00:00
Street: Kennedy Rd - NB	Lane: NB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 69	Raw Count: 10182
County: btwn Birtannia & Abilene	AADT Factor: 1	AADT Count: 10,182

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Thu,Nov/01/12						
[00:00-01:00]	71	64KM/H	8 C	---		0
[01:00-02:00]	30	65KM/H	8 C	---		0
[02:00-03:00]	21	64KM/H	7 C	---		0
[03:00-04:00]	28	53KM/H	7 C	---		0
[04:00-05:00]	29	59KM/H	7 C	---		0
[05:00-06:00]	135	63KM/H	7 C	---		0
[06:00-07:00]	467	60KM/H	6 C	---		2
[07:00-08:00]	763	57KM/H	6 C	---		4
[08:00-09:00]	892	57KM/H	7 C	---		4
[09:00-10:00]	526	58KM/H	7 C	---		3
[10:00-11:00]	374	58KM/H	8 C	---		2
[11:00-12:00]	431	60KM/H	8 C	---		2
[12:00-13:00]	566	59KM/H	8 C	---		3
[13:00-14:00]	619	58KM/H	11 C	---		3
[14:00-15:00]	552	58KM/H	12 C	---		3
[15:00-16:00]	732	62KM/H	11 C	---		3
[16:00-17:00]	1123	59KM/H	9 C	---		6
[17:00-18:00]	1098	59KM/H	8 C	---		6
[18:00-19:00]	628	62KM/H	7 C	---		3
[19:00-20:00]	355	63KM/H	7 C	---		1
[20:00-21:00]	246	62KM/H	7 C	---		1
[21:00-22:00]	193	62KM/H	6 C	---		0
[22:00-23:00]	173	63KM/H	6 C	---		0
[23:00-00:00]	130	67KM/H	6 C	---		0
	10182	60 KM/H	8 C			

[Raw] Volume Report

HI-Star ID: 5174	Begin: Nov/01/12 00:00	End: Nov/02/12 00:00
Street: Kennedy Rd - SB	Lane: SB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 69	Raw Count: 11622
County: btwn Birtannia & Abilene	AADT Factor: 1	AADT Count: 11,622

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Thu,Nov/01/12						
[00:00-01:00]	71	67KM/H	7 C	---		0
[01:00-02:00]	31	68KM/H	7 C	---		0
[02:00-03:00]	38	71KM/H	7 C	---		0
[03:00-04:00]	21	66KM/H	6 C	---		0
[04:00-05:00]	38	67KM/H	6 C	---		0
[05:00-06:00]	120	69KM/H	6 C	---		0
[06:00-07:00]	461	69KM/H	6 C	---		2
[07:00-08:00]	919	60KM/H	6 C	---		4
[08:00-09:00]	1364	52KM/H	6 C	---		9
[09:00-10:00]	853	60KM/H	6 C	---		5
[10:00-11:00]	484	63KM/H	7 C	---		2
[11:00-12:00]	491	65KM/H	8 C	---		2
[12:00-13:00]	609	63KM/H	8 C	---		3
[13:00-14:00]	599	64KM/H	11 C	---		3
[14:00-15:00]	575	64KM/H	12 C	---		3
[15:00-16:00]	882	56KM/H	11 C	---		5
[16:00-17:00]	1106	39KM/H	8 C	---		9
[17:00-18:00]	1237	29KM/H	8 C	---		10
[18:00-19:00]	649	60KM/H	8 C	---		3
[19:00-20:00]	340	66KM/H	7 C	---		1
[20:00-21:00]	209	67KM/H	6 C	---		0
[21:00-22:00]	193	69KM/H	6 C	---		0
[22:00-23:00]	176	69KM/H	6 C	---		0
[23:00-00:00]	156	70KM/H	6 C	---		0
	11622	65 KM/H	7 C			

[Raw] Volume Report

HI-Star ID: 5170	Begin: Nov/01/12 00:00	End: Nov/02/12 00:00
Street: Kennedy Rd - NB	Lane: NB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 69	Raw Count: 10942
County: btwn Derry & Slate Dr	AADT Factor: 1	AADT Count: 10,942

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Thu,Nov/01/12						
[00:00-01:00]	132	60KM/H	8 C	---		0
[01:00-02:00]	66	59KM/H	8 C	---		0
[02:00-03:00]	60	62KM/H	7 C	---		0
[03:00-04:00]	58	62KM/H	7 C	---		0
[04:00-05:00]	59	61KM/H	7 C	---		0
[05:00-06:00]	151	61KM/H	7 C	---		0
[06:00-07:00]	289	61KM/H	7 C	---		1
[07:00-08:00]	475	58KM/H	7 C	---		2
[08:00-09:00]	512	59KM/H	7 C	---		2
[09:00-10:00]	420	56KM/H	7 C	---		2
[10:00-11:00]	434	57KM/H	8 C	---		2
[11:00-12:00]	466	57KM/H	8 C	---		3
[12:00-13:00]	607	57KM/H	8 C	---		4
[13:00-14:00]	566	59KM/H	11 C	---		3
[14:00-15:00]	656	57KM/H	12 C	---		4
[15:00-16:00]	1036	55KM/H	11 C	---		6
[16:00-17:00]	1251	54KM/H	8 C	---		8
[17:00-18:00]	1367	40KM/H	8 C	---		12
[18:00-19:00]	826	60KM/H	8 C	---		4
[19:00-20:00]	457	60KM/H	7 C	---		2
[20:00-21:00]	300	60KM/H	7 C	---		2
[21:00-22:00]	251	62KM/H	6 C	---		1
[22:00-23:00]	224	63KM/H	6 C	---		1
[23:00-00:00]	279	63KM/H	6 C	---		1
	10942	59 KM/H	8 C			

[Raw] Volume Report

HI-Star ID: 4618	Begin: Nov/01/12 00:00	End: Nov/02/12 00:00
Street: Kennedy Rd - SB	Lane: SB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 69	Raw Count: 12051
County: btwn Derry & Slate Dr	AADT Factor: 1	AADT Count: 12,051

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Thu,Nov/01/12						
[00:00-01:00]	81	59KM/H	7 C	---		0
[01:00-02:00]	39	64KM/H	7 C	---		0
[02:00-03:00]	40	60KM/H	7 C	---		0
[03:00-04:00]	51	62KM/H	7 C	---		0
[04:00-05:00]	100	67KM/H	6 C	---		0
[05:00-06:00]	339	68KM/H	6 C	---		1
[06:00-07:00]	965	65KM/H	6 C	---		4
[07:00-08:00]	1297	60KM/H	7 C	---		8
[08:00-09:00]	1535	49KM/H	7 C	---		11
[09:00-10:00]	892	61KM/H	7 C	---		6
[10:00-11:00]	524	61KM/H	7 C	---		4
[11:00-12:00]	531	63KM/H	8 C	---		3
[12:00-13:00]	603	63KM/H	8 C	---		4
[13:00-14:00]	556	64KM/H	11 C	---		4
[14:00-15:00]	629	63KM/H	12 C	---		4
[15:00-16:00]	714	64KM/H	11 C	---		4
[16:00-17:00]	757	64KM/H	8 C	---		4
[17:00-18:00]	848	66KM/H	8 C	---		4
[18:00-19:00]	454	66KM/H	7 C	---		2
[19:00-20:00]	303	67KM/H	6 C	---		2
[20:00-21:00]	222	65KM/H	6 C	---		1
[21:00-22:00]	194	63KM/H	6 C	---		0
[22:00-23:00]	202	66KM/H	6 C	---		1
[23:00-00:00]	175	64KM/H	6 C	---		0
	12051	64 KM/H	7 C			

[Raw] Volume Report

HI-Star ID: 1476	Begin: Nov/01/12 00:00	End: Nov/02/12 00:00
Street: Courtneypark Dr - EB	Lane: EB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 69	Raw Count: 13376
County: btwn Kennedy & Hwy 410	AADT Factor: 1	AADT Count: 13,376

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Thu,Nov/01/12						
[00:00-01:00]	105	59KM/H	8 C	---		0
[01:00-02:00]	68	58KM/H	7 C	---		0
[02:00-03:00]	81	55KM/H	7 C	---		0
[03:00-04:00]	79	51KM/H	7 C	---		0
[04:00-05:00]	143	59KM/H	7 C	---		0
[05:00-06:00]	325	62KM/H	6 C	---		2
[06:00-07:00]	1000	65KM/H	6 C	---		5
[07:00-08:00]	1448	62KM/H	6 C	---		8
[08:00-09:00]	1341	64KM/H	6 C	---		8
[09:00-10:00]	956	62KM/H	7 C	---		6
[10:00-11:00]	667	59KM/H	8 C	---		4
[11:00-12:00]	752	60KM/H	8 C	---		6
[12:00-13:00]	814	63KM/H	8 C	---		5
[13:00-14:00]	827	61KM/H	11 C	---		5
[14:00-15:00]	748	62KM/H	12 C	---		4
[15:00-16:00]	844	60KM/H	11 C	---		6
[16:00-17:00]	782	56KM/H	8 C	---		5
[17:00-18:00]	849	59KM/H	8 C	---		5
[18:00-19:00]	488	58KM/H	7 C	---		3
[19:00-20:00]	297	61KM/H	7 C	---		2
[20:00-21:00]	235	59KM/H	6 C	---		2
[21:00-22:00]	182	57KM/H	6 C	---		1
[22:00-23:00]	170	60KM/H	6 C	---		0
[23:00-00:00]	175	61KM/H	6 C	---		0
	13376	60 KM/H	8 C			

[Raw] Volume Report

HI-Star ID: 2669	Begin: Nov/01/12 00:00	End: Nov/02/12 00:00
Street: Courtneypark Dr - WB	Lane: WB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 69	Raw Count: 14223
County: btwn Kennedy & Hwy 410	AADT Factor: 1	AADT Count: 14,223

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Thu,Nov/01/12						
[00:00-01:00]	95	66KM/H	8 C	---		0
[01:00-02:00]	82	58KM/H	7 C	---		0
[02:00-03:00]	72	64KM/H	7 C	---		0
[03:00-04:00]	76	62KM/H	7 C	---		0
[04:00-05:00]	92	65KM/H	7 C	---		0
[05:00-06:00]	224	68KM/H	6 C	---		0
[06:00-07:00]	643	69KM/H	6 C	---		2
[07:00-08:00]	713	67KM/H	6 C	---		4
[08:00-09:00]	937	68KM/H	6 C	---		5
[09:00-10:00]	755	66KM/H	7 C	---		4
[10:00-11:00]	640	65KM/H	7 C	---		4
[11:00-12:00]	724	66KM/H	8 C	---		4
[12:00-13:00]	872	68KM/H	8 C	---		5
[13:00-14:00]	784	68KM/H	11 C	---		4
[14:00-15:00]	947	67KM/H	12 C	---		6
[15:00-16:00]	1232	66KM/H	11 C	---		8
[16:00-17:00]	1708	57KM/H	8 C	---		10
[17:00-18:00]	1523	34KM/H	8 C	---		14
[18:00-19:00]	877	66KM/H	8 C	---		4
[19:00-20:00]	360	66KM/H	7 C	---		2
[20:00-21:00]	296	66KM/H	6 C	---		2
[21:00-22:00]	241	66KM/H	6 C	---		2
[22:00-23:00]	178	66KM/H	6 C	---		0
[23:00-00:00]	152	67KM/H	6 C	---		0
	14223	66 KM/H	8 C			

[Raw] Volume Report

HI-Star ID: 2519	Begin: Nov/01/12 00:00	End: Nov/02/12 00:00
Street: Courtneypark Dr - EB	Lane: EB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 69	Raw Count: 8833
County: btwn Hurontario & Edwards	AADT Factor: 1	AADT Count: 8,833

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Thu,Nov/01/12						
[00:00-01:00]	40	53KM/H	8 C	---		0
[01:00-02:00]	23	48KM/H	8 C	---		0
[02:00-03:00]	24	57KM/H	8 C	---		0
[03:00-04:00]	33	54KM/H	7 C	---		0
[04:00-05:00]	54	66KM/H	7 C	---		0
[05:00-06:00]	231	64KM/H	7 C	---		0
[06:00-07:00]	855	62KM/H	6 C	---		4
[07:00-08:00]	1207	60KM/H	6 C	---		6
[08:00-09:00]	1244	59KM/H	7 C	---		7
[09:00-10:00]	697	59KM/H	7 C	---		4
[10:00-11:00]	356	58KM/H	8 C	---		2
[11:00-12:00]	377	58KM/H	9 C	---		2
[12:00-13:00]	488	54KM/H	9 C	---		2
[13:00-14:00]	479	52KM/H	11 C	---		2
[14:00-15:00]	403	57KM/H	12 C	---		2
[15:00-16:00]	474	60KM/H	11 C	---		2
[16:00-17:00]	471	60KM/H	8 C	---		2
[17:00-18:00]	509	61KM/H	8 C	---		2
[18:00-19:00]	259	59KM/H	7 C	---		1
[19:00-20:00]	178	58KM/H	6 C	---		0
[20:00-21:00]	124	54KM/H	6 C	---		0
[21:00-22:00]	112	53KM/H	6 C	---		0
[22:00-23:00]	110	57KM/H	6 C	---		0
[23:00-00:00]	85	56KM/H	6 C	---		0
	8833	58 KM/H	8 C			

[Raw] Volume Report

HI-Star ID: 2480	Begin: Nov/01/12 00:00	End: Nov/02/12 00:00
Street: Courtneypark Dr - WB	Lane: WB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 69	Raw Count: 8877
County: btwn Hurontario & Edwards	AADT Factor: 1	AADT Count: 8,877

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Thu,Nov/01/12						
[00:00-01:00]	76	66KM/H	7 C	---		0
[01:00-02:00]	50	57KM/H	7 C	---		0
[02:00-03:00]	59	55KM/H	7 C	---		0
[03:00-04:00]	38	55KM/H	7 C	---		0
[04:00-05:00]	53	69KM/H	7 C	---		0
[05:00-06:00]	83	66KM/H	6 C	---		0
[06:00-07:00]	159	65KM/H	6 C	---		0
[07:00-08:00]	285	62KM/H	6 C	---		1
[08:00-09:00]	379	61KM/H	6 C	---		2
[09:00-10:00]	340	63KM/H	6 C	---		2
[10:00-11:00]	290	60KM/H	7 C	---		2
[11:00-12:00]	388	59KM/H	8 C	---		2
[12:00-13:00]	557	58KM/H	8 C	---		3
[13:00-14:00]	449	59KM/H	11 C	---		2
[14:00-15:00]	540	62KM/H	12 C	---		3
[15:00-16:00]	941	64KM/H	11 C	---		5
[16:00-17:00]	1253	42KM/H	8 C	---		9
[17:00-18:00]	1211	25KM/H	8 C	---		12
[18:00-19:00]	734	65KM/H	7 C	---		6
[19:00-20:00]	282	65KM/H	6 C	---		2
[20:00-21:00]	257	63KM/H	6 C	---		1
[21:00-22:00]	174	65KM/H	6 C	---		0
[22:00-23:00]	136	66KM/H	6 C	---		0
[23:00-00:00]	143	64KM/H	6 C	---		0
	8877	62 KM/H	7 C			

[Raw] Volume Report

HI-Star ID: 4392	Begin: Nov/01/12 00:00	End: Nov/02/12 00:00
Street: Courtneypark Dr - EB	Lane: EB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 69	Raw Count: 9223
County: btwn Tomken & Shawson	AADT Factor: 1	AADT Count: 9,223

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Thu,Nov/01/12						
[00:00-01:00]	50	35KM/H	8 C	---		0
[01:00-02:00]	34	41KM/H	8 C	---		0
[02:00-03:00]	37	44KM/H	8 C	---		0
[03:00-04:00]	46	50KM/H	7 C	---		0
[04:00-05:00]	90	51KM/H	7 C	---		0
[05:00-06:00]	267	54KM/H	7 C	---		1
[06:00-07:00]	650	54KM/H	7 C	---		4
[07:00-08:00]	1017	51KM/H	7 C	---		6
[08:00-09:00]	1184	51KM/H	7 C	---		8
[09:00-10:00]	802	51KM/H	8 C	---		6
[10:00-11:00]	558	50KM/H	8 C	---		4
[11:00-12:00]	518	50KM/H	9 C	---		4
[12:00-13:00]	612	50KM/H	9 C	---		4
[13:00-14:00]	666	52KM/H	11 C	---		5
[14:00-15:00]	550	52KM/H	12 C	---		4
[15:00-16:00]	505	51KM/H	11 C	---		4
[16:00-17:00]	420	54KM/H	9 C	---		3
[17:00-18:00]	461	52KM/H	8 C	---		4
[18:00-19:00]	262	51KM/H	8 C	---		2
[19:00-20:00]	150	49KM/H	7 C	---		0
[20:00-21:00]	132	50KM/H	7 C	---		0
[21:00-22:00]	71	48KM/H	6 C	---		0
[22:00-23:00]	78	46KM/H	6 C	---		0
[23:00-00:00]	63	49KM/H	6 C	---		0
	9223	51 KM/H	8 C			

[Raw] Volume Report

HI-Star ID: 4626	Begin: Nov/01/12 00:00	End: Nov/02/12 00:00
Street: Courtneypark Dr - WB	Lane: WB	Hours: 24.00
State: ON	Oper: MD	Period: 60
City: Mississauga	Posted: 69	Raw Count: 7807
County: btwn Tomken & Shawson	AADT Factor: 1	AADT Count: 7,807

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry		Period Occupancy
Thu,Nov/01/12						
[00:00-01:00]	61	59KM/H	8 C	---		0
[01:00-02:00]	37	55KM/H	7 C	---		0
[02:00-03:00]	42	60KM/H	7 C	---		0
[03:00-04:00]	36	59KM/H	7 C	---		0
[04:00-05:00]	32	57KM/H	6 C	---		0
[05:00-06:00]	69	62KM/H	6 C	---		0
[06:00-07:00]	167	61KM/H	6 C	---		0
[07:00-08:00]	242	59KM/H	6 C	---		2
[08:00-09:00]	329	56KM/H	6 C	---		2
[09:00-10:00]	386	56KM/H	6 C	---		3
[10:00-11:00]	408	57KM/H	7 C	---		3
[11:00-12:00]	397	57KM/H	8 C	---		2
[12:00-13:00]	538	58KM/H	8 C	---		4
[13:00-14:00]	478	61KM/H	8 C	---		3
[14:00-15:00]	585	60KM/H	12 C	---		4
[15:00-16:00]	882	50KM/H	9 C	---		6
[16:00-17:00]	1086	38KM/H	8 C	---		10
[17:00-18:00]	846	30KM/H	8 C	---		9
[18:00-19:00]	501	61KM/H	7 C	---		2
[19:00-20:00]	208	63KM/H	6 C	---		1
[20:00-21:00]	147	62KM/H	6 C	---		0
[21:00-22:00]	118	64KM/H	6 C	---		0
[22:00-23:00]	103	64KM/H	6 C	---		0
[23:00-00:00]	109	66KM/H	6 C	---		0
	7807	59 KM/H	7 C			

Given the interest in commercial vehicle traffic in the vicinity of Courtneypark Dr/Hurontario and beyond:

http://www.mto.gov.on.ca/iCorridor/

Interactive Map - iCorridor - MTO - Windows Internet Explorer

http://www.mto.gov.on.ca/iCorridor/map.shtml?accepted=true

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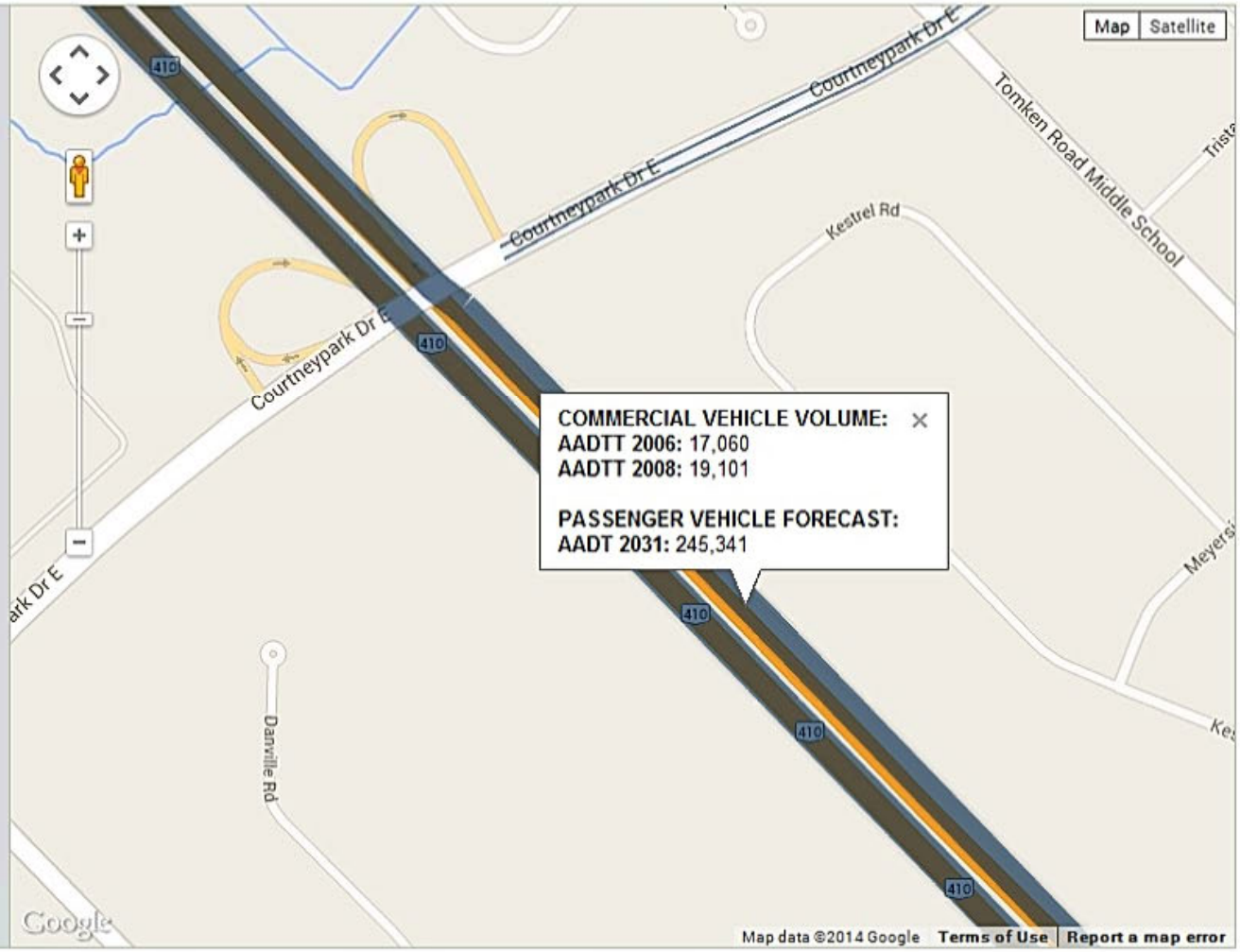
Layers: Commercial Vehicle Forecasting

SAFO Commercial Vehicle Surveys

SAFO Traffic Info

- AADTT 2006
- AADTT 2008
- ESAL 2006
- ESAL 2026 Forecast



Legend

20K and above | 10K to 20K | 5K to 10K | 1K to 5K | 0.5K to 1K | below 0.5K

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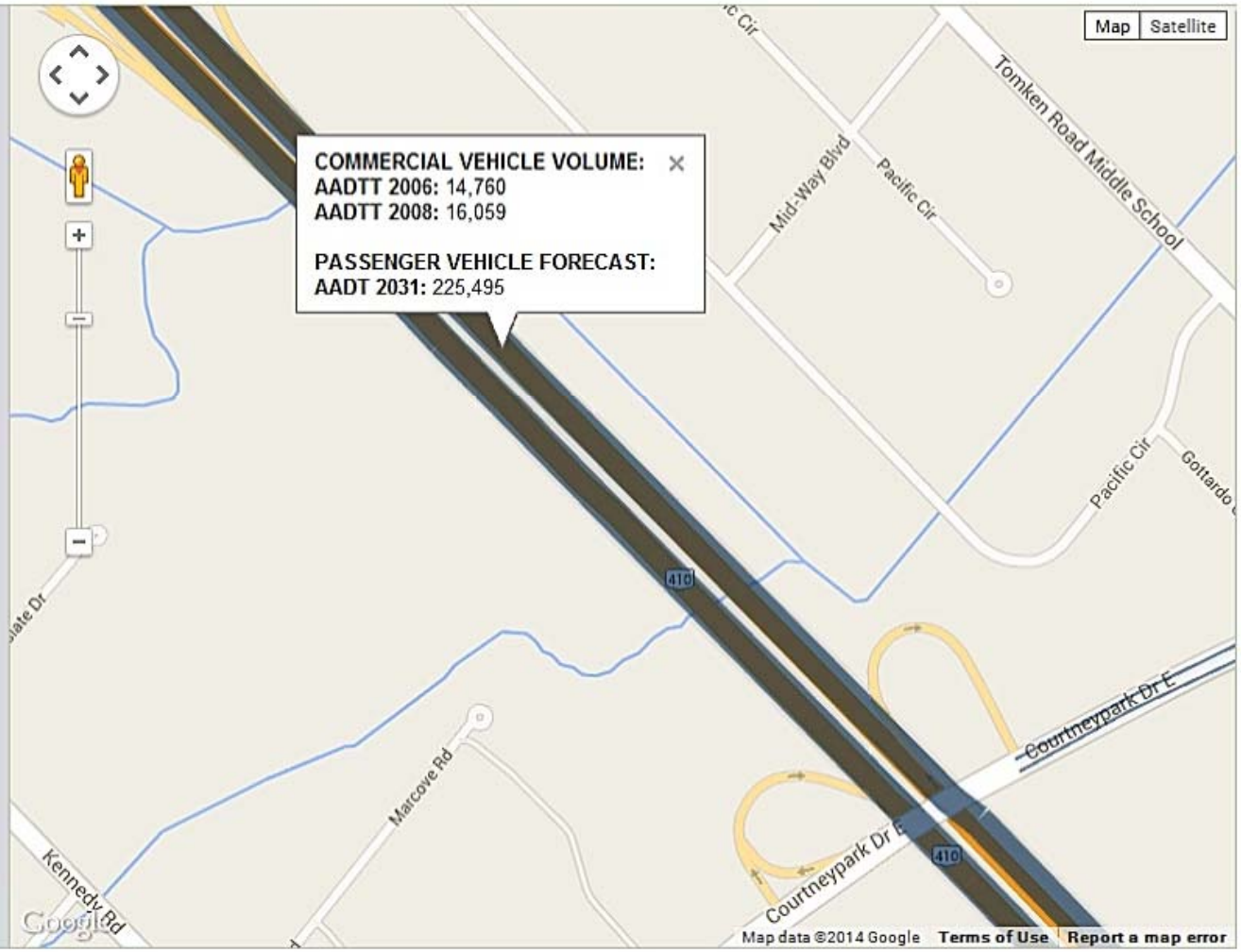
- ESAL 2026 Forecast



Legend

20K and above | 10K to 20K | 5K to 10K | 1K to 5K | 0.5K to 1K | below 0.5K

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Hwy 410 - Northbound

Interchange	Average			9/21/2010									9/22/2010									9/23/2010								
				1			2			3			4			5			6			7			8			9		
	Length	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed
Hwy 401/403				6:28:30 AM			7:22:11 AM			8:37:03 AM			6:01:51 AM			7:05:39 AM			8:22:10 AM			6:27:47 AM			7:21:18 AM			8:26:21 AM		
Courtney Park Dr	2.0	01:08	107	6:29:34 AM	01:04	112	7:23:19 AM	01:08	106	8:38:11 AM	01:08	106	6:02:57 AM	01:06	109	7:06:51 AM	01:12	100	8:23:16 AM	01:06	109	6:28:59 AM	01:12	100	7:22:24 AM	01:06	109	8:27:27 AM	01:06	109
Derry Rd	1.5	00:50	107	6:30:22 AM	00:48	113	7:24:11 AM	00:52	104	8:39:01 AM	00:50	108	6:03:45 AM	00:48	112	7:07:45 AM	00:54	100	8:24:06 AM	00:50	108	6:29:49 AM	00:50	108	7:23:16 AM	00:52	104	8:28:17 AM	00:50	108
Hwy 407	1.2	00:40	109	6:31:00 AM	00:38	114	7:24:51 AM	00:40	108	8:39:41 AM	00:40	108	6:04:23 AM	00:38	114	7:08:25 AM	00:40	108	8:24:48 AM	00:42	103	6:30:27 AM	00:38	114	7:23:58 AM	00:42	103	8:28:57 AM	00:40	108
Steeles Ave	2.1	01:13	104	6:32:13 AM	01:13	104	7:26:01 AM	01:10	108	8:40:57 AM	01:16	99	6:05:35 AM	01:12	105	7:09:43 AM	01:18	97	8:26:00 AM	01:12	105	6:31:37 AM	01:10	108	7:25:08 AM	01:10	108	8:30:11 AM	01:14	102
Clark Blvd	2.4	01:26	101	6:33:35 AM	01:22	105	7:27:25 AM	01:24	103	8:42:27 AM	01:30	96	6:07:01 AM	01:26	100	7:11:15 AM	01:32	94	8:27:24 AM	01:24	103	6:33:03 AM	01:26	100	7:26:32 AM	01:24	103	8:31:35 AM	01:24	103
Queen St	0.6	00:22	98	6:33:57 AM	00:22	98	7:27:49 AM	00:24	90	8:42:47 AM	00:20	108	6:07:23 AM	00:22	98	7:11:39 AM	00:24	90	8:27:46 AM	00:22	98	6:33:25 AM	00:22	98	7:26:54 AM	00:22	98	8:31:55 AM	00:20	108
Williams Pkwy	1.6	00:55	105	6:34:49 AM	00:52	111	7:28:41 AM	00:52	111	8:43:41 AM	00:54	107	6:08:21 AM	00:58	99	7:12:37 AM	00:58	99	8:28:41 AM	00:55	105	6:34:19 AM	00:54	107	7:27:48 AM	00:54	107	8:32:51 AM	00:56	103
Boivard Dr	1.5	00:52	103	6:35:39 AM	00:50	108	7:29:33 AM	00:52	104	8:44:31 AM	00:50	108	6:09:17 AM	00:56	96	7:13:33 AM	00:56	96	8:29:31 AM	00:50	108	6:35:11 AM	00:52	104	7:28:40 AM	00:52	104	8:33:43 AM	00:52	104
Mayfield Rd	4.4	02:39	99	6:38:17 AM	02:38	100	7:32:07 AM	02:34	103	8:47:15 AM	02:44	97	6:11:57 AM	02:40	99	7:16:19 AM	02:46	95	8:32:05 AM	02:34	103	6:37:47 AM	02:36	102	7:31:24 AM	02:44	97	8:36:21 AM	02:38	100
Valleywood Blvd	3.3	02:05	95	6:40:25 AM	02:08	93	7:34:05 AM	01:58	101	8:49:17 AM	02:02	97	6:14:13 AM	02:16	87	7:18:33 AM	02:14	89	8:34:15 AM	02:10	91	6:39:45 AM	01:58	101	7:33:28 AM	02:04	96	8:38:19 AM	01:58	101
Totals/Averages	20.6	0:12:10	102	0:11:55		104	0:11:54		104	0:12:14		101	0:12:22		100	0:12:54		96	0:12:05		102	0:11:58		103	0:12:10		102	0:11:58		103

Hwy 410 - Southbound

Interchange	Average			9/21/2010									9/22/2010									9/23/2010								
				1			2			3			4			5			6			7			8			9		
	Length	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed
Valleywood Blvd				5:59:13 AM			6:51:19 AM			7:51:05 AM			6:26:37 AM			7:34:33 AM			8:46:27 AM			5:59:40 AM			6:52:19 AM			7:45:40 AM		
Mayfield Rd	3.4	02:11	94	6:01:31 AM	02:18	89	6:53:35 AM	02:16	90	7:53:21 AM	02:16	90	6:29:01 AM	02:24	85	7:36:57 AM	02:24	85	8:48:37 AM	02:10	94	6:01:34 AM	01:54	107	6:54:11 AM	01:52	109	7:47:44 AM	02:04	99
Boivard Dr	4.4	03:10	83	6:04:09 AM	02:38	100	6:56:03 AM	02:28	107	7:57:51 AM	04:30	59	6:31:43 AM	02:42	98	7:41:39 AM	04:42	56	8:50:57 AM	02:20	113	6:04:08 AM	02:34	103	6:56:47 AM	02:36	102	7:51:48 AM	04:04	65
Williams Pkwy	1.5	02:04	44	6:05:03 AM	00:54	100	6:57:43 AM	01:40	54	8:00:22 AM	02:31	36	6:33:41 AM	01:58	46	7:45:21 AM	03:42	24	8:52:15 AM	01:18	69	6:04:56 AM	00:48	112	6:58:33 AM	01:46	51	7:55:45 AM	03:57	23
Queen St	1.6	02:17	42	6:05:57 AM	00:54	107	6:59:55 AM	02:12	44	8:02:51 AM	02:29	39	6:35:57 AM	02:16	42	7:49:54 AM	04:33	21	8:54:45 AM	02:30	38	6:05:50 AM	00:54	107	7:00:23 AM	01:50	52	7:58:37 AM	02:52	33
Clark Blvd	0.6	00:38	56	6:06:19 AM	00:22	98	7:00:29 AM	00:34	64	8:03:29 AM	00:38	57	6:36:41 AM	00:44	49	7:51:04 AM	01:10	31	8:55:27 AM	00:42	51	6:06:12 AM	00:22	98	7:00:55 AM	00:32	68	7:59:19 AM	00:42	51
Steeles Ave	2.4	02:46	52	6:07:45 AM	01:26	100	7:03:03 AM	02:34	56	8:07:07 AM	03:38	40	6:39:07 AM	02:26	59	7:55:40 AM	04:36	31	8:58:53 AM	03:26	42	6:07:42 AM	01:30	96	7:02:51 AM	01:56	74	8:02:45 AM	03:26	42
Hwy 407	2.1	02:32	50	6:09:01 AM	01:16	99	7:05:17 AM	02:14	56	8:10:59 AM	03:52	33	6:40:31 AM	01:24	90	7:59:24 AM	03:44	34	9:02:17 AM	03:24	37	6:08:52 AM	01:10	108	7:05:10 AM	02:19	54	8:06:11 AM	03:26	37
Derry Rd	1.2	02:04	35	6:09:41 AM	00:40	108	7:07:23 AM	02:06	34	8:13:57 AM	02:58	24	6:41:37 AM	01:06	65	8:02:28 AM	03:04	23	9:04:57 AM	02:40	27	6:09:30 AM	00:38	114	7:07:34 AM	02:24	30	8:09:07 AM	02:56	25
Courtney Park Dr	1.5	01:48	50	6:10:41 AM	01:00	90	7:09:21 AM	01:58	46	8:15:49 AM	01:52	48	6:43:37 AM	02:00	45	8:04:56 AM	02:28	36	9:06:51 AM	01:54	47	6:10:38 AM	01:08	79	7:09:24 AM	01:50	49	8:11:05 AM	01:58	46
Hwy 401/403	2.0	01:20	90	6:12:02 AM	01:21	89	7:10:33 AM	01:12	100	8:17:03 AM	01:14	97	6:45:05 AM	01:28	82	8:06:14 AM	01:18	92	9:08:09 AM	01:18	92	6:12:02 AM	01:24	86	7:10:38 AM	01:14	97	8:12:39 AM	01:34	77
Totals/Averages	20.7	0:20:50	60	0:12:49		97	0:19:14		65	0:25:58		48	0:18:28		67	0:31:41		39	0:21:42		57	0:12:22		100	0:18:19		68	0:26:59		46

Hwy 410 - Northbound

Interchange	Average			9/21/2010									9/22/2010									9/23/2010								
				1			2			3			4			5			6			7			8			9		
	Length	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed
Hwy 401/403				3:31:43 PM			4:32:11 PM			5:31:34 PM			4:06:07 PM			5:11:33 PM			6:19:07 PM			3:33:21 PM			4:41:09 PM			5:48:37 PM		
Courtney Park Dr	2.0	02:33	47	3:32:59 PM	01:16	95	4:35:39 PM	03:28	35	5:35:34 PM	04:00	30	4:08:35 PM	02:28	49	5:14:19 PM	02:46	43	6:20:19 PM	01:12	100	3:35:21 PM	02:00	60	4:43:39 PM	02:30	48	5:51:51 PM	03:14	37
Derry Rd	1.5	02:11	41	3:33:59 PM	01:00	90	4:36:57 PM	01:18	69	5:39:00 PM	03:26	26	4:10:13 PM	01:38	55	5:17:33 PM	03:14	28	6:23:03 PM	02:44	33	3:36:15 PM	00:54	100	4:45:55 PM	02:16	40	5:55:01 PM	03:10	28
Hwy 407	1.2	01:44	41	3:34:41 PM	00:42	103	4:37:51 PM	00:54	80	5:42:46 PM	03:46	19	4:11:28 PM	01:15	58	5:20:37 PM	03:04	23	6:24:11 PM	01:08	64	3:36:53 PM	00:38	114	4:47:21 PM	01:26	50	5:57:47 PM	02:46	26
Steeles Ave	2.1	02:44	46	3:36:01 PM	01:20	95	4:41:05 PM	03:14	39	5:46:56 PM	04:10	30	4:13:44 PM	02:16	56	5:25:05 PM	04:28	28	6:26:19 PM	02:08	59	3:38:18 PM	01:25	89	4:50:43 PM	03:22	37	6:00:03 PM	02:16	56
Clark Blvd	2.4	02:19	62	3:37:33 PM	01:32	94	4:43:33 PM	02:28	58	5:49:50 PM	02:54	50	4:15:37 PM	01:53	76	5:27:19 PM	02:14	64	6:28:59 PM	02:40	54	3:40:24 PM	02:06	69	4:53:13 PM	02:30	58	6:02:41 PM	02:38	55
Queen St	0.7	00:26	99	3:37:57 PM	00:24	105	4:44:01 PM	00:28	90	5:50:16 PM	00:26	97	4:16:01 PM	00:24	105	5:27:43 PM	00:24	105	6:29:25 PM	00:26	97	3:40:48 PM	00:24	105	4:53:41 PM	00:28	90	6:03:07 PM	00:26	97
Williams Pkwy	1.5	01:00	90	3:38:49 PM	00:52	104	4:45:22 PM	01:21	67	5:51:10 PM	00:54	100	4:17:03 PM	01:02	87	5:28:48 PM	01:05	83	6:30:21 PM	00:56	96	3:41:42 PM	00:54	100	4:54:41 PM	01:00	90	6:04:05 PM	00:58	93
Boivard Dr	1.6	00:56	102	3:39:41 PM	00:52	111	4:46:26 PM	01:04	90	5:52:12 PM	01:02	93	4:17:59 PM	00:56	103	5:29:38 PM	00:50	115	6:31:21 PM	01:00	96	3:42:36 PM	00:54	107	4:55:37 PM	00:56	103	6:04:57 PM	00:52	111
Mayfield Rd	4.4	02:39	100	3:42:17 PM	02:36	102	4:49:08 PM	02:42	98	5:54:50 PM	02:38	100	4:20:49 PM	02:50	93	5:32:24 PM	02:46	95	6:34:01 PM	02:40	99	3:45:02 PM	02:26	108	4:58:13 PM	02:36	102	6:07:33 PM	02:36	102
Valleywood Blvd	3.3	02:00	99	3:44:17 PM	02:00	99	4:51:14 PM	02:06	94	5:56:56 PM	02:06	94	4:22:53 PM	02:04	96	5:34:28 PM	02:04	96	6:35:57 PM	01:56	102	3:46:56 PM	01:54	104	5:00:07 PM	01:54	104	6:09:29 PM	01:56	102
Totals/Averages	20.7	0:18:33	67	0:12:34		99	0:19:03		65	0:25:22		49	0:16:46		74	0:22:55		54	0:16:50		74	0:13:35		91	0:18:58		65	0:20:52		60

Hwy 410 - Southbound

Interchange	Average			9/21/2010									9/22/2010									9/23/2010					
				1			2			3			4			5			6			7			8		
	Length	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed	Time	TT	Speed
Valleywood Blvd				3:58:31 PM			4:57:30 PM			6:04:24 PM			4:35:43 PM			5:49:26 PM			4:01:40 PM			5:11:17 PM			6:22:55 PM		
Mayfield Rd	3.3	02:00	99	4:00:41 PM	02:10	91	4:59:40 PM	02:10	91	6:06:24 PM	02:00	99	4:37:53 PM	02:10	91	5:51:24 PM	01:58	101	4:03:34 PM	01:54	104	5:13:05 PM	01:48	110	6:24:47 PM	01:52	106
Boivard Dr	4.4	02:29	106	4:03:13 PM	02:32	104	5:02:16 PM	02:36	102	6:08:50 PM	02:26	108	4:40:21 PM	02:28	107	5:53:54 PM	02:30	106	4:06:00 PM	02:26	108	5:15:33 PM	02:28	107	6:27:15 PM	02:28	107
Williams Pkwy	1.5	00:51	106	4:04:05 PM	00:52	104	5:03:08 PM	00:52	104	6:09:42 PM	00:52	104	4:41:07 PM	00:46	117	5:54:46 PM	00:52	104	4:06:50 PM	00:50	108	5:16:23 PM	00:50	108	6:28:07 PM	00:52	104
Queen St	1.6	00:52	110	4:04:55 PM	00:50	115	5:04:02 PM	00:54	107	6:10:36 PM	00:54	107	4:42:01 PM	00:54	107	5:55:38 PM	00:52	111	4:07:42 PM	00:52	111	5:17:15 PM	00:52	111	6:28:57 PM	00:50	115
Clark Blvd	0.6	00:22	99	4:05:17 PM	00:22	98	5:04:24 PM	00:22	98	6:10:58 PM	00:22	98	4:42:21 PM	00:20	108	5:56:00 PM	00:22	98	4:08:06 PM	00:24	90	5:17:37 PM	00:22	98	6:29:17 PM	00:20	108
Steeles Ave	2.4	01:24	103	4:06:47 PM	01:30	96	5:05:48 PM	01:24	103	6:12:20 PM	01:22	105	4:43:41 PM	01:20	108	5:57:24 PM	01:24	103	4:09:30 PM	01:24	103	5:19:03 PM	01:26	100	6:30:39 PM	01:22	105
Hwy 407	2.1	01:13	104	4:07:57 PM	01:10	108	5:07:02 PM	01:14	102	6:13:32 PM	01:12	105	4:44:51 PM	01:10	108	5:58:38 PM	01:14	102	4:10:50 PM	01:20	95	5:20:17 PM	01:14	102	6:31:47 PM	01:08	111
Derry Rd	1.2	00:39	111	4:08:37 PM	00:40	108	5:07:42 PM	00:40	108	6:14:08 PM	00:36	120	4:45:29 PM	00:38	114	5:59:18 PM	00:40	108	4:11:28 PM	00:38	114	5:20:57 PM	00:40	108	6:32:25 PM	00:38	114
Courtney Park Dr	1.5	01:04	85	4:09:37 PM	01:00	90	5:08:54 PM	01:12	75	6:15:02 PM	00:54	100	4:46:37 PM	01:08	79	6:00:12 PM	00:54	100	4:12:38 PM	01:10	77	5:22:19 PM	01:22	66	6:33:15 PM	00:50	108
Hwy 401/403	2.0	01:30	80	4:10:53 PM	01:16	95	5:11:18 PM	02:24	50	6:16:14 PM	01:12	100	4:47:55 PM	01:18	92	6:02:12 PM	02:00	60	4:13:56 PM	01:18	92	5:23:41 PM	01:22	88	6:34:21 PM	01:06	109
Totals/Averages	20.6	0:12:23	100	0:12:22		100	0:13:48		90	0:11:50		104	0:12:12		101	0:12:46		97	0:12:16		101	0:12:24		100	0:11:26		108

Project: Courtneypark Drive Class EA - Highway 410 VISSIM Model
Project #: 1650-10564
Task: Existing AM Peak Hour OD Matrix

	Zone	1 North Limit	2 South Limit	3 Derry Rd W	4 Derry R E	5 Courtneypark W	6 Courtneypark E	
North Limit	1		4760	770	841	0	0	6371
South Limit	2	5385		447	1091	562	623	8108
Derry Rd W	3	266	549		1587	0	0	2402
Derry Rd E	4	250	356	697		0	0	1303
Courtneypark Dr W	5	0	193	0	0		1202	1395
Courtneypark Dr E	6	0	202	0	0	317		519
								20098
		5901	6060	1914	3519	879	1825	20098
		6778	**6456**	**1914**	**3519**	**879**	**1825**	
TOTAL IN		1	2	3	4	5	6	

TOTAL OUT		
6767	1	North Limit
8985	2	South Limit
2402	3	Derry Rd W
1303	4	Derry Rd E
1395	5	Courtneypark Dr W
519	6	Courtneypark Dr E

Project: Courtneypark Drive Class EA - Highway 410 VISSIM Model
Project #: 1650-10564
Task: Existing PM Peak Hour OD Matrix

	Zone	1 North Limit	2 South Limit	3 Derry Rd W	4 Derry R E	5 Courtneypark W	6 Courtneypark E	
North Limit	1		4152	435	262	0	0	4849
South Limit	2	7029		720	341	197	138	8425
Derry Rd W	3	768	444		836	0	0	2048
Derry Rd E	4	943	601	1813		0	0	3357
Courtneypark Dr W	5	0	274	0	0		516	790
Courtneypark Dr E	6	0	461	0	0	1434		1895
								21364
		8740	5932	2968	1439	1631	654	21364
		9221	**6562**	**2968**	**1439**	**1631**	**654**	
TOTAL IN		1	2	3	4	5	6	

TOTAL OUT		
5479	1	North Limit
8906	2	South Limit
2048	3	Derry Rd W
3357	4	Derry Rd E
790	5	Courtneypark Dr W
1895	6	Courtneypark Dr E

Appendix B
Calibration/Validation Parameters

Table 4. Wisconsin DOT freeway model calibration criteria.

Criteria and Measures	Calibration Acceptance Targets
Hourly Flows, Model Versus Observed	
Individual Link Flows	
Within 15%, for 700 veh/h < Flow < 2700 veh/h	> 85% of cases
Within 100 veh/h, for Flow < 700 veh/h	> 85% of cases
Within 400 veh/h, for Flow > 2700 veh/h	> 85% of cases
Sum of All Link Flows	Within 5% of sum of all link counts
GEH Statistic < 5 for Individual Link Flows*	> 85% of cases
GEH Statistic for Sum of All Link Flows	GEH < 4 for sum of all link counts
Travel Times, Model Versus Observed	
Journey Times, Network	
Within 15% (or 1 min, if higher)	> 85% of cases
Visual Audits	
Individual Link Speeds	
Visually Acceptable Speed-Flow Relationship	To analyst's satisfaction
Bottlenecks	
Visually Acceptable Queuing	To analyst's satisfaction

*The GEH statistic is computed as follows:

$$GEH = \sqrt{\frac{(E-V)^2}{(E+V)/2}} \tag{4}$$

where:

E = model estimated volume
V = field count

Source: "Freeway System Operational Assessment," *Paramics Calibration and Validation Guidelines* (Draft), Technical Report I-33, Wisconsin DOT, District 2, June 2002.

Project: Courtneypark Dr Class EA - Highway 410 VISSIM Model
Project #: 1650-10564
Task: Coding Assumptions in VISSIM - January 2014

Vehicle Inputs

Volumes (Truck %)	As calculated - refer to VISSIM Volume Inputs & Traffic Data
Length of auto (default)	
Length of heavy truck (default)	

Functions

Maximum acceleration (default)
Desired acceleration (default)
Maximum decceleration (default)
Desired decceleration (default)

Routings

Static - Turning movements
Distribution based on developed OD Matrix

Desired Speed and Reduced Speed

Highway 410	Posted speed limit (100 km/h)	
Arterials	Posted speed limit (70 km/h)	
Reduced Speed Right Turns	Auto:	18 km/h
	Truck:	15 km/h
Reduced Speed Left Turns	Auto:	40 - 45 km/h
	Truck:	30 - 35 km/h

Conflict Area/Priority Rules

Priority Rule	Right Turning
	Min. Gap Time: 3.0 s; Min. Headway: 5.0 m; Max. Speed: 180 km/h
Conflict Areas	

Driving Behaviour Parameter Sets

Urban (motorized)

Following

CC0 (Standstill Distance)	1.5 m	default
CC1 (Headway Time)	0.9 s	default
CC2 (Following Variation)	4.00 m	default
CC3 (Threshold for Entering 'Following')	-8	default
CC4 (Negative 'Following' Threshold)	-0.35	default
CC5 (Positive 'Following' Threshold)	0.35	default
CC6 (Speed Dependency of Oscillation)	11.44	default
CC7 (Oscillation Acceleration)	0.25 m/s2	default
CC8 (Standstill Acceleration)	3.50 m/s2	default
CC9 (Acceleration at 80 km/h)	1.5 m/s2	default

Lane Change (defaults)

Lateral (defaults)
Signal Control (defaults)

Freeway (free lane selection)

Following

CC0 (Standstill Distance)	1.5 m	default
CC1 (Headway Time)	**0.65 s**	default = 0.9s
CC2 (Following Variation)	**4.0 m**	default
CC3 (Threshold for Entering 'Following')	-8	default
CC4 (Negative 'Following' Threshold)	-0.35	default
CC5 (Positive 'Following' Threshold)	0.35	default
CC6 (Speed Dependency of Oscillation)	11.44	default
CC7 (Oscillation Acceleration)	**0.75 m/s2**	default = 0.25 m/s2
CC8 (Standstill Acceleration)	**5.00 m/s2**	default = 3.50 m/s2
CC9 (Acceleration at 80 km/h)	1.5 m/s2	default

Lane Change

General Behaviour: Free Lane Selection

Necessary lane change (route)	Own	Trailing Vehicle		
Maximum deceleration:	-3.50 m/s2	**-3.00 m/s2**	default =	-3.50 m/s2
- 1 m/s2 per distance:	300.0 m	200.0 m		
Accepted deceleration:	-1.00 m/s2	-0.50 m/s2		

Waiting time before diffusion: 10.00 s	default=60 s	
Min. headway (front/rear): 0.30 m	default=0.35 s	
Safety distance reduction factor: 0.50		default=0.6
Maximum deceleration for cooperative braking: -7.00 m/s2		default= -3 m/s2

Overtake reduced speed areas: checked (active)

Advanced merging: checked (active)

Cooperative lane change: checked (active)

Maximum speed difference: 10.80 km/h	default
Maximum collision time: 10.00 s	default

Lateral (defaults)

Signal Control (defaults)

Lane Changing Distance

At least 250 m for each lane change
For a 8-lane highway, the maximum number of lane changes is 3, the lane change distance will be 750 m

Simulation Parameters

Simulation Interval	AM Peak Period	6 AM to 9 AM
	Evaluation	**7 AM to 8 AM Peak Hour**
	PM Peak Period	3 PM to 6 PM
	Evaluation	**4 PM to 5 PM Peak Hour**

Stantec

Memo

To:	File	From:	
			Markham
File:	165010564	Date:	November 28, 2013

Reference: Courtneypark Dr E Corridor – Calibration

Existing lane configurations;

Existing signal timing plans;

Calculated peak hour factors;

Heavy vehicle percentages extracted;

2013 Traffic counts;

Volumes – not balanced, but less than 10% difference between intersections;

Default saturation flows of 1,900 vphpl;

Calibration target of v/c < 1.0; As volumes are actually flowing and processed by intersections;

Methodology: Increase saturation flows incrementally until target is achieved for individual turning movements;

Reference: Courtneypark Dr E Corridor – Calibration

Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay	v/c	Q	LOS	Delay	v/c	Q
Kennedy Road/ Courtneypark Drive E *Signalized*	EB	Left	D	42	0.35	32	F	105	0.99	78
		Thru-Thru/Right	E	75	0.99	199	D	38	0.53	84
	WB	Left	E	77	0.92	81	C	33	0.64	33
		Thru-Thru/Right	C	29	0.44	84	F	106	1.12	277
	NB	Left	D	37	0.51	21	C	31	0.53	34
		Thru-Thru/Right	D	46	0.61	88	F	88	1.05	222
	SB	Left	D	36	0.76	69	D	49	0.76	50
		Thru-Thru/Right	D	49	0.87	175	D	45	0.72	124
	Overall Intersection		***D***	***52***	***0.92***	**-**	***E***	***75***	***1.05***	**-**
Highway 410 West Terminal/ Courtneypark Drive E *Unsignalized*	EB	Left	C	15	0.37	13	C	20	0.55	25
		Dual Thru	Unopposed Movement							
	WB	Dual Thru	Unopposed Movement							
		Right	Unopposed Movement							
Highway 410 East Terminal/ Courtneypark Drive E *Signalized*	EB	Dual Thru	C	22	0.75	89	A	10	0.28	54
	WB	Dual Thru	B	13	0.40	47	B	20	0.89	165
	SB	Dual Left	C	31	0.47	84	D	42	0.22	26
		Right	D	41	0.70	133	D	54	0.58	69
	Overall Intersection		***C***	***26***	***0.73***	**-**	***C***	***21***	***0.80***	**-**
Tomken Road/ Courtneypark Drive E *Signalized*	EB	Left	B	17	0.49	47	E	71	0.75	41
		Dual Thru	C	24	0.69	136	B	16	0.26	30
		Right	D	37	0.92	48	B	14	0.11	4
	WB	Left	D	49	0.11	10	B	19	0.07	7
		Thru-Thru/Right	D	53	0.36	53	D	49	0.98	227
	NB	Dual Left	E	64	0.55	28	F	84	0.92	92
		Dual Thru	C	24	0.27	47	F	83	1.05	257
		Right	C	21	0.04	6	C	29	0.03	0
	SB	Left	D	52	0.68	95	D	48	0.61	21
		Dual Thru	E	61	0.94	215	E	55	0.76	106
		Right	C	35	0.22	29	E	76	0.89	148
	Overall Intersection		***D***	***40***	***0.91***	**-**	***E***	***62***	***1.01***	**-**
Ordan Drive-Shawson Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	4	0.19	9	B	13	0.12	7
		Thru-Thru/Right	A	4	0.44	29	B	14	0.22	31
	WB	Left	A	9	0.16	8	B	11	0.10	13
		Thru-Thru/Right	A	7	0.12	15	B	12	0.41	71
	NB	Left	D	44	0.06	9	E	62	0.61	57
		Thru/Right	D	44	0.05	11	D	44	0.07	14
	SB	Left	D	43	0.02	4	D	43	0.02	6
		Thru/Right	D	44	0.04	10	D	45	0.12	21
	Overall Intersection		***A***	***7***	***0.35***	**-**	***B***	***20***	***0.46***	**-**
Vipond Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	1	0.13	1	B	13	0.03	4
		Thru-Thru/Right	A	1	0.37	4	B	17	0.26	48
	WB	Left	A	4	0.12	4	B	12	0.09	9
		Thru-Thru/Right	A	4	0.15	8	B	14	0.42	61

Reference: Courtneypark Dr E Corridor – Calibration

Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay	v/c	Q	LOS	Delay	v/c	Q
	NB	Left	D	47	0.06	9	D	45	0.23	27
		Thru/Right	D	47	0.05	12	D	41	0.04	10
	SB	Left	D	46	0.01	4	D	42	0.09	14
		Thru/Right	D	46	0.02	7	D	42	0.10	16
	Overall Intersection		***A***	***4***	***0.30***	**-**	***B***	***19***	***0.37***	**-**
Ordan Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	10	0.02	4	A	2	0.01	< 1
		Thru-Thru/Right	B	12	0.35	62	A	3	0.28	15
	WB	Left	A	5	0.06	4	A	4	0.05	2
		Thru-Thru/Right	A	6	0.19	20	A	5	0.36	27
	NB	Left	D	47	0.04	8	D	50	0.26	28
		Thru/Right	D	47	0.03	8	D	46	0.04	0
	SB	Left	D	50	0.16	15	D	52	0.33	31
		Thru/Right	D	47	0.03	7	D	46	0.07	12
	Overall Intersection		***B***	***11***	***0.31***	**-**	***B***	***10***	***0.35***	**-**
Dixie Road/ Courtneypark Drive E *Signalized*	EB	Left	D	37	0.55	50	F	355	1.60	204
		Thru-Thru/Right	D	46	0.72	90	B	19	0.27	22
	WB	Left	D	50	0.19	11	D	36	0.25	26
		Thru	E	57	0.46	39	F	110	1.05	207
		Right	D	53	0.09	8	F	214	1.32	245
	NB	Left	F	96	0.91	76	D	40	0.71	44
		Triple Thru	C	31	0.47	80	E	64	1.01	232
		Right	C	25	0.05	0	C	26	0.03	0
	SB	Left	C	20	0.72	89	F	218	1.30	91
		Triple Thru	B	15	0.46	93	C	31	0.47	78
		Right	B	13	0.24	13	C	26	0.10	13
	Overall Intersection		***C***	***28***	***0.83***	**-**	***F***	***100***	***1.49***	**-**

Changes:

Intersection	Movement	Peak Hour	v/c	Ideal Sat	Prot Sat	Perm Sat	ROTR Sat
Kennedy	WBT-T/R	PM	1.12	1,900			
			0.99	2,150	-	-	-
	NBT-T/R	PM	1.05	1,900			
			0.97	2,050	-	-	-
Tomken	NBT-T	PM	1.05	1,900			
			0.99	2,000	-	-	-
Dixie	EBL	PM	1.28	1,900			
			1.18	1,900	2,800	325	-
			0.99	1,900	3,350	325	
	WBR	PM	1.32	1,900			

Reference: Courtneypark Dr E Corridor – Calibration

			1.14	2,200			
			1.06	2,350			
			1.02	2,450			
			1.00	2,500	-	-	125
			0.98	2,500	-	-	140
	NBT-T-T	PM	1.01	1,900			
			0.98	1,950	-	-	-
	SBL	PM	1.52	1,900	1990	160	
			0.98	1,900	3,150	160	

Reference: Courtneypark Dr E Corridor – Calibration

Calibrated Model

Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay	v/c	Q	LOS	Delay	v/c	Q
Kennedy Road/ Courtneypark Drive E *Signalized*	EB	Left	D	42	0.35	32	F	105	0.99	78
		Thru-Thru/Right	E	75	0.99	199	D	38	0.53	84
	WB	Left	E	78	0.92	79	B	20	0.64	20
		Thru-Thru/Right	C	29	0.44	85	D	44	0.99	251
	NB	Left	D	37	0.51	21	C	31	0.53	34
		Thru-Thru/Right	D	46	0.61	88	E	67	0.97	209
	SB	Left	D	36	0.76	69	D	49	0.76	50
		Thru-Thru/Right	D	49	0.87	175	D	45	0.72	124
	Overall Intersection		***D***	***52***	***0.92***	**-**	***D***	***50***	***0.97***	**-**
Highway 410 West Terminal/ Courtneypark Drive E *Unsignalized*	EB	Left	B	15	0.36	12	C	20	0.54	24
		Dual Thru	Unopposed Movement							
	WB	Dual Thru	Unopposed Movement							
		Right	Unopposed Movement							
Highway 410 East Terminal/ Courtneypark Drive E *Signalized*	EB	Dual Thru	B	18	0.75	62	B	17	0.28	63
	WB	Dual Thru	B	16	0.40	57	B	20	0.89	138
	SB	Dual Left	C	31	0.47	84	D	42	0.22	26
		Right	D	41	0.70	133	D	54	0.58	69
	Overall Intersection		***C***	***25***	***0.73***	**-**	***C***	***23***	***0.80***	**-**
Tomken Road/ Courtneypark Drive E *Signalized*	EB	Left	C	23	0.50	62	E	76	0.75	44
		Dual Thru	C	28	0.70	133	B	12	0.26	26
		Right	D	47	0.93	232	A	3	0.11	0
	WB	Left	D	50	0.11	9	B	18	0.07	7
		Thru-Thru/Right	D	54	0.37	47	D	51	0.98	230
	NB	Dual Left	E	64	0.55	28	F	84	0.92	92
		Dual Thru	C	24	0.27	47	E	68	0.99	247
		Right	C	21	0.04	6	C	29	0.03	0
	SB	Left	D	50	0.67	95	D	48	0.61	21
		Dual Thru	E	58	0.92	215	E	55	0.76	106
		Right	C	34	0.22	29	E	76	0.89	148
	Overall Intersection		***D***	***42***	***0.91***	**-**	***E***	***57***	***0.99***	**-**
Ordan Drive-Shawson Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	4	0.19	10	A	5	0.12	3
		Thru-Thru/Right	A	6	0.44	47	A	4	0.22	12
	WB	Left	A	7	0.16	6	A	7	0.10	7
		Thru-Thru/Right	A	6	0.12	11	A	9	0.41	71
	NB	Left	D	44	0.06	9	E	62	0.61	57
		Thru/Right	D	44	0.05	11	D	44	0.07	14
	SB	Left	D	43	0.02	4	D	43	0.02	6
		Thru/Right	D	44	0.04	10	D	45	0.12	21
	Overall Intersection		***A***	***8***	***0.35***	**-**	***B***	***16***	***0.46***	**-**
Vipond Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	2	0.13	2	B	12	0.03	4
		Thru-Thru/Right	A	2	0.37	6	B	14	0.26	45
	WB	Left	A	3	0.12	2	A	7	0.09	5
		Thru-Thru/Right	A	2	0.15	3	A	8	0.42	36

Reference: Courtneypark Dr E Corridor – Calibration

Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay	v/c	Q	LOS	Delay	v/c	Q
	NB	Left	D	47	0.06	9	D	45	0.23	27
		Thru/Right	D	47	0.05	12	D	41	0.04	10
	SB	Left	D	46	0.01	4	D	42	0.09	14
		Thru/Right	D	46	0.02	7	D	42	0.10	16
	Overall Intersection		***A***	***4***	***0.30***	**-**	***B***	***15***	***0.37***	**-**
Ordan Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	3	0.02	1	A	3	0.01	< 1
		Thru-Thru/Right	A	3	0.35	15	A	3	0.28	14
	WB	Left	A	5	0.06	5	A	4	0.05	2
		Thru-Thru/Right	A	6	0.19	22	A	4	0.36	25
	NB	Left	D	47	0.04	8	D	50	0.26	28
		Thru/Right	D	47	0.03	8	D	46	0.04	0
	SB	Left	D	50	0.16	15	D	52	0.33	31
		Thru/Right	D	47	0.03	7	D	46	0.07	12
	Overall Intersection		***A***	***6***	***0.31***	**-**	***A***	***10***	***0.35***	**-**
Dixie Road/ Courtneypark Drive E *Signalized*	EB	Left	C	31	0.56	61	F	108	0.98	146
		Thru-Thru/Right	D	41	0.73	92	B	12	0.27	7
	WB	Left	D	50	0.19	11	D	36	0.25	26
		Thru	E	58	0.47	40	F	88	0.97	197
		Right	D	53	0.09	8	F	88	0.98	204
	NB	Left	F	94	0.90	76	D	40	0.71	44
		Triple Thru	C	31	0.47	80	E	58	0.98	227
		Right	C	25	0.05	0	C	26	0.03	0
	SB	Left	B	20	0.72	86	F	89	0.95	70
		Triple Thru	B	15	0.46	92	C	31	0.47	78
		Right	B	12	0.24	13	C	26	0.10	13
	Overall Intersection		***C***	***27***	***0.83***	**-**	***E***	***59***	***1.00***	**-**

Phone:
Fax:

Attachment:

c.

Appendix C

Existing Conditions
Intersection Analysis Results

Table 1: Existing Base Year (2013) Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
Kennedy Road/ Courtneypark Drive E *Signalized*	EB	Left	D	42	0.35	32	F	105	0.99	78
		Thru-Thru/Right	E	75	0.99	199	D	38	0.53	84
	WB	Left	E	78	0.92	79	B	20	0.64	21
		Thru-Thru/Right	C	29	0.44	85	D	44	0.99	170
	NB	Left	D	37	0.51	21	C	31	0.53	34
		Thru-Thru/Right	D	46	0.61	88	E	67	0.97	209
	SB	Left	D	36	0.76	69	D	49	0.76	50
		Thru-Thru/Right	D	49	0.87	175	D	45	0.72	124
	Overall Intersection		***D***	***52***	***0.92***	**-**	***D***	***50***	***0.97***	**-**
Highway 410 West Terminal/ Courtneypark Drive E *Unsignalized*	EB	Left	B	14	0.35	12	C	19	0.53	23
		Dual Thru	Unopposed Movement							
	WB	Dual Thru	Unopposed Movement							
		Right	Unopposed Movement							
Highway 410 East Terminal/ Courtneypark Drive E *Signalized*	EB	Dual Thru	B	18	0.75	62	B	17	0.28	63
	WB	Dual Thru	B	16	0.40	57	B	20	0.89	138
	SB	Dual Left	C	31	0.47	84	D	42	0.22	26
		Right	D	41	0.70	133	E	56	0.63	76
	Overall Intersection		***C***	***25***	***0.73***	**-**	***C***	***23***	***0.82***	**-**
Tomken Road/ Courtneypark Drive E *Signalized*	EB	Left	C	23	0.50	62	E	76	0.75	44
		Dual Thru	C	28	0.70	133	B	12	0.26	26
		Right	D	47	0.93	232	A	3	0.11	0
	WB	Left	D	52	0.11	9	B	18	0.07	7
		Thru-Thru/Right	E	57	0.37	49	D	50	0.98	230
	NB	Dual Left	E	64	0.55	28	F	84	0.92	92
		Dual Thru	C	24	0.27	47	E	68	0.99	247
		Right	C	21	0.04	6	C	29	0.03	0
	SB	Left	D	50	0.67	95	D	48	0.61	21
		Dual Thru	E	58	0.92	215	E	55	0.76	106
		Right	C	34	0.22	29	E	76	0.89	148
	Overall Intersection		***D***	***42***	***0.91***	**-**	***E***	***57***	***0.99***	**-**
Ordan Drive-Shawson Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	4	0.19	10	A	5	0.12	3
		Thru-Thru/Right	A	6	0.44	47	A	4	0.22	12
	WB	Left	A	6	0.16	4	A	9	0.10	14
		Thru-Thru/Right	A	4	0.12	8	B	13	0.41	103
	NB	Left	D	44	0.06	9	E	62	0.61	57
		Thru/Right	D	44	0.05	11	D	44	0.07	14
	SB	Left	D	43	0.02	4	D	43	0.02	6
		Thru/Right	D	44	0.04	10	D	45	0.12	21
	Overall Intersection		***A***	***8***	***0.35***	**-**	***B***	***18***	***0.46***	**-**

Table 1: Existing Base Year (2013) Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
Vipond Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	2	0.13	2	B	12	0.03	4
		Thru-Thru/Right	A	2	0.37	6	B	14	0.26	45
	WB	Left	A	3	0.12	2	A	7	0.09	6
		Thru-Thru/Right	A	2	0.15	3	A	8	0.42	37
	NB	Left	D	47	0.06	9	D	45	0.23	27
		Thru/Right	D	47	0.05	12	D	41	0.04	10
	SB	Left	D	46	0.01	4	D	42	0.09	14
		Thru/Right	D	46	0.02	7	D	42	0.10	16
	Overall Intersection		***A***	***4***	***0.30***	**-**	***B***	***15***	***0.37***	**-**
Ordan Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	3	0.02	1	A	3	0.01	< 1
		Thru-Thru/Right	A	3	0.35	15	A	3	0.28	14
	WB	Left	A	8	0.06	5	A	4	0.05	2
		Thru-Thru/Right	A	9	0.19	22	A	4	0.36	24
	NB	Left	D	47	0.04	8	D	50	0.26	28
		Thru/Right	D	47	0.03	8	D	46	0.04	0
	SB	Left	D	50	0.16	15	D	52	0.33	31
		Thru/Right	D	47	0.03	7	D	46	0.07	12
	Overall Intersection		***A***	***7***	***0.31***	**-**	***A***	***10***	***0.35***	**-**
Dixie Road/ Courtneypark Drive E *Signalized*	EB	Left	D	45	0.61	27	F	120	0.99	88
		Dual Thru	D	49	0.88	148	C	26	0.37	42
		Right	C	32	0.12	23	A	5	0.11	2
	WB	Left	D	45	0.21	10	D	35	0.22	26
		Thru	D	48	0.18	19	D	49	0.55	78
		Right	D	47	0.09	10	F	88	0.98	204
	NB	Left	F	96	0.91	76	D	40	0.71	44
		Triple Thru	C	32	0.48	80	E	58	0.98	227
		Right	C	25	0.05	0	C	26	0.03	0
	SB	Left	E	67	0.78	88	F	130	0.98	47
		Triple Thru	B	18	0.49	103	C	31	0.47	78
		Right	B	15	0.24	15	C	26	0.10	13
	Overall Intersection		***C***	***34***	***0.88***	**-**	***E***	***58***	***0.98***	**-**

Table 1: Existing Base Year (2013) Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
Kennedy Road/ Derry Road E *Signalized*	EB	Left	F	109	0.98	88	F	126	1.09	104
		Triple Thru	D	43	0.85	173	D	42	0.75	137
		Right	C	28	0.16	26	C	29	0.05	1
	WB	Dual Left	F	88	0.93	81	F	87	0.96	86
		Triple Thru	A	10	0.40	38	D	45	0.98	275
		Right	B	15	0.15	5	C	23	0.62	101
	NB	Left	F	184	1.05	51	D	41	0.40	43
		Dual Thru	D	50	0.42	48	E	70	0.96	181
		Right	D	48	0.20	25	D	44	0.56	80
	SB	Left	F	101	1.00	129	F	106	0.97	62
		Dual Thru	E	77	0.99	194	C	33	0.31	51
		Right	D	41	0.21	31	C	30	0.09	14
	Overall Intersection		***D***	***52***	***0.99***	**-**	***D***	***51***	***1.05***	**-**
Highway 410 West Terminal/ Derry Road E *Signalized*	EB	Triple Thru	A	9	0.67	50	B	20	0.46	124
	WB	Triple Thru	C	30	0.43	101	B	12	0.72	201
	SB	Left-Left/Right	F	150	1.20	246	E	75	0.90	97
		Right	F	160	1.20	262	F	98	0.94	122
	Overall Intersection		***E***	***64***	***0.84***	**-**	***C***	***25***	***0.76***	**-**
Highway 410 East Terminal/ Derry Road E *Signalized*	EB	Triple Thru	B	18	0.88	133	B	13	0.42	51
	WB	Triple Thru	A	7	0.45	39	C	25	0.89	129
	NB	Left-Left/Right	F	84	1.16	202	D	50	0.78	128
		Right	F	184	1.27	301	E	60	0.78	126
	Overall Intersection		***D***	***47***	***1.02***	**-**	***C***	***29***	***0.85***	**-**
Tomken Road/ Derry Road E *Signalized*	EB	Left	D	48	1.00	43	F	140	1.00	48
		Triple Thru	C	28	0.84	153	C	31	0.61	106
		Right	C	21	0.64	40	C	33	0.08	6
	WB	Left	E	65	0.96	79	D	40	0.48	16
		Triple Thru	C	31	0.49	112	E	60	0.98	172
		Right	C	22	0.02	5	F	824	0.03	3
	NB	Dual Left	E	65	0.54	26	F	323	1.57	282
		Thru-Thru/Right	C	32	0.26	39	E	66	1.00	260
	SB	Left	D	42	0.14	16	F	98	0.62	25
		Dual Thru	E	59	0.82	127	D	48	0.36	45
		Right	D	44	0.23	27	F	101	1.00	172
	Overall Intersection		***D***	***36***	***0.90***	**-**	***F***	***109***	***1.13***	**-**
Dixie Road/ Derry Road E *Signalized*	EB	Dual Left	E	66	0.76	57	E	78	0.99	87
		Triple Thru	F	112	1.09	285	E	67	0.99	196
		Right	F	144	0.10	21	D	37	0.03	2
	WB	Dual Left	F	104	0.99	92	F	108	0.99	82

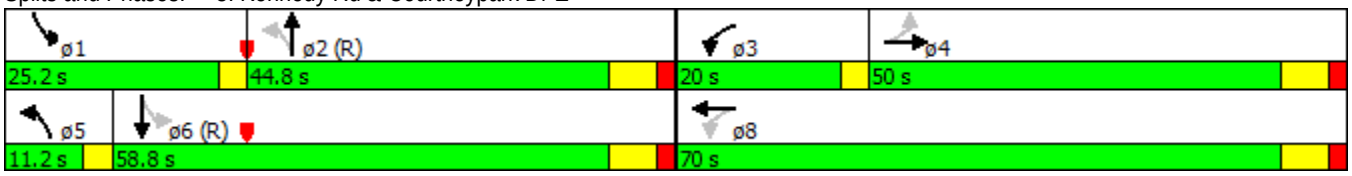
Table 1: Existing Base Year (2013) Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
		Triple Thru	D	44	0.68	103	E	68	0.98	181
		Right	C	33	0.02	< 1	D	37	0.09	9
	NB	Dual Left	E	67	0.47	18	E	64	0.46	25
		Triple Thru	D	46	0.66	96	E	63	0.99	252
		Right	D	43	0.48	65	E	59	0.88	188
	SB	Dual Left	E	64	0.56	32	E	70	0.62	28
		Triple Thru	E	61	0.96	189	C	35	0.39	60
		Right	C	35	0.14	18	C	31	0.10	11
	Overall Intersection		***E***	***76***	***1.01***	**-**	***E***	***64***	***0.96***	**-**

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	74	919	195	464	74	370	270	993
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Minimum Split (s)	35.0	35.0	9.0	35.0	9.0	37.0	15.5	37.0
Total Split (s)	50.0	50.0	20.0	70.0	11.2	44.8	25.2	58.8
Total Split (%)	35.7%	35.7%	14.3%	50.0%	8.0%	32.0%	18.0%	42.0%
Yellow Time (s)	5.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	3.0	7.0	3.0	7.0	3.0	7.0
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Min	Max	Min	C-Max	Min	C-Max
Act Effct Green (s)	43.6	43.6	67.0	63.0	52.4	40.7	67.0	52.2
Actuated g/C Ratio	0.31	0.31	0.48	0.45	0.37	0.29	0.48	0.37
v/c Ratio	0.35	0.99	0.91	0.45	0.50	0.63	0.73	0.86
Control Delay	43.3	74.0	72.6	27.4	33.3	41.9	35.0	49.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	74.0	72.6	27.4	33.3	41.9	35.0	49.0
LOS	D	E	E	C	C	D	C	D
Approach Delay		71.9		38.1		40.9		46.1
Approach LOS		E		D		D		D

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 113.4 (81%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 50.8 Intersection LOS: D
Intersection Capacity Utilization 97.3% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 3: Kennedy Rd & Courtneypark Dr E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	1034	201	647	76	584	278	1081
v/c Ratio	0.35	0.99	0.91	0.45	0.50	0.63	0.73	0.86
Control Delay	43.3	74.0	72.6	27.4	33.3	41.9	35.0	49.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	74.0	72.6	27.4	33.3	41.9	35.0	49.0
Queue Length 50th (m)	16.4	~152.7	46.4	63.2	11.3	66.4	47.5	145.2
Queue Length 95th (m)	31.8	#199.2	m#79.3	84.5	20.7	88.4	68.9	174.7
Internal Link Dist (m)		190.6		519.5		142.2		201.4
Turn Bay Length (m)	65.0		95.0		100.0		85.0	
Base Capacity (vph)	218	1040	228	1434	158	926	405	1250
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.99	0.88	0.45	0.48	0.63	0.69	0.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	919	84	195	464	164	74	370	197	270	993	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1637	3324		1484	3131		1600	3020		1629	3344	
Flt Permitted	0.41	1.00		0.09	1.00		0.12	1.00		0.27	1.00	
Satd. Flow (perm)	700	3324		134	3131		204	3020		462	3344	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	76	947	87	201	478	169	76	381	203	278	1024	57
RTOR Reduction (vph)	0	5	0	0	25	0	0	49	0	0	3	0
Lane Group Flow (vph)	76	1029	0	201	622	0	76	535	0	278	1078	0
Confl. Peds. (#/hr)	7		10	10		7	34		5	5		34
Heavy Vehicles (%)	11%	8%	10%	23%	9%	18%	14%	10%	21%	12%	7%	25%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.6	43.6		63.0	63.0		48.5	40.7		63.0	52.2	
Effective Green, g (s)	43.6	43.6		63.0	63.0		48.5	40.7		63.0	52.2	
Actuated g/C Ratio	0.31	0.31		0.45	0.45		0.35	0.29		0.45	0.37	
Clearance Time (s)	7.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	218	1035		218	1408		148	877		368	1246	
v/s Ratio Prot		c0.31		c0.11	0.20		0.03	0.18		c0.10	c0.32	
v/s Ratio Perm	0.11			0.31			0.15			0.24		
v/c Ratio	0.35	0.99		0.92	0.44		0.51	0.61		0.76	0.87	
Uniform Delay, d1	37.2	48.1		41.3	26.4		33.5	42.8		27.1	40.6	
Progression Factor	1.00	1.00		1.05	1.08		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	26.7		34.8	0.8		3.0	3.2		8.6	8.2	
Delay (s)	41.6	74.7		78.1	29.3		36.5	46.0		35.6	48.8	
Level of Service	D	E		E	C		D	D		D	D	
Approach Delay (s)		72.5			40.9			44.9			46.1	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	52.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	193	1202	852	202	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	205	1279	906	215	0	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)			312			
pX, platoon unblocked	0.95				0.95	0.95
vC, conflicting volume	906				1956	453
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	786				1896	307
tC, single (s)	4.9				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.6				3.5	3.3
p0 queue free %	65				100	100
cM capacity (veh/h)	593				39	657

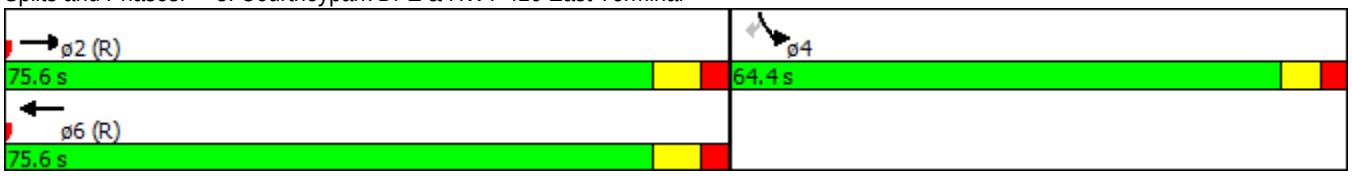
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	205	639	639	453	453	215
Volume Left	205	0	0	0	0	0
Volume Right	0	0	0	0	0	215
cSH	593	1700	1700	1700	1700	1700
Volume to Capacity	0.35	0.38	0.38	0.27	0.27	0.13
Queue Length 95th (m)	11.7	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	14.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	2.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Volume (vph)	1191	519	623	562
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	6	4	
Permitted Phases				4
Detector Phase	2	6	4	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	8.0	8.0
Minimum Split (s)	28.0	28.0	23.0	23.0
Total Split (s)	75.6	75.6	64.4	64.4
Total Split (%)	54.0%	54.0%	46.0%	46.0%
Yellow Time (s)	5.0	5.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	8.0	8.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	67.6	67.6	57.4	57.4
Actuated g/C Ratio	0.48	0.48	0.41	0.41
v/c Ratio	0.75	0.40	0.47	0.76
Control Delay	18.3	15.6	31.7	26.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.3	15.6	31.7	26.7
LOS	B	B	C	C
Approach Delay	18.3	15.6	29.3	
Approach LOS	B	B	C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 71.4 (51%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 22.3	Intersection LOS: C
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 8: Courtneypark Dr E & HWY 410 East Terminal



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1241	541	649	585
v/c Ratio	0.75	0.40	0.47	0.76
Control Delay	18.3	15.6	31.7	26.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.3	15.6	31.7	26.7
Queue Length 50th (m)	55.8	43.0	67.2	82.4
Queue Length 95th (m)	m61.9	56.8	84.2	132.5
Internal Link Dist (m)	288.2	524.5	121.7	
Turn Bay Length (m)				
Base Capacity (vph)	1647	1345	1369	769
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	0.75	0.40	0.47	0.76

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1191	519	0	623	562
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0		7.0	7.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3411	2786		3340	1512
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3411	2786		3340	1512
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1241	541	0	649	585
RTOR Reduction (vph)	0	0	0	0	0	149
Lane Group Flow (vph)	0	1241	541	0	649	436
Heavy Vehicles (%)	0%	7%	31%	0%	6%	8%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		67.6	67.6		57.4	57.4
Effective Green, g (s)		67.6	67.6		57.4	57.4
Actuated g/C Ratio		0.48	0.48		0.41	0.41
Clearance Time (s)		8.0	8.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1647	1345		1369	619
v/s Ratio Prot		c0.36	0.19		0.19	
v/s Ratio Perm						c0.29
v/c Ratio		0.75	0.40		0.47	0.70
Uniform Delay, d1		29.4	23.2		30.2	34.3
Progression Factor		0.56	0.63		1.00	1.00
Incremental Delay, d2		1.6	0.8		1.2	6.6
Delay (s)		18.0	15.5		31.4	40.8
Level of Service		B	B		C	D
Approach Delay (s)		18.0	15.5		35.9	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

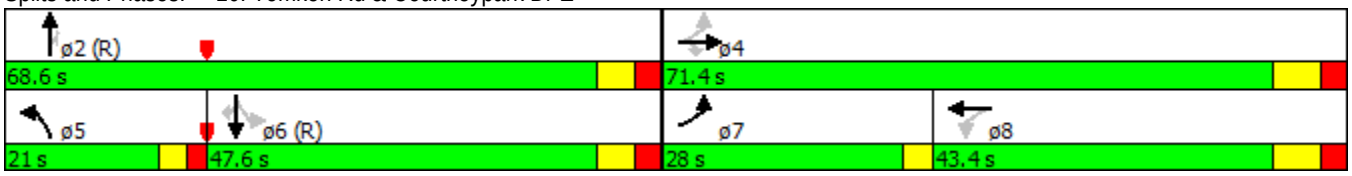
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	231	964	726	11	218	118	356	47	198	993	167
Turn Type	pm+pt	NA	Perm	Perm	NA	Prot	NA	Perm	Perm	NA	Perm
Protected Phases	7	4			8	5	2			6	
Permitted Phases	4		4	8				2	6		6
Detector Phase	7	4	4	8	8	5	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	13.0	13.0	13.0	13.0	5.0	14.0	14.0	14.0	14.0	14.0
Minimum Split (s)	9.0	40.0	40.0	40.0	40.0	10.0	41.0	41.0	41.0	41.0	41.0
Total Split (s)	28.0	71.4	71.4	43.4	43.4	21.0	68.6	68.6	47.6	47.6	47.6
Total Split (%)	20.0%	51.0%	51.0%	31.0%	31.0%	15.0%	49.0%	49.0%	34.0%	34.0%	34.0%
Yellow Time (s)	3.0	5.0	5.0	5.0	5.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	8.0	8.0	8.0	8.0	5.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead			Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	65.3	60.3	60.3	39.2	39.2	11.8	64.7	64.7	47.9	47.9	47.9
Actuated g/C Ratio	0.47	0.43	0.43	0.28	0.28	0.08	0.46	0.46	0.34	0.34	0.34
v/c Ratio	0.47	0.70	0.94	0.11	0.39	0.55	0.27	0.08	0.67	0.92	0.36
Control Delay	21.5	28.4	35.7	55.6	54.0	70.3	24.6	4.0	53.5	58.6	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	28.4	35.7	55.6	54.0	70.3	24.6	4.0	53.5	58.6	12.2
LOS	C	C	D	E	D	E	C	A	D	E	B
Approach Delay		30.3			54.1		33.0			52.1	
Approach LOS		C			D		C			D	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 93.8 (67%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 39.6 Intersection LOS: D
Intersection Capacity Utilization 104.0% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 10: Tomken Rd & Courtneypark Dr E



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	248	1037	781	12	294	127	383	51	213	1068	180
v/c Ratio	0.47	0.70	0.94	0.11	0.39	0.55	0.27	0.08	0.67	0.92	0.36
Control Delay	21.5	28.4	35.7	55.6	54.0	70.3	24.6	4.0	53.5	58.6	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	28.4	35.7	55.6	54.0	70.3	24.6	4.0	53.5	58.6	12.2
Queue Length 50th (m)	45.0	115.6	121.6	2.8	35.1	17.7	35.2	0.0	52.0	154.7	7.6
Queue Length 95th (m)	m62.2	133.0	#232.1	9.1	49.3	27.6	47.0	6.0	#95.1	#214.5	28.5
Internal Link Dist (m)		524.5			466.9		171.2			190.6	
Turn Bay Length (m)	120.0		100.0	50.0		80.0		50.0	130.0		85.0
Base Capacity (vph)	568	1559	854	109	771	313	1417	642	317	1156	497
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.67	0.91	0.11	0.38	0.41	0.27	0.08	0.67	0.92	0.36

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	231	964	726	11	218	56	118	356	47	198	993	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	3444	1508	1544	2666		2745	3067	1319	1679	3380	1182
Flt Permitted	0.51	1.00	1.00	0.24	1.00		0.95	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	917	3444	1508	385	2666		2745	3067	1319	928	3380	1182
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	248	1037	781	12	234	60	127	383	51	213	1068	180
RTOR Reduction (vph)	0	0	178	0	16	0	0	0	27	0	0	93
Lane Group Flow (vph)	248	1037	603	12	278	0	127	383	24	213	1068	87
Confl. Peds. (#/hr)	4		7	7		4	3		9	9		3
Heavy Vehicles (%)	7%	6%	6%	18%	29%	45%	29%	19%	21%	8%	8%	36%
Turn Type	pm+pt	NA	Perm	Perm	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	60.3	60.3	60.3	39.2	39.2		11.8	64.7	64.7	47.9	47.9	47.9
Effective Green, g (s)	60.3	60.3	60.3	39.2	39.2		11.8	64.7	64.7	47.9	47.9	47.9
Actuated g/C Ratio	0.43	0.43	0.43	0.28	0.28		0.08	0.46	0.46	0.34	0.34	0.34
Clearance Time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	496	1483	649	107	746		231	1417	609	317	1156	404
v/s Ratio Prot	0.06	0.30			0.10		c0.05	0.12			c0.32	
v/s Ratio Perm	0.15		c0.40	0.03					0.02	0.23		0.07
v/c Ratio	0.50	0.70	0.93	0.11	0.37		0.55	0.27	0.04	0.67	0.92	0.22
Uniform Delay, d1	26.6	32.5	37.8	37.5	40.5		61.5	23.1	20.6	39.3	44.3	32.7
Progression Factor	0.84	0.81	0.80	1.37	1.39		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	1.2	16.6	0.5	0.3		2.7	0.5	0.1	10.8	13.5	1.2
Delay (s)	22.9	27.5	46.9	51.7	56.8		64.2	23.6	20.7	50.2	57.8	33.9
Level of Service	C	C	D	D	E		E	C	C	D	E	C
Approach Delay (s)		34.3			56.6			32.5			53.8	
Approach LOS		C			E			C			D	

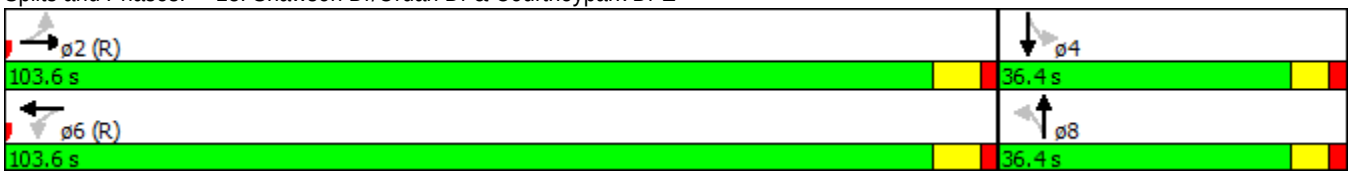
Intersection Summary			
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	136	916	44	234	13	9	4	2
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	32.0	32.0	32.0	32.0	10.0	10.0	10.0	10.0
Total Split (s)	103.6	103.6	103.6	103.6	36.4	36.4	36.4	36.4
Total Split (%)	74.0%	74.0%	74.0%	74.0%	26.0%	26.0%	26.0%	26.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	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	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	96.6	96.6	96.6	96.6	30.4	30.4	30.4	30.4
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.22	0.22	0.22	0.22
v/c Ratio	0.19	0.45	0.16	0.12	0.06	0.10	0.02	0.13
Control Delay	4.4	5.9	6.0	4.3	44.7	22.6	43.5	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	5.9	6.0	4.3	44.7	22.6	43.5	15.2
LOS	A	A	A	A	D	C	D	B
Approach Delay		5.7		4.6		29.3		17.9
Approach LOS		A		A		C		B

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 26.6 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.45
Intersection Signal Delay: 6.5 Intersection LOS: A
Intersection Capacity Utilization 55.5% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 13: Shawson Dr/Ordan Dr & Courtneypark Dr E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	1026	45	244	13	30	4	39
v/c Ratio	0.19	0.45	0.16	0.12	0.06	0.10	0.02	0.13
Control Delay	4.4	5.9	6.0	4.3	44.7	22.6	43.5	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	5.9	6.0	4.3	44.7	22.6	43.5	15.2
Queue Length 50th (m)	5.4	20.4	2.2	6.0	2.9	2.0	0.9	0.4
Queue Length 95th (m)	m9.7	47.3	4.4	8.1	8.9	10.7	4.2	10.2
Internal Link Dist (m)		466.9		278.5		123.7		151.6
Turn Bay Length (m)	45.0		30.0		35.0		35.0	
Base Capacity (vph)	732	2301	276	2041	208	311	246	301
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.45	0.16	0.12	0.06	0.10	0.02	0.13

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	136	916	89	44	234	5	13	9	21	4	2	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1680	3327		1547	2958		1245	1360		1460	1257	
Flt Permitted	0.60	1.00		0.25	1.00		0.73	1.00		0.74	1.00	
Satd. Flow (perm)	1061	3327		400	2958		959	1360		1134	1257	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	139	935	91	45	239	5	13	9	21	4	2	37
RTOR Reduction (vph)	0	5	0	0	1	0	0	16	0	0	29	0
Lane Group Flow (vph)	139	1021	0	45	243	0	13	14	0	4	10	0
Confl. Peds. (#/hr)	3					3	3					3
Heavy Vehicles (%)	8%	8%	11%	18%	23%	20%	46%	11%	33%	25%	50%	28%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	96.6	96.6		96.6	96.6		30.4	30.4		30.4	30.4	
Effective Green, g (s)	96.6	96.6		96.6	96.6		30.4	30.4		30.4	30.4	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.22	0.22		0.22	0.22	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	732	2295		276	2041		208	295		246	272	
v/s Ratio Prot		c0.31			0.08			0.01			0.01	
v/s Ratio Perm	0.13			0.11			c0.01			0.00		
v/c Ratio	0.19	0.44		0.16	0.12		0.06	0.05		0.02	0.04	
Uniform Delay, d1	7.7	9.7		7.6	7.3		43.5	43.3		43.1	43.2	
Progression Factor	0.51	0.56		0.59	0.58		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.5		1.3	0.1		0.6	0.3		0.1	0.3	
Delay (s)	4.3	5.9		5.7	4.4		44.1	43.6		43.2	43.5	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		5.7			4.6			43.8			43.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	96	766	45	275	12	9	4	2
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	29.0	29.0	29.0	29.0	30.0	30.0	30.0	30.0
Total Split (s)	106.4	106.4	106.4	106.4	33.6	33.6	33.6	33.6
Total Split (%)	76.0%	76.0%	76.0%	76.0%	24.0%	24.0%	24.0%	24.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	99.4	99.4	99.4	99.4	26.6	26.6	26.6	26.6
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.19	0.19	0.19	0.19
v/c Ratio	0.13	0.37	0.12	0.15	0.06	0.12	0.01	0.05
Control Delay	1.9	1.9	2.7	1.6	47.6	21.9	46.5	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	1.9	2.7	1.6	47.6	21.9	46.5	22.8
LOS	A	A	A	A	D	C	D	C
Approach Delay		1.9		1.8		28.3		27.8
Approach LOS		A		A		C		C

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 29.4 (21%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.37
Intersection Signal Delay: 3.1 Intersection LOS: A
Intersection Capacity Utilization 63.5% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 16: Vipond Dr & Courtneypark Dr E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	98	858	46	315	12	36	4	15
v/c Ratio	0.13	0.37	0.12	0.15	0.06	0.12	0.01	0.05
Control Delay	1.9	1.9	2.7	1.6	47.6	21.9	46.5	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	1.9	2.7	1.6	47.6	21.9	46.5	22.8
Queue Length 50th (m)	1.7	7.1	0.8	2.2	2.8	2.1	0.9	0.5
Queue Length 95th (m)	2.0	5.5	1.8	3.1	8.7	11.7	4.4	6.7
Internal Link Dist (m)		278.5		341.9		126.6		117.6
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	752	2312	378	2110	203	302	267	285
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.37	0.12	0.15	0.06	0.12	0.01	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	766	74	45	275	33	12	9	26	4	2	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.89		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1796	3248		1643	2962		1360	1477		1822	1445	
Flt Permitted	0.56	1.00		0.31	1.00		0.75	1.00		0.73	1.00	
Satd. Flow (perm)	1060	3248		533	2962		1070	1477		1407	1445	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	98	782	76	46	281	34	12	9	27	4	2	13
RTOR Reduction (vph)	0	5	0	0	7	0	0	22	0	0	11	0
Lane Group Flow (vph)	98	853	0	46	308	0	12	14	0	4	4	0
Confl. Peds. (#/hr)	3		1	1		3	5		1	1		5
Heavy Vehicles (%)	1%	11%	7%	11%	23%	3%	33%	0%	19%	0%	50%	8%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	99.4	99.4		99.4	99.4		26.6	26.6		26.6	26.6	
Effective Green, g (s)	99.4	99.4		99.4	99.4		26.6	26.6		26.6	26.6	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.19	0.19		0.19	0.19	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	752	2306		378	2103		203	280		267	274	
v/s Ratio Prot		c0.26			0.10			0.01			0.00	
v/s Ratio Perm	0.09			0.09			c0.01			0.00		
v/c Ratio	0.13	0.37		0.12	0.15		0.06	0.05		0.01	0.02	
Uniform Delay, d1	6.5	8.0		6.4	6.6		46.4	46.4		46.1	46.1	
Progression Factor	0.23	0.18		0.31	0.24		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.4		0.7	0.1		0.6	0.3		0.1	0.1	
Delay (s)	1.8	1.9		2.6	1.7		47.0	46.7		46.2	46.2	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		1.9			1.8			46.8			46.2	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	4.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	11	665	26	336	9	5	23	5
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	32.0	32.0	32.0	32.0	30.0	30.0	30.0	30.0
Total Split (s)	107.8	107.8	107.8	107.8	32.2	32.2	32.2	32.2
Total Split (%)	77.0%	77.0%	77.0%	77.0%	23.0%	23.0%	23.0%	23.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	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	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	100.8	100.8	100.8	100.8	26.2	26.2	26.2	26.2
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.19	0.19	0.19	0.19
v/c Ratio	0.02	0.35	0.06	0.20	0.04	0.07	0.16	0.05
Control Delay	3.0	2.9	7.8	8.2	47.2	25.3	50.8	33.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	2.9	7.8	8.2	47.2	25.3	50.8	33.2
LOS	A	A	A	A	D	C	D	C
Approach Delay		2.9		8.2		32.9		45.3
Approach LOS		A		A		C		D

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 9.8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.35
Intersection Signal Delay: 6.5 Intersection LOS: A
Intersection Capacity Utilization 40.4% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 19: Ordan Dr & Courtneypark Dr E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	12	804	28	429	10	19	24	11
v/c Ratio	0.02	0.35	0.06	0.20	0.04	0.07	0.16	0.05
Control Delay	3.0	2.9	7.8	8.2	47.2	25.3	50.8	33.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	2.9	7.8	8.2	47.2	25.3	50.8	33.2
Queue Length 50th (m)	0.3	9.1	2.7	21.0	2.3	1.1	5.6	1.1
Queue Length 95th (m)	m1.0	14.7	m4.8	m22.4	7.5	8.4	14.5	6.8
Internal Link Dist (m)		341.9		193.9		128.4		78.4
Turn Bay Length (m)	35.0		45.0		35.0		35.0	
Base Capacity (vph)	634	2290	439	2154	269	284	154	218
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.35	0.06	0.20	0.04	0.07	0.16	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	665	91	26	336	68	9	5	13	23	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.89		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1667	3171		1752	2976		1825	1461		1049	1140	
Flt Permitted	0.50	1.00		0.33	1.00		0.75	1.00		0.75	1.00	
Satd. Flow (perm)	881	3171		610	2976		1442	1461		823	1140	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	12	707	97	28	357	72	10	5	14	24	5	6
RTOR Reduction (vph)	0	8	0	0	12	0	0	11	0	0	5	0
Lane Group Flow (vph)	12	796	0	28	417	0	10	8	0	24	6	0
Confl. Peds. (#/hr)	3		2	2		3						
Heavy Vehicles (%)	9%	14%	3%	4%	18%	24%	0%	0%	23%	74%	40%	67%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	100.8	100.8		100.8	100.8		26.2	26.2		26.2	26.2	
Effective Green, g (s)	100.8	100.8		100.8	100.8		26.2	26.2		26.2	26.2	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	634	2283		439	2142		269	273		154	213	
v/s Ratio Prot		c0.25			0.14			0.01			0.01	
v/s Ratio Perm	0.01			0.05			0.01			c0.03		
v/c Ratio	0.02	0.35		0.06	0.19		0.04	0.03		0.16	0.03	
Uniform Delay, d1	5.6	7.3		5.8	6.4		46.6	46.5		47.6	46.5	
Progression Factor	0.53	0.35		1.28	1.40		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4		0.3	0.2		0.3	0.2		2.1	0.2	
Delay (s)	3.0	3.0		7.6	9.1		46.8	46.7		49.8	46.8	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		3.0			9.0			46.7			48.8	
Approach LOS		A			A			D			D	

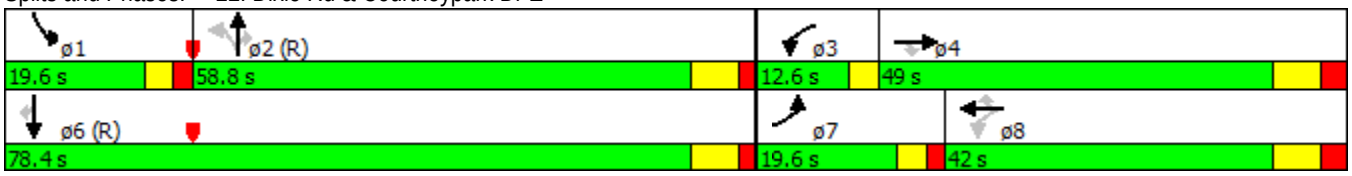
Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	143	379	103	25	91	104	116	804	78	350	1258	328
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases			4	8		8	2		2			6
Detector Phase	7	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	4.0	4.0	4.0	8.0	4.0	4.0
Minimum Split (s)	14.0	39.0	39.0	9.0	39.0	39.0	28.0	28.0	28.0	13.0	28.0	28.0
Total Split (s)	19.6	49.0	49.0	12.6	42.0	42.0	58.8	58.8	58.8	19.6	78.4	78.4
Total Split (%)	14.0%	35.0%	35.0%	9.0%	30.0%	30.0%	42.0%	42.0%	42.0%	14.0%	56.0%	56.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	3.0	3.0	0.0	3.0	3.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	8.0	8.0	3.0	8.0	8.0	7.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	Min	Min	None	Min	Min	C-Max	C-Max	C-Max	Min	C-Max	C-Max
Act Effct Green (s)	12.4	35.8	35.8	37.3	25.0	25.0	58.1	58.1	58.1	19.4	82.6	82.6
Actuated g/C Ratio	0.09	0.26	0.26	0.27	0.18	0.18	0.42	0.42	0.42	0.14	0.59	0.59
v/c Ratio	0.61	0.88	0.27	0.17	0.19	0.34	0.90	0.47	0.12	0.78	0.49	0.35
Control Delay	51.4	52.2	9.1	29.4	47.0	6.6	96.0	32.0	0.3	70.4	18.9	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	52.2	9.1	29.4	47.0	6.6	96.0	32.0	0.3	70.4	18.9	2.8
LOS	D	D	A	C	D	A	F	C	A	E	B	A
Approach Delay		44.9			25.9			36.9			25.5	
Approach LOS		D			C			D			C	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 31 (22%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 31.7 Intersection LOS: C
Intersection Capacity Utilization 72.6% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 22: Dixie Rd & Courtneypark Dr E



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	395	107	26	95	108	121	838	81	365	1310	342
v/c Ratio	0.61	0.88	0.27	0.17	0.19	0.34	0.90	0.47	0.12	0.78	0.49	0.35
Control Delay	51.4	52.2	9.1	29.4	47.0	6.6	96.0	32.0	0.3	70.4	18.9	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	52.2	9.1	29.4	47.0	6.6	96.0	32.0	0.3	70.4	18.9	2.8
Queue Length 50th (m)	16.3	112.8	12.2	4.6	11.4	0.0	~33.4	66.0	0.0	50.2	79.4	0.0
Queue Length 95th (m)	27.4	147.9	23.1	10.4	18.5	9.7	#75.6	79.5	0.0	#87.7	103.0	14.8
Internal Link Dist (m)		193.9			206.9			193.9			185.2	
Turn Bay Length (m)	55.0		45.0	45.0			85.0		50.0	100.0		125.0
Base Capacity (vph)	286	517	437	179	697	387	135	1799	694	468	2689	983
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.76	0.24	0.15	0.14	0.28	0.90	0.47	0.12	0.78	0.49	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	143	379	103	25	91	104	116	804	78	350	1258	328
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	8.0	8.0	3.0	8.0	8.0	7.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.95	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2745	1762	1262	1341	2874	1184	1571	4334	1476	3372	4561	1429
Flt Permitted	0.95	1.00	1.00	0.29	1.00	1.00	0.20	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	2745	1762	1262	412	2874	1184	328	4334	1476	3372	4561	1429
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	149	395	107	26	95	108	121	838	81	365	1310	342
RTOR Reduction (vph)	0	0	70	0	0	88	0	0	48	0	0	143
Lane Group Flow (vph)	149	395	37	26	95	20	121	838	33	365	1310	199
Confl. Peds. (#/hr)	23		5	5		23	4		20	20		4
Heavy Vehicles (%)	29%	9%	27%	36%	27%	32%	16%	21%	5%	5%	15%	12%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases			4	8		8	2		2			6
Actuated Green, G (s)	12.4	35.8	35.8	31.2	26.3	26.3	56.9	56.9	56.9	19.4	81.3	81.3
Effective Green, g (s)	12.4	35.8	35.8	31.2	26.3	26.3	56.9	56.9	56.9	19.4	81.3	81.3
Actuated g/C Ratio	0.09	0.26	0.26	0.22	0.19	0.19	0.41	0.41	0.41	0.14	0.58	0.58
Clearance Time (s)	5.0	8.0	8.0	3.0	8.0	8.0	7.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	243	450	322	124	539	222	133	1761	599	467	2648	829
v/s Ratio Prot	c0.05	c0.22		0.01	0.03			0.19		c0.11	0.29	
v/s Ratio Perm			0.03	0.04		0.02	c0.37		0.02			0.14
v/c Ratio	0.61	0.88	0.12	0.21	0.18	0.09	0.91	0.48	0.05	0.78	0.49	0.24
Uniform Delay, d1	61.5	50.0	40.0	43.6	47.8	47.0	39.1	30.6	25.2	58.3	17.3	14.3
Progression Factor	0.67	0.64	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	16.7	0.2	0.8	0.2	0.2	56.9	0.9	0.2	8.3	0.7	0.7
Delay (s)	45.4	48.9	32.1	44.5	47.9	47.2	96.0	31.5	25.4	66.5	17.9	15.0
Level of Service	D	D	C	D	D	D	F	C	C	E	B	B
Approach Delay (s)		45.4			47.2			38.5			26.2	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: EB Courtneypark Dr E

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (km)	Arterial Speed	Arterial LOS
Kennedy Rd	II	70	14.5	74.0	88.5	0.21	8.7	F
HWY 410 East Termina	II	70	44.1	18.3	62.4	0.86	49.4	B
Tomken Rd	II	70	32.7	28.4	61.1	0.55	32.3	D
Shawson Dr	II	70	30.2	5.9	36.1	0.49	49.0	B
Vipond Dr	II	70	20.5	1.9	22.4	0.30	48.6	B
Ordan Dr	II	70	23.6	2.9	26.5	0.37	49.7	B
Dixie Rd	II	70	14.8	52.2	67.0	0.22	11.7	F
Total	II		180.4	183.6	364.0	3.00	29.6	D

Arterial Level of Service: WB Courtneypark Dr E

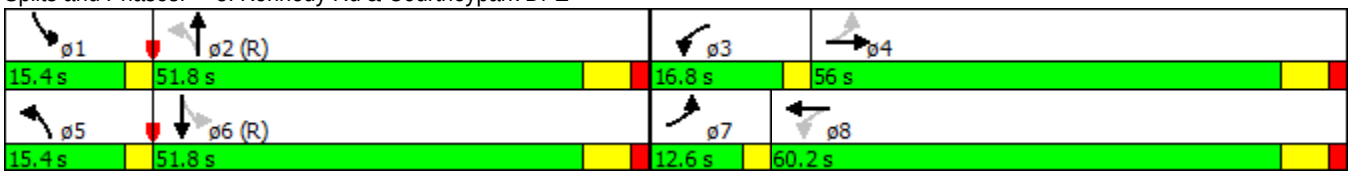
Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (km)	Arterial Speed	Arterial LOS
Dixie Rd	II	70	15.6	47.0	62.6	0.23	13.3	F
Ordan Dr	II	70	14.8	8.2	23.0	0.22	34.1	D
Vipond Dr	II	70	23.6	1.6	25.2	0.37	52.3	B
Ordan Dr	II	70	20.5	4.3	24.8	0.30	43.9	C
Tomken Rd	II	70	30.2	54.0	84.2	0.49	21.0	E
HWY 410 East Termina	II	70	32.7	15.6	48.3	0.55	40.9	C
Kennedy Rd	II	70	44.1	27.4	71.5	0.86	43.1	C
Total	II		181.5	158.1	339.6	3.01	31.9	D

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	155	429	181	1081	120	920	124	626
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Minimum Split (s)	9.0	35.0	9.0	35.0	9.0	37.0	8.0	37.0
Total Split (s)	12.6	56.0	16.8	60.2	15.4	51.8	15.4	51.8
Total Split (%)	9.0%	40.0%	12.0%	43.0%	11.0%	37.0%	11.0%	37.0%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
All-Red Time (s)	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0	3.0	7.0	3.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Min	C-Max	Min	C-Max
Act Effct Green (s)	62.6	49.0	69.8	53.2	60.8	45.8	61.6	46.2
Actuated g/C Ratio	0.45	0.35	0.50	0.38	0.43	0.33	0.44	0.33
v/c Ratio	0.97	0.54	0.61	0.99	0.51	0.97	0.74	0.72
Control Delay	93.5	37.1	17.5	44.5	29.7	66.5	52.0	45.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.5	37.1	17.5	44.5	29.7	66.5	52.0	45.3
LOS	F	D	B	D	C	E	D	D
Approach Delay		49.9		41.1		62.7		46.2
Approach LOS		D		D		E		D

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 40.6 (29%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 49.5 Intersection LOS: D
Intersection Capacity Utilization 92.8% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 3: Kennedy Rd & Courtneypark Dr E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	170	582	199	1422	132	1116	136	784
v/c Ratio	0.97	0.54	0.61	0.99	0.51	0.97	0.74	0.72
Control Delay	93.5	37.1	17.5	44.5	29.7	66.5	52.0	45.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.5	37.1	17.5	44.5	29.7	66.5	52.0	45.3
Queue Length 50th (m)	30.9	65.1	14.7	77.1	21.1	161.1	21.9	99.7
Queue Length 95th (m)	#77.5	83.6	m20.6	#170.3	34.3	#209.3	#49.6	124.1
Internal Link Dist (m)		190.6		519.5		142.2		201.4
Turn Bay Length (m)	65.0		95.0		100.0		85.0	
Base Capacity (vph)	175	1079	326	1436	274	1149	195	1093
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.54	0.61	0.99	0.48	0.97	0.70	0.72

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	429	101	181	1081	213	120	920	96	124	626	87
Ideal Flow (vphpl)	1900	1900	1900	1900	2150	1900	1900	2050	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1738	3043		1424	3750		1703	3499		1615	3290	
Flt Permitted	0.08	1.00		0.31	1.00		0.20	1.00		0.09	1.00	
Satd. Flow (perm)	149	3043		466	3750		352	3499		147	3290	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	170	471	111	199	1188	234	132	1011	105	136	688	96
RTOR Reduction (vph)	0	15	0	0	12	0	0	5	0	0	7	0
Lane Group Flow (vph)	170	567	0	199	1410	0	132	1111	0	136	777	0
Confl. Peds. (#/hr)	9		8	8		9	28		2	2		28
Heavy Vehicles (%)	5%	16%	16%	28%	6%	12%	7%	8%	38%	13%	8%	10%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	58.6	49.0		65.8	53.2		56.8	45.8		57.6	46.2	
Effective Green, g (s)	58.6	49.0		65.8	53.2		56.8	45.8		57.6	46.2	
Actuated g/C Ratio	0.42	0.35		0.47	0.38		0.41	0.33		0.41	0.33	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	171	1065		313	1425		248	1144		180	1085	
v/s Ratio Prot	c0.07	0.19		c0.06	c0.38		0.04	c0.32		c0.06	0.24	
v/s Ratio Perm	0.35			0.24			0.17			0.25		
v/c Ratio	0.99	0.53		0.64	0.99		0.53	0.97		0.76	0.72	
Uniform Delay, d1	38.0	36.3		24.0	43.1		28.7	46.4		32.8	41.1	
Progression Factor	1.00	1.00		0.64	0.70		1.00	1.00		1.00	1.00	
Incremental Delay, d2	67.3	1.9		4.6	14.0		2.2	20.5		16.4	4.0	
Delay (s)	105.4	38.3		19.8	44.1		30.9	66.9		49.2	45.2	
Level of Service	F	D		B	D		C	E		D	D	
Approach Delay (s)		53.4			41.1			63.1			45.8	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	50.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	274	498	1616	461	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.98	0.98	0.98	0.92	0.98	0.98
Hourly flow rate (vph)	280	508	1649	501	0	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)			312			
pX, platoon unblocked	0.54				0.54	0.54
vC, conflicting volume	1649				2462	824
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	505				2007	0
tC, single (s)	4.4				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	47				100	100
cM capacity (veh/h)	529				13	591

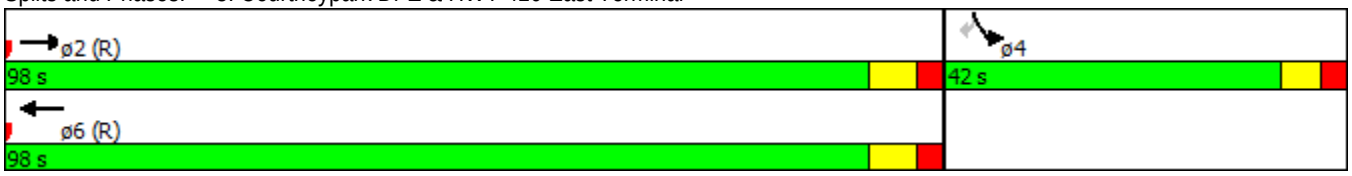
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	280	254	254	824	824	501
Volume Left	280	0	0	0	0	0
Volume Right	0	0	0	0	0	501
cSH	529	1700	1700	1700	1700	1700
Volume to Capacity	0.53	0.15	0.15	0.48	0.48	0.29
Queue Length 95th (m)	23.3	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	19.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	6.8			0.0		
Approach LOS						

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBT	WBT	SBL	SBR
Lane Configurations				
Volume (vph)	516	1895	138	197
Turn Type	NA	NA	Prot	Perm
Protected Phases	2	6	4	
Permitted Phases				4
Detector Phase	2	6	4	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	8.0	8.0
Minimum Split (s)	28.0	28.0	23.0	23.0
Total Split (s)	98.0	98.0	42.0	42.0
Total Split (%)	70.0%	70.0%	30.0%	30.0%
Yellow Time (s)	5.0	5.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	8.0	8.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Max	C-Max	Max	Max
Act Effct Green (s)	90.0	90.0	35.0	35.0
Actuated g/C Ratio	0.64	0.64	0.25	0.25
v/c Ratio	0.28	0.89	0.22	0.64
Control Delay	17.5	20.5	42.7	53.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.5	20.5	42.7	53.7
LOS	B	C	D	D
Approach Delay	17.5	20.5	49.2	
Approach LOS	B	C	D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 49 (35%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 23.4	Intersection LOS: C
Intersection Capacity Utilization 77.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 8: Courtneypark Dr E & HWY 410 East Terminal



Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	543	1995	145	207
v/c Ratio	0.28	0.89	0.22	0.64
Control Delay	17.5	20.5	42.7	53.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.5	20.5	42.7	53.7
Queue Length 50th (m)	50.3	130.8	16.5	47.7
Queue Length 95th (m)	m62.5	m137.6	25.9	75.9
Internal Link Dist (m)	288.2	524.5	121.7	
Turn Bay Length (m)				
Base Capacity (vph)	1939	2234	660	321
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	0.28	0.89	0.22	0.64

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	516	1895	0	138	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0	8.0		7.0	7.0
Lane Util. Factor		0.95	0.95		0.97	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3017	3476		2642	1237
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3017	3476		2642	1237
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	543	1995	0	145	207
RTOR Reduction (vph)	0	0	0	0	0	12
Lane Group Flow (vph)	0	543	1995	0	145	195
Heavy Vehicles (%)	0%	21%	5%	0%	34%	32%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		90.0	90.0		35.0	35.0
Effective Green, g (s)		90.0	90.0		35.0	35.0
Actuated g/C Ratio		0.64	0.64		0.25	0.25
Clearance Time (s)		8.0	8.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1939	2234		660	309
v/s Ratio Prot		0.18	c0.57		0.05	
v/s Ratio Perm						c0.16
v/c Ratio		0.28	0.89		0.22	0.63
Uniform Delay, d1		10.9	21.0		41.7	46.8
Progression Factor		1.57	0.85		1.00	1.00
Incremental Delay, d2		0.3	2.2		0.8	9.4
Delay (s)		17.4	19.9		42.4	56.2
Level of Service		B	B		D	E
Approach Delay (s)		17.4	19.9		50.5	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

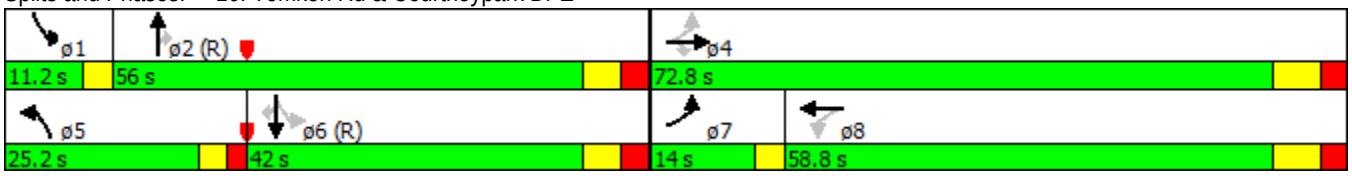
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	98	337	132	23	1008	411	1237	29	70	581	427
Turn Type	pm+pt	NA	Perm	Perm	NA	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8	5	2		1	6	
Permitted Phases	4		4	8				2	6		6
Detector Phase	7	4	4	8	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	13.0	13.0	13.0	13.0	5.0	14.0	14.0	5.0	14.0	14.0
Minimum Split (s)	9.0	40.0	40.0	40.0	40.0	10.0	41.0	41.0	9.0	41.0	41.0
Total Split (s)	14.0	72.8	72.8	58.8	58.8	25.2	56.0	56.0	11.2	42.0	42.0
Total Split (%)	10.0%	52.0%	52.0%	42.0%	42.0%	18.0%	40.0%	40.0%	8.0%	30.0%	30.0%
Yellow Time (s)	3.0	5.0	5.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	0.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	8.0	8.0	8.0	8.0	5.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead			Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Min	Max	Max	Max	Max	Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	69.8	64.8	64.8	51.5	51.5	20.2	51.3	51.3	46.8	35.0	35.0
Actuated g/C Ratio	0.50	0.46	0.46	0.37	0.37	0.14	0.37	0.37	0.33	0.25	0.25
v/c Ratio	0.74	0.26	0.21	0.07	0.98	0.92	0.98	0.06	0.52	0.76	0.92
Control Delay	75.6	12.4	1.1	18.4	50.8	83.7	64.6	0.2	37.1	55.6	56.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.6	12.4	1.1	18.4	50.8	83.7	64.6	0.2	37.1	55.6	56.2
LOS	E	B	A	B	D	F	E	A	D	E	E
Approach Delay		20.7			50.2		68.2			54.6	
Approach LOS		C			D		E			D	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 138.6 (99%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 54.2 Intersection LOS: D
Intersection Capacity Utilization 100.9% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 10: Tomken Rd & Courtneypark Dr E



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	104	359	140	24	1241	437	1316	31	74	618	454
v/c Ratio	0.74	0.26	0.21	0.07	0.98	0.92	0.98	0.06	0.52	0.76	0.92
Control Delay	75.6	12.4	1.1	18.4	50.8	83.7	64.6	0.2	37.1	55.6	56.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.6	12.4	1.1	18.4	50.8	83.7	64.6	0.2	37.1	55.6	56.2
Queue Length 50th (m)	22.3	20.3	0.0	2.8	180.9	62.3	~204.2	0.0	11.4	83.8	83.1
Queue Length 95th (m)	#44.0	25.5	0.0	m6.9	#230.3	#92.1	#246.8	0.0	21.0	105.9	#147.6
Internal Link Dist (m)		524.5			466.9		171.2			190.6	
Turn Bay Length (m)	120.0		100.0	50.0		80.0		50.0	130.0		85.0
Base Capacity (vph)	147	1396	658	334	1260	477	1340	490	147	814	496
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.26	0.21	0.07	0.98	0.92	0.98	0.06	0.50	0.76	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	337	132	23	1008	159	411	1237	29	70	581	427
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	3.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1332	3017	1260	1607	3401		3309	3659	1189	1601	3259	1483
Flt Permitted	0.07	1.00	1.00	0.54	1.00		0.95	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	103	3017	1260	909	3401		3309	3659	1189	193	3259	1483
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	104	359	140	24	1072	169	437	1316	31	74	618	454
RTOR Reduction (vph)	0	0	75	0	9	0	0	0	20	0	0	126
Lane Group Flow (vph)	104	359	65	24	1232	0	437	1316	11	74	618	328
Confl. Peds. (#/hr)	1		6	6		1	6		10	10		6
Heavy Vehicles (%)	37%	21%	27%	13%	4%	11%	7%	5%	34%	14%	12%	8%
Turn Type	pm+pt	NA	Perm	Perm	NA		Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	64.8	64.8	64.8	51.5	51.5		20.2	50.7	50.7	41.5	35.0	35.0
Effective Green, g (s)	64.8	64.8	64.8	51.5	51.5		20.2	50.7	50.7	41.5	35.0	35.0
Actuated g/C Ratio	0.46	0.46	0.46	0.37	0.37		0.14	0.36	0.36	0.30	0.25	0.25
Clearance Time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	138	1396	583	334	1251		477	1325	430	122	814	370
v/s Ratio Prot	c0.06	0.12			c0.36		c0.13	c0.36		0.03	0.19	
v/s Ratio Perm	0.29		0.05	0.03					0.01	0.15		0.22
v/c Ratio	0.75	0.26	0.11	0.07	0.98		0.92	0.99	0.03	0.61	0.76	0.89
Uniform Delay, d1	31.1	22.9	21.3	28.7	43.9		59.1	44.5	28.8	39.9	48.6	50.6
Progression Factor	1.78	0.52	0.13	0.61	0.66		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.1	0.4	0.4	0.4	21.1		24.9	23.2	0.1	8.3	6.6	25.4
Delay (s)	75.5	12.4	3.1	17.8	50.2		83.9	67.6	28.9	48.2	55.2	76.0
Level of Service	E	B	A	B	D		F	E	C	D	E	E
Approach Delay (s)		21.1			49.6			71.0			63.0	
Approach LOS		C			D			E			E	

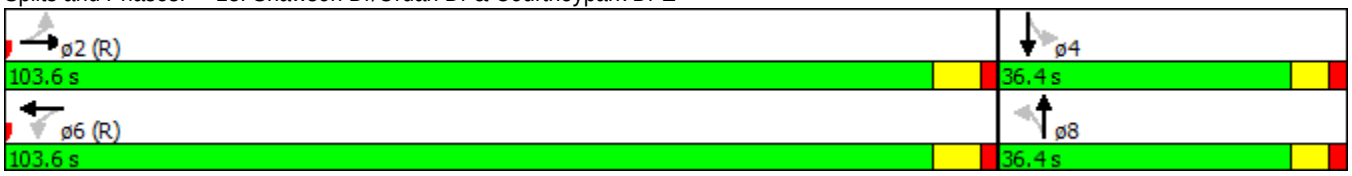
Intersection Summary			
HCM 2000 Control Delay	57.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	27	380	53	895	121	6	6	11
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	32.0	32.0	32.0	32.0	33.0	33.0	33.0	33.0
Total Split (s)	103.6	103.6	103.6	103.6	36.4	36.4	36.4	36.4
Total Split (%)	74.0%	74.0%	74.0%	74.0%	26.0%	26.0%	26.0%	26.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	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	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	96.6	96.6	96.6	96.6	30.4	30.4	30.4	30.4
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.22	0.22	0.22	0.22
v/c Ratio	0.12	0.23	0.10	0.41	0.61	0.19	0.02	0.34
Control Delay	5.3	4.2	9.0	13.5	62.8	14.1	43.7	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	4.2	9.0	13.5	62.8	14.1	43.7	11.0
LOS	A	A	A	B	E	B	D	B
Approach Delay		4.2		13.3		46.8		12.4
Approach LOS		A		B		D		B

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 33.6 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 14.3 Intersection LOS: B
Intersection Capacity Utilization 79.0% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 13: Shawson Dr/Ordan Dr & Courtneypark Dr E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	471	58	986	133	65	7	149
v/c Ratio	0.12	0.23	0.10	0.41	0.61	0.19	0.02	0.34
Control Delay	5.3	4.2	9.0	13.5	62.8	14.1	43.7	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	4.2	9.0	13.5	62.8	14.1	43.7	11.0
Queue Length 50th (m)	1.3	9.7	6.8	88.4	33.5	1.5	1.5	2.7
Queue Length 95th (m)	m2.8	11.9	14.1	103.4	56.7	14.0	5.8	20.8
Internal Link Dist (m)		466.9		278.5		123.7		151.6
Turn Bay Length (m)	45.0		30.0		35.0		35.0	
Base Capacity (vph)	243	2081	591	2396	218	345	297	442
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.23	0.10	0.41	0.61	0.19	0.02	0.34

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	380	48	53	895	2	121	6	53	6	11	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.87		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1294	3006		1690	3472		1657	1381		1817	1542	
Flt Permitted	0.26	1.00		0.48	1.00		0.58	1.00		0.71	1.00	
Satd. Flow (perm)	352	3006		857	3472		1007	1381		1367	1542	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	30	418	53	58	984	2	133	7	58	7	12	137
RTOR Reduction (vph)	0	7	0	0	0	0	0	45	0	0	107	0
Lane Group Flow (vph)	30	464	0	58	986	0	133	20	0	7	42	0
Confl. Peds. (#/hr)	1					1	1		3	3		1
Heavy Vehicles (%)	41%	17%	38%	8%	5%	50%	10%	33%	17%	0%	18%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	96.6	96.6		96.6	96.6		30.4	30.4		30.4	30.4	
Effective Green, g (s)	96.6	96.6		96.6	96.6		30.4	30.4		30.4	30.4	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.22	0.22		0.22	0.22	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	242	2074		591	2395		218	299		296	334	
v/s Ratio Prot		0.15			c0.28			0.01			0.03	
v/s Ratio Perm	0.09			0.07			c0.13			0.01		
v/c Ratio	0.12	0.22		0.10	0.41		0.61	0.07		0.02	0.12	
Uniform Delay, d1	7.4	8.0		7.2	9.4		49.5	43.5		43.1	44.1	
Progression Factor	0.54	0.51		1.17	1.37		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.2		0.3	0.5		12.1	0.4		0.1	0.8	
Delay (s)	5.0	4.3		8.8	13.4		61.5	43.9		43.3	44.9	
Level of Service	A	A		A	B		E	D		D	D	
Approach Delay (s)		4.4			13.2			55.8			44.8	
Approach LOS		A			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	9	428	36	805	57	5	24	13
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	29.0	29.0	29.0	29.0	30.0	30.0	30.0	30.0
Total Split (s)	99.4	99.4	99.4	99.4	40.6	40.6	40.6	40.6
Total Split (%)	71.0%	71.0%	71.0%	71.0%	29.0%	29.0%	29.0%	29.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	92.4	92.4	92.4	92.4	33.6	33.6	33.6	33.6
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.24	0.24	0.24	0.24
v/c Ratio	0.03	0.26	0.09	0.42	0.23	0.12	0.09	0.25
Control Delay	11.8	13.8	7.1	7.7	45.3	14.7	42.5	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	13.8	7.1	7.7	45.3	14.7	42.5	11.5
LOS	B	B	A	A	D	B	D	B
Approach Delay		13.7		7.6		32.5		17.5
Approach LOS		B		A		C		B

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 96.6 (69%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.42
Intersection Signal Delay: 11.9 Intersection LOS: B
Intersection Capacity Utilization 60.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 16: Vipond Dr & Courtneypark Dr E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	11	536	43	962	68	49	29	120
v/c Ratio	0.03	0.26	0.09	0.42	0.23	0.12	0.09	0.25
Control Delay	11.8	13.8	7.1	7.7	45.3	14.7	42.5	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	13.8	7.1	7.7	45.3	14.7	42.5	11.5
Queue Length 50th (m)	0.0	39.0	2.8	33.5	15.3	1.3	6.3	3.2
Queue Length 95th (m)	4.3	44.8	5.5	37.1	26.9	10.3	13.8	16.0
Internal Link Dist (m)		278.5		341.9		126.6		117.6
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	328	2068	456	2264	298	396	318	471
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.26	0.09	0.42	0.23	0.12	0.09	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	428	22	36	805	3	57	5	36	24	13	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1818	3129		1483	3433		1770	1518		1737	1633	
Flt Permitted	0.26	1.00		0.44	1.00		0.67	1.00		0.73	1.00	
Satd. Flow (perm)	498	3129		692	3433		1244	1518		1326	1633	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	11	510	26	43	958	4	68	6	43	29	15	105
RTOR Reduction (vph)	0	3	0	0	0	0	0	33	0	0	80	0
Lane Group Flow (vph)	11	533	0	43	962	0	68	16	0	29	40	0
Confl. Peds. (#/hr)	6		6	6		6	7		6	6		7
Heavy Vehicles (%)	0%	15%	27%	22%	6%	67%	2%	20%	6%	4%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	92.4	92.4		92.4	92.4		33.6	33.6		33.6	33.6	
Effective Green, g (s)	92.4	92.4		92.4	92.4		33.6	33.6		33.6	33.6	
Actuated g/C Ratio	0.66	0.66		0.66	0.66		0.24	0.24		0.24	0.24	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	328	2065		456	2265		298	364		318	391	
v/s Ratio Prot		0.17			c0.28			0.01			0.02	
v/s Ratio Perm	0.02			0.06			c0.05			0.02		
v/c Ratio	0.03	0.26		0.09	0.42		0.23	0.04		0.09	0.10	
Uniform Delay, d1	8.3	9.8		8.6	11.2		42.8	40.9		41.3	41.5	
Progression Factor	1.37	1.39		0.75	0.62		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.3		0.4	0.6		1.8	0.2		0.6	0.5	
Delay (s)	11.5	13.9		6.9	7.6		44.6	41.1		41.9	42.0	
Level of Service	B	B		A	A		D	D		D	D	
Approach Delay (s)		13.8			7.6			43.1			42.0	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	2	501	21	687	56	0	62	15
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	32.0	32.0	32.0	32.0	30.0	30.0	30.0	30.0
Total Split (s)	106.4	106.4	106.4	106.4	33.6	33.6	33.6	33.6
Total Split (%)	76.0%	76.0%	76.0%	76.0%	24.0%	24.0%	24.0%	24.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	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	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	99.4	99.4	99.4	99.4	27.6	27.6	27.6	27.6
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.20	0.20	0.20	0.20
v/c Ratio	0.01	0.28	0.05	0.36	0.26	0.11	0.33	0.11
Control Delay	2.5	2.9	3.6	4.1	50.6	0.4	53.1	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	2.9	3.6	4.1	50.6	0.4	53.1	29.3
LOS	A	A	A	A	D	A	D	C
Approach Delay		2.9		4.1		25.9		45.6
Approach LOS		A		A		C		D

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 93.8 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 7.9 Intersection LOS: A
Intersection Capacity Utilization 51.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 19: Ordan Dr & Courtneypark Dr E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2	645	26	858	68	66	76	35
v/c Ratio	0.01	0.28	0.05	0.36	0.26	0.11	0.33	0.11
Control Delay	2.5	2.9	3.6	4.1	50.6	0.4	53.1	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	2.9	3.6	4.1	50.6	0.4	53.1	29.3
Queue Length 50th (m)	0.0	10.9	0.9	17.5	16.1	0.0	18.3	4.1
Queue Length 95th (m)	m0.3	13.7	m2.1	24.4	27.5	0.0	30.6	12.1
Internal Link Dist (m)		341.9		193.9		128.4		78.4
Turn Bay Length (m)	35.0		45.0		35.0		35.0	
Base Capacity (vph)	279	2279	474	2379	264	591	229	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.28	0.05	0.36	0.26	0.11	0.33	0.11

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	501	28	21	687	16	56	0	54	62	15	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1212	3208		1601	3349		1735	1541		1547	1603	
Flt Permitted	0.31	1.00		0.40	1.00		0.73	1.00		0.71	1.00	
Satd. Flow (perm)	393	3208		669	3349		1341	1541		1162	1603	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	2	611	34	26	838	20	68	0	66	76	18	17
RTOR Reduction (vph)	0	3	0	0	1	0	0	53	0	0	14	0
Lane Group Flow (vph)	2	642	0	26	857	0	68	13	0	76	21	0
Confl. Peds. (#/hr)	5					5	1					1
Heavy Vehicles (%)	50%	13%	11%	14%	8%	31%	5%	0%	6%	18%	7%	14%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	99.4	99.4		99.4	99.4		27.6	27.6		27.6	27.6	
Effective Green, g (s)	99.4	99.4		99.4	99.4		27.6	27.6		27.6	27.6	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.20	0.20		0.20	0.20	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	279	2277		474	2377		264	303		229	316	
v/s Ratio Prot		0.20			c0.26			0.01			0.01	
v/s Ratio Perm	0.01			0.04			0.05			c0.07		
v/c Ratio	0.01	0.28		0.05	0.36		0.26	0.04		0.33	0.07	
Uniform Delay, d1	5.9	7.4		6.1	7.9		47.5	45.5		48.3	45.7	
Progression Factor	0.43	0.36		0.53	0.47		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.2	0.4		2.3	0.3		3.9	0.4	
Delay (s)	2.6	2.9		3.5	4.1		49.9	45.8		52.1	46.1	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		2.9			4.1			47.9			50.2	
Approach LOS		A			A			D			D	

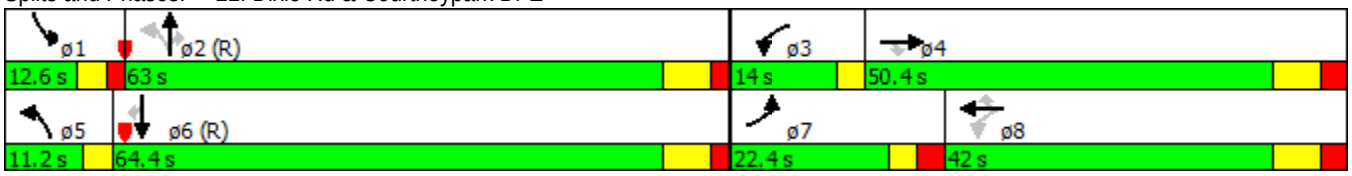
Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	365	179	146	84	439	546	183	1805	30	154	832	132
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	5.0	8.0	8.0	5.0	4.0	4.0	7.6	4.0	4.0
Minimum Split (s)	14.0	39.0	39.0	9.0	39.0	39.0	9.0	28.0	28.0	12.6	28.0	28.0
Total Split (s)	22.4	50.4	50.4	14.0	42.0	42.0	11.2	63.0	63.0	12.6	64.4	64.4
Total Split (%)	16.0%	36.0%	36.0%	10.0%	30.0%	30.0%	8.0%	45.0%	45.0%	9.0%	46.0%	46.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	0.0	3.0	3.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	8.0	8.0	3.0	8.0	8.0	3.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	Max	Max	C-Max	C-Max	Max	C-Max	C-Max
Act Effct Green (s)	16.4	42.4	42.4	50.0	34.0	34.0	68.2	56.0	56.0	7.6	57.4	57.4
Actuated g/C Ratio	0.12	0.30	0.30	0.36	0.24	0.24	0.49	0.40	0.40	0.05	0.41	0.41
v/c Ratio	0.99	0.37	0.29	0.20	0.55	0.98	0.68	0.98	0.05	0.98	0.47	0.22
Control Delay	118.1	26.0	2.1	25.2	49.3	72.4	33.7	57.7	0.2	128.5	31.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.1	26.0	2.1	25.2	49.3	72.4	33.7	57.7	0.2	128.5	31.2	4.8
LOS	F	C	A	C	D	E	C	E	A	F	C	A
Approach Delay		69.7			59.2			54.7			41.5	
Approach LOS		E			E			D			D	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 28 (20%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 54.8 Intersection LOS: D
Intersection Capacity Utilization 98.2% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 22: Dixie Rd & Courtneypark Dr E



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	388	190	155	89	467	581	195	1920	32	164	885	140
v/c Ratio	0.99	0.37	0.29	0.20	0.55	0.98	0.68	0.98	0.05	0.98	0.47	0.22
Control Delay	118.1	26.0	2.1	25.2	49.3	72.4	33.7	57.7	0.2	128.5	31.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.1	26.0	2.1	25.2	49.3	72.4	33.7	57.7	0.2	128.5	31.2	4.8
Queue Length 50th (m)	54.8	21.3	0.4	14.4	59.9	128.7	28.7	190.7	0.0	23.8	64.9	0.0
Queue Length 95th (m)	#87.5	41.5	1.7	25.5	77.6	#203.8	43.7	#226.9	0.0	#47.3	77.6	12.9
Internal Link Dist (m)		193.9			206.9			193.9			185.2	
Turn Bay Length (m)	55.0		45.0	45.0			85.0		50.0	100.0		125.0
Base Capacity (vph)	392	514	530	437	844	592	287	1957	590	168	1886	639
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.37	0.29	0.20	0.55	0.98	0.68	0.98	0.05	0.98	0.47	0.22

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	365	179	146	84	439	546	183	1805	30	154	832	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	2500	1900	1950	1900	1900	1900	1900
Total Lost time (s)	6.0	8.0	8.0	3.0	8.0	8.0	3.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3350	1700	1394	1647	3476	2003	1659	4893	1278	3100	4601	1359
Flt Permitted	0.95	1.00	1.00	0.64	1.00	1.00	0.26	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	325	1700	1394	1106	3476	2003	446	4893	1278	160	4601	1359
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	388	190	155	89	467	581	195	1920	32	164	885	140
RTOR Reduction (vph)	0	0	108	0	0	106	0	0	19	0	0	83
Lane Group Flow (vph)	388	190	47	89	467	475	195	1920	13	164	885	57
Confl. Peds. (#/hr)	7		11	11		7	3		13	13		3
Heavy Vehicles (%)	11%	13%	14%	10%	5%	5%	10%	10%	23%	22%	14%	18%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Actuated Green, G (s)	16.4	42.4	42.4	45.0	34.0	34.0	64.2	56.0	56.0	7.6	57.4	57.4
Effective Green, g (s)	16.4	42.4	42.4	45.0	34.0	34.0	64.2	56.0	56.0	7.6	57.4	57.4
Actuated g/C Ratio	0.12	0.30	0.30	0.32	0.24	0.24	0.46	0.40	0.40	0.05	0.41	0.41
Clearance Time (s)	6.0	8.0	8.0	3.0	8.0	8.0	3.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	392	514	422	398	844	486	275	1957	511	168	1886	557
v/s Ratio Prot	c0.12	0.11		0.02	0.13		0.04	c0.39		c0.05	0.19	
v/s Ratio Perm			0.03	0.05		c0.24	0.28		0.01			0.04
v/c Ratio	0.99	0.37	0.11	0.22	0.55	0.98	0.71	0.98	0.03	0.98	0.47	0.10
Uniform Delay, d1	61.7	38.3	35.2	34.1	46.4	52.6	25.7	41.5	25.5	66.1	30.2	25.4
Progression Factor	1.26	0.62	0.13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	42.4	2.0	0.5	1.3	2.6	35.6	14.4	16.3	0.1	63.5	0.8	0.4
Delay (s)	120.3	25.7	5.2	35.4	49.0	88.2	40.0	57.8	25.5	129.6	31.0	25.8
Level of Service	F	C	A	D	D	F	D	E	C	F	C	C
Approach Delay (s)		71.4			68.0			55.7			44.0	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	57.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: EB Courtneypark Dr E

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (km)	Arterial Speed	Arterial LOS
Kennedy Rd	II	70	14.5	37.1	51.6	0.21	15.0	F
HWY 410 East Termina	II	70	44.1	17.5	61.6	0.86	50.0	B
Tomken Rd	II	70	32.7	12.4	45.1	0.55	43.8	C
Shawson Dr	II	70	30.2	4.2	34.4	0.49	51.4	B
Vipond Dr	II	70	20.5	13.8	34.3	0.30	31.7	D
Ordan Dr	II	70	23.6	2.9	26.5	0.37	49.7	B
Dixie Rd	II	70	14.8	26.0	40.8	0.22	19.2	F
Total	II		180.4	113.9	294.3	3.00	36.6	C

Arterial Level of Service: WB Courtneypark Dr E

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (km)	Arterial Speed	Arterial LOS
Dixie Rd	II	70	15.6	49.3	64.9	0.23	12.8	F
Ordan Dr	II	70	14.8	4.1	18.9	0.22	41.5	C
Vipond Dr	II	70	23.6	7.7	31.3	0.37	42.1	C
Ordan Dr	II	70	20.5	13.5	34.0	0.30	32.0	D
Tomken Rd	II	70	30.2	50.8	81.0	0.49	21.8	E
HWY 410 East Termina	II	70	32.7	20.5	53.2	0.55	37.1	C
Kennedy Rd	II	70	44.1	44.5	88.6	0.86	34.8	D
Total	II		181.5	190.4	371.9	3.01	29.2	D

Queues
3: Kennedy Road & Derry Road East

7/14/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	151	1662	159	543	1224	206	66	265	255	329	1015	140
v/c Ratio	0.98	0.85	0.24	0.93	0.40	0.22	1.05	0.42	0.55	0.89	0.99	0.31
Control Delay	110.1	43.7	11.9	88.2	9.8	2.2	180.9	51.7	10.4	71.7	77.2	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.1	43.7	11.9	88.2	9.8	2.2	180.9	51.7	10.4	71.7	77.2	20.3
Queue Length 50th (m)	41.2	152.8	10.1	74.5	29.1	0.5	~19.5	34.2	0.0	76.2	148.2	12.8
Queue Length 95th (m)	#87.5	173.1	25.6	m81.4	m37.8	m4.9	#51.1	48.1	24.5	#128.8	#193.7	31.2
Internal Link Dist (m)		267.1			518.3			268.1			273.7	
Turn Bay Length (m)	105.0		140.0	220.0		225.0	60.0		75.0	95.0		100.0
Base Capacity (vph)	154	1959	660	592	3024	954	63	632	460	368	1024	452
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.85	0.24	0.92	0.40	0.22	1.05	0.42	0.55	0.89	0.99	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	1612	154	527	1187	200	64	257	247	319	985	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2500	1900	1900	2300	2150	1900
Total Lost time (s)	8.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1706	4948	1512	3052	4856	1408	2125	3230	1306	2065	3897	1498
Flt Permitted	0.22	1.00	1.00	0.95	1.00	1.00	0.15	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	390	4948	1512	3052	4856	1408	327	3230	1306	1071	3897	1498
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	151	1662	159	543	1224	206	66	265	255	329	1015	140
RTOR Reduction (vph)	0	0	61	0	0	78	0	0	205	0	0	59
Lane Group Flow (vph)	151	1662	98	543	1224	128	66	265	50	329	1015	81
Heavy Vehicles (%)	7%	6%	8%	16%	8%	16%	13%	13%	25%	7%	6%	9%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Actuated Green, G (s)	55.5	55.5	55.5	26.7	87.2	87.2	27.4	27.4	27.4	36.8	36.8	36.8
Effective Green, g (s)	55.5	55.5	55.5	26.7	87.2	87.2	27.4	27.4	27.4	36.8	36.8	36.8
Actuated g/C Ratio	0.40	0.40	0.40	0.19	0.62	0.62	0.20	0.20	0.20	0.26	0.26	0.26
Clearance Time (s)	8.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	154	1961	599	582	3024	876	63	632	255	329	1024	393
v/s Ratio Prot		0.34		c0.18	0.25			0.08		0.05	c0.26	
v/s Ratio Perm	c0.39		0.06			0.09	0.20		0.04	c0.21		0.05
v/c Ratio	0.98	0.85	0.16	0.93	0.40	0.15	1.05	0.42	0.20	1.00	0.99	0.21
Uniform Delay, d1	41.7	38.4	27.3	55.8	13.3	11.0	56.3	49.3	47.1	51.0	51.4	40.2
Progression Factor	1.00	1.00	1.00	1.28	0.71	1.34	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	67.6	4.8	0.6	16.4	0.3	0.2	127.3	0.5	0.4	49.6	25.9	0.3
Delay (s)	109.3	43.2	27.9	87.7	9.7	14.9	183.6	49.8	47.5	100.7	77.3	40.5
Level of Service	F	D	C	F	A	B	F	D	D	F	E	D
Approach Delay (s)		47.0			31.7			63.8			79.0	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	51.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2014	1243	1199	552
v/c Ratio	0.67	0.43	1.20	1.18
Control Delay	8.7	29.8	139.7	137.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.7	29.8	139.7	137.9
Queue Length 50th (m)	42.6	103.9	~203.9	~184.3
Queue Length 95th (m)	50.1	m100.8	#246.0	#261.8
Internal Link Dist (m)	518.3	377.8	224.2	
Turn Bay Length (m)				
Base Capacity (vph)	2990	2882	1003	469
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.67	0.43	1.20	1.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1853	1144	0	841	770
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0	7.0
Lane Util. Factor		0.91	0.91		0.97	0.91
Frt		1.00	1.00		0.96	0.85
Flt Protected		1.00	1.00		0.96	1.00
Satd. Flow (prot)		4902	4725		3386	1443
Flt Permitted		1.00	1.00		0.96	1.00
Satd. Flow (perm)		4902	4725		3386	1443
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2014	1243	0	914	837
RTOR Reduction (vph)	0	0	0	0	22	51
Lane Group Flow (vph)	0	2014	1243	0	1177	501
Heavy Vehicles (%)	2%	7%	11%	2%	2%	3%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		85.4	85.4		40.6	40.6
Effective Green, g (s)		85.4	85.4		40.6	40.6
Actuated g/C Ratio		0.61	0.61		0.29	0.29
Clearance Time (s)		7.0	7.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2990	2882		981	418
v/s Ratio Prot		c0.41	0.26		c0.35	
v/s Ratio Perm						0.35
v/c Ratio		0.67	0.43		1.20	1.20
Uniform Delay, d1		18.1	14.4		49.7	49.7
Progression Factor		0.44	2.02		1.00	1.00
Incremental Delay, d2		0.7	0.4		99.8	110.3
Delay (s)		8.6	29.6		149.5	160.0
Level of Service		A	C		F	F
Approach Delay (s)		8.6	29.6		152.8	
Approach LOS		A	C		F	

Intersection Summary			
HCM 2000 Control Delay	64.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2583	1120	1057	580
v/c Ratio	0.88	0.45	1.16dr	1.27
Control Delay	18.1	7.3	82.3	175.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.1	7.3	82.3	175.7
Queue Length 50th (m)	130.3	23.2	~160.9	~222.0
Queue Length 95th (m)	m132.9	39.3	#202.3	#300.7
Internal Link Dist (m)	377.8	410.9	103.4	
Turn Bay Length (m)				
Base Capacity (vph)	2924	2493	1026	458
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.88	0.45	1.03	1.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2428	0	0	1053	447	1091
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0			7.0	7.0	7.0
Lane Util. Factor	0.91			0.91	0.97	0.91
Frt	1.00			1.00	0.92	0.85
Flt Protected	1.00			1.00	0.98	1.00
Satd. Flow (prot)	5043			4299	3202	1429
Flt Permitted	1.00			1.00	0.98	1.00
Satd. Flow (perm)	5043			4299	3202	1429
Peak-hour factor, PHF	0.94	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	2583	0	0	1120	476	1161
RTOR Reduction (vph)	0	0	0	0	1	1
Lane Group Flow (vph)	2583	0	0	1120	1056	579
Heavy Vehicles (%)	4%	2%	2%	22%	5%	4%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	81.2			81.2	44.8	44.8
Effective Green, g (s)	81.2			81.2	44.8	44.8
Actuated g/C Ratio	0.58			0.58	0.32	0.32
Clearance Time (s)	7.0			7.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2924			2493	1024	457
v/s Ratio Prot	c0.51			0.26	0.33	
v/s Ratio Perm						c0.40
v/c Ratio	0.88			0.45	1.16dr	1.27
Uniform Delay, d1	25.3			16.7	47.6	47.6
Progression Factor	0.61			0.40	1.00	1.00
Incremental Delay, d2	2.3			0.5	36.3	136.2
Delay (s)	17.9			7.2	83.9	183.8
Level of Service	B			A	F	F
Approach Delay (s)	17.9			7.2	119.3	
Approach LOS	B			A	F	

Intersection Summary			
HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	333	1789	577	186	970	34	114	297	30	696	229
v/c Ratio	0.97	0.84	0.71	0.95	0.49	0.05	0.54	0.28	0.14	0.82	0.49
Control Delay	36.7	28.4	11.8	64.8	30.9	6.3	71.8	28.5	43.9	59.1	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	28.4	11.8	64.8	30.9	6.3	71.8	28.5	43.9	59.1	11.1
Queue Length 50th (m)	36.3	144.1	41.9	42.0	100.7	1.6	15.9	26.6	6.5	96.9	3.6
Queue Length 95th (m)	m#42.8	m153.0	m39.7	#79.1	111.9	m5.2	25.9	38.5	15.7	#126.5	27.4
Internal Link Dist (m)		410.9			1342.9			365.8		212.8	
Turn Bay Length (m)	190.0		195.0	215.0		75.0	275.0		90.0		75.0
Base Capacity (vph)	345	2127	815	196	1972	661	240	1061	213	844	463
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.84	0.71	0.95	0.49	0.05	0.47	0.28	0.14	0.82	0.49

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	323	1735	560	180	941	33	111	215	73	29	675	222
Ideal Flow (vphpl)	2075	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1812	4948	1541	1630	4483	1384	2855	2884		1426	3380	1219
Flt Permitted	0.23	1.00	1.00	0.06	1.00	1.00	0.95	1.00		0.57	1.00	1.00
Satd. Flow (perm)	442	4948	1541	111	4483	1384	2855	2884		856	3380	1219
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	333	1789	577	186	970	34	114	222	75	30	696	229
RTOR Reduction (vph)	0	0	153	0	0	19	0	24	0	0	0	159
Lane Group Flow (vph)	333	1789	424	186	970	15	114	273	0	30	696	70
Heavy Vehicles (%)	10%	6%	6%	12%	17%	18%	24%	19%	30%	28%	8%	34%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6				4		4
Actuated Green, G (s)	71.2	60.2	60.2	74.0	61.6	61.6	10.4	50.4		35.0	35.0	35.0
Effective Green, g (s)	71.2	60.2	60.2	74.0	61.6	61.6	10.4	50.4		35.0	35.0	35.0
Actuated g/C Ratio	0.51	0.43	0.43	0.53	0.44	0.44	0.07	0.36		0.25	0.25	0.25
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	332	2127	662	193	1972	608	212	1038		214	845	304
v/s Ratio Prot	0.08	0.36		c0.09	0.22		c0.04	0.09			c0.21	
v/s Ratio Perm	c0.43		0.28	0.42		0.01				0.04		0.06
v/c Ratio	1.00	0.84	0.64	0.96	0.49	0.02	0.54	0.26		0.14	0.82	0.23
Uniform Delay, d1	27.7	35.6	31.4	41.7	28.0	22.2	62.5	31.7		40.8	49.6	41.8
Progression Factor	0.73	0.75	0.61	0.42	1.07	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	27.5	1.3	1.4	47.7	0.7	0.1	2.6	0.6		1.4	8.9	1.8
Delay (s)	47.8	28.2	20.5	65.2	30.7	22.3	65.1	32.3		42.2	58.5	43.5
Level of Service	D	C	C	E	C	C	E	C		D	E	D
Approach Delay (s)		29.0			35.8			41.4			54.4	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	312	2356	148	405	972	22	70	847	381	154	1467	162
v/c Ratio	0.76	1.07	0.24	0.99	0.66	0.05	0.38	0.68	0.67	0.57	0.96	0.32
Control Delay	69.4	97.9	19.0	104.0	43.3	0.2	69.3	49.2	19.4	69.2	62.5	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.4	97.9	19.0	104.0	43.3	0.2	69.3	49.2	19.4	69.2	62.5	8.0
Queue Length 50th (m)	46.0	~255.9	11.3	58.6	85.3	0.0	9.7	77.1	24.8	21.4	~157.6	1.4
Queue Length 95th (m)	m57.1	#285.0	m20.9	#92.2	102.7	0.0	17.8	95.9	65.0	32.2	#188.5	18.4
Internal Link Dist (m)		1342.9			444.1			341.5			298.1	
Turn Bay Length (m)	160.0		120.0	225.0		120.0	100.0		90.0	130.0		100.0
Base Capacity (vph)	460	2211	620	408	1472	479	194	1253	568	358	1528	514
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.07	0.24	0.99	0.66	0.05	0.36	0.68	0.67	0.43	0.96	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	293	2215	139	381	914	21	66	796	358	145	1379	152
Ideal Flow (vphpl)	1900	2500	1900	2150	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3190	6449	1512	3577	4483	1142	3026	4641	1361	3133	4856	1296
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3190	6449	1512	3577	4483	1142	3026	4641	1361	3133	4856	1296
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	312	2356	148	405	972	22	70	847	381	154	1467	162
RTOR Reduction (vph)	0	0	98	0	0	15	0	0	200	0	0	106
Lane Group Flow (vph)	312	2356	50	405	972	7	70	847	181	154	1467	56
Heavy Vehicles (%)	11%	7%	8%	12%	17%	43%	17%	13%	20%	13%	8%	26%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	18.0	47.0	47.0	16.0	45.0	45.0	6.9	38.8	38.8	12.2	44.1	44.1
Effective Green, g (s)	18.0	47.0	47.0	16.0	45.0	45.0	6.9	38.8	38.8	12.2	44.1	44.1
Actuated g/C Ratio	0.13	0.34	0.34	0.11	0.32	0.32	0.05	0.28	0.28	0.09	0.32	0.32
Clearance Time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	410	2165	507	408	1440	367	149	1286	377	273	1529	408
v/s Ratio Prot	0.10	c0.37		c0.11	0.22		0.02	0.18		c0.05	c0.30	
v/s Ratio Perm			0.03			0.01			0.13			0.04
v/c Ratio	0.76	1.09	0.10	0.99	0.68	0.02	0.47	0.66	0.48	0.56	0.96	0.14
Uniform Delay, d1	58.9	46.5	31.9	61.9	41.2	32.4	64.8	44.7	42.2	61.3	47.1	34.3
Progression Factor	1.00	1.40	4.49	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	47.0	0.3	42.4	2.6	0.1	2.3	1.2	1.0	2.7	14.3	0.2
Delay (s)	65.8	112.2	143.9	104.4	43.7	32.5	67.1	46.0	43.2	64.0	61.4	34.5
Level of Service	E	F	F	F	D	C	E	D	D	E	E	C
Approach Delay (s)		108.7			61.1			46.3			59.2	
Approach LOS		F			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	76.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues
3: Kennedy Road & Derry Road East

7/14/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	239	1344	73	396	2369	470	109	958	412	140	356	135
v/c Ratio	1.06	0.75	0.12	0.96	0.98	0.66	0.40	0.96	0.69	0.93	0.31	0.21
Control Delay	109.6	42.2	0.7	88.3	44.7	17.1	45.8	70.4	23.6	88.8	33.8	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.6	42.2	0.7	88.3	44.7	17.1	45.8	70.4	23.6	88.8	33.8	5.6
Queue Length 50th (m)	~50.6	118.7	0.0	54.5	240.0	72.4	24.4	138.1	40.4	25.5	37.5	0.0
Queue Length 95th (m)	#104.2	136.5	0.9	m#85.6	#275.0	m100.5	42.9	#180.6	79.6	#62.3	50.5	13.9
Internal Link Dist (m)		267.1			518.3			268.1			273.7	
Turn Bay Length (m)	105.0		140.0	220.0		225.0	60.0		75.0	95.0		100.0
Base Capacity (vph)	226	1795	599	413	2409	711	271	993	595	151	1160	641
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.75	0.12	0.96	0.98	0.66	0.40	0.96	0.69	0.93	0.31	0.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	237	1331	72	392	2345	465	108	948	408	139	352	134
Ideal Flow (vphpl)	2500	1900	1900	1900	2050	1900	1900	1900	1900	2050	1900	1900
Total Lost time (s)	3.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2224	4948	1432	3079	5441	1420	1674	3476	1458	1840	3288	1570
Flt Permitted	0.08	1.00	1.00	0.95	1.00	1.00	0.54	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	184	4948	1432	3079	5441	1420	950	3476	1458	182	3288	1570
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	239	1344	73	396	2369	470	109	958	412	140	356	135
RTOR Reduction (vph)	0	0	47	0	0	82	0	0	179	0	0	87
Lane Group Flow (vph)	239	1344	26	396	2369	388	109	958	233	140	356	48
Heavy Vehicles (%)	8%	6%	14%	15%	4%	15%	9%	5%	12%	7%	11%	4%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Actuated Green, G (s)	60.4	50.8	50.8	18.8	62.0	62.0	40.0	40.0	40.0	49.4	49.4	49.4
Effective Green, g (s)	60.4	50.8	50.8	18.8	62.0	62.0	40.0	40.0	40.0	49.4	49.4	49.4
Actuated g/C Ratio	0.43	0.36	0.36	0.13	0.44	0.44	0.29	0.29	0.29	0.35	0.35	0.35
Clearance Time (s)	3.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	219	1795	519	413	2409	628	271	993	416	144	1160	553
v/s Ratio Prot	c0.07	0.27		0.13	c0.44			0.28		c0.05	0.11	
v/s Ratio Perm	c0.39		0.02			0.27	0.11		0.16	c0.29		0.03
v/c Ratio	1.09	0.75	0.05	0.96	0.98	0.62	0.40	0.96	0.56	0.97	0.31	0.09
Uniform Delay, d1	38.8	39.0	29.0	60.2	38.5	29.9	40.4	49.3	42.5	39.0	32.9	30.2
Progression Factor	1.00	1.00	1.00	1.01	0.85	0.66	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	87.3	2.9	0.2	26.6	11.9	3.1	1.0	20.3	1.7	66.2	0.2	0.1
Delay (s)	126.1	41.9	29.1	87.3	44.5	22.9	41.3	69.6	44.3	105.2	33.0	30.3
Level of Service	F	D	C	F	D	C	D	E	D	F	C	C
Approach Delay (s)		53.5			46.6			60.5			48.5	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	51.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	105.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1654	2611	490	228
v/c Ratio	0.46	0.72	0.90	0.94
Control Delay	20.0	11.9	76.6	99.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.0	11.9	76.6	99.3
Queue Length 50th (m)	108.7	181.9	68.0	66.9
Queue Length 95th (m)	m123.9	201.2	#96.9	#121.6
Internal Link Dist (m)	518.3	377.8	224.2	
Turn Bay Length (m)				
Base Capacity (vph)	3584	3618	556	248
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	0.46	0.72	0.88	0.92

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1604	2533	0	262	435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0	7.0
Lane Util. Factor		0.91	0.91		0.97	0.91
Frt		1.00	1.00		0.93	0.85
Flt Protected		1.00	1.00		0.97	1.00
Satd. Flow (prot)		4948	4995		3060	1351
Flt Permitted		1.00	1.00		0.97	1.00
Satd. Flow (perm)		4948	4995		3060	1351
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1654	2611	0	270	448
RTOR Reduction (vph)	0	0	0	0	6	6
Lane Group Flow (vph)	0	1654	2611	0	484	222
Heavy Vehicles (%)	2%	6%	5%	2%	11%	10%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		101.4	101.4		24.6	24.6
Effective Green, g (s)		101.4	101.4		24.6	24.6
Actuated g/C Ratio		0.72	0.72		0.18	0.18
Clearance Time (s)		7.0	7.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3583	3617		537	237
v/s Ratio Prot		0.33	c0.52		0.16	
v/s Ratio Perm						c0.16
v/c Ratio		0.46	0.72		0.90	0.94
Uniform Delay, d1		8.0	11.2		56.5	56.9
Progression Factor		2.43	0.99		1.00	1.00
Incremental Delay, d2		0.3	0.6		18.3	41.1
Delay (s)		19.7	11.6		74.8	98.1
Level of Service		B	B		E	F
Approach Delay (s)		19.7	11.6		82.2	
Approach LOS		B	B		F	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1168	2568	802	327
v/c Ratio	0.42	0.89	0.78	0.81
Control Delay	13.5	25.7	50.2	50.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.5	25.7	50.2	50.1
Queue Length 50th (m)	34.2	144.2	104.0	72.0
Queue Length 95th (m)	50.9	m129.0	127.9	#126.2
Internal Link Dist (m)	377.8	410.9	103.4	
Turn Bay Length (m)				
Base Capacity (vph)	2813	2892	1024	405
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.89	0.78	0.81

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1098	0	0	2414	720	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0			7.0	7.0	7.0
Lane Util. Factor	0.91			0.91	0.97	0.91
Frt	1.00			1.00	0.99	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	4768			4902	3298	1134
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	4768			4902	3298	1134
Peak-hour factor, PHF	0.94	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	1168	0	0	2568	766	363
RTOR Reduction (vph)	0	0	0	0	3	54
Lane Group Flow (vph)	1168	0	0	2568	799	273
Heavy Vehicles (%)	10%	2%	2%	7%	6%	31%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	82.6			82.6	43.4	43.4
Effective Green, g (s)	82.6			82.6	43.4	43.4
Actuated g/C Ratio	0.59			0.59	0.31	0.31
Clearance Time (s)	7.0			7.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2813			2892	1022	351
v/s Ratio Prot	0.24			c0.52	c0.24	
v/s Ratio Perm						0.24
v/c Ratio	0.42			0.89	0.78	0.78
Uniform Delay, d1	15.6			24.7	44.0	43.9
Progression Factor	0.83			1.01	1.00	1.00
Incremental Delay, d2	0.4			0.4	6.0	15.6
Delay (s)	13.4			25.3	49.9	59.5
Level of Service	B			C	D	E
Approach Delay (s)	13.4			25.3	52.7	
Approach LOS	B			C	D	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	103	1218	111	84	2148	50	1191	1438	29	253	444
v/c Ratio	0.97	0.61	0.17	0.46	0.98	0.08	1.57	1.00	0.62	0.36	1.00
Control Delay	111.3	31.4	6.2	35.9	59.9	6.6	301.9	64.5	101.0	47.9	85.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.3	31.4	6.2	35.9	59.9	6.6	301.9	64.5	101.0	47.9	85.4
Queue Length 50th (m)	18.0	96.0	3.6	11.9	157.3	1.2	~240.4	~207.3	7.3	31.4	101.9
Queue Length 95th (m)	m#47.5	105.6	m6.2	m16.3	m#171.6	m2.9	#281.9	#259.5	#24.8	44.5	#172.2
Internal Link Dist (m)		410.9			1342.9			365.8		212.8	
Turn Bay Length (m)	190.0		195.0	215.0		75.0	275.0		90.0		75.0
Base Capacity (vph)	106	1984	650	184	2201	661	757	1432	47	710	444
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.61	0.17	0.46	0.98	0.08	1.57	1.00	0.62	0.36	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	1145	104	79	2019	47	1120	1117	235	27	238	417
Ideal Flow (vphpl)	2075	1900	1900	1900	1975	1900	2500	1900	1900	1900	1900	2100
Total Lost time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1510	4725	1396	1722	5242	1445	4613	3380		1587	3230	1687
Flt Permitted	0.07	1.00	1.00	0.15	1.00	1.00	0.95	1.00		0.13	1.00	1.00
Satd. Flow (perm)	108	4725	1396	263	5242	1445	4613	3380		217	3230	1687
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	103	1218	111	84	2148	50	1191	1188	250	29	253	444
RTOR Reduction (vph)	0	0	64	0	0	29	0	13	0	0	0	73
Lane Group Flow (vph)	103	1218	47	84	2148	21	1191	1425	0	29	253	371
Heavy Vehicles (%)	32%	11%	17%	6%	4%	13%	1%	5%	6%	15%	13%	7%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6				4		4
Actuated Green, G (s)	64.2	58.8	58.8	64.2	58.8	58.8	23.0	58.8		30.8	30.8	30.8
Effective Green, g (s)	64.2	58.8	58.8	64.2	58.8	58.8	23.0	58.8		30.8	30.8	30.8
Actuated g/C Ratio	0.46	0.42	0.42	0.46	0.42	0.42	0.16	0.42		0.22	0.22	0.22
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	103	1984	586	176	2201	606	757	1419		47	710	371
v/s Ratio Prot	c0.04	0.26		0.02	0.41		c0.26	c0.42			0.08	
v/s Ratio Perm	c0.42		0.03	0.20		0.01				0.13		0.22
v/c Ratio	1.00	0.61	0.08	0.48	0.98	0.03	1.57	1.00		0.62	0.36	1.00
Uniform Delay, d1	34.3	31.7	24.4	23.3	39.9	23.9	58.5	40.6		49.3	46.2	54.6
Progression Factor	1.67	0.94	1.34	1.63	1.22	34.47	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	82.9	1.3	0.2	1.5	11.9	0.1	264.4	25.0		48.2	1.4	46.5
Delay (s)	140.3	31.1	32.9	39.6	60.4	823.7	322.9	65.6		97.5	47.6	101.1
Level of Service	F	C	C	D	E	F	F	E		F	D	F
Approach Delay (s)		39.1			76.3			182.1			82.3	
Approach LOS		D			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	108.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	105.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	414	1605	49	345	1474	127	110	2128	647	121	609	139
v/c Ratio	0.99	0.99	0.09	0.99	0.98	0.24	0.46	0.99	0.91	0.61	0.39	0.24
Control Delay	79.5	66.5	1.8	107.4	67.8	3.7	68.1	62.9	42.7	77.8	35.9	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	66.5	1.8	107.4	67.8	3.7	68.1	62.9	42.7	77.8	35.9	4.5
Queue Length 50th (m)	57.0	168.6	0.0	49.9	148.5	0.0	15.3	214.9	109.0	17.1	46.5	0.0
Queue Length 95th (m)	m#87.0	m#196.0	m1.6	#81.5	#180.9	8.8	24.6	#251.5	#187.5	27.8	59.9	11.1
Internal Link Dist (m)		1342.9			444.1			341.5			298.1	
Turn Bay Length (m)	160.0		120.0	225.0		120.0	100.0		90.0	130.0		100.0
Base Capacity (vph)	420	1617	527	348	1509	524	481	2142	708	201	1558	571
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.99	0.09	0.99	0.98	0.24	0.23	0.99	0.91	0.60	0.39	0.24

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	381	1477	45	317	1356	117	101	1958	595	111	560	128
Ideal Flow (vphpl)	2150	2300	1900	1900	2050	1900	1900	2300	1900	1900	1900	1900
Total Lost time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3676	5720	1471	3052	5338	1458	3340	6046	1484	3133	4521	1361
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3676	5720	1471	3052	5338	1458	3340	6046	1484	3133	4521	1361
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	414	1605	49	345	1474	127	110	2128	647	121	609	139
RTOR Reduction (vph)	0	0	35	0	0	91	0	0	183	0	0	91
Lane Group Flow (vph)	414	1605	14	345	1474	36	110	2128	464	121	609	48
Heavy Vehicles (%)	9%	11%	11%	16%	6%	12%	6%	5%	10%	13%	16%	20%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	16.0	39.6	39.6	16.0	39.6	39.6	10.1	49.6	49.6	8.8	48.3	48.3
Effective Green, g (s)	16.0	39.6	39.6	16.0	39.6	39.6	10.1	49.6	49.6	8.8	48.3	48.3
Actuated g/C Ratio	0.11	0.28	0.28	0.11	0.28	0.28	0.07	0.35	0.35	0.06	0.34	0.34
Clearance Time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	420	1617	416	348	1509	412	240	2142	525	196	1559	469
v/s Ratio Prot	0.11	c0.28		c0.11	0.28		0.03	c0.35		c0.04	0.13	
v/s Ratio Perm			0.01			0.02			0.31			0.04
v/c Ratio	0.99	0.99	0.03	0.99	0.98	0.09	0.46	0.99	0.88	0.62	0.39	0.10
Uniform Delay, d1	61.9	50.1	36.3	61.9	49.7	36.9	62.3	45.0	42.5	64.0	34.7	31.1
Progression Factor	0.65	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.3	19.4	0.1	45.8	18.3	0.4	1.4	17.8	16.2	5.7	0.2	0.1
Delay (s)	77.5	66.6	36.5	107.7	68.0	37.3	63.7	62.9	58.7	69.6	34.9	31.2
Level of Service	E	E	D	F	E	D	E	E	E	E	C	C
Approach Delay (s)		68.1			73.0			61.9			39.1	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	63.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Appendix D

Detailed VISSIM TMCs Results

Project: Highway 410 - Courtneypark Dr
Project # 1650-10564
Task: Traffic Analysis
Summary of Intersection TMCs and LOS
Existing Conditions AM

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Derry Road West Terminal - Hwy 410 -- Signalized Intersection						TMC GEH Summary			Total Intersection GEH Summary		
Movement	AM					AM GEH			AM GEH		
	Obs	Modelled	GEH	Delay	LOS	1-5	5-10	>10	1-5	5-10	>10
EBT	1853	1844.2	0.2	17.7	B	1	0	0			
EBR	549	558.4	0.4	0.7	A	1	0	0			
WBT	1144	1345	5.7	17.3	B	0	1	0			
WBR	356	359.8	0.2	2.8	A	1	0	0			
SBL	841	821.8	0.7	44.06	D	1	0	0			
SBR	770	761.6	0.3	24.74	C	1	0	0			
ALL	**5513**	**5690.8**	**2.4**	**12.26**	B				1	0	0

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Derry Road East Terminal - Hwy 410 -- Signalized Intersection						TMC GEH Summary			Total Intersection GEH Summary		
Movement	AM					AM GEH			AM GEH		
	Obs	Modelled	GEH	Delay	LOS	1-5	5-10	>10	1-5	5-10	>10
EBT	2428	2377.6	1.0	24.44	C	1	0	0			
EBR	266	268	0.1	1.76	A	1	0	0			
WBT	1053	1044.6	0.3	29.26	C	1	0	0			
WBR	250	237.6	0.8	0.2	A	1	0	0			
NBL	447	675.2	9.6	42.26	D	0	1	0			
NBR	1092	1267.2	5.1	43.08	D	0	1	0			
ALL	**5536**	**5870.2**	**4.4**	**13.98**	B				1	0	0

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Courtneypark Drive West Terminal - Hwy 410 -- Unsignalized Intersection						TMC GEH Summary			Total Intersection GEH Summary		
Movement	AM					AM GEH			AM GEH		
	Obs	Modelled	GEH	Delay	LOS	1-5	5-10	>10	1-5	5-10	>10
EBL	193	193.8	0.1	5.1	A	1	0	0			
EBT	1202	1203.6	0.0	0.18	A	1	0	0			
WBT	879	838	1.4	0.1	A	1	0	0			
WBR	202	213	0.8	2.2	A	1	0	0			
ALL	**2476**	**2448.4**	**0.6**	**0.94**	**A**				1	0	0

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Courtneypark Drive East Terminal - Hwy 410 -- Signalized Intersection						TMC GEH Summary			Total Intersection GEH Summary		
Movement	AM					AM GEH			AM GEH		
	Obs	Modelled	GEH	Delay	LOS	1-5	5-10	>10	1-5	5-10	>10
EBT	1202	1205.6	0.1	27.38	C	1	0	0			
WBT	519	529	0.4	24.1	C	1	0	0			
SBL	623	586	1.5	30.12	C	1	0	0			
SBR	562	516	2.0	10.84	B	1	0	0			
ALL	**2906**	**2836.6**	**1.3**	**11.70**	B				1	0	0

17	3	0	4	0	0
85%	15%	0%	100%	0%	0%
20			4		

Highway 410 - Courtneypark Dr
1650-10564
Traffic Analysis
Summary of Intersection TMCs and LOS
Existing Conditions PM

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Derry Road West Terminal - Hwy 410 -- Signalized Intersection						TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM					PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	1-5	5-10	>10	1-5	5-10	>10
EBT	1604	1608	0.1	10.38	B	1	0	0			
EBR	444	454.6	0.5	0.64	A	1	0	0			
WBT	2533	2576	0.9	9.5	A	1	0	0			
WBR	601	643	1.7	3.9	A	1	0	0			
SBL	262	263.6	0.1	51.5	D	1	0	0			
SBR	435	414.4	1.0	26.44	C	1	0	0			
ALL	**5879**	**5959.6**	**1.0**	**5.86**	A				1	0	0

15

Derry Road East Terminal - Hwy 410 -- Signalized Intersection						TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM					PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	1-5	5-10	>10	1-5	5-10	>10
EBT	1098	1097.2	0.0	13.02	B	1	0	0			
EBR	768	765.2	0.1	3.68	A	1	0	0			
WBT	2414	2413.8	0.0	26.1	C	1	0	0			
WBR	943	923.2	0.6	0.6	A	1	0	0			
NBL	720	809.4	3.2	53.78	D	1	0	0			
NBR	341	671.6	14.7	36.74	D	0	0	1			
ALL	**6284**	**6680.4**	**4.9**	**11.92**	B				1	0	0

14

Courtneypark Drive West Terminal - Hwy 410 -- Unsignalized Intersection						TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM					PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	1-5	5-10	>10	1-5	5-10	>10
EBL	274	273	0.1	19.44	B	1	0	0			
EBT	516	515	0.0	0	A	1	0	0			
WBT	1631	1592.4	1.0	0.18	A	1	0	0			
WBR	461	458.6	0.1	1.52	A	1	0	0			
ALL	**2882**	**2839**	**0.8**	**1.10**	**A**				1	0	0

13

Courtneypark Drive East Terminal - Hwy 410 -- Signalized Intersection						TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM					PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	1-5	5-10	>10	1-5	5-10	>10
EBT	516	517	0.0	11.62	B	1	0	0			
WBT	1895	1901.2	0.1	14.86	B	1	0	0			
SBL	138	96.6	3.8	44.32	D	1	0	0			
SBR	197	142.6	4.2	21.8	C	1	0	0			
ALL	**2746**	**2657.4**	**1.7**	**3.99**	A				1	0	0

19	0	1	4	0	0
95%	0%	5%	100%	0%	0%
20			4		

Project: Highway 410 - Courtneypark Dr
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	16	Derry Road West Terminal - Hwy 410 -- Signalized Intersection							TMC GEH Summary			Total Intersection GEH Summary		
		Movement	AM						AM GEH			AM GEH		
			Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
62-64		EBT	2216	1650	12.9	91.88	F	218.08	418.1	0	0	1			
63-74		EBR	657	618	1.6	0.80	A	0	0	1	0	0			
50-57		WBT	1368	1409	1.1	25.46	C	26.6	143.82	1	0	0			
51-52		WBR	426	468	2.0	4.72	A	0	0	1	0	0			
58-62		SBL	1006	1097	2.8	40.94	D	45.16	158.26	1	0	0			
58-57		SBR	921	1006	2.7	26.42	C	45.16	158.26	1	0	0			
		ALL	6594	6247	4.3	54.78	D	-	-				1	0	0

	15	Derry Road East Terminal - Hwy 410 -- Signalized Intersection							TMC GEH Summary			Total Intersection GEH Summary		
		Movement	AM						AM GEH			AM GEH		
			Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
67-68		EBT	2779	2402	7.4	51.08	D	218.1	388.2	0	1	0			
69-70		EBR	318	281	2.1	2.02	A	0.0	0.0	1	0	0			
44-48		WBT	1260	1135	3.6	37.40	D	37.9	145.8	1	0	0			
45-46		WBR	327	328	0.0	0.26	A	0.0	0.0	1	0	0			
12-48		NBL	535	761	8.9	35.06	D	361.8	510.2	0	1	0			
12-68		NBR	1305	1617	8.2	61.04	E	361.8	510.2	0	1	0			
		ALL	6524	6523	0.0	42.17	D	-	-				1	0	0

	14	Courtneypark Drive West Terminal - Hwy 410 -- Signalized Intersection							TMC GEH Summary			Total Intersection GEH Summary		
		Movement	AM						AM GEH			AM GEH		
			Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
26-42		EBL	231	243	0.8	6.06	A	0.6	47.7	1	0	0			
25-27		EBT	1438	1449	0.3	0.00	A	0.0	0.0	1	0	0			
	41	WBT	1051	1022	0.9	17.92	B	11.3	84.1	1	0	0			
35-37		WBR	242	268	1.6	2.26	A	0.0	0.0	1	0	0			
		ALL	2962	2982	0.4	11.19	B	-	-				1	0	0

	13	Courtneypark Drive East Terminal - Hwy 410 -- Signalized Intersection							TMC GEH Summary			Total Intersection GEH Summary		
		Movement	AM						AM GEH			AM GEH		
			Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
	30	EBT	1438	1445	0.2	28.80	C	27.8	129.0	1	0	0			
	31	WBT	621	631	0.4	25.82	C	12.5	68.2	1	0	0			
83-31		NBL	745	756	0.4	15.34	B	16.5	90.8	1	0	0			
83-30		NBR	672	651	0.8	25.38	C	16.5	90.8	1	0	0			
		ALL	3476	3482	0.1	26.88	C	-	-				1	0	0

16	3	1	4	0	0
80%	15%	5%	100%	0%	0%
20			4		

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Derry Road West Terminal - Hwy 410 -- Signalized Intersection								TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM							PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
EBT	1919	1834	2.0	19.18	B	23.8	142.6	1	0	0			
EBR	531	608	3.2	0.70	A	0.0	0.0	1	0	0			
WBT	3030	2676	6.6	15.725	B	31.7	238.8	0	1	0			
WBR	719	725.25	0.2	4.53	A	0.0	0.0	1	0	0			
SBL	313	367.25	2.9	42.175	D	21.3	75.0	1	0	0			
SBR	520	533	0.6	32.975	C	21.3	75.0	1	0	0			
ALL	**7032**	**6743**	**3.5**	**20.50**	C	-	-				1	0	0

Derry Road East Terminal - Hwy 410 -- Signalized Intersection								TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM							PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
EBT	1313	1195	3.3	17.05	B	12.7	73.9	1	0	0			
EBR	919	1003	2.7	5.95	A	0.0	0.0	1	0	0			
WBT	2888	2290	11.8	25.75	C	42.3	234.3	0	0	1			
WBR	1128	1003	3.8	5.95	A	0.0	0.0	1	0	0			
NBL	861	1103	7.7	48.5	D	67.6	260.9	0	1	0			
NBR	408	829.75	17.0	23.875	C	67.6	260.9	0	0	1			
ALL	**7517**	**7424**	**1.1**	**29.10**	C	-	-				1	0	0

Courtneypark Drive West Terminal - Hwy 410 -- Signalized Intersection								TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM							PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
EBL	328	345	0.9	19.1	B	7.3	81.9	1	0	0			
EBT	617	620	0.1	0.00	A	0.0	0.0	1	0	0			
WBT	1951	1900	1.2	14.025	B	16.8	146.5	1	0	0			
WBR	551	602	2.1	1.925	A	0.0	0.0	1	0	0			
ALL	**3447**	**3468**	**0.4**	**15.44**	**B**	-	-				1	0	0

Courtneypark Drive East Terminal - Hwy 410 -- Signalized Intersection								TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM							PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
EBT	617	620	0.1	9.325	A	4.1	43.6	1	0	0			
WBT	2267	2308.5	0.9	10.85	B	14.8	108.5	1	0	0			
NBL	165	111.25	4.6	5.3	A	8.7	36.5	1	0	0			
NBR	236	178	4.0	47.40	D	8.7	36.5	1	0	0			
ALL	**3285**	**3218**	**1.2**	**13.85**	B	-	-				1	0	0

16	2	2	4	0	0
80%	10%	10%	100%	0%	0%
20			4		

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	16	Derry Road West Terminal - Hwy 410 -- Signalized Intersection							TMC GEH Summary			Total Intersection GEH Summary		
		Movement	AM						AM GEH			AM GEH		
			Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
62-64		EBT	1888	1890.4	0.1	23.02	C	30.3	159.5	1	0	0			
63-74		EBR	718	713	0.2	0.76	A	0.0	0.0	1	0	0			
50-57		WBT	1271	1365	2.6	22.44	C	22.8	130.2	1	0	0			
51-52		WBR	465	470	0.2	3.46	A	0.0	0.0	1	0	0			
58-62		SBL	704	733	1.1	34.66	C	25.1	102.2	1	0	0			
58-57		SBR	654	651	0.1	20.2	C	25.1	102.2	1	0	0			
		ALL	5700	5822	1.6	25.60	C	-	-				1	0	0

	15	Derry Road East Terminal - Hwy 410 -- Signalized Intersection							TMC GEH Summary			Total Intersection GEH Summary		
		Movement	AM						AM GEH			AM GEH		
			Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
67-68		EBT	2383	2391	0.2	23.5	C	35.9	160.6	1	0	0			
69-70		EBR	209	214	0.3	1.74	A	0.0	0.0	1	0	0			
44-48		WBT	1152	1141	0.3	29.72	C	25.9	118.0	1	0	0			
45-46		WBR	178	188	0.8	0.36	A	0.0	0.0	1	0	0			
12-48		NBL	584	712	5.0	42.68	D	366.7	510.2	0	1	0			
12-68		NBR	1426	1553.2	3.3	64.84	E	366.7	510.2	1	0	0			
		ALL	5932	6199	3.4	39.94	D	-	-				1	0	0

	14	Courtneypark Drive West Terminal - Hwy 410 -- Signalized Intersection							TMC GEH Summary			Total Intersection GEH Summary		
		Movement	AM						AM GEH			AM GEH		
			Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
26-42		EBL	252	212	2.6	15.34	B	3.4	59.0	1	0	0			
25-25		EBT	1654	1449	5.2	9.78	A	10.0	96.8	0	1	0			
	41	WBT	1092	995.2	3.0	59.86	E	38.1	143.9	1	0	0			
35-37		WBR	264	269	0.3	2.12	A	0.0	0.0	1	0	0			
108-25		SBL	306	201	6.6	50.94	D	10.3	42.6	0	1	0			
108-41		SBR	442	322	6.1	5.6	A	10.3	42.6	0	1	0			
		ALL	4010	3448	9.2	37.06	D	-	-				0	1	0

	13	Courtneypark Drive East Terminal - Hwy 410 -- Signalized Intersection							TMC GEH Summary			Total Intersection GEH Summary		
		Movement	AM						AM GEH			AM GEH		
			Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
	30	EBT	1744	1653	2.2	23.5	C	23.6	119.6	1	0	0			
	10107	EBR	216	254	2.5	0.3	A	0.0	0.0	1	0	0			
9-10105		WBL	92	75	1.8	27.76	C	2.3	31.6	1	0	0			
	31	WBT	621	636.2	0.6	18.04	B	9.6	76.8	1	0	0			
10099-31		NBL	735	621	4.4	38.42	D	22.5	95.5	1	0	0			
10099-30		NBR	814	711	3.7	16.12	B	22.5	95.5	1	0	0			
		ALL	4222	3949	4.3	17.96	B	-	-				1	0	0

20	4	0	3	1	0
83%	17%	0%	75%	25%	0%
24			4		

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Derry Road West Terminal - Hwy 410 -- Signalized Intersection								TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM							PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
EBT	1460	1471	0.3	11.74	B	11.5	94.3	1	0	0			
EBR	580	590	0.4	0.70	A	0.0	0.0	1	0	0			
WBT	2796	2809	0.2	11.36	B	24.4	185.8	1	0	0			
WBR	786	801	0.5	4.64	A	0.0	2.8	1	0	0			
SBL	204	166	2.8	46.62	D	11.4	48.5	1	0	0			
SBR	370	273	5.4	26.88	C	11.4	48.5	0	1	0			
ALL	**6196**	**6109**	**1.1**	**14.02**	B	-	-				1	0	0

Derry Road East Terminal - Hwy 410 -- Signalized Intersection								TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM							PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
EBT	1062	1041	0.6	12.62	B	8.2	56.9	1	0	0			
EBR	602	593	0.4	3.02	A	0.0	0.0	1	0	0			
WBT	2641	2621	0.4	25.62	C	49.7	263.1	1	0	0			
WBR	740	715	0.9	0.54	A	0.0	0.0	1	0	0			
NBL	941	984	1.4	50.50	D	64.9	186.0	1	0	0			
NBR	446	592	6.4	11.88	B	64.9	186.0	0	1	0			
ALL	**6432**	**6546**	**1.4**	**28.36**	C	-	-				1	0	0

Courtneypark Drive West Terminal - Hwy 410 -- Signalized Intersection								TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM							PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
EBL	358	366.2	0.4	24.16	C	6.58	91.38	1	0	0			
EBT	886	901.2	0.5	4.74	A	2.64	45.42	1	0	0			
WBT	1951	1919	0.7	22.12	C	29.24	182.8	1	0	0			
WBR	603	594	0.4	1.88	A	0	0	1	0	0			
SBL	64	27	5.5	58.16	E	2.5	19.32	0	1	0			
SBR	255	115	10.3	8.06	A	2.5	19.32	0	0	1			
ALL	**4117**	**3922**	**3.1**	**24.08**	**C**	-	-				1	0	0

Courtneypark Drive East Terminal - Hwy 410 -- Signalized Intersection								TMC GEH Summary			Total Intersection GEH Summary		
Movement	PM							PM GEH			PM GEH		
	Obs	Modelled	GEH	Delay	LOS	Avg Queue	Max Queue	1-5	5-10	>10	1-5	5-10	>10
EBT	700	653	1.8	43.34	D	21.3	89.0	1	0	0			
EBR	268	271	0.2	0.30	A	0.0	0.0	1	0	0			
WBL	701	615	3.3	16.94	B	13.5	150.7	1	0	0			
WBT	2296	2377	1.7	9.88	A	13.0	119.9	1	0	0			
NBL	258	203	3.7	55.60	E	10.9	43.9	1	0	0			
NBR	180	122	4.8	5.82	A	10.9	43.9	1	0	0			
ALL	**4403**	**4241**	**2.5**	**25.65**	C	-	-				1	0	0

20	3	1	4	0	0
83%	13%	4%	100%	0%	0%
24			4		

Appendix E
Forecasting Methodology

Stantec

Memo

To:	File	From:	Adrian Soo Steven Kwan Stantec - Markham
File:	165010564	Date:	May 23, 2014

Reference: Courtneypark Drive EA – Traffic Forecasting

1.0 Introduction & Background

This memo documents the methodology and analysis undertaken to determine future traffic volume forecasts within the Courtneypark Drive EA Study Area.

Traffic forecasts were developed for the following scenarios:

- 2031 Do Nothing;
- 2031 Partial Interchange with widening of Courtneypark Drive E; and
- 2031 Full Interchange with widening of Courtneypark Drive E.

2.0 Macro-Modelling

The City of Mississauga's EMME/3 model was utilized to assist in developing future traffic forecasts. The City uses the "Simplified GTA Model" which was developed by Peter Dalton Inc. The EMME model is calibrated and validated at a screenline level based on the 2006 Transportation Tomorrow Survey (TTS), cordon and ATR traffic counts. As part of the calibration process for this Study after discussions between City of Mississauga staff with Region of Peel and MTO staff, lane capacities were adjusted by City of Mississauga to account for the impact of truck volumes.

The future 2031 network lane configurations were developed in discussion with the Region and MTO and reflect the expected lane configurations of the provincial highway system, regional and City roadways that are applicable to this Study.

Relevant outputs from the City's EMME/3 model including volume plots and select link analyses were determined by City staff and provided to Stantec for use in developing the future traffic forecasts and are attached in **Appendix A** and **Appendix B**.

3.0 Methodology & Analysis

In order to develop growth rates for roadways within the Study Area, screenline volumes were compared between the 2011 base model volumes and the 2031 partial interchange with the widening of Courtneypark Drive model volumes. This comparison reflects the actual travel demand on Courtneypark Drive versus the actual traffic assigned to Courtneypark Drive. That is, the actual number of vehicles who ***want*** to use Courtneypark Drive versus the actual number of vehicles who ***can,*** with the remainder assigned to alternative routes due to capacity constraints. These resultant growth rates were applied to the base existing traffic volumes to develop the 2031 do nothing and 2031 partial interchange with widening of Courtney Park Drive scenarios.

Reference: Courtneypark Drive EA – Traffic Forecasting

A comparison of link volume plots as well as select link analyses for the 2031 partial interchange with widening of Courtneypark Drive and the 2031 full interchange with widening of Courtneypark Drive scenarios was completed to understand the changes in traffic patterns associated with the full interchange at Courtneypark Drive.

3.1 Screenline Analysis

The screenlines utilized for analysis are illustrated below in **Figure 1**. Vertical screenlines to assess east-west travel are located west of Kennedy Road (V1), Tomken Road (V2), and Dixie Road (V3). Horizontal screenlines to assess north-south travel are located south of Courtneypark Drive E (H1) and Derry Road (H2).

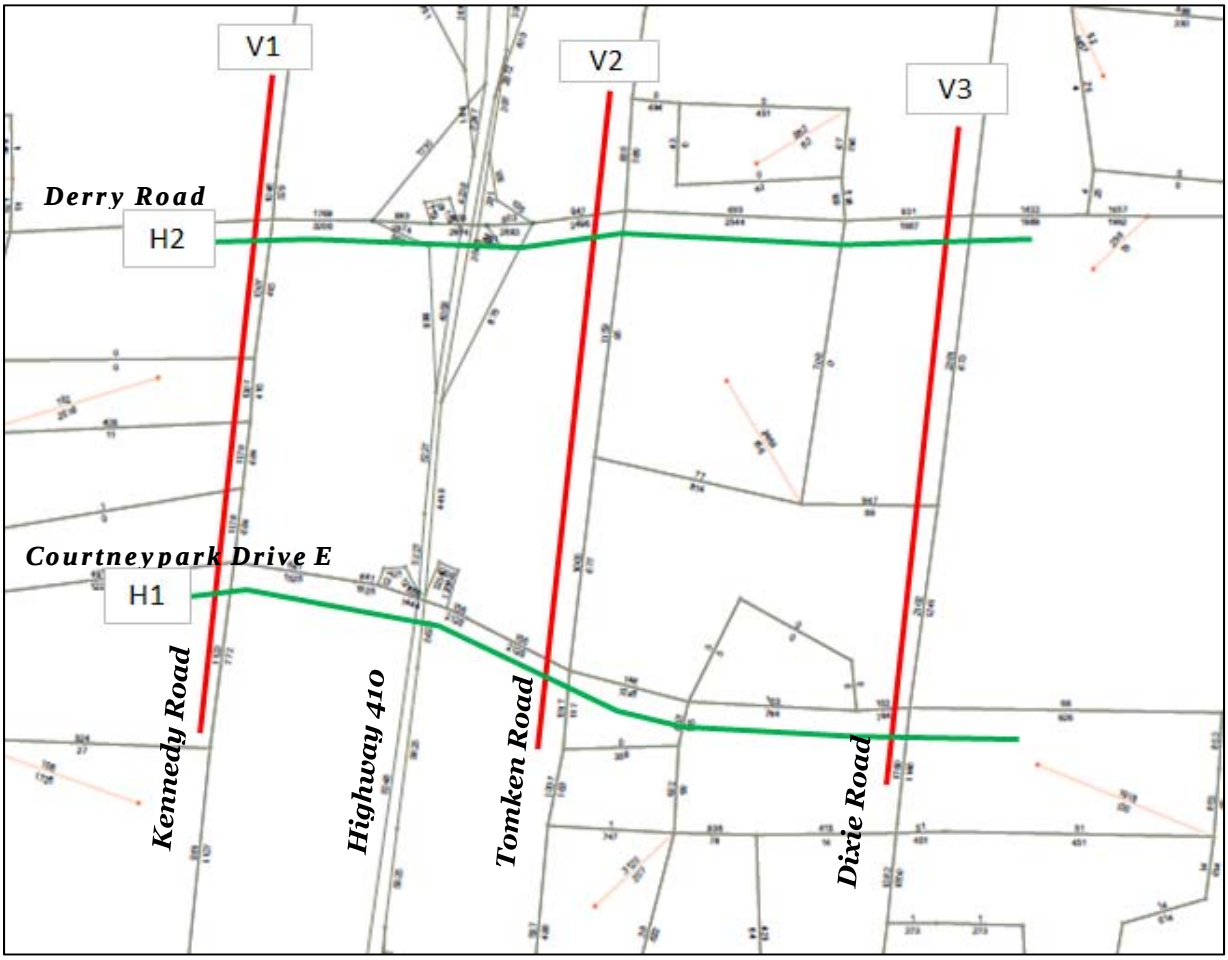


Figure 1: Screenline Locations

Table 1 and **Table 2** summarize the screenline volumes for each of the scenarios in the a.m. and p.m. peak hours, respectively.

Road	SL	AM Peak Hour											
		2011			2031 BAU			2031 Partial I/C			2031 Full I/C		
		EB/NB	WB/SB	2-Way	EB/NB	WB/SB	2-Way	EB/NB	WB/SB	2-Way	EB/NB	WB/SB	2-Way
Courtneypark Drive	V1	1222	481	1703	1233	578	1811	1338	557	1895	1212	931	2143
	V2	2128	156	2284	2123	175	2298	2717	189	2906	2786	322	3108
	V3	794	163	957	923	227	1150	1236	200	1436	1219	242	1461
Derry Road	V1	2608	1201	3809	2529	1572	4101	2542	1571	4113	2615	1534	4149
	V2	3496	847	4343	3660	873	4533	3547	876	4423	3545	839	4384
	V3	1867	931	2798	2085	1280	3365	2088	1279	3367	2142	1328	3470
Total	V1	3830	1682	5512	3762	2150	5912	3880	2128	6008	3827	2465	6292
Total	V2	5624	1003	6627	5783	1048	6831	6264	1065	7329	6331	1161	7492
Total	V3	2661	1094	3755	3008	1507	4515	3324	1479	4803	3361	1570	4931
Kennedy Road	H1	772	1123	1895	891	963	1854	921	913	1834	953	1129	2082
	H2	415	1307	1722	602	1075	1677	516	1180	1696	454	698	1152
Hwy 410	H1	5625	5348	10973	5758	6703	12461	5742	6683	12425	5408	6217	11625
	H2	3543	4358	7901	4844	5952	10796	4853	5927	10780	5304	7212	12516
Tomken Road	H1	117	1317	1434	71	1138	1209	64	1178	1242	107	1179	1286
	H2	95	1159	1254	87	950	1037	92	825	917	40	737	777
Dixie Road	H1	1146	1780	2926	1433	1751	3184	1438	1859	3297	1461	1881	3342
	H2	673	2391	3064	973	2002	2975	1003	1907	2910	948	1883	2831
Total (Excluding Hwy 410)	H1	2035	4220	6255	2395	3852	6247	2423	3950	6373	2521	4189	6710
Total (Excluding Hwy 410)	H2	1183	4857	6040	1662	4027	5689	1611	3912	5523	1442	3318	4760

* BAU = Business as Usual / Do Nothing

Table 1: AM Peak Hour Screenline Volumes

Reference: Courtneypark Drive EA – Traffic Forecasting

Road	SL	PM Peak Hour											
		2011			2031 BAU			2031 Partial I/C			2031 Full I/C		
		EB/NB	WB/SB	2-Way	EB/NB	WB/SB	2-Way	EB/NB	WB/SB	2-Way	EB/NB	WB/SB	2-Way
Courtneypark Drive	V1	618	1236	1854	786	1255	2041	719	1329	2048	863	1353	2216
	V2	464	2141	2605	510	1785	2295	558	2271	2829	733	2842	3575
	V3	306	920	1226	366	829	1195	367	1115	1482	249	1084	1333
Derry Road	V1	1473	2310	3783	1715	2176	3891	1795	2225	4020	1758	2210	3968
	V2	1189	2755	3944	1472	3010	4482	1526	2905	4431	1447	2694	4141
	V3	1257	1583	2840	1766	1803	3569	1812	1764	3576	1844	1881	3725
Total	V1	2091	3546	5637	2501	3431	5932	2514	3554	6068	2621	3563	6184
Total	V2	1653	4896	6549	1982	4795	6777	2084	5176	7260	2180	5536	7716
Total	V3	1563	2503	4066	2132	2632	4764	2179	2879	5058	2093	2965	5058
Kennedy Road	H1	955	967	1922	849	989	1838	821	1022	1843	973	1083	2056
	H2	1020	743	1763	955	902	1857	987	817	1804	746	510	1256
Hwy 410	H1	6035	5352	11387	6223	6421	12644	6268	6491	12759	5643	6157	11800
	H2	4971	3807	8778	5946	5407	11353	5990	5351	11341	7316	6382	13698
Tomken Road	H1	1081	161	1242	948	217	1165	1012	226	1238	1065	255	1320
	H2	856	145	1001	827	193	1020	785	217	1002	426	121	547
Dixie Road	H1	1574	1219	2793	1322	1441	2763	1365	1395	2760	1518	1431	2949
	H2	1970	911	2881	1832	1150	2982	1805	1258	3063	1613	1057	2670
Total (Excluding Hwy 410)	H1	3610	2347	5957	3119	2647	5766	3198	2643	5841	3556	2769	6325
Total (Excluding Hwy 410)	H2	3846	1799	5645	3614	2245	5859	3577	2292	5869	2785	1688	4473

* BAU = Business as Usual / Do Nothing

Table 2: PM Peak Hour Screenline Volumes

Table 3 and **Table 4** summarize the per annum growth rates between 2011 and 2031 with and without the widening of Courtneypark Drive for the AM and PM peak hours, respectively.

Road	SL	GR: 2011 - 2031 BAU			GR: 2011 - 2031 Partial I/C		
		EB/NB	WB/SB	2-Way	EB/NB	WB/SB	2-Way
Courtneypark Drive	V1	0.04%	0.92%	0.31%	0.45%	0.74%	0.54%
	V2	-0.01%	0.58%	0.03%	1.23%	0.96%	1.21%
	V3	0.76%	1.67%	0.92%	2.24%	1.03%	2.05%
Derry Road	V1	-0.15%	1.36%	0.37%	-0.13%	1.35%	0.38%
	V2	0.23%	0.15%	0.21%	0.07%	0.17%	0.09%
	V3	0.55%	1.60%	0.93%	0.56%	1.60%	0.93%
Total	V1	-0.09%	1.23%	0.35%	0.06%	1.18%	0.43%
Total	V2	0.14%	0.22%	0.15%	0.54%	0.30%	0.50%
Total	V3	0.61%	1.61%	0.93%	1.12%	1.52%	1.24%
Kennedy Road	H1	0.72%	-0.77%	-0.11%	0.89%	-1.03%	-0.16%
	H2	1.88%	-0.97%	-0.13%	1.10%	-0.51%	-0.08%
Hwy 410	H1	0.12%	1.14%	0.64%	0.10%	1.12%	0.62%
	H2	1.58%	1.57%	1.57%	1.59%	1.55%	1.57%
Tomken Road	H1	-2.47%	-0.73%	-0.85%	-2.97%	-0.56%	-0.72%
	H2	-0.44%	-0.99%	-0.95%	-0.16%	-1.69%	-1.55%
Dixie Road	H1	1.12%	-0.08%	0.42%	1.14%	0.22%	0.60%
	H2	1.86%	-0.88%	-0.15%	2.02%	-1.12%	-0.26%
Total (Excluding Hwy 410)	H1	0.82%	-0.46%	-0.01%	0.88%	-0.33%	0.09%
Total (Excluding Hwy 410)	H2	1.71%	-0.93%	-0.30%	1.56%	-1.08%	-0.45%

* BAU = Business as Usual / Do Nothing

Table 3: AM Peak Hour Screenline Growth Per Annum

Road	SL	GR: 2011 - 2031 BAU			GR: 2011 - 2031 Partial I/C		
		EB/NB	WB/SB	2-Way	EB/NB	WB/SB	2-Way
Courtneypark Drive	V1	1.21%	0.08%	0.48%	0.76%	0.36%	0.50%
	V2	0.47%	-0.91%	-0.63%	0.93%	0.30%	0.41%
	V3	0.90%	-0.52%	-0.13%	0.91%	0.97%	0.95%
Derry Road	V1	0.76%	-0.30%	0.14%	0.99%	-0.19%	0.30%
	V2	1.07%	0.44%	0.64%	1.26%	0.27%	0.58%
	V3	1.71%	0.65%	1.15%	1.85%	0.54%	1.16%
Total	V1	0.90%	-0.16%	0.26%	0.93%	0.01%	0.37%
Total	V2	0.91%	-0.10%	0.17%	1.17%	0.28%	0.52%
Total	V3	1.56%	0.25%	0.80%	1.68%	0.70%	1.10%
Kennedy Road	H1	-0.59%	0.11%	-0.22%	-0.75%	0.28%	-0.21%
	H2	-0.33%	0.97%	0.26%	-0.16%	0.48%	0.12%
Hwy 410	H1	0.15%	0.91%	0.52%	0.19%	0.97%	0.57%
	H2	0.90%	1.77%	1.29%	0.94%	1.72%	1.29%
Tomken Road	H1	-0.65%	1.50%	-0.32%	-0.33%	1.71%	-0.02%
	H2	-0.17%	1.44%	0.09%	-0.43%	2.04%	0.00%
Dixie Road	H1	-0.87%	0.84%	-0.05%	-0.71%	0.68%	-0.06%
	H2	-0.36%	1.17%	0.17%	-0.44%	1.63%	0.31%
Total (Excluding Hwy 410)	H1	-0.73%	0.60%	-0.16%	-0.60%	0.60%	-0.10%
Total (Excluding Hwy 410)	H2	-0.31%	1.11%	0.19%	-0.36%	1.22%	0.19%

* BAU = Business as Usual / Do Nothing

Table 4: PM Peak Hour Screenline Growth Per Annum

Key conclusions from the calculated growth rates are:

- For east-west travel in the a.m. peak hour in the peak direction (eastbound), screenline growth rates ranged from 0.06% p.a. to 1.12% p.a. when Courtneypark Drive capacity was unconstrained (with widening);

- For north-south travel on the arterial roads, in both the a.m. and p.m. peak hours, the peak direction screenline growth rates ranged from -0.33% p.a. to -1.08% p.a. when Courtneypark Drive capacity was unconstrained (with widening);

- For north-south travel on Highway 410, the peak hour, peak direction growth rates ranged from 0.19% p.a. to 1.55% p.a. when Courtneypark Drive capacity was unconstrained (with widening);

- Comparatively, growth was substantially less, approximately half of the widening scenario when Courtneypark Drive was not widened, i.e. capacity was constrained demonstrating that the travel demand is being accommodated on other east-west routes; and

- The model indicates that growth on the north-south arterial roads generally appears static or in some cases negative while Highway 410 experiences robust growth. This reflects the oversensitivity of the model when the sub-area is effectively at capacity and additional capacity (on Highway 410 and other roadways outside of this sub-area) is provided. This implies that existing traffic volumes on the north-south arterial roads would be reduced to below existing levels which is unrealistic as population and employment values are effectively static. However it should be understood that this is a systemic limitation in the model and reflects why these models are calibrated at a screenline level versus an individual link level and require analyst interpretation.

3.2 Growth Rates

The growth rates that were developed for each scenario are summarized in **Table 5**.

Scenario	Road Section	Absolute Growth Rate	Notes/Comments
2031 Do Nothing	Courtneypark Drive	1.0 % Per Annum	- Compound growth - To be applied to all links - To reflect actual travel demand
	Derry Road	0.5 % Per Annum	
	Kennedy Road		
	Tomken Road		
	Dixie Road		
	Highway 410	1.5% Per Annum	
2031 Partial Interchange	Courtneypark Drive	1.0 % Per Annum	- Compound growth - To be applied to all links
	Derry Road	0.5 % Per Annum	
	Kennedy Road		
	Tomken Road		
	Dixie Road		
	Highway 410	1.5% Per Annum	

Table 5 – Growth Rate Summary

The resulting traffic forecasts for the 2031 Do Nothing and Partial Interchange scenarios are shown in **Figure 2** and **Figure 3**, respectively.

For the 2031 full interchange scenario, the forecasts generated for the 2031 partial interchange scenario were used as the starting point. Based on a comparison of link volumes, traffic volumes were manually adjusted to reflect the anticipated change in traffic patterns at the Derry Road and Courtneypark Drive E interchanges. The ramp volume comparisons are summarized in **Table 6** and **Table 7**, for the AM and PM peak hours, respectively.

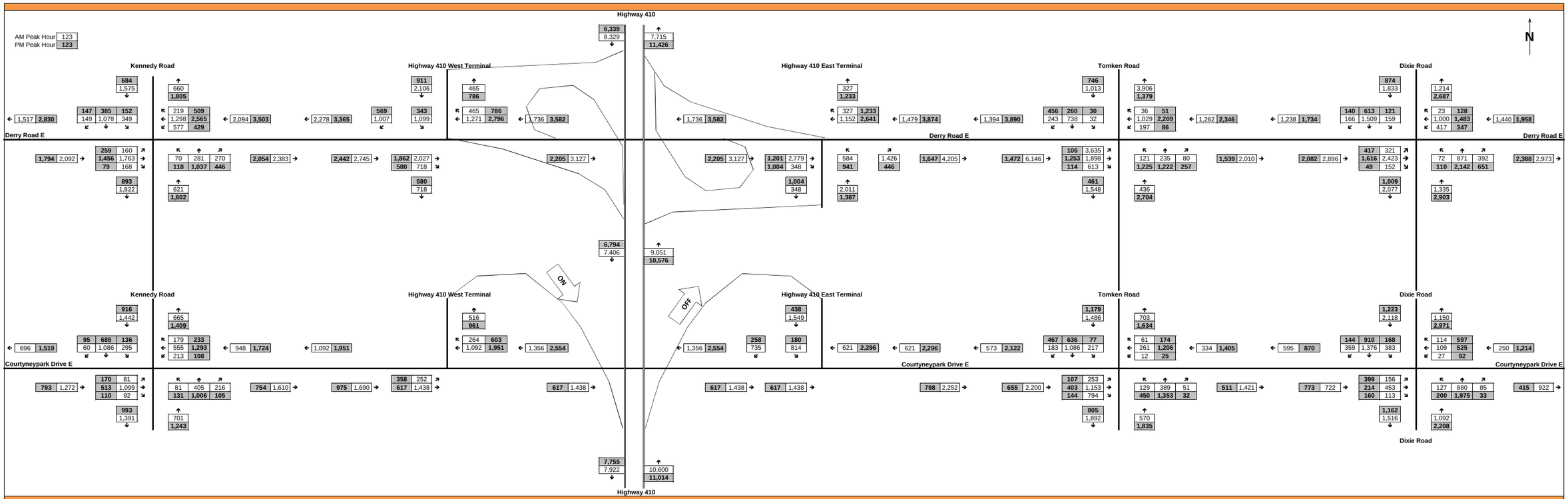


FIGURE 2
2031 "DO NOTHING" PEAK HOUR VOLUMES

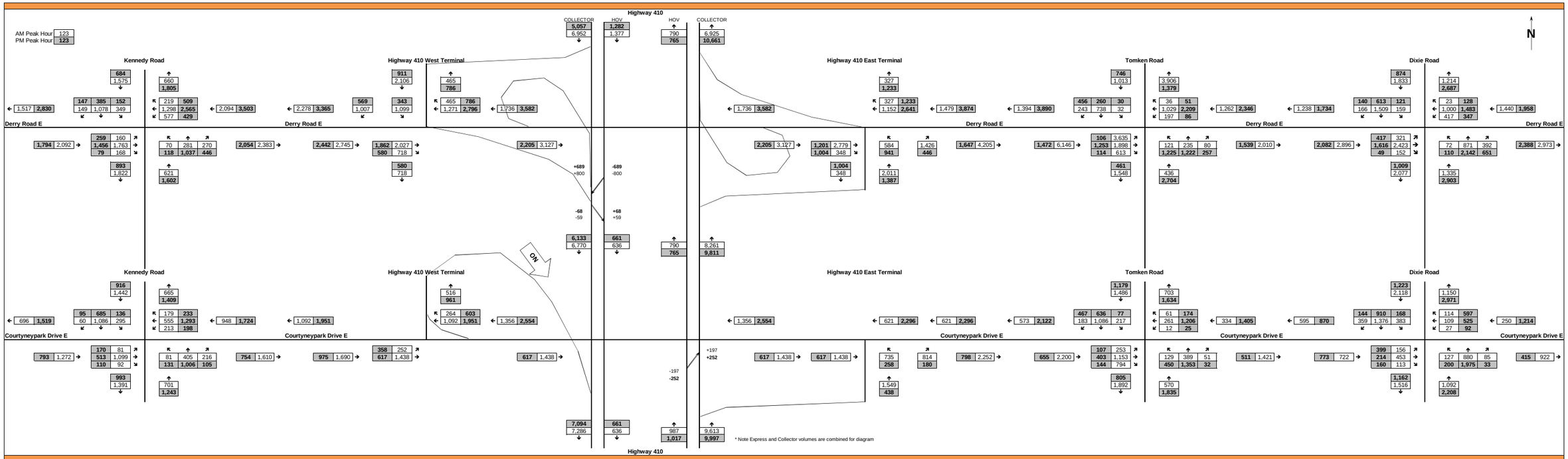


FIGURE 3
2031 "PARTIAL INTERCHANGE" PEAK HOUR VOLUMES

Road Section		AM Peak Hour			
		2031 Partial I/C		2031 Full I/C	
From	To	Volume	-	Volume	Difference
Hwy 410 NB	Off-Ramp to Courtneypark Dr	1180	-	1296	116
Hwy 410 SB	Off-Ramp to Courtneypark Dr	-	-	1895	-
Courtneypark Drive	Hwy 410 SB	126	-	171	45
Courtneypark Drive	Hwy 410 NB	-	-	824	-
Hwy 410 NB	Off-Ramp to Derry Road	890	-	927	37
Hwy 410 SB	Off-Ramp to Derry Road	2167	-	1429	-738
Derry Road EB	Hwy 410 SB	631	-	728	97
Derry Road EB	Hwy 410 NB	414	-	250	-164
Derry Road WB	Hwy 410 SB	94	-	100	6
Derry Road WB	Hwy 410 NB	178	-	102	-76

Table 6: AM Peak Hour – Ramp Volume Comparisons

Road Section		PM Peak Hour			
		2031 Partial I/C		2031 Full I/C	
From	To	Volume	-	Volume	Difference
Hwy 410 NB	Off-Ramp to Courtneypark Dr	264	-	257	-7
Hwy 410 SB	Off-Ramp to Courtneypark Dr	-	-	1506	-
Courtneypark Drive	Hwy 410 SB	926	-	947	21
Courtneypark Drive	Hwy 410 NB	-	-	1992	-
Hwy 410 NB	Off-Ramp to Derry Road	278	-	319	41
Hwy 410 SB	Off-Ramp to Derry Road	1561	-	946	-615
Derry Road EB	Hwy 410 SB	215	-	334	119
Derry Road EB	Hwy 410 NB	704	-	436	-268
Derry Road WB	Hwy 410 SB	483	-	447	-36
Derry Road WB	Hwy 410 NB	1108	-	706	-402

Table 7: PM Peak Hour – Ramp Volume Comparisons

Key conclusions from the scenario comparison are:

- For the same reasons as previously noted, the model appears to over-assign (over-prioritize) the new ramps at the Courtneypark Drive interchange. For example, in the 2031 partial interchange scenario in the a.m. peak hour the Hwy 410 SB off-ramp to Derry Road carries 2,167 vehicles. In the 2031 full interchange scenario, the Derry Road off-ramp carries 1,429 vehicles and the Courtneypark Drive off-ramp carries 1,895 vehicles for a total of 3,324 vehicles. This results in an additional 1,157 vehicles exiting Highway 410 in the sub-area although there are no differences in land use (Land uses for area zones attached in **Appendix C**);

- It is expected that the full interchange at Courtneypark Drive would primarily improve access to land uses around the interchange location, and would have minimal attraction to longer through trips.

Therefore, the primary basis for identifying the new ramp volumes was the difference in the Derry Road ramp volumes between the partial and full EMME/3 plots;

- 40% of Derry Road to northbound Highway 410 on-ramp volumes will be diverted to the Courtneypark Drive E to northbound Highway 410 on-ramp in the a.m. and p.m. peak hours;
- 10% of the northbound Dixie Road to Highway 407 eastbound on-ramp volume will be diverted to the Courtneypark Drive E to northbound Highway 410 on-Ramp in the a.m. and p.m. peak hours; and
- 35% of southbound Highway 410 Off-Ramp to Derry Road volumes will be diverted to the southbound Highway 410 off-ramp to Courtneypark Drive E in the a.m. and p.m. peak hours.

The resulting traffic volumes for the 2031 full interchange scenario are shown in **Figure 4**.

3.3 Truck Volumes

It is expected that with the provision of a full interchange at Courtneypark Drive, there will be a greater attraction for large trucks/commercial vehicles. A full interchange at Courtneypark Drive will offer a simpler route for trucks destined for the airport and the commercial/industrial land uses along Courtneypark Drive. Trucks destined for these areas originating from the north must currently exit at the Derry Road interchange; proceed east along Derry Road south along Tomken Road or Dixie Road and then east along Courtneypark Drive. A full interchange would allow these trucks to exit directly at Courtneypark Drive and proceed easterly and avoid having to make any further turning movements. Trips in the reverse direction would also benefit from the provision of a full interchange.

While the City's travel demand forecasting model does not directly model trucks and their respective origins and destinations, a review of the classifications for the traffic data along the Derry Road and Courtneypark Drive corridors provides sufficient information for a first-principles assessment of the number of trucks that may benefit from a full interchange.

- Existing two-way truck volumes on Courtneypark Drive range from 120-290 trucks and 120-270 trucks in the a.m. and p.m. peak hours, respectively;
- Over the eight-hour count period, existing two-way truck volumes on Courtneypark Drive range from 1,150-2,500 trucks, representing approximately 16% of total traffic;
- Existing two-way truck volumes on Derry Road range from 320-430 trucks and 240-450 trucks in the a.m. and p.m. peak hours respectively;
- Over the eight-hour count period, existing two-way truck volumes on Derry Road range from 1,950-3,612 trucks, representing approximately 13% of total traffic;
- It is estimated that approximately 40 truck trips, two-way in the a.m. and p.m. peak hours have an origin or destination along Courtneypark Drive east of Dixie Road or Highway 410 north of Derry Road;
- Over the eight-hour count period, approximately 330 trucks, two-way travel between these two points;

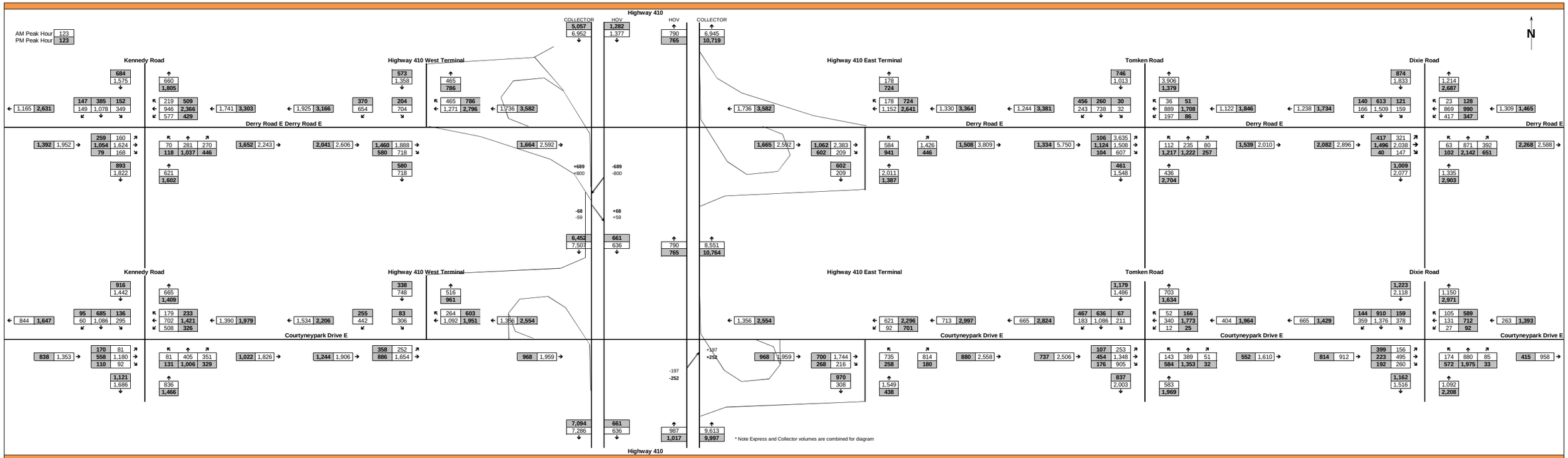


FIGURE 4
2031 "FULL INTERCHANGE" PEAK HOUR VOLUMES

- For the 2031 horizon year, these volumes would increase to approximately 45 truck trips, two-way in the a.m. and p.m. peak hours, and approximately 360 trucks, two-way; and

- With the provision of a full interchange at Courtneypark Drive, it is expected that these trucks as well as additional trucks not counted (i.e. outside of the eight-hour count period) would divert from Derry Road to Courtneypark Drive providing an improved goods movement function.

These manual changes in truck volumes have been incorporated into the 2031 full interchange scenario shown in **Figure 4**. Existing and future truck volumes have been included in **Appendix D**.

Appendix A

EMME/3 Outputs

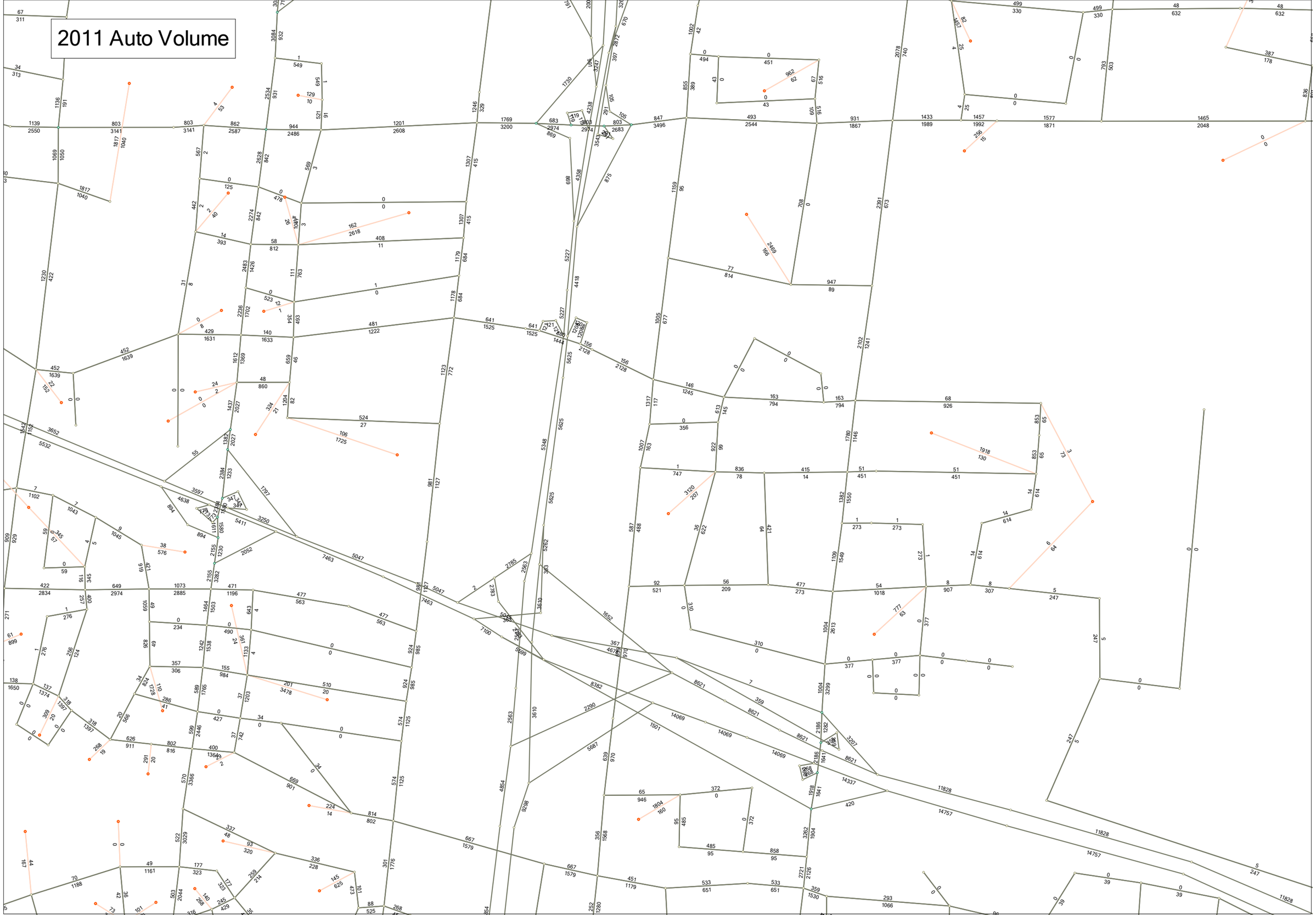
Existing

2031 Business as Usual

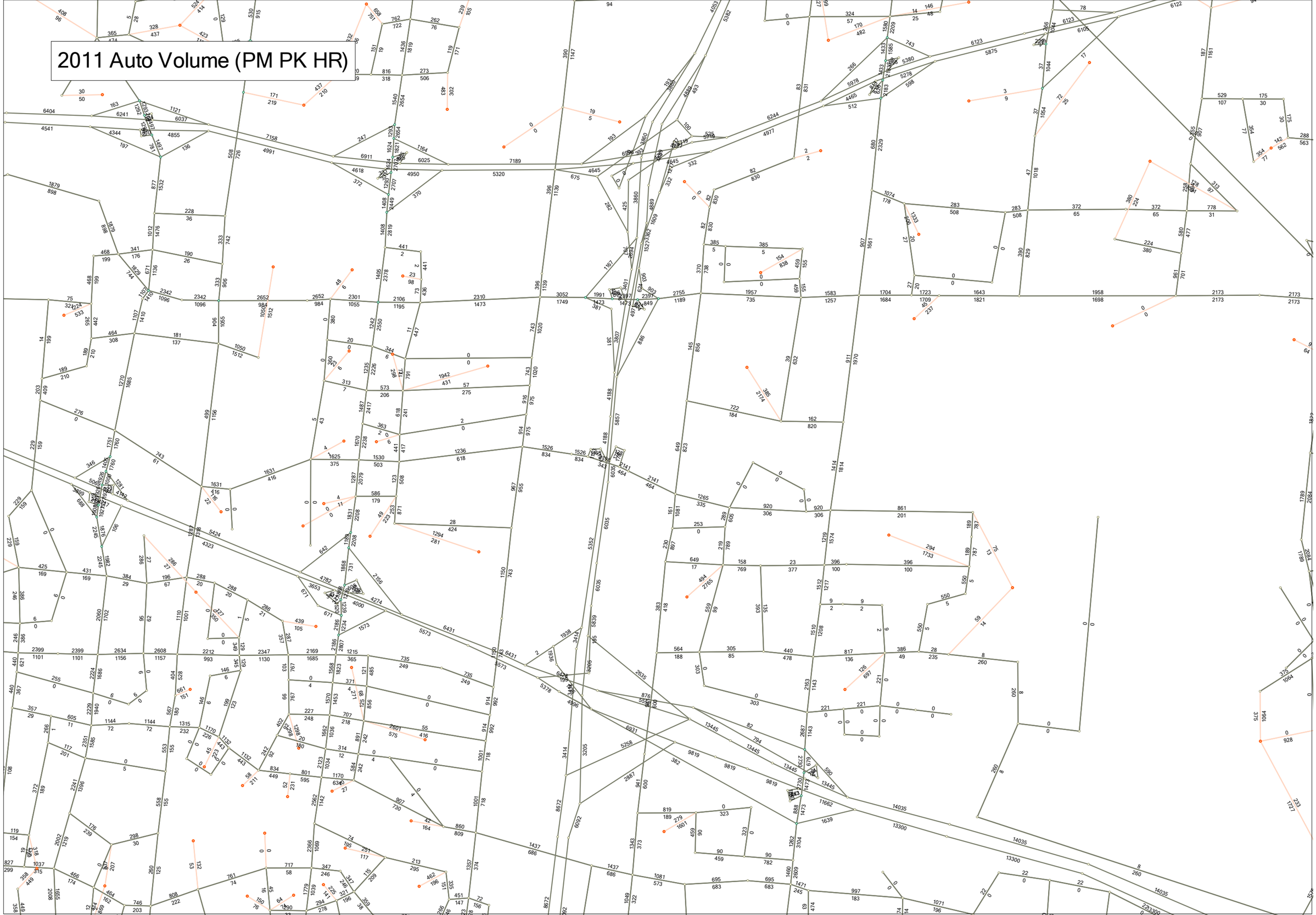
2031 Partial Interchange

2031 Full Interchange

2011 Auto Volume



2011 Auto Volume (PM PK HR)



2031 BAU Network - CPD ANALY AMPK (410 Fix)

2031 BAU Network - CPD ANALY PMPK (410 Fix)

2031 Network Widening Part Int - CPD ANALY AMPK (410 Fix)

2031 Network Widening Part Int - CPD ANALY PMPK (410 Fix)

2031 Network Widening Full Int - CPD ANALY AMPK (410 Fix)

2031 Network Widening Full Int - CPD ANALY PMPK (410 Fix)

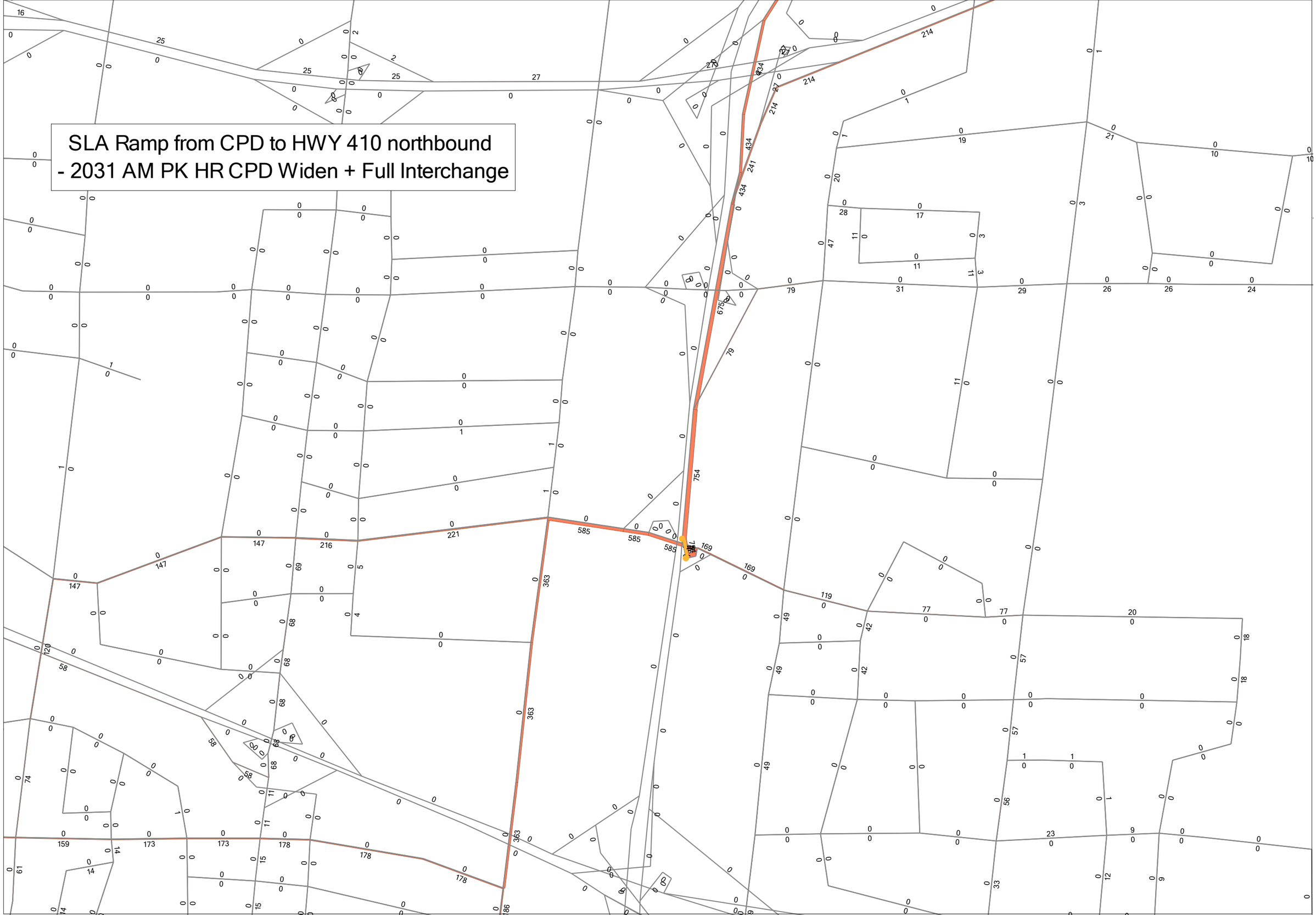
Appendix B

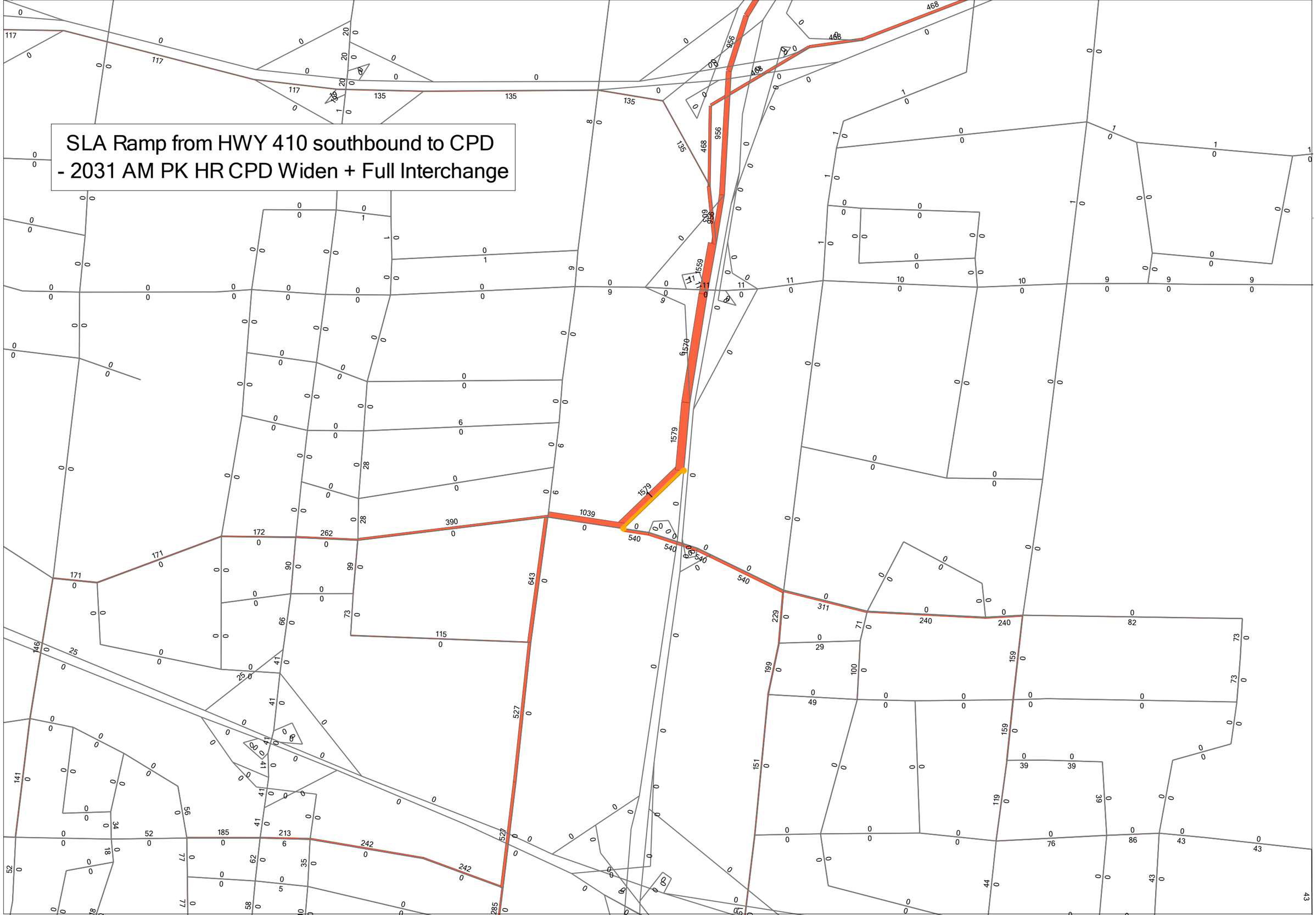
EMME/3 Outputs

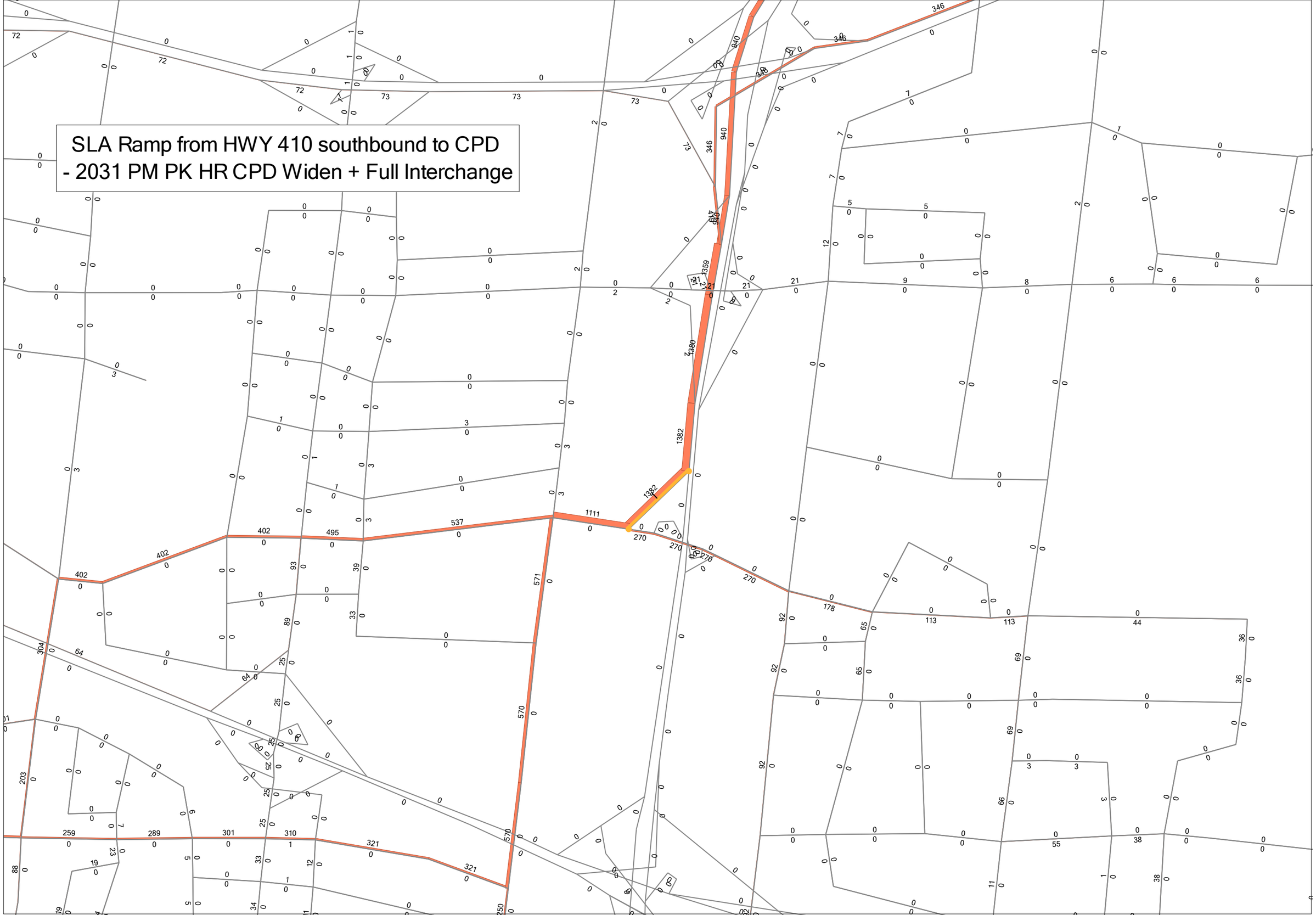
Select Link Analysis

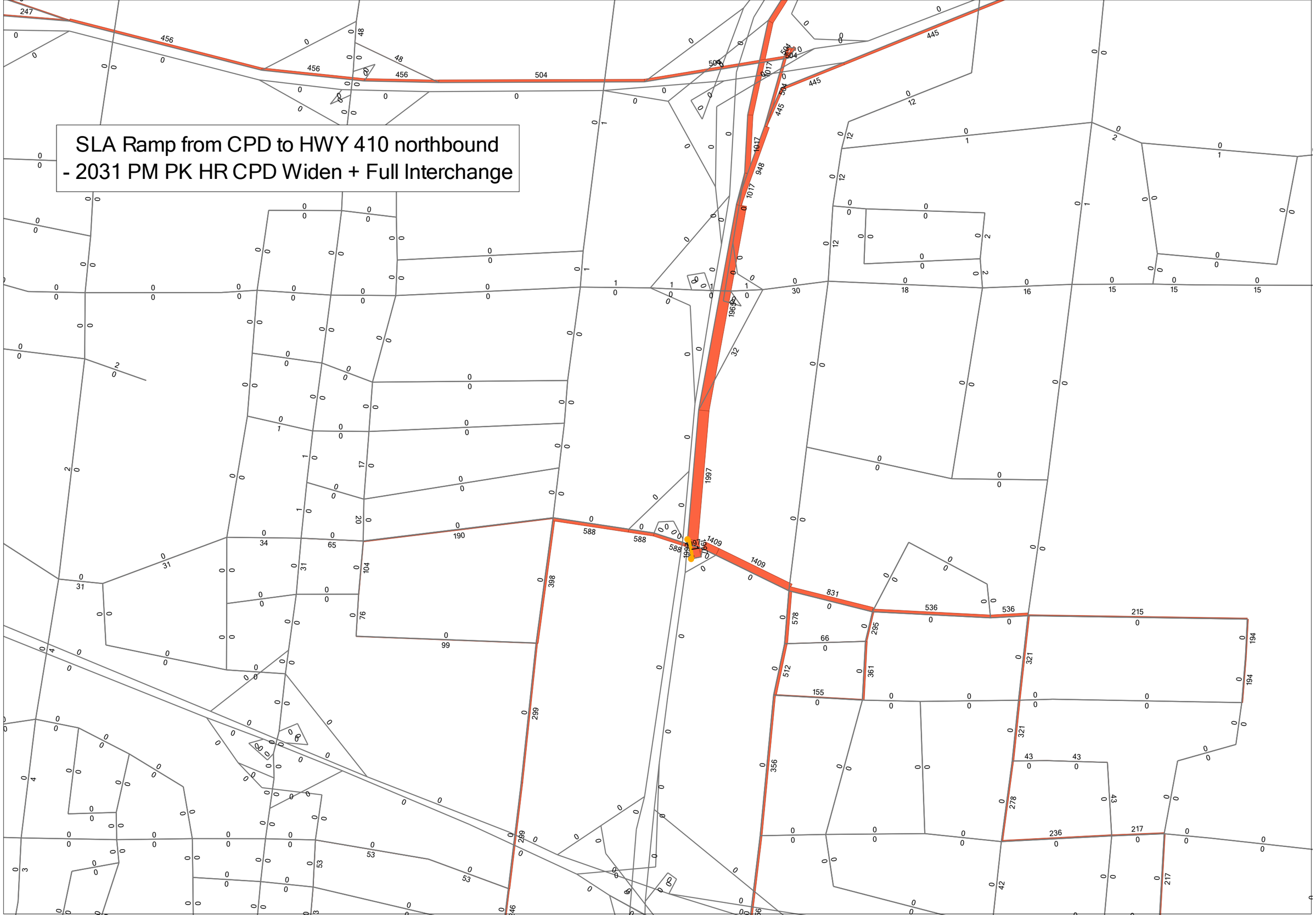
Existing Lane Capacities

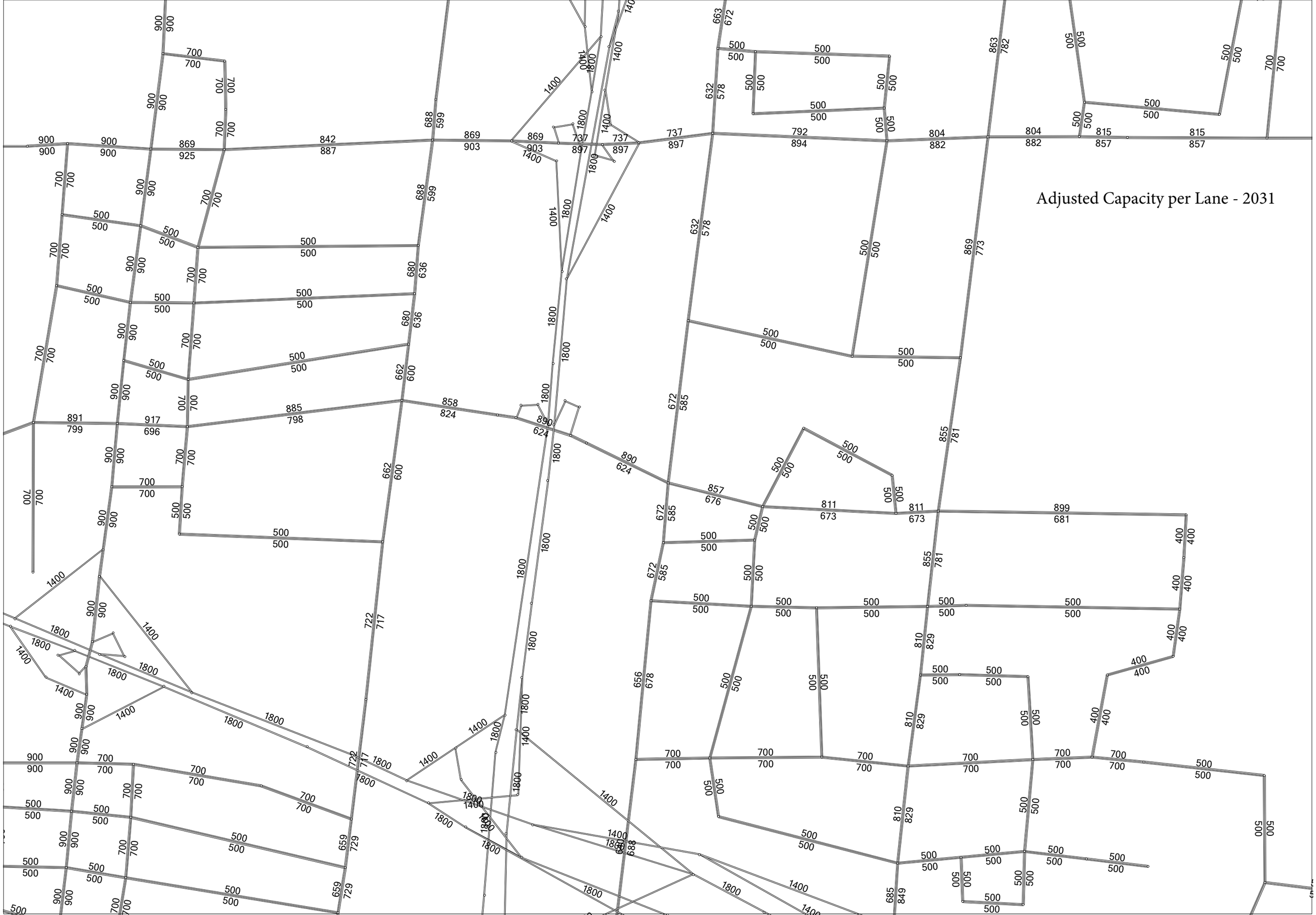
2031 Lane Capacities


SLA Ramp from CPD to HWY 410 northbound
- 2031 AM PK HR CPD Widen + Full Interchange


SLA Ramp from HWY 410 southbound to CPD
- 2031 AM PK HR CPD Widen + Full Interchange


SLA Ramp from HWY 410 southbound to CPD
- 2031 PM PK HR CPD Widen + Full Interchange


SLA Ramp from CPD to HWY 410 northbound
- 2031 PM PK HR CPD Widen + Full Interchange


Adjusted Capacity per Lane - 2031

Appendix C

EMME/3 Zones and Land Uses

3706
3626
3624
3621
3705
3816
3704
3696
3703
3713
LESTER B. PEARSON
INTERNATIONAL
AIRPORT
(MALTON)
HIGHWAY NO. 401
DERRY ROAD EAST
COURTNEYPARK DRIVE EAST
BRITANNIA ROAD EAST
HURONTARIO STREET
KENNEDY ROAD
TOMKEN ROAD
DIXIE ROAD
BRAMALEA ROAD
AIRPORT ROAD
TERMINAL 3
TERMINAL 1
CONVAIR DR.
OREN ROAD
ATHERTON

Population

	3621	3696	3703	3705	3626	3713	3704	3816	3624	3706	TOTAL
2011	12	0	0	0	0	4	4	0	0	0	20
2031	11	0	0	0	0	4	4	0	0	0	19

Employment

	3621	3696	3703	3705	3626	3713	3704	3816	3624	3706	TOTAL
2011	10526	6903	15203	11918	4588	3813	9488	697	1231	7073	71438
2031	10976	8235	14351	11250	4382	3645	8956	786	1559	6869	71009

Appendix D

Truck Volumes

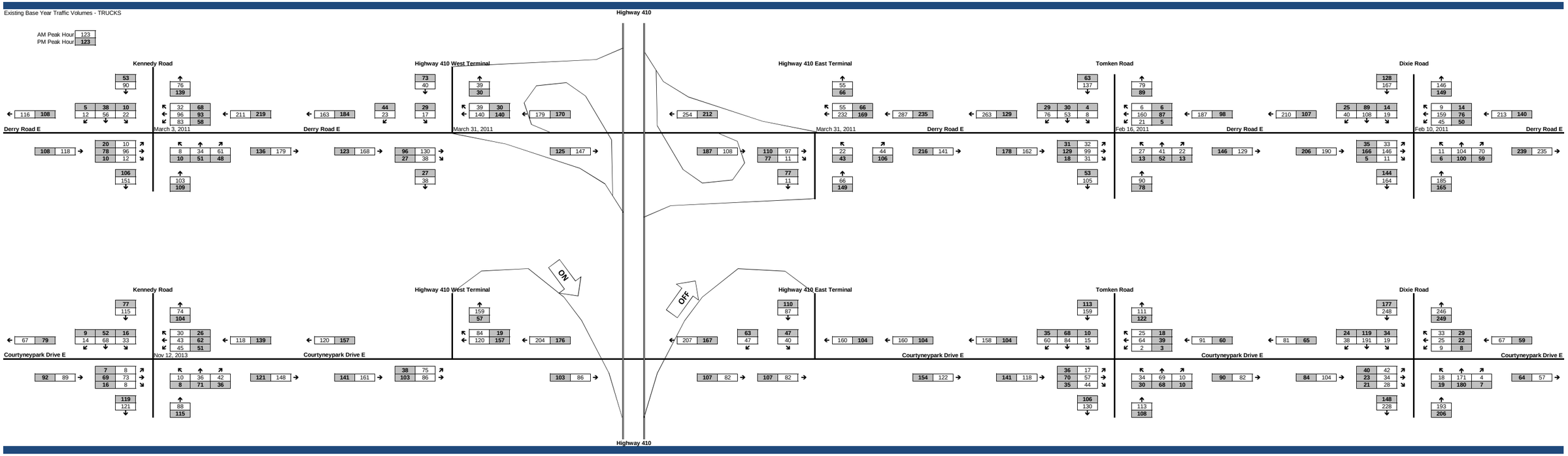
Existing

2031 Business as Usual & Partial Interchange

2031 Full Interchange

Existing Base Year Traffic Volumes - TRUCKS

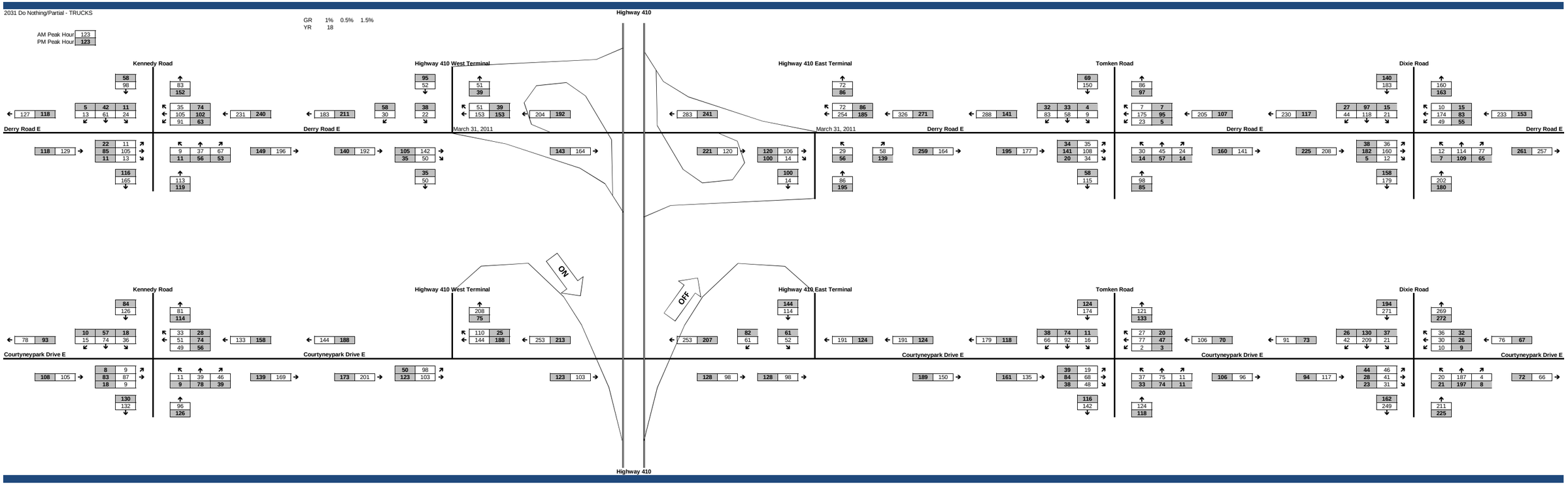
AM Peak Hour	123
PM Peak Hour	**123**



2031 Do Nothing/Partial - TRUCKS

GR 1% 0.5% 1.5%
YR 18

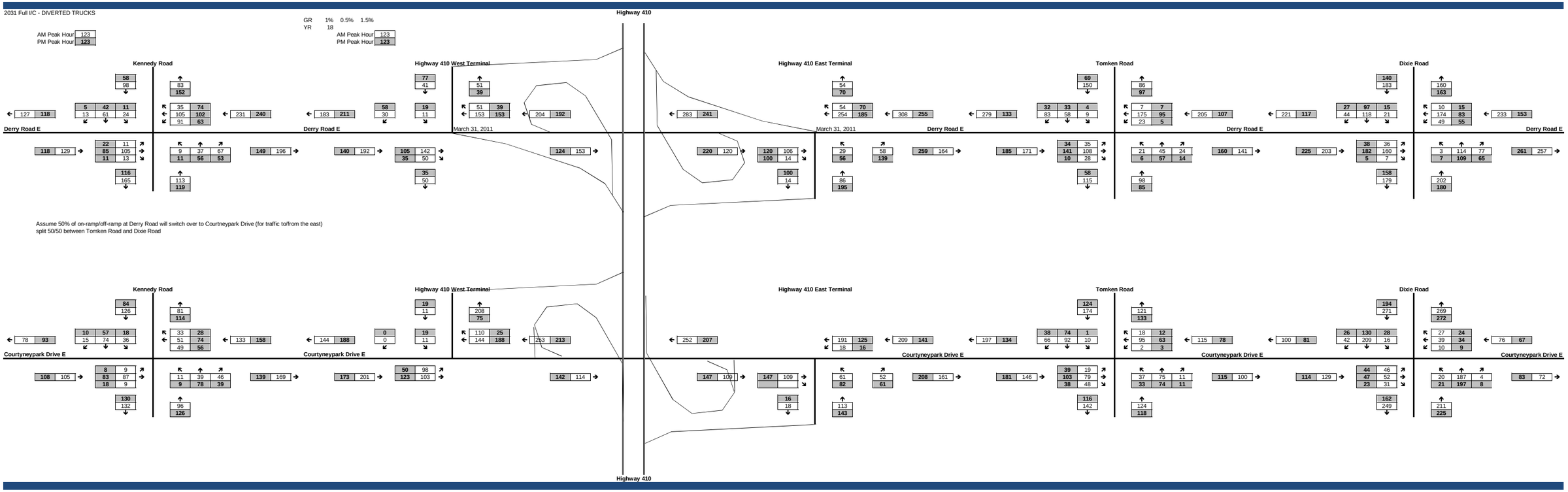
AM Peak Hour 123
PM Peak Hour **123**



2031 Full I/C - DIVERTED TRUCKS

AM Peak Hour	123
PM Peak Hour	**123**

GR	1%	0.5%	1.5%
YR	18		
	AM Peak Hour		123
	PM Peak Hour		**123**



Assume 50% of on-ramp/off-ramp at Derry Road will switch over to Courtneypark Drive (for traffic to/from the east) split 50/50 between Tomken Road and Dixie Road

Appendix F

2031 Do Nothing
Intersection Analysis Results

Table 2: 2031 Future "Do Nothing" Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
Kennedy Road/ Courtneypark Drive E *Signalized*	EB	Left	D	39	0.38	34	F	122	1.06	87
		Thru-Thru/Right	F	86	1.05	237	D	49	0.73	110
	WB	Left	F	128	1.03	105	B	18	0.63	26
		Thru-Thru/Right	B	18	0.48	62	E	78	1.11	318
	NB	Left	E	60	0.72	32	D	43	0.72	40
		Thru-Thru/Right	E	58	0.79	103	F	90	1.06	237
	SB	Left	E	66	0.94	108	F	132	1.06	73
		Thru-Thru/Right	E	74	1.01	223	D	51	0.82	140
	Overall Intersection		***E***	***67***	***1.05***	**-**	***E***	***72***	***1.09***	**-**
Highway 410 West Terminal/ Courtneypark Drive E *Signalized*	EB	Left	A	7	0.68	18	D	47	0.88	64
		Dual Thru	A	< 1	0.45	0	A	< 1	0.20	0
	WB	Dual Thru	A	1	0.39	20	B	13	0.83	123
		Right	A	1	0.24	0	B	11	0.53	54
	Overall Intersection		***A***	***1***	***0.49***	**-**	***B***	***14***	***0.84***	**-**
Highway 410 East Terminal/ Courtneypark Drive E *Signalized*	EB	Dual Thru	D	41	0.98	267	B	11	0.32	74
	WB	Dual Thru	B	18	0.52	63	C	26	1.01	124
	NB	Dual Left	C	29	0.52	95	D	51	0.47	48
		Dual Right	C	34	0.69	128	D	44	0.09	11
	Overall Intersection		***C***	***33***	***0.83***	**-**	***C***	***26***	***0.88***	**-**
Tomken Road/ Courtneypark Drive E *Signalized*	EB	Left	C	25	0.54	61	F	185	1.08	63
		Dual Thru	C	32	0.76	164	B	16	0.32	30
		Right	F	91	1.09	277	A	2	0.12	1
	WB	Left	D	41	0.16	9	B	14	0.08	5
		Thru-Thru/Right	D	42	0.37	53	F	88	1.13	284
	NB	Dual Left	F	147	1.01	43	F	122	1.07	110
		Dual Thru	C	28	0.32	53	E	78	1.04	268
		Right	C	24	0.04	7	C	27	0.03	0
	SB	Left	E	59	0.77	100	E	57	0.71	31
		Dual Thru	F	81	1.03	224	D	53	0.77	114
		Right	D	35	0.24	29	F	98	1.01	186
	Overall Intersection		***E***	***58***	***1.09***	**-**	***E***	***78***	***1.11***	**-**
Ordan Drive-Shawson Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	2	0.19	5	B	15	0.24	7
		Thru-Thru/Right	A	2	0.46	20	B	11	0.31	32
	WB	Left	A	3	0.18	3	B	18	0.14	21
		Thru-Thru/Right	A	1	0.12	4	C	28	0.57	169
	NB	Left	E	58	0.13	11	D	43	0.44	53
		Thru/Right	E	57	0.08	13	C	34	0.06	13
	SB	Left	E	56	0.03	5	C	33	0.02	6
		Thru/Right	E	56	0.05	12	D	37	0.23	37

Table 2: 2031 Future "Do Nothing" Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
	Overall Intersection		***A***	***5***	***0.42***	***-***	***C***	***25***	***0.53***	***-***
Vipond Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	3	0.15	4	B	14	0.05	6
		Thru-Thru/Right	A	3	0.45	14	B	18	0.31	66
	WB	Left	A	3	0.17	2	A	7	0.11	5
		Thru-Thru/Right	A	2	0.18	3	A	8	0.50	39
	NB	Left	D	46	0.06	9	D	46	0.26	29
		Thru/Right	D	46	0.05	12	D	42	0.05	11
	SB	Left	D	45	0.01	4	D	43	0.10	15
		Thru/Right	D	45	0.02	7	D	43	0.13	18
	Overall Intersection		***A***	***5***	***0.36***	***-***	***B***	***16***	***0.44***	***-***
Ordan Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	10	0.02	3	A	4	0.01	< 1
		Thru-Thru/Right	A	10	0.44	54	A	5	0.37	19
	WB	Left	A	8	0.09	6	A	5	0.08	3
		Thru-Thru/Right	A	9	0.25	33	A	6	0.47	33
	NB	Left	D	42	0.03	8	D	42	0.21	27
		Thru/Right	D	42	0.03	8	D	39	0.05	0
	SB	Left	D	45	0.14	15	D	43	0.27	30
		Thru/Right	D	42	0.03	7	D	39	0.06	12
	Overall Intersection		***B***	***11***	***0.36***	***-***	***B***	***10***	***0.42***	***-***
Dixie Road/ Courtneypark Drive E *Signalized*	EB	Dual Left	F	124	1.04	49	F	156	1.11	100
		Thru	F	84	0.95	214	C	23	0.42	48
		Right	E	67	0.14	34	A	9	0.12	6
	WB	Left	D	43	0.30	12	D	42	0.31	28
		Thru	D	43	0.17	22	D	55	0.70	96
		Right	D	43	0.10	16	F	145	1.15	244
	NB	Left	F	152	1.10	82	C	30	0.63	46
		Triple Thru	C	31	0.50	80	E	73	1.04	258
		Right	C	24	0.06	8	C	25	0.03	0
	SB	Left	F	141	1.11	97	F	127	0.98	50
		Triple Thru	C	20	0.56	100	D	38	0.59	94
		Right	B	17	0.26	13	C	31	0.11	11
	Overall Intersection		***D***	***51***	***1.07***	***-***	***E***	***74***	***1.08***	***-***

Table 2: 2031 Future "Do Nothing" Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
Kennedy Road/ Derry Road E *Signalized*	EB	Left	F	248	1.35	106	F	283	1.47	130
		Triple Thru	E	79	1.04	228	D	53	0.90	162
		Right	C	32	0.20	32	C	32	0.06	3
	WB	Dual Left	F	274	1.45	125	E	78	0.99	82
		Triple Thru	B	18	0.53	76	E	74	1.09	319
		Right	B	19	0.16	3	C	25	0.71	59
	NB	Left	F	187	1.09	54	D	39	0.41	45
		Dual Thru	D	38	0.30	44	E	65	0.96	193
		Right	D	37	0.23	23	D	41	0.56	80
	SB	Left	D	50	0.80	97	F	162	1.15	76
		Dual Thru	D	43	0.79	166	C	31	0.31	53
		Right	C	31	0.19	30	C	29	0.12	18
	Overall Intersection		***E***	***74***	***1.24***	**-**	***E***	***69***	***1.28***	**-**
Highway 410 West Terminal/ Derry Road E *Signalized*	EB	Triple Thru	B	12	0.84	52	A	7	0.56	54
	WB	Triple Thru	B	11	0.54	58	B	12	0.88	169
	SB	Left-Left/Right	F	155	0.79	315	D	45	0.45	57
		Right	F	197	0.87	358	E	67	0.90	118
	Overall Intersection		***E***	***73***	***1.04***	**-**	***B***	***18***	***0.88***	**-**
Highway 410 East Terminal/ Derry Road E *Signalized*	EB	Triple Thru	E	61	1.07	294	C	30	0.46	101
	WB	Triple Thru	B	11	0.55	68	C	25	0.99	107
	NB	Left-Left/Right	F	116	1.28	271	E	62	0.93	178
		Right	F	236	1.40	390	D	43	0.58	71
	Overall Intersection		***F***	***85***	***1.21***	**-**	***C***	***34***	***0.97***	**-**
Tomken Road/ Derry Road E *Signalized*	EB	Left	C	27	0.86	53	F	157	1.03	58
		Triple Thru	D	39	0.89	154	C	23	0.73	76
		Right	D	40	0.76	93	B	13	0.09	4
	WB	Left	F	115	0.96	90	D	43	0.62	13
		Triple Thru	B	12	0.62	24	F	92	1.16	268
		Right	C	27	0.03	< 1	A	1	0.04	< 1
	NB	Dual Left	F	84	0.77	34	F	206	1.32	281
		Thru-Thru/Right	D	35	0.31	44	E	68	1.03	285
	SB	Left	D	44	0.16	17	F	110	0.68	27
		Dual Thru	E	70	0.93	146	D	51	0.43	50
		Right	D	45	0.26	30	F	177	1.22	207
	Overall Intersection		***D***	***41***	***0.93***	**-**	***F***	***97***	***1.21***	**-**
Dixie Road/ Derry Road E *Signalized*	EB	Dual Left	E	78	0.77	52	F	139	1.08	100
		Triple Thru	F	85	1.12	329	E	75	1.08	226
		Right	A	4	0.16	5	D	36	0.04	1
	WB	Dual Left	F	160	1.16	109	F	134	1.08	92

Table 2: 2031 Future "Do Nothing" Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
		Triple Thru	D	45	0.73	116	F	90	1.06	208
		Right	C	32	0.02	< 1	D	38	0.13	20
	NB	Dual Left	E	66	0.45	19	E	68	0.57	27
		Triple Thru	D	47	0.72	101	F	89	1.08	290
		Right	D	48	0.63	87	F	83	1.00	225
	SB	Dual Left	E	78	0.76	41	E	80	0.74	34
		Triple Thru	F	117	1.13	218	C	35	0.42	63
		Right	D	37	0.18	23	C	31	0.11	15
	Overall Intersection		***F***	***80***	***1.12***	**-**	***F***	***84***	***1.05***	**-**

Queues
3: Kennedy Rd & Courtneypark Dr E

10/14/2014

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	84	1228	220	757	84	641	304	1182
v/c Ratio	0.38	1.05	1.01	0.49	0.69	0.81	0.91	1.01
Control Delay	40.6	84.2	111.9	17.5	55.6	53.3	60.8	73.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.6	84.2	111.9	17.5	55.6	53.3	60.8	73.0
Queue Length 50th (m)	17.4	~194.0	~52.8	56.3	13.5	80.2	56.8	~174.3
Queue Length 95th (m)	33.5	#237.0	#104.8	61.5	#32.0	103.4	#108.2	#222.6
Internal Link Dist (m)		190.6		519.5		142.2		201.4
Turn Bay Length (m)	65.0		95.0		100.0		85.0	
Base Capacity (vph)	219	1169	217	1549	121	795	336	1173
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	1.05	1.01	0.49	0.69	0.81	0.90	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	1099	92	213	555	179	81	405	216	295	1086	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1638	3329		1484	3145		1600	3019		1629	3345	
Flt Permitted	0.36	1.00		0.08	1.00		0.12	1.00		0.19	1.00	
Satd. Flow (perm)	628	3329		120	3145		195	3019		321	3345	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	84	1133	95	220	572	185	84	418	223	304	1120	62
RTOR Reduction (vph)	0	5	0	0	22	0	0	50	0	0	3	0
Lane Group Flow (vph)	84	1223	0	220	735	0	84	591	0	304	1179	0
Confl. Peds. (#/hr)	7		10	10		7	34		5	5		34
Heavy Vehicles (%)	11%	8%	10%	23%	9%	18%	14%	10%	21%	12%	7%	25%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	49.0	49.0		68.0	68.0		40.5	34.5		58.0	49.0	
Effective Green, g (s)	49.0	49.0		68.0	68.0		40.5	34.5		58.0	49.0	
Actuated g/C Ratio	0.35	0.35		0.49	0.49		0.29	0.25		0.41	0.35	
Clearance Time (s)	7.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	219	1165		214	1527		116	743		324	1170	
v/s Ratio Prot		0.37		c0.12	0.23		0.03	0.20		c0.14	c0.35	
v/s Ratio Perm	0.13			c0.38			0.18			0.25		
v/c Ratio	0.38	1.05		1.03	0.48		0.72	0.79		0.94	1.01	
Uniform Delay, d1	34.2	45.5		44.8	24.2		40.1	49.4		32.1	45.5	
Progression Factor	1.00	1.00		1.37	0.72		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	40.6		67.0	1.0		19.9	8.6		33.8	28.3	
Delay (s)	39.2	86.1		128.2	18.4		60.0	58.0		66.0	73.8	
Level of Service	D	F		F	B		E	E		E	E	
Approach Delay (s)		83.1			43.1			58.3			72.2	
Approach LOS		F			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	66.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR
Lane Group Flow (vph)	268	1530	1084	281
v/c Ratio	0.66	0.45	0.39	0.27
Control Delay	13.5	0.2	1.4	0.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.5	0.2	1.4	0.6
Queue Length 50th (m)	15.2	0.0	9.2	0.0
Queue Length 95th (m)	m17.7	m0.0	19.5	0.0
Internal Link Dist (m)		519.5	363.3	
Turn Bay Length (m)	95.0			
Base Capacity (vph)	638	3411	2782	1035
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.45	0.39	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	252	1438	1019	264	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	8.0	8.0	8.0		
Lane Util. Factor	1.00	0.95	0.95	1.00		
Frt	1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1313	3411	3202	1150		
Flt Permitted	0.26	1.00	1.00	1.00		
Satd. Flow (perm)	357	3411	3202	1150		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	268	1530	1084	281	0	0
RTOR Reduction (vph)	0	0	0	37	0	0
Lane Group Flow (vph)	268	1530	1084	244	0	0
Heavy Vehicles (%)	39%	7%	14%	42%	0%	0%
Turn Type	pm+pt	NA	NA	Perm		
Protected Phases	7	4	8			
Permitted Phases	4			8		
Actuated Green, G (s)	132.0	140.0	121.6	121.6		
Effective Green, g (s)	132.0	140.0	121.6	121.6		
Actuated g/C Ratio	0.94	1.00	0.87	0.87		
Clearance Time (s)	2.0	8.0	8.0	8.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	393	3411	2781	998		
v/s Ratio Prot	c0.04	c0.45	0.34			
v/s Ratio Perm	0.60			0.21		
v/c Ratio	0.68	0.45	0.39	0.24		
Uniform Delay, d1	0.4	0.0	1.8	1.5		
Progression Factor	14.26	1.00	0.50	0.18		
Incremental Delay, d2	1.9	0.2	0.4	0.5		
Delay (s)	7.2	0.2	1.3	0.8		
Level of Service	A	A	A	A		
Approach Delay (s)		1.2	1.2		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM 2000 Control Delay	1.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1484	647	766	848
v/c Ratio	0.98	0.52	0.52	0.69
Control Delay	42.3	18.2	29.2	33.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	42.3	18.2	29.2	33.5
Queue Length 50th (m)	158.1	55.2	77.2	102.5
Queue Length 95th (m)	#266.9	m63.0	95.4	128.3
Internal Link Dist (m)	363.3	449.2	187.3	
Turn Bay Length (m)				
Base Capacity (vph)	1510	1233	1475	1230
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	0.98	0.52	0.52	0.69

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1425	0	0	621	735	814
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0			8.0	7.0	7.0
Lane Util. Factor	0.95			0.95	0.97	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3411			2786	3278	2711
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3411			2786	3278	2711
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1484	0	0	647	766	848
RTOR Reduction (vph)	0	0	0	0	0	10
Lane Group Flow (vph)	1484	0	0	647	766	838
Heavy Vehicles (%)	7%	0%	0%	31%	8%	6%
Turn Type	NA			NA	Perm	Prot
Protected Phases	2			6		4
Permitted Phases					4	
Actuated Green, G (s)	62.0			62.0	63.0	63.0
Effective Green, g (s)	62.0			62.0	63.0	63.0
Actuated g/C Ratio	0.44			0.44	0.45	0.45
Clearance Time (s)	8.0			8.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1510			1233	1475	1219
v/s Ratio Prot	c0.44			0.23		c0.31
v/s Ratio Perm					0.23	
v/c Ratio	0.98			0.52	0.52	0.69
Uniform Delay, d1	38.5			28.3	27.6	30.7
Progression Factor	0.60			0.59	1.00	1.00
Incremental Delay, d2	18.4			1.4	1.3	3.2
Delay (s)	41.4			18.1	28.9	33.8
Level of Service	D			B	C	C
Approach Delay (s)	41.4			18.1	31.5	
Approach LOS	D			B	C	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	1240	854	13	347	139	418	55	233	1168	197
v/c Ratio	0.51	0.76	1.08	0.16	0.38	1.01	0.32	0.09	0.78	1.03	0.40
Control Delay	23.1	32.6	78.6	47.0	40.6	145.0	28.0	5.0	60.8	80.0	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	32.6	78.6	47.0	40.6	145.0	28.0	5.0	60.8	80.0	11.9
Queue Length 50th (m)	53.4	159.6	~245.6	2.7	37.8	~20.5	40.3	0.0	57.8	~181.5	8.8
Queue Length 95th (m)	m60.9	m164.3	m#277.2	9.0	53.1	#42.7	53.4	7.0	#99.7	#223.9	29.4
Internal Link Dist (m)		449.2			466.9		171.2			190.6	
Turn Bay Length (m)	120.0		100.0	50.0		80.0		50.0	130.0		85.0
Base Capacity (vph)	535	1623	789	83	924	137	1292	591	300	1134	497
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.76	1.08	0.16	0.38	1.01	0.32	0.09	0.78	1.03	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	1153	794	12	261	61	129	389	51	217	1086	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	3444	1508	1545	2677		2745	3067	1319	1679	3380	1182
Flt Permitted	0.49	1.00	1.00	0.15	1.00		0.95	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	870	3444	1508	246	2677		2745	3067	1319	897	3380	1182
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	272	1240	854	13	281	66	139	418	55	233	1168	197
RTOR Reduction (vph)	0	0	79	0	15	0	0	0	32	0	0	100
Lane Group Flow (vph)	272	1240	775	13	332	0	139	418	23	233	1168	97
Confl. Peds. (#/hr)	4		7	7		4	3		9	9		3
Heavy Vehicles (%)	7%	6%	6%	18%	29%	45%	29%	19%	21%	8%	8%	36%
Turn Type	pm+pt	NA	Perm	Perm	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	66.0	66.0	66.0	47.6	47.6		7.0	59.0	59.0	47.0	47.0	47.0
Effective Green, g (s)	66.0	66.0	66.0	47.6	47.6		7.0	59.0	59.0	47.0	47.0	47.0
Actuated g/C Ratio	0.47	0.47	0.47	0.34	0.34		0.05	0.42	0.42	0.34	0.34	0.34
Clearance Time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	501	1623	710	83	910		137	1292	555	301	1134	396
v/s Ratio Prot	0.06	0.36			0.12		c0.05	0.14			c0.35	
v/s Ratio Perm	0.20		c0.51	0.05					0.02	0.26		0.08
v/c Ratio	0.54	0.76	1.09	0.16	0.37		1.01	0.32	0.04	0.77	1.03	0.24
Uniform Delay, d1	23.4	30.6	37.0	32.2	34.8		66.5	27.1	23.9	41.7	46.5	33.6
Progression Factor	1.04	1.00	1.03	1.24	1.19		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	1.1	52.6	0.9	0.2		80.8	0.7	0.1	17.5	34.7	1.5
Delay (s)	24.9	31.5	90.7	40.8	41.8		147.3	27.8	24.0	59.2	81.2	35.1
Level of Service	C	C	F	D	D		F	C	C	E	F	D
Approach Delay (s)		52.1			41.8			54.6			72.3	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	58.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	109.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	1217	49	291	14	33	4	42
v/c Ratio	0.19	0.46	0.18	0.12	0.13	0.19	0.03	0.24
Control Delay	1.8	1.8	3.2	1.3	59.1	29.8	56.0	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.8	1.8	3.2	1.3	59.1	29.8	56.0	20.6
Queue Length 50th (m)	3.4	14.4	0.9	2.6	3.5	2.5	1.0	0.5
Queue Length 95th (m)	m5.3	20.3	2.6	4.4	10.7	12.9	4.8	11.9
Internal Link Dist (m)		466.9		278.5		123.7		151.6
Turn Bay Length (m)	45.0		30.0		35.0		35.0	
Base Capacity (vph)	804	2646	273	2346	108	175	129	178
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.46	0.18	0.12	0.13	0.19	0.03	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	1096	97	48	280	5	14	10	23	4	2	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1680	3331		1547	2960		1241	1362		1460	1252	
Flt Permitted	0.57	1.00		0.21	1.00		0.73	1.00		0.74	1.00	
Satd. Flow (perm)	1015	3331		345	2960		953	1362		1131	1252	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	152	1118	99	49	286	5	14	10	23	4	2	40
RTOR Reduction (vph)	0	5	0	0	1	0	0	20	0	0	35	0
Lane Group Flow (vph)	152	1212	0	49	290	0	14	13	0	4	7	0
Confl. Peds. (#/hr)	3					3	3					3
Heavy Vehicles (%)	8%	8%	11%	18%	23%	20%	46%	11%	33%	25%	50%	28%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	111.0	111.0		111.0	111.0		16.0	16.0		16.0	16.0	
Effective Green, g (s)	111.0	111.0		111.0	111.0		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.11	0.11		0.11	0.11	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	804	2641		273	2346		108	155		129	143	
v/s Ratio Prot		c0.36			0.10			0.01			0.01	
v/s Ratio Perm	0.15			0.14			c0.01			0.00		
v/c Ratio	0.19	0.46		0.18	0.12		0.13	0.08		0.03	0.05	
Uniform Delay, d1	3.5	4.7		3.5	3.3		55.7	55.4		55.1	55.2	
Progression Factor	0.41	0.31		0.47	0.35		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.4		1.4	0.1		2.5	1.0		0.4	0.6	
Delay (s)	1.8	1.8		3.1	1.3		58.2	56.5		55.6	55.8	
Level of Service	A	A		A	A		E	E		E	E	
Approach Delay (s)		1.8			1.5			57.0			55.8	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	1018	50	373	13	39	4	16
v/c Ratio	0.15	0.45	0.17	0.18	0.06	0.12	0.01	0.05
Control Delay	2.7	3.1	3.3	1.6	46.5	21.3	45.2	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.7	3.1	3.3	1.6	46.5	21.3	45.2	22.1
Queue Length 50th (m)	3.0	14.4	0.7	2.2	3.0	2.3	0.9	0.5
Queue Length 95th (m)	4.3	14.2	1.5	3.0	9.1	12.3	4.3	6.9
Internal Link Dist (m)		278.5		341.9		126.6		117.6
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	701	2281	302	2079	213	319	280	300
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.45	0.17	0.18	0.06	0.12	0.01	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	916	81	49	329	36	13	10	28	4	2	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1797	3252		1643	2963		1360	1480		1822	1447	
Flt Permitted	0.53	1.00		0.25	1.00		0.75	1.00		0.73	1.00	
Satd. Flow (perm)	1002	3252		433	2963		1069	1480		1403	1447	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	107	935	83	50	336	37	13	10	29	4	2	14
RTOR Reduction (vph)	0	5	0	0	6	0	0	23	0	0	11	0
Lane Group Flow (vph)	107	1013	0	50	367	0	13	16	0	4	5	0
Confl. Peds. (#/hr)	3		1	1		3	5		1	1		5
Heavy Vehicles (%)	1%	11%	7%	11%	23%	3%	33%	0%	19%	0%	50%	8%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	98.0	98.0		98.0	98.0		28.0	28.0		28.0	28.0	
Effective Green, g (s)	98.0	98.0		98.0	98.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.20	0.20		0.20	0.20	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	701	2276		303	2074		213	296		280	289	
v/s Ratio Prot		c0.31			0.12			0.01			0.00	
v/s Ratio Perm	0.11			0.12			c0.01			0.00		
v/c Ratio	0.15	0.45		0.17	0.18		0.06	0.05		0.01	0.02	
Uniform Delay, d1	7.1	9.2		7.1	7.2		45.4	45.3		44.9	44.9	
Progression Factor	0.32	0.28		0.29	0.20		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.6		1.2	0.2		0.5	0.3		0.1	0.1	
Delay (s)	2.7	3.1		3.2	1.6		45.9	45.6		45.0	45.1	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		3.1			1.8			45.7			45.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	13	952	30	507	11	20	27	12
v/c Ratio	0.02	0.44	0.09	0.25	0.03	0.06	0.14	0.05
Control Delay	9.7	9.3	8.5	8.6	42.6	22.1	45.6	28.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.7	9.3	8.5	8.6	42.6	22.1	45.6	28.5
Queue Length 50th (m)	0.8	31.9	3.3	30.6	2.4	1.1	6.0	1.1
Queue Length 95th (m)	m2.6	54.0	m6.2	m32.5	7.7	7.9	14.7	6.6
Internal Link Dist (m)		341.9		193.9		128.4		78.4
Turn Bay Length (m)	35.0		45.0		35.0		35.0	
Base Capacity (vph)	548	2159	335	2036	329	343	187	262
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.44	0.09	0.25	0.03	0.06	0.14	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	795	100	28	402	74	10	5	14	25	5	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.89		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	3174		1753	2984		1825	1454		1049	1126	
Flt Permitted	0.46	1.00		0.27	1.00		0.75	1.00		0.74	1.00	
Satd. Flow (perm)	810	3174		494	2984		1440	1454		822	1126	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	13	846	106	30	428	79	11	5	15	27	5	7
RTOR Reduction (vph)	0	7	0	0	11	0	0	12	0	0	5	0
Lane Group Flow (vph)	13	945	0	30	496	0	11	8	0	27	7	0
Confl. Peds. (#/hr)	3		2	2		3						
Heavy Vehicles (%)	9%	14%	3%	4%	18%	24%	0%	0%	23%	74%	40%	67%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	95.0	95.0		95.0	95.0		32.0	32.0		32.0	32.0	
Effective Green, g (s)	95.0	95.0		95.0	95.0		32.0	32.0		32.0	32.0	
Actuated g/C Ratio	0.68	0.68		0.68	0.68		0.23	0.23		0.23	0.23	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	549	2153		335	2024		329	332		187	257	
v/s Ratio Prot		c0.30			0.17			0.01			0.01	
v/s Ratio Perm	0.02			0.06			0.01			c0.03		
v/c Ratio	0.02	0.44		0.09	0.25		0.03	0.03		0.14	0.03	
Uniform Delay, d1	7.4	10.3		7.7	8.7		42.0	41.9		43.1	41.9	
Progression Factor	1.28	0.86		1.00	1.02		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.6		0.5	0.3		0.2	0.1		1.6	0.2	
Delay (s)	9.5	9.5		8.2	9.1		42.2	42.0		44.7	42.1	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		9.5			9.1			42.1			43.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	162	472	118	28	114	119	132	917	89	399	1433	374
v/c Ratio	1.04	0.95	0.28	0.23	0.18	0.34	1.07	0.49	0.13	1.11	0.55	0.38
Control Delay	124.2	84.5	22.9	34.6	45.1	10.1	141.5	30.1	3.7	134.7	19.8	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	124.2	84.5	22.9	34.6	45.1	10.1	141.5	30.1	3.7	134.7	19.8	2.5
Queue Length 50th (m)	~24.8	~145.0	14.3	5.1	13.5	0.0	~40.4	66.5	0.0	~64.6	87.2	0.0
Queue Length 95th (m)	#48.7	#213.8	34.1	12.1	22.3	16.3	#82.3	79.5	8.1	#97.2	100.3	13.3
Internal Link Dist (m)		193.9			206.9			193.9			185.2	
Turn Bay Length (m)	55.0		45.0	45.0			85.0		50.0	100.0		125.0
Base Capacity (vph)	156	498	424	123	636	354	123	1857	690	361	2606	976
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.95	0.28	0.23	0.18	0.34	1.07	0.49	0.13	1.11	0.55	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	453	113	27	109	114	127	880	85	383	1376	359
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	8.0	8.0	3.0	8.0	8.0	7.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.95	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2745	1762	1262	1342	2874	1184	1572	4334	1476	3372	4561	1429
Flt Permitted	0.95	1.00	1.00	0.18	1.00	1.00	0.17	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	2745	1762	1262	257	2874	1184	288	4334	1476	3372	4561	1429
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	162	472	118	28	114	119	132	917	89	399	1433	374
RTOR Reduction (vph)	0	0	67	0	0	92	0	0	52	0	0	163
Lane Group Flow (vph)	162	472	51	28	114	27	132	917	37	399	1433	211
Confl. Peds. (#/hr)	23		5	5		23	4		20	20		4
Heavy Vehicles (%)	29%	9%	27%	36%	27%	32%	16%	21%	5%	5%	15%	12%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases			4	8		8	2		2			6
Actuated Green, G (s)	8.0	39.6	39.6	35.8	32.2	32.2	58.8	58.8	58.8	15.0	78.8	78.8
Effective Green, g (s)	8.0	39.6	39.6	35.8	32.2	32.2	58.8	58.8	58.8	15.0	78.8	78.8
Actuated g/C Ratio	0.06	0.28	0.28	0.26	0.23	0.23	0.42	0.42	0.42	0.11	0.56	0.56
Clearance Time (s)	6.0	8.0	8.0	3.0	8.0	8.0	7.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	156	498	356	93	661	272	120	1820	619	361	2567	804
v/s Ratio Prot	c0.06	c0.27		0.01	0.04			0.21		c0.12	0.31	
v/s Ratio Perm			0.04	0.07		0.02	c0.46		0.03			0.15
v/c Ratio	1.04	0.95	0.14	0.30	0.17	0.10	1.10	0.50	0.06	1.11	0.56	0.26
Uniform Delay, d1	66.0	49.2	37.5	41.1	43.2	42.5	40.6	29.9	24.2	62.5	19.5	15.7
Progression Factor	0.66	1.18	1.79	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	79.7	26.0	0.2	1.8	0.1	0.2	111.6	1.0	0.2	78.8	0.9	0.8
Delay (s)	123.5	83.8	67.2	43.0	43.3	42.6	152.2	30.9	24.3	141.3	20.4	16.5
Level of Service	F	F	E	D	D	D	F	C	C	F	C	B
Approach Delay (s)		89.7			43.0			44.4			41.6	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	50.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues
3: Kennedy Rd & Courtneypark Dr E

10/14/2014

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	187	685	218	1677	144	1220	149	857
v/c Ratio	1.03	0.74	0.61	1.11	0.70	1.06	1.03	0.82
Control Delay	110.8	48.4	14.9	78.7	43.4	87.3	114.8	51.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.8	48.4	14.9	78.7	43.4	87.3	114.8	51.3
Queue Length 50th (m)	~38.5	87.6	24.5	~276.5	24.3	~193.6	~28.4	114.3
Queue Length 95th (m)	#87.4	110.4	m26.3	#318.2	#40.2	#236.6	#73.4	140.1
Internal Link Dist (m)		190.6		519.5		142.2		201.4
Turn Bay Length (m)	65.0		95.0		100.0		85.0	
Base Capacity (vph)	181	928	356	1514	209	1155	144	1046
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.74	0.61	1.11	0.69	1.06	1.03	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	513	110	198	1293	233	131	1006	105	136	685	95
Ideal Flow (vphpl)	1900	1900	1900	1900	2150	1900	1900	2050	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1738	3050		1425	3760		1705	3498		1615	3291	
Flt Permitted	0.10	1.00		0.21	1.00		0.14	1.00		0.09	1.00	
Satd. Flow (perm)	174	3050		319	3760		247	3498		154	3291	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	187	564	121	218	1421	256	144	1105	115	149	753	104
RTOR Reduction (vph)	0	13	0	0	10	0	0	5	0	0	8	0
Lane Group Flow (vph)	187	672	0	218	1667	0	144	1215	0	149	849	0
Confl. Peds. (#/hr)	9		8	8		9	28		2	2		28
Heavy Vehicles (%)	5%	16%	16%	28%	6%	12%	7%	8%	38%	13%	8%	10%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	52.0	42.0		69.0	56.0		55.8	46.0		52.2	44.2	
Effective Green, g (s)	52.0	42.0		69.0	56.0		55.8	46.0		52.2	44.2	
Actuated g/C Ratio	0.37	0.30		0.49	0.40		0.40	0.33		0.37	0.32	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	176	915		346	1504		200	1149		140	1039	
v/s Ratio Prot	c0.08	0.22		0.11	c0.44		c0.05	c0.35		c0.06	0.26	
v/s Ratio Perm	0.32			0.20			0.24			0.33		
v/c Ratio	1.06	0.73		0.63	1.11		0.72	1.06		1.06	0.82	
Uniform Delay, d1	36.8	44.0		23.7	42.0		31.1	47.0		37.5	44.2	
Progression Factor	1.00	1.00		0.56	0.56		1.00	1.00		1.00	1.00	
Incremental Delay, d2	85.4	5.2		4.5	54.4		11.7	43.0		94.3	7.1	
Delay (s)	122.2	49.2		17.7	78.0		42.8	90.0		131.8	51.3	
Level of Service	F	D		B	E		D	F		F	D	
Approach Delay (s)		64.8			71.1			85.0			63.2	
Approach LOS		E			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	72.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	102.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR
Lane Group Flow (vph)	365	608	1972	655
v/c Ratio	0.88	0.20	0.83	0.56
Control Delay	44.9	0.1	14.6	8.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	44.9	0.1	14.6	8.2
Queue Length 50th (m)	33.8	0.0	123.9	44.0
Queue Length 95th (m)	m63.9	m0.0	m123.4	m54.1
Internal Link Dist (m)		519.5	363.3	
Turn Bay Length (m)	95.0			
Base Capacity (vph)	469	3017	2365	1180
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	0.78	0.20	0.83	0.56

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	358	596	1933	603	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	8.0	8.0	8.0		
Lane Util. Factor	1.00	0.95	0.95	1.00		
Frt	1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1601	3017	3318	1570		
Flt Permitted	0.06	1.00	1.00	1.00		
Satd. Flow (perm)	94	3017	3318	1570		
Peak-hour factor, PHF	0.98	0.98	0.98	0.92	0.98	0.98
Adj. Flow (vph)	365	608	1972	655	0	0
RTOR Reduction (vph)	0	0	0	61	0	0
Lane Group Flow (vph)	365	608	1972	594	0	0
Heavy Vehicles (%)	14%	21%	10%	4%	0%	0%
Turn Type	pm+pt	NA	NA	Perm		
Protected Phases	7	4	8			
Permitted Phases	4			8		
Actuated Green, G (s)	132.0	140.0	99.8	99.8		
Effective Green, g (s)	132.0	140.0	99.8	99.8		
Actuated g/C Ratio	0.94	1.00	0.71	0.71		
Clearance Time (s)	2.0	8.0	8.0	8.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	413	3017	2365	1119		
v/s Ratio Prot	c0.19	0.20	c0.59			
v/s Ratio Perm	0.64			0.38		
v/c Ratio	0.88	0.20	0.83	0.53		
Uniform Delay, d1	44.0	0.0	14.2	9.3		
Progression Factor	0.74	1.00	0.85	1.14		
Incremental Delay, d2	14.5	0.1	1.2	0.6		
Delay (s)	46.9	0.1	13.3	11.2		
Level of Service	D	A	B	B		
Approach Delay (s)		17.7	12.8		0.0	
Approach LOS		B	B		A	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	649	2386	272	189
v/c Ratio	0.32	1.01	0.47	0.31
Control Delay	11.1	27.0	51.3	7.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.1	27.0	51.3	7.3
Queue Length 50th (m)	59.2	~353.0	34.2	0.0
Queue Length 95th (m)	73.8	m123.8	48.4	11.0
Internal Link Dist (m)	363.3	449.2	163.3	
Turn Bay Length (m)				
Base Capacity (vph)	2047	2358	574	608
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	0.32	1.01	0.47	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	617	0	0	2267	258	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0			8.0	7.0	7.0
Lane Util. Factor	0.95			0.95	0.97	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3017			3476	2682	2145
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3017			3476	2682	2145
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	649	0	0	2386	272	189
RTOR Reduction (vph)	0	0	0	0	0	149
Lane Group Flow (vph)	649	0	0	2386	272	41
Heavy Vehicles (%)	21%	0%	0%	5%	32%	34%
Turn Type	NA			NA	Perm	Prot
Protected Phases	2			6		4
Permitted Phases					4	
Actuated Green, G (s)	95.0			95.0	30.0	30.0
Effective Green, g (s)	95.0			95.0	30.0	30.0
Actuated g/C Ratio	0.68			0.68	0.21	0.21
Clearance Time (s)	8.0			8.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2047			2358	574	459
v/s Ratio Prot	0.22			c0.69		0.02
v/s Ratio Perm					c0.10	
v/c Ratio	0.32			1.01	0.47	0.09
Uniform Delay, d1	9.2			22.5	48.1	44.0
Progression Factor	1.14			0.77	1.00	1.00
Incremental Delay, d2	0.4			8.9	2.8	0.4
Delay (s)	10.9			26.3	50.9	44.4
Level of Service	B			C	D	D
Approach Delay (s)	10.9			26.3	48.2	
Approach LOS	B			C	D	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	114	429	153	27	1468	479	1439	34	82	677	497
v/c Ratio	1.04	0.32	0.24	0.08	1.13	1.07	1.04	0.07	0.68	0.77	1.01
Control Delay	145.1	16.5	1.0	14.1	89.8	117.6	77.2	0.2	51.8	53.6	80.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	145.1	16.5	1.0	14.1	89.8	117.6	77.2	0.2	51.8	53.6	80.3
Queue Length 50th (m)	~25.4	22.4	0.2	2.1	~250.9	~75.3	~225.6	0.0	12.4	91.2	~112.5
Queue Length 95th (m)	#62.5	30.3	0.6	m4.8	#284.2	#110.0	#268.3	0.0	#30.7	114.1	#185.6
Internal Link Dist (m)		449.2			466.9		171.2			190.6	
Turn Bay Length (m)	120.0		100.0	50.0		80.0		50.0	130.0		85.0
Base Capacity (vph)	110	1357	651	321	1298	449	1385	503	121	884	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.32	0.24	0.08	1.13	1.07	1.04	0.07	0.68	0.77	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	403	144	25	1206	174	450	1353	32	77	636	467
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	3.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1332	3017	1260	1608	3409		3309	3659	1189	1601	3259	1483
Flt Permitted	0.07	1.00	1.00	0.50	1.00		0.95	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	100	3017	1260	850	3409		3309	3659	1189	177	3259	1483
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	114	429	153	27	1283	185	479	1439	34	82	677	497
RTOR Reduction (vph)	0	0	84	0	8	0	0	0	21	0	0	91
Lane Group Flow (vph)	114	429	69	27	1460	0	479	1439	13	82	677	406
Confl. Peds. (#/hr)	1		6	6		1	6		10	10		6
Heavy Vehicles (%)	37%	21%	27%	13%	4%	11%	7%	5%	34%	14%	12%	8%
Turn Type	pm+pt	NA	Perm	Perm	NA		Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	63.0	63.0	63.0	53.0	53.0		19.0	53.0	53.0	44.0	38.0	38.0
Effective Green, g (s)	63.0	63.0	63.0	53.0	53.0		19.0	53.0	53.0	44.0	38.0	38.0
Actuated g/C Ratio	0.45	0.45	0.45	0.38	0.38		0.14	0.38	0.38	0.31	0.27	0.27
Clearance Time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	106	1357	567	321	1290		449	1385	450	116	884	402
v/s Ratio Prot	c0.05	0.14			c0.43		c0.14	c0.39		0.03	0.21	
v/s Ratio Perm	0.43		0.05	0.03					0.01	0.19		0.27
v/c Ratio	1.08	0.32	0.12	0.08	1.13		1.07	1.04	0.03	0.71	0.77	1.01
Uniform Delay, d1	35.3	24.7	22.4	27.9	43.5		60.5	43.5	27.3	39.0	46.9	51.0
Progression Factor	2.20	0.64	0.06	0.48	0.46		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	107.6	0.6	0.4	0.4	68.3		61.4	34.9	0.1	17.8	6.3	47.4
Delay (s)	185.4	16.3	1.7	13.8	88.2		121.9	78.4	27.4	56.8	53.2	98.4
Level of Service	F	B	A	B	F		F	E	C	E	D	F
Approach Delay (s)		40.8			86.9			88.2			71.3	
Approach LOS		D			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	77.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	106.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	558	64	1179	145	72	8	164
v/c Ratio	0.24	0.31	0.14	0.57	0.44	0.15	0.02	0.31
Control Delay	15.7	10.7	18.2	28.5	43.4	10.3	33.4	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	10.7	18.2	28.5	43.4	10.3	33.4	20.6
Queue Length 50th (m)	2.4	20.2	9.6	151.2	32.0	1.5	1.5	17.5
Queue Length 95th (m)	m6.5	31.7	20.8	168.6	53.3	13.0	5.6	36.5
Internal Link Dist (m)		466.9		278.5		123.7		151.6
Turn Bay Length (m)	45.0		30.0		35.0		35.0	
Base Capacity (vph)	139	1793	444	2059	328	478	426	537
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.31	0.14	0.57	0.44	0.15	0.02	0.31

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	455	53	58	1071	2	132	7	58	7	12	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.87		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1294	3015		1690	3473		1657	1381		1817	1542	
Flt Permitted	0.17	1.00		0.42	1.00		0.60	1.00		0.71	1.00	
Satd. Flow (perm)	236	3015		749	3473		1046	1381		1358	1542	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	33	500	58	64	1177	2	145	8	64	8	13	151
RTOR Reduction (vph)	0	7	0	0	0	0	0	44	0	0	53	0
Lane Group Flow (vph)	33	551	0	64	1179	0	145	28	0	8	111	0
Confl. Peds. (#/hr)	1					1	1		3	3		1
Heavy Vehicles (%)	41%	17%	38%	8%	5%	50%	10%	33%	17%	0%	18%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	83.0	83.0		83.0	83.0		44.0	44.0		44.0	44.0	
Effective Green, g (s)	83.0	83.0		83.0	83.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio	0.59	0.59		0.59	0.59		0.31	0.31		0.31	0.31	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	139	1787		444	2058		328	434		426	484	
v/s Ratio Prot		0.18			c0.34			0.02			0.07	
v/s Ratio Perm	0.14			0.09			c0.14			0.01		
v/c Ratio	0.24	0.31		0.14	0.57		0.44	0.06		0.02	0.23	
Uniform Delay, d1	13.5	14.2		12.7	17.6		38.2	33.6		33.1	35.5	
Progression Factor	0.80	0.74		1.34	1.55		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.8	0.4		0.6	1.0		4.3	0.3		0.1	1.1	
Delay (s)	14.6	10.9		17.7	28.2		42.5	33.9		33.2	36.6	
Level of Service	B	B		B	C		D	C		C	D	
Approach Delay (s)		11.1			27.7			39.6			36.4	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	12	639	46	1150	74	52	31	131
v/c Ratio	0.05	0.31	0.11	0.50	0.26	0.13	0.10	0.28
Control Delay	14.4	17.7	7.3	8.1	46.6	14.3	43.1	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	17.7	7.3	8.1	46.6	14.3	43.1	12.8
Queue Length 50th (m)	1.9	59.1	2.7	36.6	16.8	1.3	6.8	5.0
Queue Length 95th (m)	5.5	66.3	5.0	38.6	29.2	10.6	14.6	18.4
Internal Link Dist (m)		278.5		341.9		126.6		117.6
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	257	2082	407	2280	283	392	311	467
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.31	0.11	0.50	0.26	0.13	0.10	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	512	24	39	963	3	62	5	39	26	14	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1821	3132		1485	3434		1771	1517		1737	1635	
Flt Permitted	0.20	1.00		0.39	1.00		0.64	1.00		0.72	1.00	
Satd. Flow (perm)	387	3132		614	3434		1202	1517		1322	1635	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	12	610	29	46	1146	4	74	6	46	31	17	114
RTOR Reduction (vph)	0	2	0	0	0	0	0	35	0	0	83	0
Lane Group Flow (vph)	12	637	0	46	1150	0	74	17	0	31	48	0
Confl. Peds. (#/hr)	6		6	6		6	7		6	6		7
Heavy Vehicles (%)	0%	15%	27%	22%	6%	67%	2%	20%	6%	4%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	93.0	93.0		93.0	93.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	93.0	93.0		93.0	93.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66		0.24	0.24		0.24	0.24	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	257	2080		407	2281		283	357		311	385	
v/s Ratio Prot		0.20			c0.33			0.01			0.03	
v/s Ratio Perm	0.03			0.07			c0.06			0.02		
v/c Ratio	0.05	0.31		0.11	0.50		0.26	0.05		0.10	0.13	
Uniform Delay, d1	8.1	9.9		8.5	11.9		43.6	41.3		41.9	42.1	
Progression Factor	1.66	1.75		0.77	0.62		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.4		0.5	0.7		2.2	0.2		0.6	0.7	
Delay (s)	13.9	17.7		7.1	8.0		45.8	41.6		42.5	42.8	
Level of Service	B	B		A	A		D	D		D	D	
Approach Delay (s)		17.6			8.0			44.1			42.8	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2	768	28	1024	74	72	83	38
v/c Ratio	0.01	0.37	0.08	0.48	0.21	0.12	0.27	0.09
Control Delay	3.5	4.5	5.4	6.4	42.1	0.4	43.8	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.5	4.5	5.4	6.4	42.1	0.4	43.8	24.7
Queue Length 50th (m)	0.0	16.8	1.3	27.2	16.1	0.0	18.3	4.2
Queue Length 95th (m)	m0.3	19.3	m2.5	33.3	27.0	0.0	30.0	11.7
Internal Link Dist (m)		341.9		193.9		128.4		78.4
Turn Bay Length (m)	35.0		45.0		35.0		35.0	
Base Capacity (vph)	192	2066	358	2155	353	589	305	437
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.37	0.08	0.48	0.21	0.12	0.27	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	599	31	23	822	18	61	0	59	68	16	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1214	3209		1601	3351		1735	1541		1547	1607	
Flt Permitted	0.24	1.00		0.33	1.00		0.73	1.00		0.71	1.00	
Satd. Flow (perm)	300	3209		557	3351		1338	1541		1156	1607	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	2	730	38	28	1002	22	74	0	72	83	20	18
RTOR Reduction (vph)	0	3	0	0	1	0	0	53	0	0	13	0
Lane Group Flow (vph)	2	766	0	28	1023	0	74	19	0	83	25	0
Confl. Peds. (#/hr)	5					5	1					1
Heavy Vehicles (%)	50%	13%	11%	14%	8%	31%	5%	0%	6%	18%	7%	14%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	90.0	90.0		90.0	90.0		37.0	37.0		37.0	37.0	
Effective Green, g (s)	90.0	90.0		90.0	90.0		37.0	37.0		37.0	37.0	
Actuated g/C Ratio	0.64	0.64		0.64	0.64		0.26	0.26		0.26	0.26	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	192	2062		358	2154		353	407		305	424	
v/s Ratio Prot		0.24			c0.31			0.01			0.02	
v/s Ratio Perm	0.01			0.05			0.06			c0.07		
v/c Ratio	0.01	0.37		0.08	0.47		0.21	0.05		0.27	0.06	
Uniform Delay, d1	9.0	11.7		9.4	12.9		40.1	38.4		40.8	38.5	
Progression Factor	0.38	0.34		0.52	0.44		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.5		0.4	0.6		1.3	0.2		2.2	0.3	
Delay (s)	3.5	4.5		5.2	6.4		41.5	38.6		43.0	38.7	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		4.5			6.3			40.0			41.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	424	228	170	98	559	635	213	2101	35	179	968	153
v/c Ratio	1.11	0.42	0.30	0.28	0.70	1.12	0.62	1.04	0.06	0.98	0.59	0.26
Control Delay	145.8	23.6	2.5	29.6	55.2	114.6	25.5	72.1	0.2	125.8	38.4	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	145.8	23.6	2.5	29.6	55.2	114.6	25.5	72.1	0.2	125.8	38.4	4.1
Queue Length 50th (m)	~67.9	19.8	0.3	16.5	75.4	~170.9	30.4	~229.9	0.0	25.9	79.5	0.0
Queue Length 95th (m)	#99.5	48.4	6.1	28.7	95.8	#244.3	46.0	#258.1	0.0	#50.3	94.4	11.0
Internal Link Dist (m)		193.9			206.9			193.9			185.2	
Turn Bay Length (m)	55.0		45.0	45.0			85.0		50.0	100.0		125.0
Base Capacity (vph)	382	546	563	352	794	565	346	2016	613	183	1643	595
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.42	0.30	0.28	0.70	1.12	0.62	1.04	0.06	0.98	0.59	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	399	214	160	92	525	597	200	1975	33	168	910	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	2500	1900	1950	1900	1900	1900	1900
Total Lost time (s)	6.0	8.0	8.0	3.0	8.0	8.0	3.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3350	1700	1394	1648	3476	2003	1659	4893	1278	3100	4601	1359
Flt Permitted	0.95	1.00	1.00	0.62	1.00	1.00	0.19	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	325	1700	1394	1069	3476	2003	326	4893	1278	160	4601	1359
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	424	228	170	98	559	635	213	2101	35	179	968	153
RTOR Reduction (vph)	0	0	115	0	0	108	0	0	21	0	0	98
Lane Group Flow (vph)	424	228	55	98	559	527	213	2101	14	179	968	55
Confl. Peds. (#/hr)	7		11	11		7	3		13	13		3
Heavy Vehicles (%)	11%	13%	14%	10%	5%	5%	10%	10%	23%	22%	14%	18%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Actuated Green, G (s)	16.0	45.0	45.0	38.0	32.0	32.0	71.0	57.7	57.7	8.3	50.0	50.0
Effective Green, g (s)	16.0	45.0	45.0	38.0	32.0	32.0	71.0	57.7	57.7	8.3	50.0	50.0
Actuated g/C Ratio	0.11	0.32	0.32	0.27	0.23	0.23	0.51	0.41	0.41	0.06	0.36	0.36
Clearance Time (s)	6.0	8.0	8.0	3.0	8.0	8.0	3.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	382	546	448	314	794	457	336	2016	526	183	1643	485
v/s Ratio Prot	c0.13	0.13		0.01	0.16		0.08	c0.43		c0.06	0.21	
v/s Ratio Perm			0.04	0.07		c0.26	0.24		0.01			0.04
v/c Ratio	1.11	0.42	0.12	0.31	0.70	1.15	0.63	1.04	0.03	0.98	0.59	0.11
Uniform Delay, d1	62.0	37.2	33.5	39.5	49.6	54.0	21.6	41.1	24.5	65.8	36.6	30.1
Progression Factor	1.26	0.57	0.25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	78.2	2.2	0.5	2.6	5.2	91.3	8.8	32.0	0.1	61.1	1.6	0.5
Delay (s)	156.4	23.3	9.1	42.1	54.8	145.3	30.4	73.2	24.6	126.8	38.2	30.6
Level of Service	F	C	A	D	D	F	C	E	C	F	D	C
Approach Delay (s)		89.0			98.3			68.6			49.5	
Approach LOS		F			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	73.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Queues
3: Kennedy Road & Derry Road East

7/14/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	165	1818	173	595	1338	226	72	290	278	360	1111	154
v/c Ratio	1.36	1.04	0.29	1.45	0.53	0.27	1.09	0.30	0.48	0.74	0.79	0.26
Control Delay	243.7	77.2	15.0	252.5	18.6	2.7	182.5	38.1	7.4	43.8	44.2	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	243.7	77.2	15.0	252.5	18.6	2.7	182.5	38.1	7.4	43.8	44.2	15.9
Queue Length 50th (m)	~59.8	~198.8	13.5	~121.9	75.8	4.3	~21.4	31.8	1.5	70.3	140.5	13.8
Queue Length 95th (m)	#105.8	#228.0	31.5	m#125.4	m76.1	m3.4	#54.2	44.2	23.2	97.2	166.4	30.2
Internal Link Dist (m)		267.1			518.3			268.1			273.7	
Turn Bay Length (m)	105.0		140.0	220.0		225.0	60.0		75.0	95.0		100.0
Base Capacity (vph)	121	1745	598	410	2539	843	69	1015	595	487	1464	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.36	1.04	0.29	1.45	0.53	0.27	1.04	0.29	0.47	0.74	0.76	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	1763	168	577	1298	219	70	281	270	349	1078	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2500	1900	1900	2300	2150	1900
Total Lost time (s)	8.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1706	4948	1512	3052	4856	1408	2125	3230	1306	2065	3897	1498
Flt Permitted	0.19	1.00	1.00	0.95	1.00	1.00	0.10	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	346	4948	1512	3052	4856	1408	221	3230	1306	1124	3897	1498
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	165	1818	173	595	1338	226	72	290	278	360	1111	154
RTOR Reduction (vph)	0	0	65	0	0	108	0	0	189	0	0	50
Lane Group Flow (vph)	165	1818	108	595	1338	118	72	290	89	360	1111	104
Heavy Vehicles (%)	7%	6%	8%	16%	8%	16%	13%	13%	25%	7%	6%	9%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Actuated Green, G (s)	49.4	49.4	49.4	18.8	73.2	73.2	42.2	42.2	42.2	50.8	50.8	50.8
Effective Green, g (s)	49.4	49.4	49.4	18.8	73.2	73.2	42.2	42.2	42.2	50.8	50.8	50.8
Actuated g/C Ratio	0.35	0.35	0.35	0.13	0.52	0.52	0.30	0.30	0.30	0.36	0.36	0.36
Clearance Time (s)	8.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	122	1745	533	409	2538	736	66	973	393	448	1414	543
v/s Ratio Prot		0.37		c0.19	0.28			0.09		0.03	c0.29	
v/s Ratio Perm	c0.48		0.07			0.08	c0.33		0.07	0.26		0.07
v/c Ratio	1.35	1.04	0.20	1.45	0.53	0.16	1.09	0.30	0.23	0.80	0.79	0.19
Uniform Delay, d1	45.3	45.3	31.6	60.6	22.0	17.4	48.9	37.5	36.7	39.8	39.7	30.5
Progression Factor	1.00	1.00	1.00	1.05	0.81	1.08	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	202.9	33.3	0.9	211.0	0.4	0.2	138.0	0.2	0.3	10.0	3.0	0.2
Delay (s)	248.2	78.6	32.4	274.4	18.2	19.0	186.9	37.7	37.0	49.8	42.7	30.7
Level of Service	F	E	C	F	B	B	F	D	D	D	D	C
Approach Delay (s)		87.9			88.9			54.2			43.1	
Approach LOS		F			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	73.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2203	1360	1567	723
v/c Ratio	0.85	0.54	1.23	1.30
Control Delay	12.3	10.9	146.4	182.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.3	10.9	146.4	182.1
Queue Length 50th (m)	49.5	39.0	~272.7	~275.0
Queue Length 95th (m)	m52.4	m57.7	#314.7	#357.6
Internal Link Dist (m)	518.3	377.8	224.2	
Turn Bay Length (m)				
Base Capacity (vph)	2591	2497	1278	557
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.85	0.54	1.23	1.30

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	2027	1251	0	1099	1007
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0	7.0
Lane Util. Factor		0.91	0.91		0.97	0.91
Frt		1.00	1.00		0.96	0.85
Flt Protected		1.00	1.00		0.96	1.00
Satd. Flow (prot)		4902	4725		3386	1443
Flt Permitted		1.00	1.00		0.96	1.00
Satd. Flow (perm)		4902	4725		3386	1443
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2203	1360	0	1195	1095
RTOR Reduction (vph)	0	0	0	0	21	21
Lane Group Flow (vph)	0	2203	1360	0	1546	702
Heavy Vehicles (%)	2%	7%	11%	2%	2%	3%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		74.0	74.0		52.0	52.0
Effective Green, g (s)		74.0	74.0		52.0	52.0
Actuated g/C Ratio		0.53	0.53		0.37	0.37
Clearance Time (s)		7.0	7.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2591	2497		1257	535
v/s Ratio Prot		c0.45	0.29		0.46	
v/s Ratio Perm						c0.49
v/c Ratio		0.85	0.54		1.23	1.31
Uniform Delay, d1		28.3	21.8		44.0	44.0
Progression Factor		0.38	0.47		1.00	1.00
Incremental Delay, d2		1.4	0.6		110.5	153.1
Delay (s)		12.2	10.9		154.5	197.1
Level of Service		B	B		F	F
Approach Delay (s)		12.2	10.9		168.0	
Approach LOS		B	B		F	

Intersection Summary			
HCM 2000 Control Delay	72.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	121.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2826	1226	1380	758
v/c Ratio	1.07	0.55	1.28dr	1.40
Control Delay	61.6	10.6	113.1	226.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	61.6	10.6	113.1	226.9
Queue Length 50th (m)	~326.7	94.8	~229.2	~307.6
Queue Length 95th (m)	m#293.8	68.0	#271.0	#390.4
Internal Link Dist (m)	377.8	410.9	103.4	
Turn Bay Length (m)				
Base Capacity (vph)	2629	2241	1211	540
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.07	0.55	1.14	1.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2656	0	0	1152	584	1426
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0			7.0	7.0	7.0
Lane Util. Factor	0.91			0.91	0.97	0.91
Frt	1.00			1.00	0.92	0.85
Flt Protected	1.00			1.00	0.98	1.00
Satd. Flow (prot)	5043			4299	3202	1429
Flt Permitted	1.00			1.00	0.98	1.00
Satd. Flow (perm)	5043			4299	3202	1429
Peak-hour factor, PHF	0.94	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	2826	0	0	1226	621	1517
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	2826	0	0	1226	1380	758
Heavy Vehicles (%)	4%	2%	2%	22%	5%	4%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	73.0			73.0	53.0	53.0
Effective Green, g (s)	73.0			73.0	53.0	53.0
Actuated g/C Ratio	0.52			0.52	0.38	0.38
Clearance Time (s)	7.0			7.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2629			2241	1212	540
v/s Ratio Prot	c0.56			0.29	0.43	
v/s Ratio Perm						c0.53
v/c Ratio	1.07			0.55	1.28dr	1.40
Uniform Delay, d1	33.5			22.4	43.5	43.5
Progression Factor	0.74			0.43	1.00	1.00
Incremental Delay, d2	36.1			0.8	72.8	192.6
Delay (s)	61.0			10.5	116.3	236.1
Level of Service	E			B	F	F
Approach Delay (s)	61.0			10.5	158.8	
Approach LOS	E			B	F	

Intersection Summary			
HCM 2000 Control Delay	84.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	121.8%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	364	1957	632	203	1061	37	125	324	33	761	251
v/c Ratio	0.85	0.89	0.80	0.94	0.62	0.06	0.77	0.33	0.16	0.93	0.53
Control Delay	23.8	39.7	28.1	102.2	12.2	0.1	93.5	31.7	44.5	70.0	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	39.7	28.1	102.2	12.2	0.1	93.5	31.7	44.5	70.0	11.6
Queue Length 50th (m)	62.2	185.6	118.8	46.0	19.1	0.0	17.9	31.1	7.3	109.2	4.3
Queue Length 95th (m)	m52.9	m153.7	m92.9	m#90.0	24.1	m0.0	#33.8	44.1	16.9	#145.5	29.6
Internal Link Dist (m)		410.9			1342.9			365.8		212.8	
Turn Bay Length (m)	190.0		195.0	215.0		75.0	275.0		90.0		75.0
Base Capacity (vph)	497	2191	793	215	1701	598	163	991	202	820	470
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.89	0.80	0.94	0.62	0.06	0.77	0.33	0.16	0.93	0.53

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	353	1898	613	197	1029	36	121	235	80	32	738	243
Ideal Flow (vphpl)	2075	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1812	4948	1541	1630	4483	1384	2855	2883		1426	3380	1219
Flt Permitted	0.17	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.56	1.00	1.00
Satd. Flow (perm)	317	4948	1541	129	4483	1384	2855	2883		834	3380	1219
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	364	1957	632	203	1061	37	125	242	82	33	761	251
RTOR Reduction (vph)	0	0	111	0	0	23	0	24	0	0	0	175
Lane Group Flow (vph)	364	1957	521	203	1061	14	125	300	0	33	761	76
Heavy Vehicles (%)	10%	6%	6%	12%	17%	18%	24%	19%	30%	28%	8%	34%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6				4		4
Actuated Green, G (s)	79.0	62.0	62.0	67.1	53.1	53.1	8.0	47.0		34.0	34.0	34.0
Effective Green, g (s)	79.0	62.0	62.0	67.1	53.1	53.1	8.0	47.0		34.0	34.0	34.0
Actuated g/C Ratio	0.56	0.44	0.44	0.48	0.38	0.38	0.06	0.34		0.24	0.24	0.24
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	423	2191	682	211	1700	524	163	967		202	820	296
v/s Ratio Prot	c0.14	0.40		c0.10	0.24		c0.04	0.10			c0.23	
v/s Ratio Perm	0.34		0.34	c0.36		0.01				0.04		0.06
v/c Ratio	0.86	0.89	0.76	0.96	0.62	0.03	0.77	0.31		0.16	0.93	0.26
Uniform Delay, d1	25.6	35.9	32.8	41.3	35.3	27.2	65.1	34.5		41.8	51.8	42.8
Progression Factor	0.99	1.08	1.19	1.74	0.30	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.8	0.6	0.8	42.8	1.3	0.1	19.2	0.8		1.7	18.1	2.1
Delay (s)	27.1	39.4	39.8	114.6	11.9	27.3	84.2	35.3		43.5	69.9	44.9
Level of Service	C	D	D	F	B	C	F	D		D	E	D
Approach Delay (s)		37.9			28.3			48.9			63.1	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	341	2578	162	444	1064	24	77	927	417	169	1605	177
v/c Ratio	0.77	1.12	0.26	1.16	0.73	0.05	0.45	0.72	0.75	0.76	1.13	0.36
Control Delay	81.2	85.4	2.0	150.3	45.7	0.2	72.5	49.2	27.7	85.9	112.3	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	85.4	2.0	150.3	45.7	0.2	72.5	49.2	27.7	85.9	112.3	9.9
Queue Length 50th (m)	42.0	~305.7	4.2	~74.7	96.1	0.0	10.8	85.1	45.0	24.1	~188.0	4.2
Queue Length 95th (m)	m51.5	#329.4	m5.3	#108.5	115.6	0.0	19.3	101.3	87.4	#40.6	#217.5	22.8
Internal Link Dist (m)		1342.9			444.1			341.5			298.1	
Turn Bay Length (m)	160.0		120.0	225.0		120.0	100.0		90.0	130.0		100.0
Base Capacity (vph)	501	2303	615	383	1459	477	172	1295	557	223	1422	489
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.12	0.26	1.16	0.73	0.05	0.45	0.72	0.75	0.76	1.13	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	321	2423	152	417	1000	23	72	871	392	159	1509	166
Ideal Flow (vphpl)	1900	2500	1900	2150	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3190	6449	1512	3577	4483	1142	3026	4641	1361	3133	4856	1296
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3190	6449	1512	3577	4483	1142	3026	4641	1361	3133	4856	1296
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	341	2578	162	444	1064	24	77	927	417	169	1605	177
RTOR Reduction (vph)	0	0	75	0	0	16	0	0	177	0	0	110
Lane Group Flow (vph)	341	2578	87	444	1064	8	77	927	240	169	1605	67
Heavy Vehicles (%)	11%	7%	8%	12%	17%	43%	17%	13%	20%	13%	8%	26%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	19.4	50.0	50.0	15.0	45.6	45.6	8.0	39.1	39.1	9.9	41.0	41.0
Effective Green, g (s)	19.4	50.0	50.0	15.0	45.6	45.6	8.0	39.1	39.1	9.9	41.0	41.0
Actuated g/C Ratio	0.14	0.36	0.36	0.11	0.33	0.33	0.06	0.28	0.28	0.07	0.29	0.29
Clearance Time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	442	2303	540	383	1460	371	172	1296	380	221	1422	379
v/s Ratio Prot	0.11	c0.40		c0.12	0.24		0.03	0.20		c0.05	c0.33	
v/s Ratio Perm			0.06			0.01			0.18			0.05
v/c Ratio	0.77	1.12	0.16	1.16	0.73	0.02	0.45	0.72	0.63	0.76	1.13	0.18
Uniform Delay, d1	58.2	45.0	30.7	62.5	41.7	32.0	63.9	45.4	44.1	63.9	49.5	36.9
Progression Factor	1.22	0.57	0.11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.8	59.2	0.5	97.0	3.2	0.1	1.9	1.9	3.4	14.5	67.4	0.2
Delay (s)	78.0	84.8	3.9	159.5	45.0	32.2	65.7	47.3	47.5	78.4	116.9	37.1
Level of Service	E	F	A	F	D	C	E	D	D	E	F	D
Approach Delay (s)		79.8			77.9			48.4			106.4	
Approach LOS		E			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	80.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Queues
3: Kennedy Road & Derry Road East

7/14/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	262	1471	80	433	2591	514	119	1047	451	154	389	148
v/c Ratio	1.41	0.90	0.14	0.99	1.09	0.74	0.41	0.96	0.69	1.10	0.31	0.22
Control Delay	241.6	52.9	1.6	79.3	74.0	20.8	43.2	66.0	20.6	136.2	31.8	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	241.6	52.9	1.6	79.3	74.0	20.8	43.2	66.0	20.6	136.2	31.8	7.5
Queue Length 50th (m)	~75.0	141.7	0.0	62.2	~294.5	61.9	26.0	149.8	39.9	~29.9	39.9	3.7
Queue Length 95th (m)	#130.4	161.9	2.8	m#83.2	#318.7	m59.9	45.2	#193.1	80.3	#75.5	53.2	17.8
Internal Link Dist (m)		267.1			518.3			268.1			273.7	
Turn Bay Length (m)	105.0		140.0	220.0		225.0	60.0		75.0	95.0		100.0
Base Capacity (vph)	186	1639	558	439	2386	693	289	1092	655	140	1235	669
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.41	0.90	0.14	0.99	1.09	0.74	0.41	0.96	0.69	1.10	0.31	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	259	1456	79	429	2565	509	118	1037	446	152	385	147
Ideal Flow (vphpl)	2500	1900	1900	1900	2050	1900	1900	1900	1900	2050	1900	1900
Total Lost time (s)	3.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2224	4948	1432	3079	5441	1420	1674	3476	1458	1840	3288	1570
Flt Permitted	0.10	1.00	1.00	0.95	1.00	1.00	0.52	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	238	4948	1432	3079	5441	1420	920	3476	1458	166	3288	1570
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	262	1471	80	433	2591	514	119	1047	451	154	389	148
RTOR Reduction (vph)	0	0	53	0	0	71	0	0	197	0	0	79
Lane Group Flow (vph)	262	1471	27	433	2591	443	119	1047	254	154	389	69
Heavy Vehicles (%)	8%	6%	14%	15%	4%	15%	9%	5%	12%	7%	11%	4%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Actuated Green, G (s)	46.4	46.4	46.4	20.0	61.4	61.4	44.0	44.0	44.0	52.6	52.6	52.6
Effective Green, g (s)	46.4	46.4	46.4	20.0	61.4	61.4	44.0	44.0	44.0	52.6	52.6	52.6
Actuated g/C Ratio	0.33	0.33	0.33	0.14	0.44	0.44	0.31	0.31	0.31	0.38	0.38	0.38
Clearance Time (s)	3.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	178	1639	474	439	2386	622	289	1092	458	134	1235	589
v/s Ratio Prot	c0.07	0.30		0.14	c0.48			0.30		c0.05	0.12	
v/s Ratio Perm	c0.41		0.02			0.31	0.13		0.17	c0.38		0.04
v/c Ratio	1.47	0.90	0.06	0.99	1.09	0.71	0.41	0.96	0.56	1.15	0.31	0.12
Uniform Delay, d1	42.5	44.5	31.9	59.9	39.3	32.1	37.8	47.1	39.9	39.0	30.9	28.5
Progression Factor	1.00	1.00	1.00	0.86	0.80	0.69	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	240.2	8.2	0.2	27.2	43.1	3.6	1.0	17.9	1.5	123.4	0.1	0.1
Delay (s)	282.7	52.7	32.1	78.6	74.3	25.7	38.8	65.0	41.3	162.4	31.1	28.6
Level of Service	F	D	C	E	E	C	D	E	D	F	C	C
Approach Delay (s)		85.0			67.8			56.5			59.8	
Approach LOS		F			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	68.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	113.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1809	2857	642	299
v/c Ratio	0.56	0.87	0.86	0.90
Control Delay	6.9	12.2	62.2	80.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.9	12.2	62.2	80.3
Queue Length 50th (m)	37.2	160.6	85.4	85.8
Queue Length 95th (m)	m54.3	m163.8	107.9	#138.5
Internal Link Dist (m)	518.3	377.8	224.2	
Turn Bay Length (m)				
Base Capacity (vph)	3241	3272	810	358
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.56	0.87	0.79	0.84

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1755	2771	0	343	569
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0	7.0
Lane Util. Factor		0.91	0.91		0.97	0.91
Frt		1.00	1.00		0.93	0.85
Flt Protected		1.00	1.00		0.97	1.00
Satd. Flow (prot)		4948	4995		3060	1351
Flt Permitted		1.00	1.00		0.97	1.00
Satd. Flow (perm)		4948	4995		3060	1351
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1809	2857	0	354	587
RTOR Reduction (vph)	0	0	0	0	2	2
Lane Group Flow (vph)	0	1809	2857	0	640	297
Heavy Vehicles (%)	2%	6%	5%	2%	11%	10%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		91.7	91.7		34.3	34.3
Effective Green, g (s)		91.7	91.7		34.3	34.3
Actuated g/C Ratio		0.66	0.66		0.24	0.24
Clearance Time (s)		7.0	7.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3240	3271		749	330
v/s Ratio Prot		0.37	c0.57		0.21	
v/s Ratio Perm						c0.22
v/c Ratio		0.56	0.87		0.86	0.90
Uniform Delay, d1		13.1	19.5		50.5	51.2
Progression Factor		0.49	0.55		1.00	1.00
Incremental Delay, d2		0.3	0.9		9.4	26.3
Delay (s)		6.7	11.6		59.9	77.5
Level of Service		A	B		E	E
Approach Delay (s)		6.7	11.6		65.5	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1278	2810	1048	427
v/c Ratio	0.46	0.99	0.99	1.06
Control Delay	29.5	25.3	71.4	100.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.5	25.3	71.4	100.8
Queue Length 50th (m)	99.8	148.5	148.2	~130.0
Queue Length 95th (m)	97.9	m106.8	#194.0	#201.6
Internal Link Dist (m)	377.8	410.9	103.4	
Turn Bay Length (m)				
Base Capacity (vph)	2758	2836	1062	403
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	0.46	0.99	0.99	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1201	0	0	2641	941	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0			7.0	7.0	7.0
Lane Util. Factor	0.91			0.91	0.97	0.91
Frt	1.00			1.00	0.99	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	4768			4902	3298	1134
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	4768			4902	3298	1134
Peak-hour factor, PHF	0.94	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	1278	0	0	2810	1001	474
RTOR Reduction (vph)	0	0	0	0	3	39
Lane Group Flow (vph)	1278	0	0	2810	1045	388
Heavy Vehicles (%)	10%	2%	2%	7%	6%	31%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	81.0			81.0	45.0	45.0
Effective Green, g (s)	81.0			81.0	45.0	45.0
Actuated g/C Ratio	0.58			0.58	0.32	0.32
Clearance Time (s)	7.0			7.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2758			2836	1060	364
v/s Ratio Prot	0.27			c0.57	0.32	
v/s Ratio Perm						c0.34
v/c Ratio	0.46			0.99	0.99	1.07
Uniform Delay, d1	17.0			29.1	47.2	47.5
Progression Factor	1.70			0.74	1.00	1.00
Incremental Delay, d2	0.5			3.4	24.5	66.0
Delay (s)	29.3			24.8	71.7	113.5
Level of Service	C			C	E	F
Approach Delay (s)	29.3			24.8	83.8	
Approach LOS	C			C	F	

Intersection Summary			
HCM 2000 Control Delay	41.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	113	1333	121	91	2350	54	1303	1573	32	277	485
v/c Ratio	1.00	0.73	0.20	0.60	1.16	0.09	1.32	1.03	0.68	0.43	1.18
Control Delay	117.3	21.1	2.1	41.3	95.4	0.2	193.2	67.2	112.9	51.4	141.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	117.3	21.1	2.1	41.3	95.4	0.2	193.2	67.2	112.9	51.4	141.0
Queue Length 50th (m)	19.8	61.2	0.6	7.7	~274.8	0.0	~239.4	~241.9	8.3	35.6	~138.5
Queue Length 95th (m)	m#46.8	m73.0	m2.8	m13.1	m#267.6	m0.0	#281.2	#285.2	#27.1	49.7	#206.7
Internal Link Dist (m)		410.9			1342.9			365.8		212.8	
Turn Bay Length (m)	190.0		195.0	215.0		75.0	275.0		90.0		75.0
Base Capacity (vph)	113	1822	612	151	2021	615	988	1533	47	646	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.73	0.20	0.60	1.16	0.09	1.32	1.03	0.68	0.43	1.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	1253	114	86	2209	51	1225	1222	257	30	260	456
Ideal Flow (vphpl)	2075	1900	1900	1900	1975	1900	2500	1900	1900	1900	1900	2100
Total Lost time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1510	4725	1396	1722	5242	1445	4613	3380		1587	3230	1687
Flt Permitted	0.07	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.14	1.00	1.00
Satd. Flow (perm)	118	4725	1396	188	5242	1445	4613	3380		239	3230	1687
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	113	1333	121	91	2350	54	1303	1300	273	32	277	485
RTOR Reduction (vph)	0	0	74	0	0	33	0	13	0	0	0	75
Lane Group Flow (vph)	113	1333	47	91	2350	21	1303	1560	0	32	277	410
Heavy Vehicles (%)	32%	11%	17%	6%	4%	13%	1%	5%	6%	15%	13%	7%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6				4		4
Actuated Green, G (s)	60.0	54.0	54.0	60.0	54.0	54.0	30.0	63.0		28.0	28.0	28.0
Effective Green, g (s)	60.0	54.0	54.0	60.0	54.0	54.0	30.0	63.0		28.0	28.0	28.0
Actuated g/C Ratio	0.43	0.39	0.39	0.43	0.39	0.39	0.21	0.45		0.20	0.20	0.20
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	110	1822	538	146	2021	557	988	1521		47	646	337
v/s Ratio Prot	c0.04	0.28		0.03	c0.45		c0.28	0.46			0.09	
v/s Ratio Perm	0.40		0.03	0.24		0.01				0.13		c0.24
v/c Ratio	1.03	0.73	0.09	0.62	1.16	0.04	1.32	1.03		0.68	0.43	1.22
Uniform Delay, d1	35.6	36.8	27.3	27.1	43.0	26.8	55.0	38.5		51.9	49.0	56.0
Progression Factor	1.83	0.51	0.32	1.40	0.34	0.04	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	83.3	2.1	0.2	5.5	77.3	0.1	150.6	29.9		58.2	2.1	121.3
Delay (s)	148.7	21.0	9.0	43.4	91.9	1.1	205.6	68.4		110.0	51.1	177.3
Level of Service	F	C	A	D	F	A	F	E		F	D	F
Approach Delay (s)		29.3			88.2			130.6			130.6	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	96.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	112.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	453	1757	53	377	1612	139	120	2328	708	132	666	152
v/c Ratio	1.08	1.08	0.11	1.08	1.06	0.28	0.57	1.08	1.00	0.74	0.42	0.26
Control Delay	131.3	75.1	0.7	128.9	87.4	10.2	75.0	87.0	60.7	88.5	35.6	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	131.3	75.1	0.7	128.9	87.4	10.2	75.0	87.0	60.7	88.5	35.6	5.8
Queue Length 50th (m)	~69.4	~199.8	0.2	~60.0	~178.7	3.6	16.9	~262.6	138.8	18.9	51.3	0.0
Queue Length 95th (m)	m#99.7	m#225.4	m0.6	#91.9	#208.2	19.6	27.4	#289.8	#225.1	#34.1	63.1	14.8
Internal Link Dist (m)		1342.9			444.1			341.5			298.1	
Turn Bay Length (m)	160.0		120.0	225.0		120.0	100.0		90.0	130.0		100.0
Base Capacity (vph)	420	1634	503	348	1525	503	214	2159	709	179	1588	577
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.08	0.11	1.08	1.06	0.28	0.56	1.08	1.00	0.74	0.42	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	417	1616	49	347	1483	128	110	2142	651	121	613	140
Ideal Flow (vphpl)	2150	2300	1900	1900	2050	1900	1900	2300	1900	1900	1900	1900
Total Lost time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3676	5720	1471	3052	5338	1458	3340	6046	1484	3133	4521	1361
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3676	5720	1471	3052	5338	1458	3340	6046	1484	3133	4521	1361
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	453	1757	53	377	1612	139	120	2328	708	132	666	152
RTOR Reduction (vph)	0	0	38	0	0	86	0	0	179	0	0	99
Lane Group Flow (vph)	453	1757	15	377	1612	53	120	2328	529	132	666	53
Heavy Vehicles (%)	9%	11%	11%	16%	6%	12%	6%	5%	10%	13%	16%	20%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	16.0	40.0	40.0	16.0	40.0	40.0	8.8	50.0	50.0	8.0	49.2	49.2
Effective Green, g (s)	16.0	40.0	40.0	16.0	40.0	40.0	8.8	50.0	50.0	8.0	49.2	49.2
Actuated g/C Ratio	0.11	0.29	0.29	0.11	0.29	0.29	0.06	0.36	0.36	0.06	0.35	0.35
Clearance Time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	420	1634	420	348	1525	416	209	2159	530	179	1588	478
v/s Ratio Prot	0.12	c0.31		c0.12	0.30		0.04	c0.39		c0.04	0.15	
v/s Ratio Perm			0.01			0.04			0.36			0.04
v/c Ratio	1.08	1.08	0.04	1.08	1.06	0.13	0.57	1.08	1.00	0.74	0.42	0.11
Uniform Delay, d1	62.0	50.0	36.1	62.0	50.0	37.1	63.8	45.0	44.9	65.0	34.5	30.6
Progression Factor	1.23	0.62	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	62.9	44.0	0.1	72.4	39.8	0.6	3.8	44.3	38.2	14.6	0.2	0.1
Delay (s)	139.2	75.1	36.2	134.4	89.8	37.7	67.6	89.3	83.1	79.6	34.7	30.8
Level of Service	F	E	D	F	F	D	E	F	F	E	C	C
Approach Delay (s)		87.0			94.3			87.1			40.3	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	83.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		

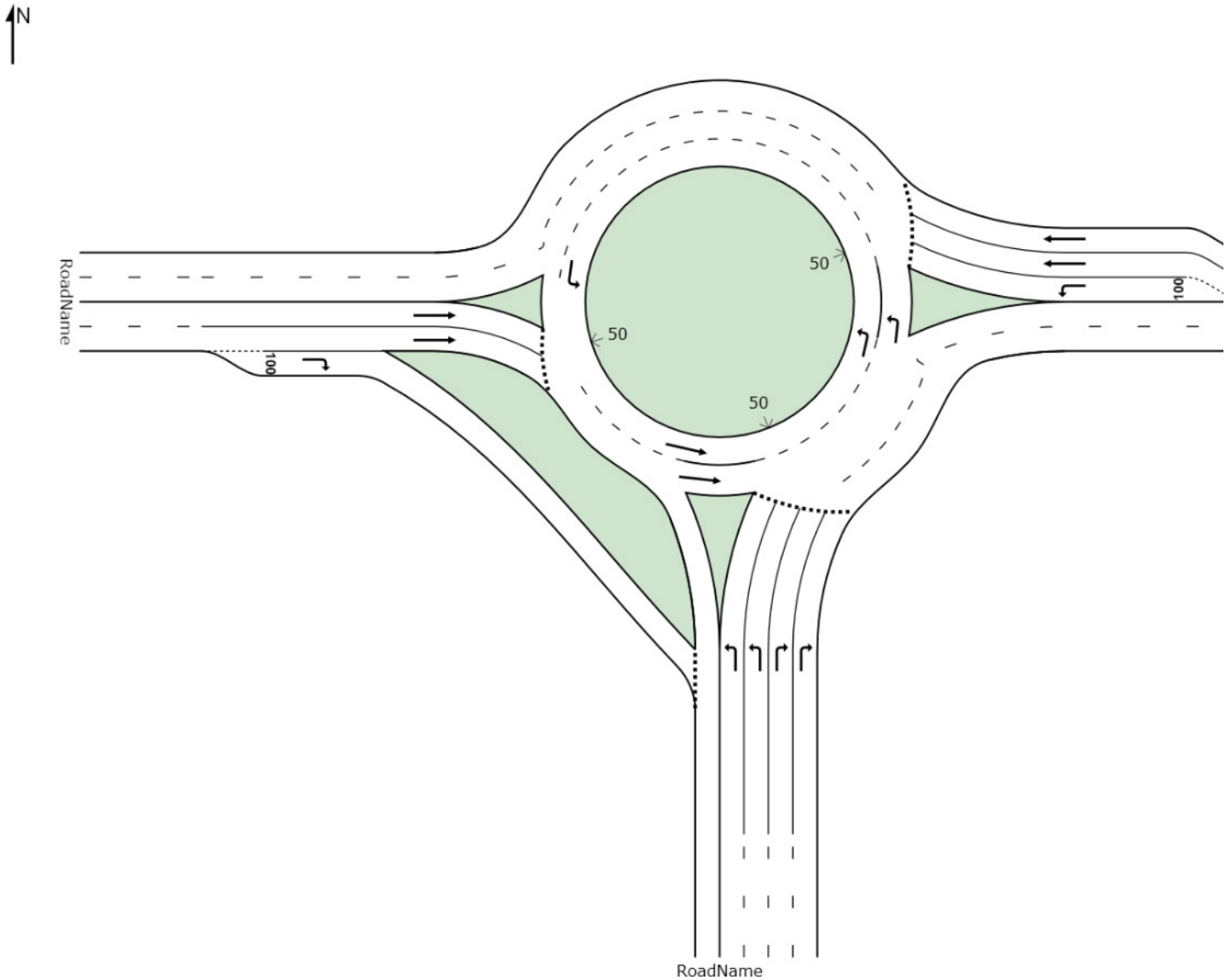
c Critical Lane Group

Appendix G
Roundabout Analysis Results

SITE LAYOUT

Site: 2031_East Terminal_FullIC_AM

New Site



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LANE SUMMARY

Site: 2031_East Terminal_FullIC_AM

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: RoadName													
Lane 1	383	8.0	249	1.540	100	298.3	LOS F	47.3	384.1	Full	500	0.0	0.0
Lane 2	383	8.0	249	1.540	100	298.3	LOS F	47.3	384.1	Full	500	0.0	0.0
Lane 3	404	6.0	253	1.593	100	320.1	LOS F	52.6	420.0	Full	500	0.0	0.1
Lane 4[d]	444	6.0	279	1.593	100	316.0	LOS F	57.3	457.4	Full	500	0.0	2.4
Approach	1614	6.9		1.593		308.6	LOS F	57.3	457.4				
East: RoadName													
Lane 1	78	0.0	755	0.103	100	5.8	LOS A	0.3	2.2	Short	100	0.0	0.0
Lane 2	319	31.0	577	0.553	100	16.5	LOS C	1.8	17.1	Full	500	0.0	0.0
Lane 3[d]	328	31.0	592	0.553	100	16.1	LOS C	1.7	16.3	Full	500	0.0	0.0
Approach	725	27.7		0.553		15.2	LOS C	1.8	17.1				
West: RoadName													
Lane 1	895	7.0	977	0.917	100	32.8	LOS D	14.0	112.5	Full	500	0.0	0.0
Lane 2[d]	895	7.0	977	0.917	100	32.8	LOS D	14.0	112.5	Full	500	0.0	0.0
Lane 3	225	0.0	1045	0.215	100	5.5	LOS A	0.9	6.9	Short	100	0.0	0.0
Approach	2016	6.2		0.917		29.7	LOS D	14.0	112.5				
Intersection	4354	10.1		1.593		130.7	LOS F	57.3	457.4				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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LANE SUMMARY

Site: 2031_East Terminal_FullIC_PM

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Hwy 410 NB Ramp													
Lane 1	133	32.0	447	0.297	100	12.9	LOS B	0.7	6.5	Full	500	0.0	0.0
Lane 2[d]	139	32.0	466	0.297	100	12.4	LOS B	0.6	6.2	Full	500	0.0	0.0
Lane 3	95	34.0	440	0.215	100	11.5	LOS B	0.5	4.4	Full	500	0.0	0.0
Lane 4	95	34.0	440	0.215	100	11.5	LOS B	0.5	4.4	Full	500	0.0	0.0
Approach	461	32.8		0.297		12.2	LOS B	0.7	6.5				
East: Courtneypark Drive													
Lane 1	721	0.0	864	0.835	100	25.5	LOS D	8.7	65.9	Short	100	0.0	0.0
Lane 2	1182	5.0	822	1.438	100	219.8	LOS F	129.7	1027.1	Full	500	0.0	34.0
Lane 3[d]	1204	5.0	837	1.438	100	219.5	LOS F	131.5	1041.4	Full	500	0.0	34.9
Approach	3107	3.8		1.438		174.6	LOS F	131.5	1041.4				
West: Courtneypark Drive													
Lane 1	358	21.0	454	0.789	100	35.6	LOS E	4.7	42.2	Full	500	0.0	0.0
Lane 2[d]	358	21.0	454	0.789	100	35.6	LOS E	4.7	42.2	Full	500	0.0	0.0
Lane 3	282	0.0	549	0.513	100	15.8	LOS C	2.6	19.4	Short	100	0.0	0.0
Approach	999	15.1		0.789		30.0	LOS D	4.7	42.2				
Intersection	4567	9.2		1.438		126.6	LOS F	131.5	1041.4				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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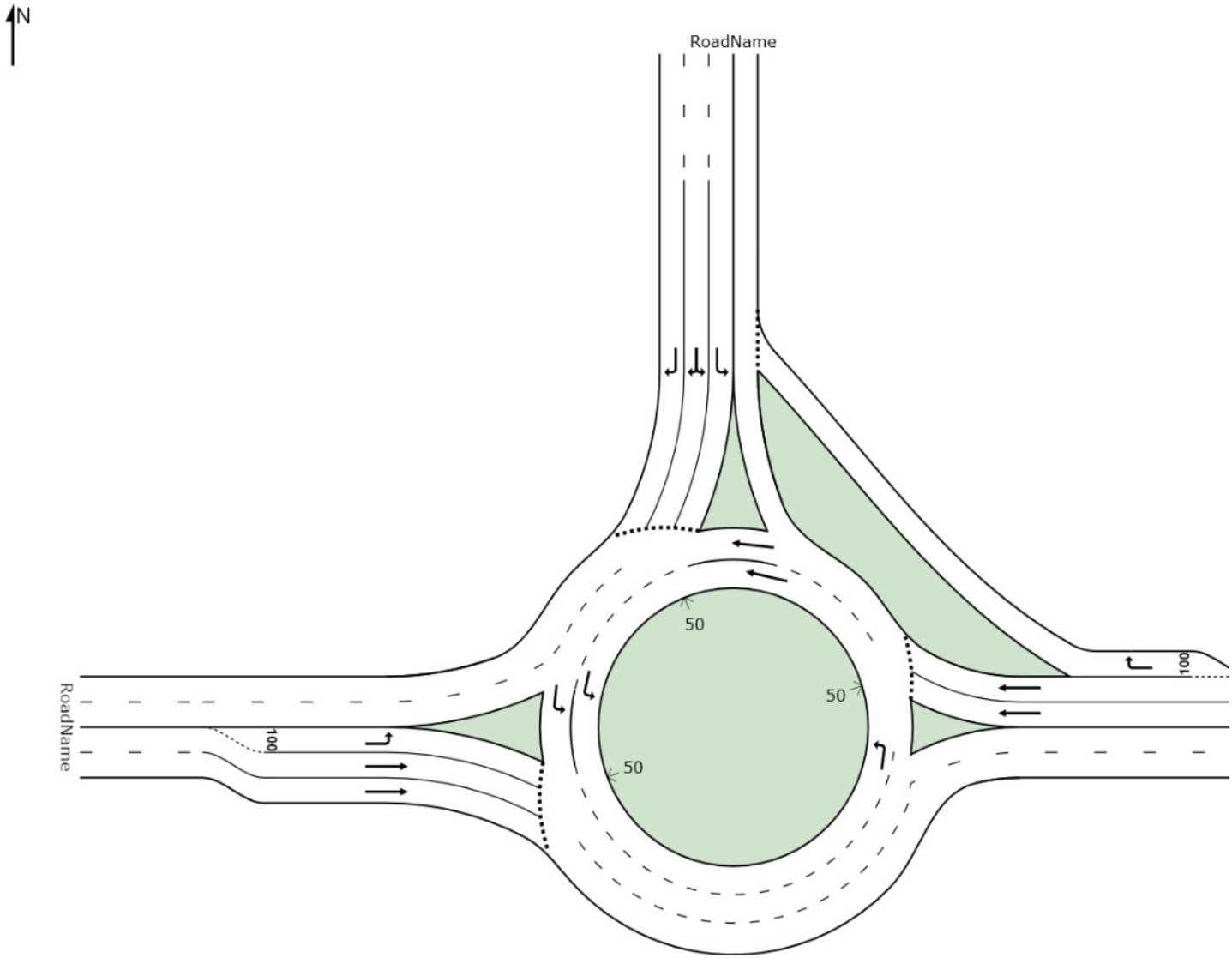
SITE LAYOUT

Site: 2031_West Terminal_FullIC_AM

New Site



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SIDRA INTERSECTION 6

LANE SUMMARY

Site: 2031_West Terminal_FullIC_AM

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: RoadName													
Lane 1	542	14.0	683	0.794	100	26.4	LOS D	6.7	56.8	Full	500	0.0	0.0
Lane 2[d]	542	14.0	683	0.794	100	26.4	LOS D	6.7	56.8	Full	500	0.0	0.0
Lane 3	281	42.0	548	0.512	100	15.8	LOS C	1.8	18.2	Short	100	0.0	0.0
Approach	1365	19.8		0.794		24.2	LOS C	6.7	56.8				
North: RoadName													
Lane 1	256	0.0	447	0.572	100	21.1	LOS C	2.3	17.2	Full	500	0.0	0.0
Lane 2[d]	272	0.0	476	0.572	100	20.1	LOS C	2.2	16.7	Full	500	0.0	0.0
Lane 3	256	0.0	447	0.572	100	21.1	LOS C	2.3	17.2	Full	500	0.0	0.0
Approach	784	0.0		0.572		20.8	LOS C	2.3	17.2				
West: RoadName													
Lane 1	268	39.0	642	0.417	100	11.6	LOS B	1.0	10.2	Short	100	0.0	0.0
Lane 2	873	7.0	835	1.046	100	65.9	LOS F	32.8	264.0	Full	500	0.0	0.0
Lane 3[d]	887	7.0	848	1.046	100	65.5	LOS F	32.5	261.7	Full	500	0.0	0.0
Approach	2028	11.2		1.046		58.5	LOS F	32.8	264.0				
Intersection	4177	11.9		1.046		40.2	LOS E	32.8	264.0				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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LANE SUMMARY

Site: 2031_West Terminal_FullIC_PM

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: RoadName													
Lane 1	986	10.0	677	1.456	100	231.3	LOS F	112.2	924.4	Full	500	0.0	28.0
Lane 2[d]	986	10.0	677	1.456	100	231.3	LOS F	112.2	924.4	Full	500	0.0	28.0
Lane 3	615	4.0	716	0.859	100	31.9	LOS D	10.1	79.2	Short	100	0.0	0.0
Approach	2588	8.6		1.456		183.9	LOS F	112.2	924.4				
North: RoadName													
Lane 1	65	0.0	370	0.177	52[5]	12.7	LOS B	0.5	3.6	Full	500	0.0	0.0
Lane 2	125	0.0	370	0.339	100	16.3	LOS C	1.0	7.8	Full	500	0.0	0.0
Lane 3[d]	135	0.0	398	0.339	100	15.3	LOS C	1.0	7.6	Full	500	0.0	0.0
Approach	326	0.0		0.339		15.2	LOS C	1.0	7.8				
West: RoadName													
Lane 1	365	14.0	944	0.387	100	8.1	LOS A	1.3	10.8	Short	100	0.0	0.0
Lane 2	440	21.0	889	0.495	100	10.4	LOS B	1.7	15.2	Full	500	0.0	0.0
Lane 3[d]	442	21.0	892	0.495	100	10.4	LOS B	1.6	14.2	Full	500	0.0	0.0
Approach	1247	18.9		0.495		9.7	LOS A	1.7	15.2				
Intersection	4160	11.0		1.456		118.5	LOS F	112.2	924.4				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane underutilisation determined by program
d Dominant lane on roundabout approach

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Appendix H

2031 Widening with Partial Interchange Analysis Results

Table 3: 2031 Future "Widening of Courtneypark Drive with Partial I/C" Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
Kennedy Road/ Courtneypark Drive E *Signalized*	EB	Left	D	46	0.40	37	E	66	0.83	72
		Triple Thru	D	53	0.82	129	D	50	0.55	64
		Right	D	37	0.07	12	D	43	0.09	16
	WB	Left	E	71	0.88	82	C	23	0.64	45
		Triple Thru	C	22	0.27	38	D	42	0.89	160
		Right	D	37	0.14	14	C	27	0.39	61
	NB	Left	D	45	0.64	26	C	25	0.48	33
		Dual Thru	D	42	0.44	69	D	41	0.77	168
		Right	D	39	0.17	21	C	28	0.12	15
	SB	Left	C	30	0.68	75	D	44	0.76	49
		Dual Thru	D	45	0.84	175	C	34	0.55	104
		Right	C	27	0.05	6	C	26	0.08	12
	Overall Intersection		***D***	***43***	***0.87***	**-**	***D***	***40***	***0.82***	**-**
Highway 410 West Terminal/ Courtneypark Drive E *Signalized*	EB	Left	A	7	0.71	30	C	26	0.84	103
		Triple Thru	A	< 1	0.31	< 1	A	< 1	0.14	< 1
	WB	Triple Thru	A	2	0.27	26	A	4	0.58	72
		Right	A	3	0.24	4	A	3	0.50	8
	Overall Intersection		***A***	***2***	***0.35***	**-**	***A***	***5***	***0.63***	**-**
Highway 410 East Terminal/ Courtneypark Drive E *Signalized*	EB	Triple Thru	C	31	0.68	105	A	3	0.22	8
	WB	Triple Thru	C	26	0.36	47	A	6	0.69	59
	NB	Dual Left	C	29	0.52	95	D	53	0.51	49
		Dual Right	C	34	0.69	128	D	46	0.09	11
	Overall Intersection		***C***	***30***	***0.69***	**-**	***B***	***11***	***0.65***	**-**
Tomken Road/ Courtneypark Drive E *Signalized*	EB	Left	D	45	0.76	76	F	121	0.91	56
		Triple Thru	D	38	0.67	90	C	26	0.25	32
		Right	E	79	1.08	305	C	31	0.12	8
	WB	Left	C	23	0.17	5	D	47	0.11	13
		Dual Thru-Thru/Right	C	23	0.22	19	E	71	0.97	169
	NB	Dual Left	E	57	0.36	43	F	83	0.92	99
		Dual Thru	B	19	0.26	53	D	46	0.90	226
		Right	B	17	0.05	11	C	23	0.03	0
	SB	Left	E	57	0.76	98	D	53	0.71	31
		Dual Thru	E	75	1.01	220	D	46	0.68	108
		Right	C	34	0.24	29	E	66	0.87	164
	Overall Intersection		***D***	***52***	***1.05***	**-**	***E***	***57***	***0.95***	**-**
Ordan Drive-Shawson Drive/ Courtneypark Drive E	EB	Left	A	2	0.21	6	A	9	0.25	3
		Dual Thru-Thru/Right	A	2	0.34	12	A	4	0.24	8
	WB	Left	A	9	0.20	16	B	10	0.16	8
		Dual Thru-Thru/Right	A	4	0.09	21	A	10	0.45	34

Table 3: 2031 Future "Widening of Courtneypark Drive with Partial I/C" Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
Signalized	NB	Left	D	50	0.09	10	C	34	0.35	48
		Thru/Right	D	49	0.06	12	C	28	0.06	12
	SB	Left	D	48	0.02	5	C	27	0.02	5
		Thru/Right	D	49	0.04	11	C	30	0.22	38
	Overall Intersection		***A***	***5***	***0.29***	**-**	***B***	***12***	***0.41***	**-**
Vipond Drive/ Courtneypark Drive E *Signalized*	EB	Left	B	11	0.16	26	A	7	0.05	2
		Dual Thru-Thru/Right	B	15	0.33	73	A	7	0.24	15
	WB	Left	B	16	0.17	9	B	13	0.13	14
		Dual Thru-Thru/Right	B	16	0.13	15	B	16	0.39	78
	NB	Left	D	42	0.05	9	D	37	0.20	26
		Thru/Right	D	42	0.05	12	C	34	0.04	10
	SB	Left	D	41	0.01	4	C	35	0.08	13
		Thru/Right	D	41	0.02	7	D	36	0.15	23
	Overall Intersection		***B***	***16***	***0.25***	**-**	***B***	***16***	***0.33***	**-**
Ordan Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	2	0.03	1	A	6	0.01	1
		Dual Thru-Thru/Right	A	2	0.33	4	A	7	0.28	23
	WB	Left	B	14	0.10	10	B	13	0.09	5
		Dual Thru-Thru/Right	B	12	0.18	33	B	15	0.36	40
	NB	Left	D	37	0.03	7	C	35	0.17	25
		Thru/Right	D	37	0.02	7	C	33	0.05	0
	SB	Left	D	39	0.12	14	D	36	0.22	28
		Thru/Right	D	37	0.02	6	C	33	0.05	11
	Overall Intersection		***A***	***7***	***0.26***	**-**	***B***	***14***	***0.31***	**-**
Dixie Road/ Courtneypark Drive E *Signalized*	EB	Dual Left	C	30	0.66	28	F	119	1.11	102
		Dual Thru	D	35	0.72	90	C	21	0.22	40
		Right	E	66	0.09	38	D	43	0.12	38
	WB	Left	D	54	0.25	13	D	42	0.31	29
		Dual Thru	E	58	0.35	24	D	55	0.70	96
		Right	E	56	0.10	6	F	145	1.15	244
	NB	Dual Left	E	64	0.53	29	E	68	0.62	43
		Triple Thru	C	27	0.46	89	E	73	1.04	258
		Right	C	21	0.06	0	C	25	0.03	0
	SB	Dual Left	E	63	0.76	70	F	127	0.98	50
		Triple Thru	C	22	0.58	127	D	36	0.56	91
		Right	B	18	0.26	17	C	29	0.11	11
	Overall Intersection		***C***	***33***	***0.68***	**-**	***E***	***73***	***1.08***	**-**

Table 3: 2031 Future "Partial I/C" Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
Kennedy Road/ Derry Road E *Signalized*	EB	Left	F	248	1.35	106	F	283	1.47	130
		Triple Thru	E	79	1.04	228	D	53	0.90	162
		Right	C	32	0.20	32	C	32	0.06	3
	WB	Dual Left	F	275	1.45	149	E	78	0.99	82
		Triple Thru	C	21	0.53	99	E	74	1.09	319
		Right	C	27	0.16	8	C	25	0.71	59
	NB	Left	F	187	1.09	54	D	39	0.41	45
		Dual Thru	D	38	0.30	44	E	65	0.96	193
		Right	D	37	0.23	23	D	41	0.56	80
	SB	Left	D	50	0.80	97	F	162	1.15	76
		Dual Thru	D	43	0.79	166	C	31	0.31	53
		Right	C	31	0.19	30	C	29	0.12	18
	Overall Intersection		***E***	***75***	***1.24***	**-**	***E***	***69***	***1.28***	**-**
Highway 410 West Terminal/ Derry Road E *Signalized*	EB	Triple Thru	B	14	0.92	53	A	7	0.56	54
	WB	Triple Thru	C	22	0.59	95	B	12	0.88	169
	SB	Dual Left	D	42	0.84	179	D	45	0.45	57
		Dual Right	D	53	0.94	206	E	67	0.90	118
	Overall Intersection		***C***	***29***	***0.93***	**-**	***B***	***18***	***0.88***	**-**
Highway 410 East Terminal/ Derry Road E *Signalized*	EB	Triple Thru	F	114	1.19	368	C	30	0.46	101
	WB	Triple Thru	B	12	0.61	84	C	25	0.99	107
	NB	Dual Left	C	29	0.43	77	E	62	0.93	178
		Dual Right	F	173	1.28	348	D	43	0.58	71
	Overall Intersection		***F***	***100***	***1.23***	**-**	***C***	***34***	***0.97***	**-**
Tomken Road/ Derry Road E *Signalized*	EB	Left	C	27	0.86	55	F	157	1.03	58
		Triple Thru	D	43	0.89	144	C	23	0.73	76
		Right	D	44	0.76	83	B	13	0.09	4
	WB	Left	F	115	0.96	90	D	43	0.62	13
		Triple Thru	B	12	0.62	24	F	92	1.16	268
		Right	C	27	0.03	< 1	A	1	0.04	0
	NB	Dual Left	F	84	0.77	34	F	206	1.32	281
		Thru-Thru/Right	D	35	0.31	44	E	68	1.03	285
	SB	Left	D	44	0.16	17	F	110	0.68	27
		Dual Thru	E	70	0.93	146	D	51	0.43	50
		Right	D	45	0.26	30	F	177	1.22	207
	Overall Intersection		***D***	***43***	***0.93***	**-**	***F***	***97***	***1.21***	**-**
Dixie Road/ Derry Road E *Signalized*	EB	Dual Left	E	78	0.77	52	F	139	1.08	100
		Triple Thru	F	85	1.12	329	E	75	1.08	226
		Right	A	4	0.16	5	D	36	0.04	1
	WB	Dual Left	F	160	1.16	109	F	134	1.08	92

Table 3: 2031 Future "Partial I/C" Conditions Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
		Triple Thru	D	45	0.73	116	F	90	1.06	208
		Right	C	32	0.02	< 1	D	38	0.13	20
	NB	Dual Left	E	66	0.45	19	E	68	0.57	27
		Triple Thru	D	47	0.72	101	F	89	1.08	290
		Right	D	48	0.63	87	F	83	1.00	225
	SB	Dual Left	E	78	0.76	41	E	80	0.74	34
		Triple Thru	F	117	1.13	218	C	35	0.42	63
		Right	D	37	0.18	23	C	31	0.11	15
	Overall Intersection		***F***	***80***	***1.12***	**-**	***F***	***84***	***1.05***	**-**

Queues
3: Kennedy Rd & Courtneypark Dr E

10/14/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	1133	95	220	572	185	84	418	223	304	1120	62
v/c Ratio	0.40	0.82	0.20	0.87	0.27	0.26	0.61	0.44	0.42	0.65	0.84	0.12
Control Delay	49.1	53.2	7.3	69.1	22.4	5.7	43.3	43.5	7.5	30.0	45.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	53.2	7.3	69.1	22.4	5.7	43.3	43.5	7.5	30.0	45.2	3.9
Queue Length 50th (m)	19.4	110.4	0.0	38.3	30.8	4.9	12.4	50.4	0.0	52.1	146.4	0.0
Queue Length 95th (m)	36.7	129.4	12.2	#82.2	37.5	14.2	#26.2	68.5	20.7	74.8	175.2	6.4
Internal Link Dist (m)		190.6			519.5			142.2			201.4	
Turn Bay Length (m)	65.0		50.0	95.0		50.0	100.0		50.0	85.0		50.0
Base Capacity (vph)	208	1378	482	279	2131	702	137	946	536	493	1340	530
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.82	0.20	0.79	0.27	0.26	0.61	0.44	0.42	0.62	0.84	0.12

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	1099	92	213	555	179	81	405	216	295	1086	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1636	4856	1445	1484	4812	1353	1600	3318	1324	1628	3411	1230
Flt Permitted	0.43	1.00	1.00	0.09	1.00	1.00	0.13	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	734	4856	1445	146	4812	1353	221	3318	1324	668	3411	1230
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	84	1133	95	220	572	185	84	418	223	304	1120	62
RTOR Reduction (vph)	0	0	68	0	0	103	0	0	159	0	0	38
Lane Group Flow (vph)	84	1133	27	220	572	82	84	418	64	304	1120	24
Confl. Peds. (#/hr)	7		10	10		7	34		5	5		34
Heavy Vehicles (%)	11%	8%	10%	23%	9%	18%	14%	10%	21%	12%	7%	25%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	39.7	39.7	39.7	62.0	62.0	62.0	45.9	39.9	39.9	64.0	55.0	55.0
Effective Green, g (s)	39.7	39.7	39.7	62.0	62.0	62.0	45.9	39.9	39.9	64.0	55.0	55.0
Actuated g/C Ratio	0.28	0.28	0.28	0.44	0.44	0.44	0.33	0.28	0.28	0.46	0.39	0.39
Clearance Time (s)	7.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	208	1377	409	249	2131	599	131	945	377	450	1340	483
v/s Ratio Prot		0.23		c0.12	0.12		0.03	0.13		c0.10	c0.33	
v/s Ratio Perm	0.11		0.02	c0.27		0.06	0.18		0.05	0.21		0.02
v/c Ratio	0.40	0.82	0.07	0.88	0.27	0.14	0.64	0.44	0.17	0.68	0.84	0.05
Uniform Delay, d1	40.6	46.9	36.6	39.8	24.7	23.1	35.0	40.9	37.6	25.9	38.4	26.3
Progression Factor	1.00	1.00	1.00	1.08	0.89	1.56	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.7	5.7	0.3	28.2	0.3	0.5	10.3	1.5	1.0	4.0	6.3	0.2
Delay (s)	46.3	52.5	36.9	71.1	22.3	36.6	45.3	42.4	38.6	29.9	44.7	26.5
Level of Service	D	D	D	E	C	D	D	D	D	C	D	C
Approach Delay (s)		51.0			36.0			41.6			40.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR
Lane Group Flow (vph)	268	1530	1084	281
v/c Ratio	0.69	0.31	0.27	0.27
Control Delay	16.8	0.1	1.7	1.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.8	0.1	1.7	1.1
Queue Length 50th (m)	20.7	0.0	4.0	0.0
Queue Length 95th (m)	m30.2	0.0	26.4	4.4
Internal Link Dist (m)		519.5	363.3	
Turn Bay Length (m)	95.0			240.0
Base Capacity (vph)	697	4902	4008	1037
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	0.38	0.31	0.27	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	252	1438	1019	264	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	8.0	8.0	8.0		
Lane Util. Factor	1.00	0.91	0.91	1.00		
Frt	1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1313	4902	4601	1150		
Flt Permitted	0.25	1.00	1.00	1.00		
Satd. Flow (perm)	342	4902	4601	1150		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	268	1530	1084	281	0	0
RTOR Reduction (vph)	0	0	0	36	0	0
Lane Group Flow (vph)	268	1530	1084	245	0	0
Heavy Vehicles (%)	39%	7%	14%	42%	0%	0%
Turn Type	pm+pt	NA	NA	Perm		
Protected Phases	7	4	8			
Permitted Phases	4			8		
Actuated Green, G (s)	132.0	140.0	122.0	122.0		
Effective Green, g (s)	132.0	140.0	122.0	122.0		
Actuated g/C Ratio	0.94	1.00	0.87	0.87		
Clearance Time (s)	2.0	8.0	8.0	8.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	377	4902	4009	1002		
v/s Ratio Prot	c0.04	c0.31	0.24			
v/s Ratio Perm	0.63			0.21		
v/c Ratio	0.71	0.31	0.27	0.24		
Uniform Delay, d1	0.3	0.0	1.5	1.5		
Progression Factor	6.91	1.00	0.90	1.97		
Incremental Delay, d2	4.6	0.1	0.2	0.5		
Delay (s)	7.0	0.1	1.5	3.4		
Level of Service	A	A	A	A		
Approach Delay (s)		1.1	1.9		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM 2000 Control Delay	1.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1484	647	766	848
v/c Ratio	0.68	0.36	0.52	0.69
Control Delay	31.2	25.8	29.2	33.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.2	25.8	29.2	33.5
Queue Length 50th (m)	84.4	36.5	77.2	102.5
Queue Length 95th (m)	105.2	46.8	95.4	128.3
Internal Link Dist (m)	363.3	449.2	155.5	
Turn Bay Length (m)				
Base Capacity (vph)	2170	1773	1475	1230
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.36	0.52	0.69

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1425	0	0	621	735	814
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0			8.0	7.0	7.0
Lane Util. Factor	0.91			0.91	0.97	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	4902			4004	3278	2711
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	4902			4004	3278	2711
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1484	0	0	647	766	848
RTOR Reduction (vph)	0	0	0	0	0	10
Lane Group Flow (vph)	1484	0	0	647	766	838
Heavy Vehicles (%)	7%	0%	0%	31%	8%	6%
Turn Type	NA			NA	Perm	Prot
Protected Phases	2			6		4
Permitted Phases					4	
Actuated Green, G (s)	62.0			62.0	63.0	63.0
Effective Green, g (s)	62.0			62.0	63.0	63.0
Actuated g/C Ratio	0.44			0.44	0.45	0.45
Clearance Time (s)	8.0			8.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2170			1773	1475	1219
v/s Ratio Prot	c0.30			0.16		c0.31
v/s Ratio Perm					0.23	
v/c Ratio	0.68			0.36	0.52	0.69
Uniform Delay, d1	31.2			25.9	27.6	30.7
Progression Factor	0.94			0.97	1.00	1.00
Incremental Delay, d2	1.7			0.6	1.3	3.2
Delay (s)	31.0			25.7	28.9	33.8
Level of Service	C			C	C	C
Approach Delay (s)	31.0			25.7	31.5	
Approach LOS	C			C	C	

Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	1240	854	13	347	139	418	55	233	1168	197
v/c Ratio	0.76	0.67	1.03	0.17	0.24	0.36	0.26	0.08	0.76	1.01	0.39
Control Delay	47.7	37.6	60.1	24.8	18.6	59.7	20.9	9.4	58.3	74.0	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	37.6	60.1	24.8	18.6	59.7	20.9	9.4	58.3	74.0	11.3
Queue Length 50th (m)	52.7	87.7	~206.1	2.4	20.0	18.2	33.0	2.1	57.2	~172.7	8.3
Queue Length 95th (m)	75.5	90.3	#304.7	5.2	18.6	#42.7	52.7	10.9	#97.9	#220.2	28.5
Internal Link Dist (m)		449.2			466.9		171.2			190.6	
Turn Bay Length (m)	120.0		100.0	50.0		80.0		50.0	130.0		85.0
Base Capacity (vph)	445	2297	826	94	1812	387	1593	703	307	1158	505
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.54	1.03	0.14	0.19	0.36	0.26	0.08	0.76	1.01	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	1153	794	12	261	61	129	389	51	217	1086	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	5.0	8.0	8.0		5.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	4948	1517	1545	3846		2745	3067	1319	1679	3380	1182
Flt Permitted	0.54	1.00	1.00	0.13	1.00		0.95	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	959	4948	1517	204	3846		2745	3067	1319	897	3380	1182
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	272	1240	854	13	281	66	139	418	55	233	1168	197
RTOR Reduction (vph)	0	0	15	0	33	0	0	0	19	0	0	101
Lane Group Flow (vph)	272	1240	839	13	314	0	139	418	36	233	1168	96
Confl. Peds. (#/hr)	4		7	7		4	3		9	9		3
Heavy Vehicles (%)	7%	6%	6%	18%	29%	45%	29%	19%	21%	8%	8%	36%
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	52.3	52.3	72.0	52.3	52.3		19.7	72.7	72.7	48.0	48.0	48.0
Effective Green, g (s)	52.3	52.3	72.0	52.3	52.3		19.7	72.7	72.7	48.0	48.0	48.0
Actuated g/C Ratio	0.37	0.37	0.51	0.37	0.37		0.14	0.52	0.52	0.34	0.34	0.34
Clearance Time (s)	8.0	8.0	5.0	8.0	8.0		5.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	358	1848	780	76	1436		386	1592	684	307	1158	405
v/s Ratio Prot		0.25	c0.15		0.08		0.05	0.14			c0.35	
v/s Ratio Perm	0.28		0.40	0.06					0.03	0.26		0.08
v/c Ratio	0.76	0.67	1.08	0.17	0.22		0.36	0.26	0.05	0.76	1.01	0.24
Uniform Delay, d1	38.4	36.7	34.0	29.3	29.9		54.4	18.7	16.6	40.9	46.0	32.9
Progression Factor	0.99	1.00	0.84	0.76	0.75		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.7	0.7	50.2	1.1	0.1		2.6	0.4	0.1	16.1	28.6	1.4
Delay (s)	44.8	37.5	78.8	23.4	22.6		57.0	19.1	16.8	56.9	74.6	34.3
Level of Service	D	D	E	C	C		E	B	B	E	E	C
Approach Delay (s)		53.2			22.7			27.5			67.0	
Approach LOS		D			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	107.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	1217	49	291	14	33	4	42
v/c Ratio	0.21	0.34	0.20	0.09	0.09	0.13	0.02	0.17
Control Delay	2.1	1.7	9.3	4.4	50.5	25.0	48.8	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	1.7	9.3	4.4	50.5	25.0	48.8	16.8
Queue Length 50th (m)	4.0	11.5	3.7	7.5	3.3	2.4	0.9	0.5
Queue Length 95th (m)	m5.6	11.8	15.7	20.5	10.0	12.1	4.5	11.1
Internal Link Dist (m)		466.9		278.5		123.7		151.6
Turn Bay Length (m)	45.0		30.0		35.0		35.0	
Base Capacity (vph)	737	3529	249	3128	163	252	193	248
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.34	0.20	0.09	0.09	0.13	0.02	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	1096	97	48	280	5	14	10	23	4	2	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1680	4786		1547	4253		1244	1362		1460	1255	
Flt Permitted	0.57	1.00		0.21	1.00		0.73	1.00		0.74	1.00	
Satd. Flow (perm)	1002	4786		338	4253		955	1362		1131	1255	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	152	1118	99	49	286	5	14	10	23	4	2	40
RTOR Reduction (vph)	0	7	0	0	1	0	0	19	0	0	33	0
Lane Group Flow (vph)	152	1210	0	49	290	0	14	14	0	4	9	0
Confl. Peds. (#/hr)	3					3	3					3
Heavy Vehicles (%)	8%	8%	11%	18%	23%	20%	46%	11%	33%	25%	50%	28%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	103.0	103.0		103.0	103.0		24.0	24.0		24.0	24.0	
Effective Green, g (s)	103.0	103.0		103.0	103.0		24.0	24.0		24.0	24.0	
Actuated g/C Ratio	0.74	0.74		0.74	0.74		0.17	0.17		0.17	0.17	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	737	3521		248	3128		163	233		193	215	
v/s Ratio Prot		c0.25			0.07			0.01			0.01	
v/s Ratio Perm	0.15			0.14			c0.01			0.00		
v/c Ratio	0.21	0.34		0.20	0.09		0.09	0.06		0.02	0.04	
Uniform Delay, d1	5.8	6.5		5.7	5.2		48.8	48.6		48.2	48.4	
Progression Factor	0.26	0.24		1.22	0.83		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.2		1.8	0.1		1.0	0.5		0.2	0.4	
Delay (s)	2.0	1.8		8.8	4.4		49.8	49.0		48.4	48.8	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		1.8			5.1			49.3			48.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	1018	50	373	13	39	4	16
v/c Ratio	0.16	0.33	0.17	0.13	0.05	0.11	0.01	0.05
Control Delay	11.3	14.5	16.5	14.3	42.3	19.3	41.2	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	14.5	16.5	14.3	42.3	19.3	41.2	20.1
Queue Length 50th (m)	16.7	73.8	8.0	20.9	2.8	2.1	0.9	0.4
Queue Length 95th (m)	26.4	73.2	9.2	15.4	8.7	11.7	4.1	6.5
Internal Link Dist (m)		278.5		341.9		126.6		117.6
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	655	3111	291	2836	251	370	330	351
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.33	0.17	0.13	0.05	0.11	0.01	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	916	81	49	329	36	13	10	28	4	2	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1797	4672		1643	4257		1360	1480		1822	1447	
Flt Permitted	0.52	1.00		0.25	1.00		0.75	1.00		0.73	1.00	
Satd. Flow (perm)	987	4672		439	4257		1069	1480		1403	1447	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	107	935	83	50	336	37	13	10	29	4	2	14
RTOR Reduction (vph)	0	7	0	0	9	0	0	22	0	0	11	0
Lane Group Flow (vph)	107	1011	0	50	364	0	13	17	0	4	5	0
Confl. Peds. (#/hr)	3		1	1		3	5		1	1		5
Heavy Vehicles (%)	1%	11%	7%	11%	23%	3%	33%	0%	19%	0%	50%	8%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	93.0	93.0		93.0	93.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	93.0	93.0		93.0	93.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66		0.24	0.24		0.24	0.24	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	655	3103		291	2827		251	348		330	341	
v/s Ratio Prot		c0.22			0.09			0.01			0.00	
v/s Ratio Perm	0.11			0.11			c0.01			0.00		
v/c Ratio	0.16	0.33		0.17	0.13		0.05	0.05		0.01	0.02	
Uniform Delay, d1	8.8	10.1		8.9	8.6		41.4	41.4		41.0	41.0	
Progression Factor	1.19	1.44		1.62	1.79		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.3		1.3	0.1		0.4	0.3		0.1	0.1	
Delay (s)	11.1	14.8		15.7	15.5		41.8	41.6		41.1	41.1	
Level of Service	B	B		B	B		D	D		D	D	
Approach Delay (s)		14.4			15.5			41.7			41.1	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	13	952	30	507	11	20	27	12
v/c Ratio	0.03	0.33	0.10	0.19	0.03	0.05	0.12	0.04
Control Delay	1.8	1.7	14.8	10.6	37.2	19.3	39.6	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.8	1.7	14.8	10.6	37.2	19.3	39.6	24.8
Queue Length 50th (m)	0.1	3.1	1.9	10.3	2.2	1.0	5.6	1.0
Queue Length 95th (m)	0.5	4.2	m10.1	32.8	7.2	7.4	13.7	6.2
Internal Link Dist (m)		341.9		193.9		128.4		78.4
Turn Bay Length (m)	35.0		45.0		35.0		35.0	
Base Capacity (vph)	502	2876	313	2714	401	415	228	318
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.33	0.10	0.19	0.03	0.05	0.12	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	795	100	28	402	74	10	5	14	25	5	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.89		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1667	4560		1753	4288		1825	1454		1049	1126	
Flt Permitted	0.46	1.00		0.27	1.00		0.75	1.00		0.74	1.00	
Satd. Flow (perm)	799	4560		499	4288		1440	1454		822	1126	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	13	846	106	30	428	79	11	5	15	27	5	7
RTOR Reduction (vph)	0	11	0	0	19	0	0	11	0	0	5	0
Lane Group Flow (vph)	13	941	0	30	488	0	11	9	0	27	7	0
Confl. Peds. (#/hr)	3		2	2		3						
Heavy Vehicles (%)	9%	14%	3%	4%	18%	24%	0%	0%	23%	74%	40%	67%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	88.0	88.0		88.0	88.0		39.0	39.0		39.0	39.0	
Effective Green, g (s)	88.0	88.0		88.0	88.0		39.0	39.0		39.0	39.0	
Actuated g/C Ratio	0.63	0.63		0.63	0.63		0.28	0.28		0.28	0.28	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	502	2866		313	2695		401	405		228	313	
v/s Ratio Prot		c0.21			0.11			0.01			0.01	
v/s Ratio Perm	0.02			0.06			0.01			c0.03		
v/c Ratio	0.03	0.33		0.10	0.18		0.03	0.02		0.12	0.02	
Uniform Delay, d1	9.8	12.2		10.3	10.9		36.7	36.7		37.7	36.7	
Progression Factor	0.16	0.12		1.33	1.07		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.6	0.1		0.1	0.1		1.1	0.1	
Delay (s)	1.7	1.8		14.3	11.8		36.8	36.8		38.7	36.8	
Level of Service	A	A		B	B		D	D		D	D	
Approach Delay (s)		1.8			11.9			36.8			38.1	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	162	472	118	28	114	119	132	917	89	399	1433	374
v/c Ratio	0.66	0.72	0.34	0.19	0.38	0.44	0.53	0.45	0.11	0.77	0.57	0.39
Control Delay	36.7	37.6	13.4	38.3	60.8	7.4	69.3	27.9	0.3	66.6	22.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	37.6	13.4	38.3	60.8	7.4	69.3	27.9	0.3	66.6	22.8	3.2
Queue Length 50th (m)	18.7	72.9	21.6	5.7	15.6	0.0	18.4	63.6	0.0	55.3	94.5	0.0
Queue Length 95th (m)	28.4	90.1	37.5	12.6	24.3	6.1	28.5	88.7	0.0	69.9	127.1	16.9
Internal Link Dist (m)		193.9			206.9			193.9			185.2	
Turn Bay Length (m)	55.0			45.0			85.0		50.0	100.0		125.0
Base Capacity (vph)	274	1004	461	151	636	389	265	2022	780	591	2528	958
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.47	0.26	0.19	0.18	0.31	0.50	0.45	0.11	0.68	0.57	0.39

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	453	113	27	109	114	127	880	85	383	1376	359
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	8.0	8.0	3.0	8.0	8.0	3.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.95	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2745	3349	1262	1340	2874	1184	3052	4334	1476	3372	4561	1429
Flt Permitted	0.95	1.00	1.00	0.48	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	2745	3349	1262	679	2874	1184	3052	4334	1476	3372	4561	1429
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	162	472	118	28	114	119	132	917	89	399	1433	374
RTOR Reduction (vph)	0	0	95	0	0	106	0	0	48	0	0	170
Lane Group Flow (vph)	162	472	23	28	114	13	132	917	41	399	1433	204
Confl. Peds. (#/hr)	23		5	5		23	4		20	20		4
Heavy Vehicles (%)	29%	9%	27%	36%	27%	32%	16%	21%	5%	5%	15%	12%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8			2			6
Actuated Green, G (s)	12.5	27.6	27.6	19.3	15.7	15.7	11.4	64.1	64.1	21.7	76.4	76.4
Effective Green, g (s)	12.5	27.6	27.6	19.3	15.7	15.7	11.4	64.1	64.1	21.7	76.4	76.4
Actuated g/C Ratio	0.09	0.20	0.20	0.14	0.11	0.11	0.08	0.46	0.46	0.15	0.55	0.55
Clearance Time (s)	6.0	8.0	8.0	3.0	8.0	8.0	3.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	245	660	248	110	322	132	248	1984	675	522	2489	779
v/s Ratio Prot	c0.06	c0.14		0.01	0.04		0.04	0.21		c0.12	c0.31	
v/s Ratio Perm			0.02	0.03		0.01			0.03			0.14
v/c Ratio	0.66	0.72	0.09	0.25	0.35	0.10	0.53	0.46	0.06	0.76	0.58	0.26
Uniform Delay, d1	61.7	52.5	46.0	53.1	57.5	55.8	61.7	26.1	21.2	56.7	21.1	16.9
Progression Factor	0.39	0.60	1.44	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	3.6	0.2	1.2	0.7	0.3	2.2	0.8	0.2	6.6	1.0	0.8
Delay (s)	30.4	35.0	66.3	54.4	58.1	56.2	63.9	26.9	21.3	63.3	22.0	17.7
Level of Service	C	D	E	D	E	E	E	C	C	E	C	B
Approach Delay (s)		38.9			56.8			30.7			28.8	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues
3: Kennedy Rd & Courtneypark Dr E

10/14/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	187	564	121	218	1421	256	144	1105	115	149	753	104
v/c Ratio	0.81	0.55	0.30	0.62	0.89	0.51	0.46	0.77	0.22	0.74	0.55	0.17
Control Delay	57.9	49.9	9.2	20.4	42.1	15.1	22.6	42.0	7.9	45.0	34.1	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	49.9	9.2	20.4	42.1	15.1	22.6	42.0	7.9	45.0	34.1	5.7
Queue Length 50th (m)	33.6	50.8	0.0	27.3	144.3	28.3	20.3	140.8	2.4	21.2	83.9	0.5
Queue Length 95th (m)	#71.9	63.8	16.1	45.2	160.0	60.8	32.5	167.8	15.1	#49.0	103.7	12.0
Internal Link Dist (m)		190.6			519.5			142.2			201.4	
Turn Bay Length (m)	65.0		50.0	95.0		50.0	100.0		50.0	85.0		50.0
Base Capacity (vph)	232	1033	407	351	1599	501	320	1426	517	209	1361	628
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.55	0.30	0.62	0.89	0.51	0.45	0.77	0.22	0.71	0.55	0.17

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	513	110	198	1293	233	131	1006	105	136	685	95
Ideal Flow (vphpl)	1900	1900	1900	1900	2150	1900	1900	2050	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1738	4521	1374	1424	5599	1421	1702	3647	1166	1615	3380	1410
Flt Permitted	0.12	1.00	1.00	0.31	1.00	1.00	0.27	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	229	4521	1374	460	5599	1421	476	3647	1166	164	3380	1410
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	187	564	121	218	1421	256	144	1105	115	149	753	104
RTOR Reduction (vph)	0	0	93	0	0	96	0	0	61	0	0	60
Lane Group Flow (vph)	187	564	28	218	1421	160	144	1105	54	149	753	44
Confl. Peds. (#/hr)	9		8	8		9	28		2	2		28
Heavy Vehicles (%)	5%	16%	16%	28%	6%	12%	7%	8%	38%	13%	8%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	46.0	32.0	32.0	57.0	40.0	40.0	64.4	54.8	54.8	67.6	56.4	56.4
Effective Green, g (s)	46.0	32.0	32.0	57.0	40.0	40.0	64.4	54.8	54.8	67.6	56.4	56.4
Actuated g/C Ratio	0.33	0.23	0.23	0.41	0.29	0.29	0.46	0.39	0.39	0.48	0.40	0.40
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	226	1033	314	338	1599	406	303	1427	456	195	1361	568
v/s Ratio Prot	c0.08	0.12		c0.10	c0.25		0.03	0.30		c0.06	0.22	
v/s Ratio Perm	0.19		0.02	0.16		0.11	0.19		0.05	c0.31		0.03
v/c Ratio	0.83	0.55	0.09	0.64	0.89	0.39	0.48	0.77	0.12	0.76	0.55	0.08
Uniform Delay, d1	38.2	47.6	42.5	29.6	47.9	40.3	23.3	37.2	27.2	27.3	32.1	25.8
Progression Factor	1.00	1.00	1.00	0.51	0.74	0.62	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.1	2.1	0.6	7.6	6.5	2.4	1.2	4.2	0.5	16.2	1.6	0.3
Delay (s)	66.2	49.7	43.1	22.7	41.8	27.2	24.5	41.4	27.7	43.5	33.7	26.0
Level of Service	E	D	D	C	D	C	C	D	C	D	C	C
Approach Delay (s)		52.3			37.7			38.4			34.4	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	39.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR
Lane Group Flow (vph)	365	608	1972	655
v/c Ratio	0.82	0.14	0.58	0.54
Control Delay	27.5	0.1	4.5	2.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.5	0.1	4.5	2.3
Queue Length 50th (m)	13.3	0.0	23.7	6.3
Queue Length 95th (m)	103.2	0.0	71.5	8.3
Internal Link Dist (m)		519.5	363.3	
Turn Bay Length (m)	95.0			240.0
Base Capacity (vph)	612	4334	3407	1212
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	0.60	0.14	0.58	0.54

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	358	596	1933	603	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	8.0	8.0	8.0		
Lane Util. Factor	1.00	0.91	0.91	1.00		
Frt	1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1601	4334	4768	1570		
Flt Permitted	0.08	1.00	1.00	1.00		
Satd. Flow (perm)	131	4334	4768	1570		
Peak-hour factor, PHF	0.98	0.98	0.98	0.92	0.98	0.98
Adj. Flow (vph)	365	608	1972	655	0	0
RTOR Reduction (vph)	0	0	0	90	0	0
Lane Group Flow (vph)	365	608	1972	565	0	0
Heavy Vehicles (%)	14%	21%	10%	4%	0%	0%
Turn Type	pm+pt	NA	NA	Perm		
Protected Phases	7	4	8			
Permitted Phases	4			8		
Actuated Green, G (s)	132.0	140.0	100.1	100.1		
Effective Green, g (s)	132.0	140.0	100.1	100.1		
Actuated g/C Ratio	0.94	1.00	0.71	0.71		
Clearance Time (s)	2.0	8.0	8.0	8.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	437	4334	3409	1122		
v/s Ratio Prot	c0.18	0.14	c0.41			
v/s Ratio Perm	0.61			0.36		
v/c Ratio	0.84	0.14	0.58	0.50		
Uniform Delay, d1	36.2	0.0	9.7	8.9		
Progression Factor	0.40	1.00	0.37	0.19		
Incremental Delay, d2	11.9	0.1	0.5	1.2		
Delay (s)	26.4	0.1	4.1	2.9		
Level of Service	C	A	A	A		
Approach Delay (s)		9.9	3.8		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	649	2386	272	189
v/c Ratio	0.22	0.69	0.51	0.33
Control Delay	3.0	5.6	53.7	7.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.0	5.6	53.7	7.7
Queue Length 50th (m)	7.6	50.5	34.8	0.0
Queue Length 95th (m)	8.2	m58.6	49.3	11.2
Internal Link Dist (m)	363.3	449.2	100.0	
Turn Bay Length (m)				
Base Capacity (vph)	3002	3460	536	580
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	0.22	0.69	0.51	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	617	0	0	2267	258	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0			8.0	7.0	7.0
Lane Util. Factor	0.91			0.91	0.97	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	4334			4995	2682	2145
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	4334			4995	2682	2145
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	649	0	0	2386	272	189
RTOR Reduction (vph)	0	0	0	0	0	151
Lane Group Flow (vph)	649	0	0	2386	272	38
Heavy Vehicles (%)	21%	0%	0%	5%	32%	34%
Turn Type	NA			NA	Perm	Prot
Protected Phases	2			6		4
Permitted Phases					4	
Actuated Green, G (s)	97.0			97.0	28.0	28.0
Effective Green, g (s)	97.0			97.0	28.0	28.0
Actuated g/C Ratio	0.69			0.69	0.20	0.20
Clearance Time (s)	8.0			8.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	3002			3460	536	429
v/s Ratio Prot	0.15			c0.48		0.02
v/s Ratio Perm					c0.10	
v/c Ratio	0.22			0.69	0.51	0.09
Uniform Delay, d1	7.8			12.6	49.9	45.6
Progression Factor	0.36			0.40	1.00	1.00
Incremental Delay, d2	0.2			0.5	3.4	0.4
Delay (s)	3.0			5.6	53.3	46.0
Level of Service	A			A	D	D
Approach Delay (s)	3.0			5.6	50.3	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	114	429	153	27	1468	479	1439	34	82	677	497
v/c Ratio	0.88	0.25	0.26	0.11	0.97	0.92	0.90	0.06	0.68	0.68	0.90
Control Delay	103.9	26.3	5.6	48.0	70.1	82.4	45.8	0.2	50.4	46.5	52.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.9	26.3	5.6	48.0	70.1	82.4	45.8	0.2	50.4	46.5	52.6
Queue Length 50th (m)	25.5	21.1	0.2	5.5	116.3	68.2	192.5	0.0	11.0	86.4	99.0
Queue Length 95th (m)	#56.2	32.0	7.9	m13.4	#169.2	#99.4	225.6	0.0	#30.7	108.2	#164.4
Internal Link Dist (m)		449.2			466.9		171.2			190.6	
Turn Bay Length (m)	120.0		100.0	50.0		80.0		50.0	130.0		85.0
Base Capacity (vph)	130	1702	587	256	1517	519	1594	566	121	1000	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.25	0.26	0.11	0.97	0.92	0.90	0.06	0.68	0.68	0.90

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	403	144	25	1206	174	450	1353	32	77	636	467
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	3.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1332	4334	1260	1608	4898		3309	3659	1189	1601	3259	1483
Flt Permitted	0.09	1.00	1.00	0.49	1.00		0.95	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	122	4334	1260	834	4898		3309	3659	1189	157	3259	1483
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	114	429	153	27	1283	185	479	1439	34	82	677	497
RTOR Reduction (vph)	0	0	93	0	13	0	0	0	19	0	0	100
Lane Group Flow (vph)	114	429	60	27	1455	0	479	1439	15	82	677	397
Confl. Peds. (#/hr)	1		6	6		1	6		10	10		6
Heavy Vehicles (%)	37%	21%	27%	13%	4%	11%	7%	5%	34%	14%	12%	8%
Turn Type	pm+pt	NA	Perm	Perm	NA		Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	55.0	55.0	55.0	43.0	43.0		22.0	61.0	61.0	49.0	43.0	43.0
Effective Green, g (s)	55.0	55.0	55.0	43.0	43.0		22.0	61.0	61.0	49.0	43.0	43.0
Actuated g/C Ratio	0.39	0.39	0.39	0.31	0.31		0.16	0.44	0.44	0.35	0.31	0.31
Clearance Time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	125	1702	495	256	1504		519	1594	518	116	1000	455
v/s Ratio Prot	c0.06	0.10			c0.30		c0.14	c0.39		0.03	0.21	
v/s Ratio Perm	0.30		0.05	0.03					0.01	0.22		0.27
v/c Ratio	0.91	0.25	0.12	0.11	0.97		0.92	0.90	0.03	0.71	0.68	0.87
Uniform Delay, d1	34.1	28.6	27.1	34.7	47.8		58.2	36.7	22.6	35.5	42.4	45.9
Progression Factor	1.99	0.90	1.13	1.33	1.16		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	53.4	0.3	0.5	0.8	15.8		24.4	8.7	0.1	17.8	3.7	19.9
Delay (s)	121.4	26.2	31.2	47.0	71.3		82.5	45.5	22.7	53.3	46.1	65.8
Level of Service	F	C	C	D	E		F	D	C	D	D	E
Approach Delay (s)		42.9			70.8			54.2			54.4	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	57.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	558	64	1179	145	72	8	164
v/c Ratio	0.25	0.24	0.16	0.45	0.35	0.13	0.02	0.27
Control Delay	9.3	3.7	10.5	9.8	34.4	8.4	27.4	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	3.7	10.5	9.8	34.4	8.4	27.4	20.9
Queue Length 50th (m)	1.3	6.2	3.4	22.8	28.6	1.4	1.4	20.1
Queue Length 95th (m)	m3.3	8.2	8.2	33.5	47.5	11.7	5.1	37.6
Internal Link Dist (m)		466.9		278.5		123.7		151.6
Turn Bay Length (m)	45.0		30.0		35.0		35.0	
Base Capacity (vph)	133	2299	398	2638	409	562	514	617
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.24	0.16	0.45	0.35	0.13	0.02	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	455	53	58	1071	2	132	7	58	7	12	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.87		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1294	4332		1690	4990		1657	1381		1817	1542	
Flt Permitted	0.19	1.00		0.42	1.00		0.62	1.00		0.71	1.00	
Satd. Flow (perm)	252	4332		754	4990		1081	1381		1358	1542	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	33	500	58	64	1177	2	145	8	64	8	13	151
RTOR Reduction (vph)	0	10	0	0	0	0	0	40	0	0	34	0
Lane Group Flow (vph)	33	548	0	64	1179	0	145	32	0	8	130	0
Confl. Peds. (#/hr)	1					1	1		3	3		1
Heavy Vehicles (%)	41%	17%	38%	8%	5%	50%	10%	33%	17%	0%	18%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	74.0	74.0		74.0	74.0		53.0	53.0		53.0	53.0	
Effective Green, g (s)	74.0	74.0		74.0	74.0		53.0	53.0		53.0	53.0	
Actuated g/C Ratio	0.53	0.53		0.53	0.53		0.38	0.38		0.38	0.38	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	133	2289		398	2637		409	522		514	583	
v/s Ratio Prot		0.13			c0.24			0.02			0.08	
v/s Ratio Perm	0.13			0.08			c0.13			0.01		
v/c Ratio	0.25	0.24		0.16	0.45		0.35	0.06		0.02	0.22	
Uniform Delay, d1	17.9	17.8		17.0	20.4		31.2	27.7		27.2	29.5	
Progression Factor	0.26	0.20		0.55	0.46		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	0.2		0.8	0.5		2.4	0.2		0.1	0.9	
Delay (s)	8.9	3.8		10.2	9.8		33.6	27.9		27.2	30.4	
Level of Service	A	A		B	A		C	C		C	C	
Approach Delay (s)		4.1			9.8			31.7			30.3	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	12	639	46	1150	74	52	31	131
v/c Ratio	0.05	0.24	0.13	0.39	0.20	0.10	0.08	0.24
Control Delay	7.7	7.4	13.0	16.5	37.5	11.6	35.2	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	7.4	13.0	16.5	37.5	11.6	35.2	15.9
Queue Length 50th (m)	0.6	12.9	7.5	77.9	15.1	1.2	6.1	9.9
Queue Length 95th (m)	1.9	15.2	14.0	77.6	26.3	9.5	13.2	22.5
Internal Link Dist (m)		278.5		341.9		126.6		117.6
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	232	2670	362	2924	379	497	406	557
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.24	0.13	0.39	0.20	0.10	0.08	0.24

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	512	24	39	963	3	62	5	39	26	14	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1820	4500		1485	4935		1770	1517		1737	1635	
Flt Permitted	0.21	1.00		0.39	1.00		0.66	1.00		0.72	1.00	
Satd. Flow (perm)	393	4500		611	4935		1237	1517		1322	1635	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	12	610	29	46	1146	4	74	6	46	31	17	114
RTOR Reduction (vph)	0	4	0	0	0	0	0	32	0	0	56	0
Lane Group Flow (vph)	12	635	0	46	1150	0	74	20	0	31	75	0
Confl. Peds. (#/hr)	6		6	6		6	7		6	6		7
Heavy Vehicles (%)	0%	15%	27%	22%	6%	67%	2%	20%	6%	4%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	83.0	83.0		83.0	83.0		43.0	43.0		43.0	43.0	
Effective Green, g (s)	83.0	83.0		83.0	83.0		43.0	43.0		43.0	43.0	
Actuated g/C Ratio	0.59	0.59		0.59	0.59		0.31	0.31		0.31	0.31	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	232	2667		362	2925		379	465		406	502	
v/s Ratio Prot		0.14			c0.23			0.01			0.05	
v/s Ratio Perm	0.03			0.08			c0.06			0.02		
v/c Ratio	0.05	0.24		0.13	0.39		0.20	0.04		0.08	0.15	
Uniform Delay, d1	12.0	13.5		12.5	15.1		35.7	34.1		34.4	35.2	
Progression Factor	0.58	0.53		0.94	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2		0.7	0.4		1.1	0.2		0.4	0.6	
Delay (s)	7.4	7.4		12.5	16.4		36.9	34.2		34.8	35.8	
Level of Service	A	A		B	B		D	C		C	D	
Approach Delay (s)		7.4			16.2			35.8			35.6	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2	768	28	1024	74	72	83	38
v/c Ratio	0.01	0.28	0.09	0.36	0.17	0.11	0.22	0.07
Control Delay	6.5	7.0	13.7	14.5	35.5	0.4	36.8	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	7.0	13.7	14.5	35.5	0.4	36.8	21.0
Queue Length 50th (m)	0.1	21.4	2.6	36.7	14.7	0.0	16.8	3.8
Queue Length 95th (m)	m0.7	22.6	m4.7	39.9	24.8	0.0	27.5	10.7
Internal Link Dist (m)		341.9		193.9		128.4		78.4
Turn Bay Length (m)	35.0		45.0		35.0		35.0	
Base Capacity (vph)	180	2706	328	2822	429	640	371	528
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.28	0.09	0.36	0.17	0.11	0.22	0.07

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	599	31	23	822	18	61	0	59	68	16	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1213	4611		1601	4815		1735	1541		1547	1607	
Flt Permitted	0.24	1.00		0.33	1.00		0.73	1.00		0.71	1.00	
Satd. Flow (perm)	307	4611		561	4815		1338	1541		1156	1607	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	2	730	38	28	1002	22	74	0	72	83	20	18
RTOR Reduction (vph)	0	4	0	0	2	0	0	49	0	0	12	0
Lane Group Flow (vph)	2	764	0	28	1022	0	74	23	0	83	26	0
Confl. Peds. (#/hr)	5					5	1					1
Heavy Vehicles (%)	50%	13%	11%	14%	8%	31%	5%	0%	6%	18%	7%	14%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	82.0	82.0		82.0	82.0		45.0	45.0		45.0	45.0	
Effective Green, g (s)	82.0	82.0		82.0	82.0		45.0	45.0		45.0	45.0	
Actuated g/C Ratio	0.59	0.59		0.59	0.59		0.32	0.32		0.32	0.32	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	179	2700		328	2820		430	495		371	516	
v/s Ratio Prot		0.17			c0.21			0.02			0.02	
v/s Ratio Perm	0.01			0.05			0.06			c0.07		
v/c Ratio	0.01	0.28		0.09	0.36		0.17	0.05		0.22	0.05	
Uniform Delay, d1	12.1	14.4		12.6	15.3		34.1	32.7		34.7	32.8	
Progression Factor	0.50	0.47		1.01	0.93		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.4	0.3		0.9	0.2		1.4	0.2	
Delay (s)	6.2	7.1		13.2	14.5		35.0	32.9		36.1	32.9	
Level of Service	A	A		B	B		C	C		D	C	
Approach Delay (s)		7.1			14.4			34.0			35.1	
Approach LOS		A			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	424	228	170	98	559	635	213	2101	35	179	968	153
v/c Ratio	1.11	0.22	0.30	0.28	0.70	1.12	0.62	1.04	0.06	0.98	0.56	0.25
Control Delay	117.1	21.5	7.5	29.7	55.2	114.6	68.3	72.1	0.2	125.8	35.7	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	117.1	21.5	7.5	29.7	55.2	114.6	68.3	72.1	0.2	125.8	35.7	3.8
Queue Length 50th (m)	~69.7	27.2	22.4	16.5	75.4	~170.9	29.5	~229.9	0.0	25.9	76.7	0.0
Queue Length 95th (m)	#101.5	39.5	38.3	28.7	95.8	#244.3	43.1	#258.1	0.0	#50.3	91.0	10.6
Internal Link Dist (m)		193.9			206.9			193.9			185.2	
Turn Bay Length (m)	55.0			45.0			85.0		50.0	100.0		125.0
Base Capacity (vph)	382	1038	563	349	794	565	344	2016	613	183	1741	620
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.22	0.30	0.28	0.70	1.12	0.62	1.04	0.06	0.98	0.56	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	399	214	160	92	525	597	200	1975	33	168	910	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	2500	1900	1950	1900	1900	1900	1900
Total Lost time (s)	6.0	8.0	8.0	3.0	8.0	8.0	3.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3350	3230	1394	1649	3476	2003	3219	4893	1278	3100	4601	1359
Flt Permitted	0.95	1.00	1.00	0.61	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	325	3230	1394	1058	3476	2003	3219	4893	1278	160	4601	1359
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	424	228	170	98	559	635	213	2101	35	179	968	153
RTOR Reduction (vph)	0	0	115	0	0	108	0	0	21	0	0	95
Lane Group Flow (vph)	424	228	55	98	559	527	213	2101	14	179	968	58
Confl. Peds. (#/hr)	7		11	11		7	3		13	13		3
Heavy Vehicles (%)	11%	13%	14%	10%	5%	5%	10%	10%	23%	22%	14%	18%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8			2			6
Actuated Green, G (s)	16.0	45.0	45.0	38.0	32.0	32.0	15.0	57.7	57.7	8.3	53.0	53.0
Effective Green, g (s)	16.0	45.0	45.0	38.0	32.0	32.0	15.0	57.7	57.7	8.3	53.0	53.0
Actuated g/C Ratio	0.11	0.32	0.32	0.27	0.23	0.23	0.11	0.41	0.41	0.06	0.38	0.38
Clearance Time (s)	6.0	8.0	8.0	3.0	8.0	8.0	3.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	382	1038	448	312	794	457	344	2016	526	183	1741	514
v/s Ratio Prot	c0.13	0.07		0.01	0.16		c0.07	c0.43		c0.06	0.21	
v/s Ratio Perm			0.04	0.07		c0.26			0.01			0.04
v/c Ratio	1.11	0.22	0.12	0.31	0.70	1.15	0.62	1.04	0.03	0.98	0.56	0.11
Uniform Delay, d1	62.0	34.7	33.5	39.5	49.6	54.0	59.8	41.1	24.5	65.8	34.2	28.2
Progression Factor	0.64	0.60	1.27	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	78.7	0.5	0.5	2.6	5.2	91.3	8.1	32.0	0.1	61.1	1.3	0.4
Delay (s)	118.6	21.4	43.3	42.1	54.8	145.3	67.9	73.2	24.6	126.8	35.5	28.7
Level of Service	F	C	D	D	D	F	E	E	C	F	D	C
Approach Delay (s)		76.1			98.3			72.0			47.3	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	72.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Queues
3: Kennedy Road & Derry Road East

7/14/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	165	1818	173	595	1338	226	72	290	278	360	1111	154
v/c Ratio	1.36	1.04	0.29	1.45	0.53	0.27	1.09	0.30	0.48	0.74	0.79	0.26
Control Delay	243.7	77.2	15.0	254.0	21.4	3.8	182.5	38.1	7.4	43.8	44.2	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	243.7	77.2	15.0	254.0	21.4	3.8	182.5	38.1	7.4	43.8	44.2	15.9
Queue Length 50th (m)	~59.8	~198.8	13.5	~121.8	84.9	3.3	~21.4	31.8	1.5	70.3	140.5	13.8
Queue Length 95th (m)	#105.8	#228.0	31.5	m#148.9	m98.6	m8.3	#54.2	44.2	23.2	97.2	166.4	30.2
Internal Link Dist (m)		267.1			518.3			268.1			273.7	
Turn Bay Length (m)	105.0		140.0	220.0		225.0	60.0		75.0	95.0		100.0
Base Capacity (vph)	121	1745	598	410	2539	843	69	1015	595	487	1464	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.36	1.04	0.29	1.45	0.53	0.27	1.04	0.29	0.47	0.74	0.76	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	1763	168	577	1298	219	70	281	270	349	1078	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2500	1900	1900	2300	2150	1900
Total Lost time (s)	8.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1706	4948	1512	3052	4856	1408	2125	3230	1306	2065	3897	1498
Flt Permitted	0.19	1.00	1.00	0.95	1.00	1.00	0.10	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	346	4948	1512	3052	4856	1408	221	3230	1306	1124	3897	1498
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	165	1818	173	595	1338	226	72	290	278	360	1111	154
RTOR Reduction (vph)	0	0	65	0	0	108	0	0	189	0	0	50
Lane Group Flow (vph)	165	1818	108	595	1338	118	72	290	89	360	1111	104
Heavy Vehicles (%)	7%	6%	8%	16%	8%	16%	13%	13%	25%	7%	6%	9%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Actuated Green, G (s)	49.4	49.4	49.4	18.8	73.2	73.2	42.2	42.2	42.2	50.8	50.8	50.8
Effective Green, g (s)	49.4	49.4	49.4	18.8	73.2	73.2	42.2	42.2	42.2	50.8	50.8	50.8
Actuated g/C Ratio	0.35	0.35	0.35	0.13	0.52	0.52	0.30	0.30	0.30	0.36	0.36	0.36
Clearance Time (s)	8.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	122	1745	533	409	2538	736	66	973	393	448	1414	543
v/s Ratio Prot		0.37		c0.19	0.28			0.09		0.03	c0.29	
v/s Ratio Perm	c0.48		0.07			0.08	c0.33		0.07	0.26		0.07
v/c Ratio	1.35	1.04	0.20	1.45	0.53	0.16	1.09	0.30	0.23	0.80	0.79	0.19
Uniform Delay, d1	45.3	45.3	31.6	60.6	22.0	17.4	48.9	37.5	36.7	39.8	39.7	30.5
Progression Factor	1.00	1.00	1.00	1.01	0.93	1.51	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	202.9	33.3	0.9	213.5	0.5	0.3	138.0	0.2	0.3	10.0	3.0	0.2
Delay (s)	248.2	78.6	32.4	274.6	20.9	26.6	186.9	37.7	37.0	49.8	42.7	30.7
Level of Service	F	E	C	F	C	C	F	D	D	D	D	C
Approach Delay (s)		87.9			91.4			54.2			43.1	
Approach LOS		F			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	74.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2203	1360	1195	1095
v/c Ratio	0.92	0.59	0.84	0.94
Control Delay	14.7	22.6	43.6	53.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.7	22.6	43.6	53.0
Queue Length 50th (m)	50.6	73.5	150.7	157.3
Queue Length 95th (m)	m53.2	95.0	179.4	#206.0
Internal Link Dist (m)	518.3	377.8	224.2	
Turn Bay Length (m)				
Base Capacity (vph)	2401	2315	1437	1181
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.92	0.59	0.83	0.93

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	2027	1251	0	1099	1007
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0	7.0
Lane Util. Factor		0.91	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		4902	4725		3471	2790
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		4902	4725		3471	2790
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2203	1360	0	1195	1095
RTOR Reduction (vph)	0	0	0	0	0	25
Lane Group Flow (vph)	0	2203	1360	0	1195	1070
Heavy Vehicles (%)	2%	7%	11%	2%	2%	3%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		68.6	68.6		57.4	57.4
Effective Green, g (s)		68.6	68.6		57.4	57.4
Actuated g/C Ratio		0.49	0.49		0.41	0.41
Clearance Time (s)		7.0	7.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2401	2315		1423	1143
v/s Ratio Prot		c0.45	0.29		0.34	
v/s Ratio Perm						c0.38
v/c Ratio		0.92	0.59		0.84	0.94
Uniform Delay, d1		33.1	25.6		37.2	39.5
Progression Factor		0.34	0.84		1.00	1.00
Incremental Delay, d2		2.8	0.9		4.5	13.8
Delay (s)		14.1	22.4		41.7	53.3
Level of Service		B	C		D	D
Approach Delay (s)		14.1	22.4		47.3	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	112.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2826	1226	621	1517
v/c Ratio	1.19	0.61	0.43	1.28
Control Delay	114.1	12.4	29.2	167.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	114.1	12.4	29.2	167.8
Queue Length 50th (m)	~342.1	100.7	61.3	~301.8
Queue Length 95th (m)	#367.8	83.8	77.1	#347.8
Internal Link Dist (m)	377.8	410.9	103.4	
Turn Bay Length (m)				
Base Capacity (vph)	2377	2026	1445	1184
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.19	0.61	0.43	1.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2656	0	0	1152	584	1426
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0			7.0	7.0	7.0
Lane Util. Factor	0.91			0.91	0.97	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	5043			4299	3372	2763
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	5043			4299	3372	2763
Peak-hour factor, PHF	0.94	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	2826	0	0	1226	621	1517
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	2826	0	0	1226	621	1517
Heavy Vehicles (%)	4%	2%	2%	22%	5%	4%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	66.0			66.0	60.0	60.0
Effective Green, g (s)	66.0			66.0	60.0	60.0
Actuated g/C Ratio	0.47			0.47	0.43	0.43
Clearance Time (s)	7.0			7.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2377			2026	1445	1184
v/s Ratio Prot	c0.56			0.29	0.18	
v/s Ratio Perm						c0.55
v/c Ratio	1.19			0.61	0.43	1.28
Uniform Delay, d1	37.0			27.4	28.0	40.0
Progression Factor	0.73			0.41	1.00	1.00
Incremental Delay, d2	87.0			1.1	0.9	133.1
Delay (s)	113.9			12.3	29.0	173.1
Level of Service	F			B	C	F
Approach Delay (s)	113.9			12.3	131.3	
Approach LOS	F			B	F	

Intersection Summary			
HCM 2000 Control Delay	99.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	112.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	364	1957	632	203	1061	37	125	324	33	761	251
v/c Ratio	0.85	0.89	0.80	0.94	0.62	0.06	0.77	0.33	0.16	0.93	0.53
Control Delay	23.8	42.9	31.2	102.2	12.2	0.1	93.5	31.7	44.5	70.0	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	42.9	31.2	102.2	12.2	0.1	93.5	31.7	44.5	70.0	11.6
Queue Length 50th (m)	70.0	190.1	119.8	46.0	19.1	0.0	17.9	31.1	7.3	109.2	4.3
Queue Length 95th (m)	m54.7	m143.6	m83.1	m#90.0	24.1	m0.0	#33.8	44.1	16.9	#145.5	29.6
Internal Link Dist (m)		410.9			1342.9			365.8		212.8	
Turn Bay Length (m)	190.0		195.0	215.0		75.0	275.0		90.0		75.0
Base Capacity (vph)	497	2191	793	215	1701	598	163	991	202	820	470
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.89	0.80	0.94	0.62	0.06	0.77	0.33	0.16	0.93	0.53

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	353	1898	613	197	1029	36	121	235	80	32	738	243
Ideal Flow (vphpl)	2075	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1812	4948	1541	1630	4483	1384	2855	2883		1426	3380	1219
Flt Permitted	0.17	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.56	1.00	1.00
Satd. Flow (perm)	317	4948	1541	129	4483	1384	2855	2883		834	3380	1219
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	364	1957	632	203	1061	37	125	242	82	33	761	251
RTOR Reduction (vph)	0	0	111	0	0	23	0	24	0	0	0	175
Lane Group Flow (vph)	364	1957	521	203	1061	14	125	300	0	33	761	76
Heavy Vehicles (%)	10%	6%	6%	12%	17%	18%	24%	19%	30%	28%	8%	34%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6				4		4
Actuated Green, G (s)	79.0	62.0	62.0	67.1	53.1	53.1	8.0	47.0		34.0	34.0	34.0
Effective Green, g (s)	79.0	62.0	62.0	67.1	53.1	53.1	8.0	47.0		34.0	34.0	34.0
Actuated g/C Ratio	0.56	0.44	0.44	0.48	0.38	0.38	0.06	0.34		0.24	0.24	0.24
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	423	2191	682	211	1700	524	163	967		202	820	296
v/s Ratio Prot	c0.14	0.40		c0.10	0.24		c0.04	0.10			c0.23	
v/s Ratio Perm	0.34		0.34	c0.36		0.01				0.04		0.06
v/c Ratio	0.86	0.89	0.76	0.96	0.62	0.03	0.77	0.31		0.16	0.93	0.26
Uniform Delay, d1	25.6	35.9	32.8	41.3	35.3	27.2	65.1	34.5		41.8	51.8	42.8
Progression Factor	0.99	1.17	1.32	1.74	0.30	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.8	0.6	0.8	42.8	1.3	0.1	19.2	0.8		1.7	18.1	2.1
Delay (s)	27.2	42.6	44.2	114.6	11.9	27.3	84.2	35.3		43.5	69.9	44.9
Level of Service	C	D	D	F	B	C	F	D		D	E	D
Approach Delay (s)		41.0			28.3			48.9			63.1	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	341	2578	162	444	1064	24	77	927	417	169	1605	177
v/c Ratio	0.77	1.12	0.26	1.16	0.73	0.05	0.45	0.72	0.75	0.76	1.13	0.36
Control Delay	81.2	85.4	2.0	150.3	45.7	0.2	72.5	49.2	27.7	85.9	112.3	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	85.4	2.0	150.3	45.7	0.2	72.5	49.2	27.7	85.9	112.3	9.9
Queue Length 50th (m)	42.0	~305.7	4.2	~74.7	96.1	0.0	10.8	85.1	45.0	24.1	~188.0	4.2
Queue Length 95th (m)	m51.5	#329.4	m5.3	#108.5	115.6	0.0	19.3	101.3	87.4	#40.6	#217.5	22.8
Internal Link Dist (m)		1342.9			444.1			341.5			298.1	
Turn Bay Length (m)	160.0		120.0	225.0		120.0	100.0		90.0	130.0		100.0
Base Capacity (vph)	501	2303	615	383	1459	477	172	1295	557	223	1422	489
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.12	0.26	1.16	0.73	0.05	0.45	0.72	0.75	0.76	1.13	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	321	2423	152	417	1000	23	72	871	392	159	1509	166
Ideal Flow (vphpl)	1900	2500	1900	2150	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3190	6449	1512	3577	4483	1142	3026	4641	1361	3133	4856	1296
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3190	6449	1512	3577	4483	1142	3026	4641	1361	3133	4856	1296
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	341	2578	162	444	1064	24	77	927	417	169	1605	177
RTOR Reduction (vph)	0	0	75	0	0	16	0	0	177	0	0	110
Lane Group Flow (vph)	341	2578	87	444	1064	8	77	927	240	169	1605	67
Heavy Vehicles (%)	11%	7%	8%	12%	17%	43%	17%	13%	20%	13%	8%	26%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	19.4	50.0	50.0	15.0	45.6	45.6	8.0	39.1	39.1	9.9	41.0	41.0
Effective Green, g (s)	19.4	50.0	50.0	15.0	45.6	45.6	8.0	39.1	39.1	9.9	41.0	41.0
Actuated g/C Ratio	0.14	0.36	0.36	0.11	0.33	0.33	0.06	0.28	0.28	0.07	0.29	0.29
Clearance Time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	442	2303	540	383	1460	371	172	1296	380	221	1422	379
v/s Ratio Prot	0.11	c0.40		c0.12	0.24		0.03	0.20		c0.05	c0.33	
v/s Ratio Perm			0.06			0.01			0.18			0.05
v/c Ratio	0.77	1.12	0.16	1.16	0.73	0.02	0.45	0.72	0.63	0.76	1.13	0.18
Uniform Delay, d1	58.2	45.0	30.7	62.5	41.7	32.0	63.9	45.4	44.1	63.9	49.5	36.9
Progression Factor	1.22	0.57	0.11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.8	59.2	0.5	97.0	3.2	0.1	1.9	1.9	3.4	14.5	67.4	0.2
Delay (s)	78.0	84.8	3.9	159.5	45.0	32.2	65.7	47.3	47.5	78.4	116.9	37.1
Level of Service	E	F	A	F	D	C	E	D	D	E	F	D
Approach Delay (s)		79.8			77.9			48.4			106.4	
Approach LOS		E			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	80.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Queues
3: Kennedy Road & Derry Road East

10/14/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	262	1471	80	433	2591	514	119	1047	451	154	389	148
v/c Ratio	1.41	0.90	0.14	0.99	1.09	0.74	0.41	0.96	0.69	1.10	0.31	0.22
Control Delay	241.6	52.9	1.6	78.5	73.6	20.5	43.2	66.0	20.6	136.2	31.8	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	241.6	52.9	1.6	78.5	73.6	20.5	43.2	66.0	20.6	136.2	31.8	7.5
Queue Length 50th (m)	~75.0	141.7	0.0	62.2	~294.3	61.9	26.0	149.8	39.9	~29.9	39.9	3.7
Queue Length 95th (m)	#130.4	161.9	2.8	m#81.9	#318.6	m58.7	45.2	#193.1	80.3	#75.5	53.2	17.8
Internal Link Dist (m)		267.1			518.3			268.1			273.7	
Turn Bay Length (m)	105.0		140.0	220.0		225.0	60.0		75.0	95.0		100.0
Base Capacity (vph)	186	1639	558	439	2386	693	289	1092	655	140	1235	669
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.41	0.90	0.14	0.99	1.09	0.74	0.41	0.96	0.69	1.10	0.31	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	259	1456	79	429	2565	509	118	1037	446	152	385	147
Ideal Flow (vphpl)	2500	1900	1900	1900	2050	1900	1900	1900	1900	2050	1900	1900
Total Lost time (s)	3.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2224	4948	1432	3079	5441	1420	1674	3476	1458	1840	3288	1570
Flt Permitted	0.10	1.00	1.00	0.95	1.00	1.00	0.52	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	238	4948	1432	3079	5441	1420	920	3476	1458	166	3288	1570
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	262	1471	80	433	2591	514	119	1047	451	154	389	148
RTOR Reduction (vph)	0	0	53	0	0	71	0	0	197	0	0	79
Lane Group Flow (vph)	262	1471	27	433	2591	443	119	1047	254	154	389	69
Heavy Vehicles (%)	8%	6%	14%	15%	4%	15%	9%	5%	12%	7%	11%	4%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Actuated Green, G (s)	46.4	46.4	46.4	20.0	61.4	61.4	44.0	44.0	44.0	52.6	52.6	52.6
Effective Green, g (s)	46.4	46.4	46.4	20.0	61.4	61.4	44.0	44.0	44.0	52.6	52.6	52.6
Actuated g/C Ratio	0.33	0.33	0.33	0.14	0.44	0.44	0.31	0.31	0.31	0.38	0.38	0.38
Clearance Time (s)	3.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	178	1639	474	439	2386	622	289	1092	458	134	1235	589
v/s Ratio Prot	c0.07	0.30		0.14	c0.48			0.30		c0.05	0.12	
v/s Ratio Perm	c0.41		0.02			0.31	0.13		0.17	c0.38		0.04
v/c Ratio	1.47	0.90	0.06	0.99	1.09	0.71	0.41	0.96	0.56	1.15	0.31	0.12
Uniform Delay, d1	42.5	44.5	31.9	59.9	39.3	32.1	37.8	47.1	39.9	39.0	30.9	28.5
Progression Factor	1.00	1.00	1.00	0.85	0.79	0.68	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	240.2	8.2	0.2	26.7	42.9	3.5	1.0	17.9	1.5	123.4	0.1	0.1
Delay (s)	282.7	52.7	32.1	77.8	73.9	25.4	38.8	65.0	41.3	162.4	31.1	28.6
Level of Service	F	D	C	E	E	C	D	E	D	F	C	C
Approach Delay (s)		85.0			67.4			56.5			59.8	
Approach LOS		F			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	68.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	113.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1809	2857	354	587
v/c Ratio	0.56	0.88	0.45	0.90
Control Delay	7.0	12.8	46.0	68.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.0	12.8	46.0	68.3
Queue Length 50th (m)	37.2	160.6	42.0	87.6
Queue Length 95th (m)	m54.3	m168.8	56.7	#118.4
Internal Link Dist (m)	518.3	377.8	224.2	
Turn Bay Length (m)				
Base Capacity (vph)	3221	3252	843	692
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.56	0.88	0.42	0.85

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1755	2771	0	343	569
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0	7.0
Lane Util. Factor		0.91	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		4948	4995		3190	2613
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		4948	4995		3190	2613
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1809	2857	0	354	587
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	0	1809	2857	0	354	585
Heavy Vehicles (%)	2%	6%	5%	2%	11%	10%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		91.2	91.2		34.8	34.8
Effective Green, g (s)		91.2	91.2		34.8	34.8
Actuated g/C Ratio		0.65	0.65		0.25	0.25
Clearance Time (s)		7.0	7.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3223	3253		792	649
v/s Ratio Prot		0.37	c0.57		0.11	
v/s Ratio Perm						c0.22
v/c Ratio		0.56	0.88		0.45	0.90
Uniform Delay, d1		13.4	19.9		44.5	50.9
Progression Factor		0.48	0.56		1.00	1.00
Incremental Delay, d2		0.3	1.1		0.4	15.7
Delay (s)		6.8	12.2		44.9	66.6
Level of Service		A	B		D	E
Approach Delay (s)		6.8	12.2		58.4	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1278	2810	1001	474
v/c Ratio	0.46	0.99	0.93	0.61
Control Delay	30.5	25.3	61.6	35.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.5	25.3	61.6	35.1
Queue Length 50th (m)	99.9	148.5	138.5	50.0
Queue Length 95th (m)	101.0	m106.8	#178.2	70.6
Internal Link Dist (m)	377.8	410.9	103.4	
Turn Bay Length (m)				
Base Capacity (vph)	2758	2836	1073	773
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	0.46	0.99	0.93	0.61

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1201	0	0	2641	941	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0			7.0	7.0	7.0
Lane Util. Factor	0.91			0.91	0.97	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	4768			4902	3340	2194
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	4768			4902	3340	2194
Peak-hour factor, PHF	0.94	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	1278	0	0	2810	1001	474
RTOR Reduction (vph)	0	0	0	0	0	68
Lane Group Flow (vph)	1278	0	0	2810	1001	406
Heavy Vehicles (%)	10%	2%	2%	7%	6%	31%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	81.0			81.0	45.0	45.0
Effective Green, g (s)	81.0			81.0	45.0	45.0
Actuated g/C Ratio	0.58			0.58	0.32	0.32
Clearance Time (s)	7.0			7.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2758			2836	1073	705
v/s Ratio Prot	0.27			c0.57	c0.30	
v/s Ratio Perm						0.19
v/c Ratio	0.46			0.99	0.93	0.58
Uniform Delay, d1	17.0			29.1	46.0	39.6
Progression Factor	1.75			0.74	1.00	1.00
Incremental Delay, d2	0.5			3.4	15.4	3.4
Delay (s)	30.3			24.8	61.5	43.0
Level of Service	C			C	E	D
Approach Delay (s)	30.3			24.8	55.5	
Approach LOS	C			C	E	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	113	1333	121	91	2350	54	1303	1573	32	277	485
v/c Ratio	1.00	0.73	0.20	0.60	1.16	0.09	1.32	1.03	0.68	0.43	1.18
Control Delay	123.4	23.1	2.8	41.3	95.4	0.2	193.2	67.2	112.9	51.4	141.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.4	23.1	2.8	41.3	95.4	0.2	193.2	67.2	112.9	51.4	141.0
Queue Length 50th (m)	22.0	60.1	1.0	7.7	~274.8	0.0	~239.4	~241.9	8.3	35.6	~138.5
Queue Length 95th (m)	#58.4	75.5	3.6	m13.1	m#267.6	m0.0	#281.2	#285.2	#27.1	49.7	#206.7
Internal Link Dist (m)		410.9			1342.9			365.8		212.8	
Turn Bay Length (m)	190.0		195.0	215.0		75.0	275.0		90.0		75.0
Base Capacity (vph)	113	1822	612	151	2021	615	988	1533	47	646	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.73	0.20	0.60	1.16	0.09	1.32	1.03	0.68	0.43	1.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	1253	114	86	2209	51	1225	1222	257	30	260	456
Ideal Flow (vphpl)	2075	1900	1900	1900	1975	1900	2500	1900	1900	1900	1900	2100
Total Lost time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1510	4725	1396	1722	5242	1445	4613	3380		1587	3230	1687
Flt Permitted	0.07	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.14	1.00	1.00
Satd. Flow (perm)	118	4725	1396	188	5242	1445	4613	3380		239	3230	1687
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	113	1333	121	91	2350	54	1303	1300	273	32	277	485
RTOR Reduction (vph)	0	0	74	0	0	33	0	13	0	0	0	75
Lane Group Flow (vph)	113	1333	47	91	2350	21	1303	1560	0	32	277	410
Heavy Vehicles (%)	32%	11%	17%	6%	4%	13%	1%	5%	6%	15%	13%	7%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6				4		4
Actuated Green, G (s)	60.0	54.0	54.0	60.0	54.0	54.0	30.0	63.0		28.0	28.0	28.0
Effective Green, g (s)	60.0	54.0	54.0	60.0	54.0	54.0	30.0	63.0		28.0	28.0	28.0
Actuated g/C Ratio	0.43	0.39	0.39	0.43	0.39	0.39	0.21	0.45		0.20	0.20	0.20
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	110	1822	538	146	2021	557	988	1521		47	646	337
v/s Ratio Prot	c0.04	0.28		0.03	c0.45		c0.28	0.46			0.09	
v/s Ratio Perm	0.40		0.03	0.24		0.01				0.13		c0.24
v/c Ratio	1.03	0.73	0.09	0.62	1.16	0.04	1.32	1.03		0.68	0.43	1.22
Uniform Delay, d1	35.6	36.8	27.3	27.1	43.0	26.8	55.0	38.5		51.9	49.0	56.0
Progression Factor	1.93	0.56	0.47	1.40	0.34	0.04	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	87.8	2.3	0.3	5.5	77.3	0.1	150.6	29.9		58.2	2.1	121.3
Delay (s)	156.7	23.0	13.1	43.4	91.9	1.1	205.6	68.4		110.0	51.1	177.3
Level of Service	F	C	B	D	F	A	F	E		F	D	F
Approach Delay (s)		31.8			88.2			130.6			130.6	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	96.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	112.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	453	1757	53	377	1612	139	120	2328	708	132	666	152
v/c Ratio	1.08	1.08	0.11	1.08	1.06	0.28	0.57	1.08	1.00	0.74	0.42	0.26
Control Delay	131.3	75.1	0.7	128.9	87.4	10.2	75.0	87.0	60.7	88.5	35.6	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	131.3	75.1	0.7	128.9	87.4	10.2	75.0	87.0	60.7	88.5	35.6	5.8
Queue Length 50th (m)	~69.3	~199.8	0.2	~60.0	~178.7	3.6	16.9	~262.6	138.8	18.9	51.3	0.0
Queue Length 95th (m)	m#99.7	m#225.5	m0.6	#91.9	#208.2	19.6	27.4	#289.8	#225.1	#34.1	63.1	14.8
Internal Link Dist (m)		1342.9			444.1			341.5			298.1	
Turn Bay Length (m)	160.0		120.0	225.0		120.0	100.0		90.0	130.0		100.0
Base Capacity (vph)	420	1634	503	348	1525	503	214	2159	709	179	1588	577
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.08	0.11	1.08	1.06	0.28	0.56	1.08	1.00	0.74	0.42	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	417	1616	49	347	1483	128	110	2142	651	121	613	140
Ideal Flow (vphpl)	2150	2300	1900	1900	2050	1900	1900	2300	1900	1900	1900	1900
Total Lost time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3676	5720	1471	3052	5338	1458	3340	6046	1484	3133	4521	1361
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3676	5720	1471	3052	5338	1458	3340	6046	1484	3133	4521	1361
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	453	1757	53	377	1612	139	120	2328	708	132	666	152
RTOR Reduction (vph)	0	0	38	0	0	86	0	0	179	0	0	99
Lane Group Flow (vph)	453	1757	15	377	1612	53	120	2328	529	132	666	53
Heavy Vehicles (%)	9%	11%	11%	16%	6%	12%	6%	5%	10%	13%	16%	20%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	16.0	40.0	40.0	16.0	40.0	40.0	8.8	50.0	50.0	8.0	49.2	49.2
Effective Green, g (s)	16.0	40.0	40.0	16.0	40.0	40.0	8.8	50.0	50.0	8.0	49.2	49.2
Actuated g/C Ratio	0.11	0.29	0.29	0.11	0.29	0.29	0.06	0.36	0.36	0.06	0.35	0.35
Clearance Time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	420	1634	420	348	1525	416	209	2159	530	179	1588	478
v/s Ratio Prot	0.12	c0.31		c0.12	0.30		0.04	c0.39		c0.04	0.15	
v/s Ratio Perm			0.01			0.04			0.36			0.04
v/c Ratio	1.08	1.08	0.04	1.08	1.06	0.13	0.57	1.08	1.00	0.74	0.42	0.11
Uniform Delay, d1	62.0	50.0	36.1	62.0	50.0	37.1	63.8	45.0	44.9	65.0	34.5	30.6
Progression Factor	1.23	0.62	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	62.9	44.0	0.1	72.4	39.8	0.6	3.8	44.3	38.2	14.6	0.2	0.1
Delay (s)	139.2	75.1	36.2	134.4	89.8	37.7	67.6	89.3	83.1	79.6	34.7	30.8
Level of Service	F	E	D	F	F	D	E	F	F	E	C	C
Approach Delay (s)		87.0			94.3			87.1			40.3	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	83.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Appendix I

2031 Widening with Full Interchange Analysis Results

Table 4: 2031 Future Conditions Widening along Courtneypark Drive E Full I/C @ Courtneypark Drive Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
Kennedy Road/ Courtneypark Drive E *Signalized*	EB	Left	E	65	0.59	40	E	77	0.88	75
		Triple Thru	F	111	1.10	169	E	56	0.68	72
		Right	D	43	0.07	13	D	46	0.09	17
	WB	Left	F	117	1.14	215	D	40	0.88	87
		Triple Thru	A	9	0.28	19	C	24	0.83	125
		Right	A	2	0.14	1	A	8	0.35	12
	NB	Left	E	62	0.72	31	C	28	0.52	36
		Dual Thru	D	50	0.55	71	D	50	0.86	178
		Right	D	47	0.27	29	D	43	0.59	81
	SB	Left	E	59	0.88	103	E	65	0.86	64
		Dual Thru	F	97	1.07	222	D	41	0.64	114
		Right	C	34	0.05	7	C	31	0.08	13
	Overall Intersection		***E***	***74***	***1.13***	**-**	***D***	***40***	***0.89***	**-**
Highway 410 West Terminal/ Courtneypark Drive E *Signalized*	EB	Left	B	19	0.78	57	C	30	0.71	108
		Triple Thru	C	20	0.52	148	A	4	0.25	21
	WB	Triple Thru	C	24	0.44	99	D	49	0.84	192
		Right	D	52	0.29	31	E	72	0.57	124
	SB	Dual Left	D	55	0.60	70	E	64	0.32	18
		Dual Right	D	47	0.17	15	E	60	0.09	15
	Overall Intersection		***C***	***30***	***0.76***	**-**	***D***	***42***	***0.74***	**-**
Highway 410 East Terminal/ Courtneypark Drive E *Signalized*	EB	Left	C	29	0.29	25	D	51	0.17	7
		Triple Thru	D	35	0.85	133	D	48	0.61	68
		Right	D	51	0.14	22	E	76	0.18	24
	WB	Left	E	56	0.67	30	D	43	0.95	156
		Dual Thru-Thru/Right	B	19	0.32	44	C	34	0.74	183
	NB	Left	D	49	0.82	158	E	58	0.72	80
		Left/Thru	D	52	0.84	160	D	50	0.62	76
		Dual Right	D	37	0.68	113	D	40	0.09	11
	SB	Left	-	-	-	-	-	-	-	-
		Thru/Right	C	26	0.04	10	D	43	0.22	39
	Overall Intersection		***D***	***37***	***0.84***	**-**	***D***	***42***	***0.90***	**-**
Tomken Road/ Courtneypark Drive E *Signalized*	EB	Left	D	37	0.75	43	F	133	0.91	57
		Triple Thru	C	33	0.72	74	B	18	0.25	17
		Right	F	128	1.23	371	B	16	0.15	1
	WB	Left	C	23	0.22	8	C	34	0.10	9
		Dual Thru-Thru/Right	C	20	0.25	23	F	130	1.18	272
	NB	Dual Left	E	64	0.50	48	F	165	1.20	144

Table 4: 2031 Future Conditions Widening along Courtneypark Drive E Full I/C @ Courtneypark Drive Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
		Dual Thru	C	22	0.28	53	E	67	1.00	260
		Right	B	19	0.05	11	C	26	0.03	0
	SB	Left	E	57	0.76	98	E	70	0.71	31
		Dual Thru	E	75	1.01	220	D	55	0.79	115
		Right	C	34	0.24	29	E	61	0.88	155
	Overall Intersection		***E***	***60***	***1.14***	***-***	***F***	***92***	***1.13***	***-***
Ordan Drive-Shawson Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	2	0.21	4	C	22	0.42	9
		Dual Thru-Thru/Right	A	1	0.38	10	A	2	0.21	5
	WB	Left	A	8	0.23	10	A	4	0.13	4
		Dual Thru-Thru/Right	A	4	0.11	15	A	4	0.56	23
	NB	Left	D	54	0.10	10	D	52	0.55	58
		Thru/Right	D	53	0.07	13	D	39	0.07	14
	SB	Left	D	52	0.02	5	D	38	0.02	6
		Thru/Right	D	52	0.04	12	D	44	0.36	53
	Overall Intersection		***A***	***4***	***0.34***	***-***	***A***	***10***	***0.55***	***-***
Vipond Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	7	0.17	25	B	11	0.10	3
		Dual Thru-Thru/Right	B	11	0.38	86	A	9	0.22	25
	WB	Left	B	13	0.21	11	A	4	0.12	7
		Dual Thru-Thru/Right	B	12	0.15	22	A	7	0.54	78
	NB	Left	D	43	0.06	9	D	47	0.27	30
		Thru/Right	D	43	0.05	12	D	42	0.05	11
	SB	Left	D	43	0.01	4	D	43	0.10	15
		Thru/Right	D	43	0.02	7	D	47	0.29	39
	Overall Intersection		***B***	***12***	***0.30***	***-***	***B***	***11***	***0.48***	***-***
Ordan Drive/ Courtneypark Drive E *Signalized*	EB	Left	A	1	0.03	< 1	B	10	0.02	1
		Dual Thru-Thru/Right	A	2	0.38	4	B	13	0.27	43
	WB	Left	A	8	0.12	5	B	13	0.08	4
		Dual Thru-Thru/Right	A	6	0.20	19	B	15	0.53	69
	NB	Left	D	39	0.03	7	D	43	0.22	28
		Thru/Right	D	39	0.02	8	D	40	0.05	0
	SB	Left	D	41	0.13	14	D	45	0.29	31
		Thru/Right	D	39	0.02	6	D	40	0.06	12
	Overall Intersection		***A***	***5***	***0.31***	***-***	***B***	***17***	***0.47***	***-***
Dixie Road/ Courtneypark Drive E *Signalized*	EB	Dual Left	E	63	0.66	28	F	116	1.11	96
		Dual Thru	C	21	0.73	78	C	30	0.22	42
		Right	D	53	0.21	79	D	42	0.15	41
	WB	Left	D	53	0.24	12	D	43	0.32	29

Table 4: 2031 Future Conditions Widening along Courtneypark Drive E Full I/C @ Courtneypark Drive Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
		Dual Thru	E	57	0.36	26	F	81	0.97	149
		Right	D	55	0.10	2	E	64	0.89	180
	NB	Dual Left	E	64	0.61	37	E	69	0.88	115
		Triple Thru	C	28	0.47	92	F	87	1.08	265
		Right	C	22	0.06	0	C	26	0.03	0
	SB	Dual Left	E	63	0.76	70	E	80	0.72	41
		Triple Thru	C	26	0.62	141	D	50	0.76	107
		Right	C	21	0.26	19	D	38	0.11	12
	Overall Intersection		***C***	***35***	***0.71***	**-**	***E***	***73***	***1.05***	**-**

Table 4: 2031 Future Conditions Widening along Courtneypark Drive E Full I/C @ Courtneypark Drive Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
Kennedy Road/ Derry Road E *Signalized*	EB	Left	F	132	1.04	95	F	183	1.25	122
		Triple Thru	F	96	1.08	217	D	44	0.68	111
		Right	D	37	0.22	34	C	34	0.06	3
	WB	Dual Left	F	130	1.12	142	E	68	0.88	86
		Triple Thru	B	16	0.38	66	E	58	1.04	288
		Right	C	27	0.16	14	C	30	0.74	141
	NB	Left	D	44	0.58	22	D	39	0.41	45
		Dual Thru	D	38	0.30	44	E	65	0.96	193
		Right	D	37	0.21	21	D	40	0.50	67
	SB	Left	D	50	0.81	97	F	162	1.15	76
		Dual Thru	E	57	0.91	185	C	31	0.31	53
		Right	D	35	0.18	28	C	28	0.09	14
	Overall Intersection		***E***	***66***	***1.03***	**-**	***E***	***59***	***1.20***	**-**
Highway 410 West Terminal/ Derry Road E *Signalized*	EB	Triple Thru	A	9	0.69	49	B	18	0.42	135
	WB	Triple Thru	B	10	0.47	74	A	9	0.79	131
	SB	Dual Left	D	49	0.76	113	D	52	0.38	38
		Dual Right	D	52	0.81	113	E	67	0.82	76
	Overall Intersection		***C***	***22***	***0.73***	**-**	***B***	***18***	***0.80***	**-**
Highway 410 East Terminal/ Derry Road E *Signalized*	EB	Triple Thru	D	38	1.01	291	A	5	0.40	21
	WB	Triple Thru	A	7	0.57	18	B	15	0.98	139
	NB	Dual Left	C	32	0.46	81	E	66	0.95	182
		Dual Right	F	215	1.37	363	D	43	0.54	64
	Overall Intersection		***E***	***77***	***1.17***	**-**	***C***	***25***	***0.97***	**-**
Tomken Road/ Derry Road E *Signalized*	EB	Left	C	26	0.83	55	F	147	1.03	59
		Triple Thru	D	42	0.75	128	C	28	0.75	94
		Right	D	48	0.78	86	B	20	0.08	6
	WB	Left	F	96	0.89	88	D	42	0.64	19
		Triple Thru	B	12	0.55	22	D	55	1.03	231
		Right	C	28	0.03	< 1	C	31	0.04	0
	NB	Dual Left	E	78	0.71	30	F	107	1.09	250
		Thru-Thru/Right	C	34	0.30	43	D	43	0.92	247
	SB	Left	D	42	0.15	17	F	109	0.68	27
		Dual Thru	E	62	0.88	138	D	50	0.41	49
		Right	D	43	0.24	28	F	148	1.14	197
	Overall Intersection		***D***	***42***	***0.87***	**-**	***E***	***64***	***1.08***	**-**
Dixie Road/ Derry Road E	EB	Dual Left	E	77	0.77	57	F	96	0.88	86
		Triple Thru	E	63	1.05	263	E	58	1.02	203

Table 4: 2031 Future Conditions Widening along Courtneypark Drive E Full I/C @ Courtneypark Drive Peak Hour Level of Service Analysis										
Intersection	**Approach/Movement**		**AM Peak Hour**				**PM Peak Hour**			
			LOS	**Delay**	**v/c**	**Q**	**LOS**	**Delay**	**v/c**	**Q**
Signalized		Right	A	5	0.15	6	D	37	0.03	< 1
	WB	Dual Left	F	132	1.09	105	F	134	1.08	92
		Triple Thru	D	47	0.69	101	D	54	0.80	120
		Right	C	35	0.02	< 1	D	41	0.13	21
	NB	Dual Left	E	68	0.49	17	E	66	0.53	26
		Triple Thru	D	43	0.65	98	F	81	1.06	285
		Right	D	42	0.54	75	E	71	0.95	214
	SB	Dual Left	E	78	0.76	41	E	80	0.74	34
		Triple Thru	E	67	0.99	207	C	34	0.41	62
		Right	C	33	0.16	21	C	30	0.11	15
	Overall Intersection		***E***	***61***	***1.03***	**-**	***E***	***69***	***1.03***	**-**

Queues
3: Kennedy Rd & Courtneypark Dr E

12/18/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	1216	95	524	724	185	84	418	362	304	1120	62
v/c Ratio	0.59	1.10	0.23	1.13	0.28	0.23	0.69	0.55	0.62	0.84	1.07	0.14
Control Delay	66.5	106.9	8.3	111.5	8.7	0.8	58.1	50.8	9.5	53.7	94.3	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.5	106.9	8.3	111.5	8.7	0.8	58.1	50.8	9.5	53.7	94.3	5.2
Queue Length 50th (m)	20.9	~139.0	0.0	~155.3	13.2	0.0	14.6	54.1	0.0	61.6	~180.2	0.0
Queue Length 95th (m)	#40.3	#168.5	12.8	#214.9	18.8	0.6	#31.4	71.4	28.7	#103.4	#222.2	7.3
Internal Link Dist (m)		190.6			519.5			142.2			201.4	
Turn Bay Length (m)	65.0		50.0	95.0		50.0	100.0		50.0	85.0		50.0
Base Capacity (vph)	143	1109	408	462	2543	802	122	760	582	362	1047	431
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	1.10	0.23	1.13	0.28	0.23	0.69	0.55	0.62	0.84	1.07	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	1180	92	508	702	179	81	405	351	295	1086	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1638	4856	1445	1484	4812	1353	1600	3318	1324	1628	3411	1230
Flt Permitted	0.36	1.00	1.00	0.11	1.00	1.00	0.12	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	629	4856	1445	179	4812	1353	210	3318	1324	596	3411	1230
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	84	1216	95	524	724	185	84	418	362	304	1120	62
RTOR Reduction (vph)	0	0	73	0	0	87	0	0	279	0	0	43
Lane Group Flow (vph)	84	1216	22	524	724	98	84	418	83	304	1120	19
Confl. Peds. (#/hr)	7		10	10		7	34		5	5		34
Heavy Vehicles (%)	11%	8%	10%	23%	9%	18%	14%	10%	21%	12%	7%	25%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	32.0	32.0	32.0	74.0	74.0	74.0	38.1	32.1	32.1	52.0	43.0	43.0
Effective Green, g (s)	32.0	32.0	32.0	74.0	74.0	74.0	38.1	32.1	32.1	52.0	43.0	43.0
Actuated g/C Ratio	0.23	0.23	0.23	0.53	0.53	0.53	0.27	0.23	0.23	0.37	0.31	0.31
Clearance Time (s)	7.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	143	1109	330	458	2543	715	116	760	303	345	1047	377
v/s Ratio Prot		0.25		c0.32	0.15		0.03	0.13		c0.11	c0.33	
v/s Ratio Perm	0.13		0.02	c0.29		0.07	0.17		0.06	0.22		0.02
v/c Ratio	0.59	1.10	0.07	1.14	0.28	0.14	0.72	0.55	0.27	0.88	1.07	0.05
Uniform Delay, d1	48.1	54.0	42.3	42.0	18.3	16.8	42.1	47.6	44.4	36.6	48.5	34.1
Progression Factor	1.00	1.00	1.00	0.74	0.46	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.5	57.4	0.4	86.1	0.3	0.4	19.9	2.9	2.2	22.1	48.5	0.3
Delay (s)	64.6	111.4	42.7	117.0	8.6	1.9	62.0	50.4	46.6	58.8	97.0	34.4
Level of Service	E	F	D	F	A	A	E	D	D	E	F	C
Approach Delay (s)		103.9			47.4			50.0			86.5	
Approach LOS		F			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	74.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	111.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	268	1760	1084	332	406	470
v/c Ratio	0.76	0.52	0.44	0.43	0.60	0.50
Control Delay	20.1	20.3	25.1	8.0	55.1	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	20.3	25.1	8.0	55.1	5.9
Queue Length 50th (m)	54.9	161.5	62.1	13.8	53.1	0.0
Queue Length 95th (m)	m57.3	m148.0	98.6	m31.2	70.3	15.3
Internal Link Dist (m)		519.5	363.3		106.3	
Turn Bay Length (m)	95.0			240.0		
Base Capacity (vph)	501	3396	2441	766	680	939
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.52	0.44	0.43	0.60	0.50

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	252	1654	1019	312	382	442
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1313	4902	4601	1150	3404	2818
Flt Permitted	0.21	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	286	4902	4601	1150	3404	2818
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	268	1760	1084	332	406	470
RTOR Reduction (vph)	0	0	0	156	0	376
Lane Group Flow (vph)	268	1760	1084	176	406	94
Heavy Vehicles (%)	39%	7%	14%	42%	4%	2%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	97.0	97.0	74.3	74.3	28.0	28.0
Effective Green, g (s)	97.0	97.0	74.3	74.3	28.0	28.0
Actuated g/C Ratio	0.69	0.69	0.53	0.53	0.20	0.20
Clearance Time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	342	3396	2441	610	680	563
v/s Ratio Prot	c0.11	0.36	0.24		c0.12	
v/s Ratio Perm	c0.43			0.15		0.03
v/c Ratio	0.78	0.52	0.44	0.29	0.60	0.17
Uniform Delay, d1	11.2	10.3	20.2	18.2	50.9	46.3
Progression Factor	1.28	1.93	1.15	2.79	1.00	1.00
Incremental Delay, d2	5.0	0.2	0.5	1.0	3.8	0.6
Delay (s)	19.4	20.1	23.6	51.7	54.7	47.0
Level of Service	B	C	C	D	D	D
Approach Delay (s)		20.0	30.2		50.6	
Approach LOS		C	C		D	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	91	1791	225	78	647	391	385	848	59
v/c Ratio	0.29	0.85	0.28	0.65	0.32	0.82	0.84	0.71	0.09
Control Delay	29.8	35.7	6.9	55.4	19.1	53.7	56.6	30.4	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	35.7	6.9	55.4	19.1	53.7	56.6	30.4	8.2
Queue Length 50th (m)	11.3	111.3	8.7	13.8	34.3	101.2	101.0	86.3	1.0
Queue Length 95th (m)	m24.6	132.7	21.5	#30.1	43.9	#158.0	#160.4	113.0	10.0
Internal Link Dist (m)		363.3			449.2		155.5		89.6
Turn Bay Length (m)	20.0		240.0	160.0					
Base Capacity (vph)	318	2102	815	121	2002	477	457	1190	672
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.85	0.28	0.64	0.32	0.82	0.84	0.71	0.09

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	87	1719	216	75	621	0	735	10	814	0	6	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	0.88		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		1.00	
Satd. Flow (prot)	1789	4902	1601	1472	4004		1605	1614	2711		1630	
Flt Permitted	0.39	1.00	1.00	0.06	1.00		0.72	0.69	1.00		1.00	
Satd. Flow (perm)	744	4902	1601	98	4004		1214	1165	2711		1630	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.92	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	91	1791	225	78	647	0	766	10	848	0	6	53
RTOR Reduction (vph)	0	0	128	0	0	0	0	0	125	0	32	0
Lane Group Flow (vph)	91	1791	97	78	647	0	391	385	723	0	27	0
Heavy Vehicles (%)	2%	7%	2%	24%	31%	2%	8%	2%	6%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	60.1	60.1	60.1	70.0	70.0		55.0	55.0	55.0		55.0	
Effective Green, g (s)	60.1	60.1	60.1	70.0	70.0		55.0	55.0	55.0		55.0	
Actuated g/C Ratio	0.43	0.43	0.43	0.50	0.50		0.39	0.39	0.39		0.39	
Clearance Time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	319	2104	687	116	2002		476	457	1065		640	
v/s Ratio Prot		c0.37		c0.03	0.16						0.02	
v/s Ratio Perm	0.12		0.06	0.30			0.32	c0.33	0.27			
v/c Ratio	0.29	0.85	0.14	0.67	0.32		0.82	0.84	0.68		0.04	
Uniform Delay, d1	26.0	35.9	24.3	26.7	20.9		38.1	38.6	35.2		26.2	
Progression Factor	1.04	0.87	2.08	1.58	0.89		1.00	1.00	1.00		1.00	
Incremental Delay, d2	1.9	4.0	0.4	13.8	0.4		10.9	13.2	1.7		0.1	
Delay (s)	28.8	35.4	50.8	56.1	19.0		49.0	51.8	36.9		26.4	
Level of Service	C	D	D	E	B		D	D	D		C	
Approach Delay (s)		36.7			23.0			43.4			26.4	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	272	1438	973	13	412	154	418	55	233	1168	197
v/c Ratio	0.75	0.72	1.18	0.22	0.26	0.50	0.28	0.08	0.76	1.01	0.39
Control Delay	39.8	33.6	106.6	28.3	18.1	65.5	22.9	9.9	58.3	74.0	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	33.6	106.6	28.3	18.1	65.5	22.9	9.9	58.3	74.0	11.3
Queue Length 50th (m)	42.6	82.5	~263.7	1.9	20.0	21.0	35.2	2.2	57.2	~172.7	8.3
Queue Length 95th (m)	m43.1	73.7	#370.5	8.4	23.4	#48.3	52.7	10.9	#97.9	#220.2	28.5
Internal Link Dist (m)		449.2			466.9		171.2			190.6	
Turn Bay Length (m)	120.0		100.0	50.0		80.0		50.0	130.0		85.0
Base Capacity (vph)	417	2297	825	68	1821	308	1505	667	307	1158	505
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.63	1.18	0.19	0.23	0.50	0.28	0.08	0.76	1.01	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	1337	905	12	322	61	143	389	51	217	1086	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	5.0	8.0	8.0		5.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1701	4948	1515	1546	3880		2745	3067	1319	1679	3380	1182
Flt Permitted	0.50	1.00	1.00	0.09	1.00		0.95	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	898	4948	1515	148	3880		2745	3067	1319	897	3380	1182
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	272	1438	973	13	346	66	154	418	55	233	1168	197
RTOR Reduction (vph)	0	0	15	0	22	0	0	0	20	0	0	101
Lane Group Flow (vph)	272	1438	958	13	390	0	154	418	35	233	1168	96
Confl. Peds. (#/hr)	4		7	7		4	3		9	9		3
Heavy Vehicles (%)	7%	6%	6%	18%	29%	45%	29%	19%	21%	8%	8%	36%
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	56.3	56.3	72.0	56.3	56.3		15.7	68.7	68.7	48.0	48.0	48.0
Effective Green, g (s)	56.3	56.3	72.0	56.3	56.3		15.7	68.7	68.7	48.0	48.0	48.0
Actuated g/C Ratio	0.40	0.40	0.51	0.40	0.40		0.11	0.49	0.49	0.34	0.34	0.34
Clearance Time (s)	8.0	8.0	5.0	8.0	8.0		5.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	361	1989	779	59	1560		307	1505	647	307	1158	405
v/s Ratio Prot		0.29	c0.14		0.10		0.06	0.14			c0.35	
v/s Ratio Perm	0.30		0.49	0.09					0.03	0.26		0.08
v/c Ratio	0.75	0.72	1.23	0.22	0.25		0.50	0.28	0.05	0.76	1.01	0.24
Uniform Delay, d1	35.9	35.3	34.0	27.5	27.8		58.5	21.0	18.7	40.9	46.0	32.9
Progression Factor	0.89	0.93	0.53	0.76	0.73		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	0.8	110.1	1.9	0.1		5.8	0.5	0.2	16.1	28.6	1.4
Delay (s)	37.2	33.4	128.2	22.8	20.3		64.2	21.5	18.8	56.9	74.6	34.3
Level of Service	D	C	F	C	C		E	C	B	E	E	C
Approach Delay (s)		68.2			20.4			31.7			67.0	
Approach LOS		E			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	59.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	114.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	1405	49	353	14	33	4	42
v/c Ratio	0.21	0.38	0.23	0.11	0.10	0.15	0.02	0.20
Control Delay	1.5	1.3	9.1	4.1	54.4	27.2	52.2	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.5	1.3	9.1	4.1	54.4	27.2	52.2	18.5
Queue Length 50th (m)	2.7	9.1	3.4	8.2	3.4	2.4	1.0	0.5
Queue Length 95th (m)	m4.0	9.7	9.5	14.6	10.3	12.5	4.7	11.5
Internal Link Dist (m)		466.9		278.5		123.7		151.6
Turn Bay Length (m)	45.0		30.0		35.0		35.0	
Base Capacity (vph)	719	3669	210	3252	136	214	161	213
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.38	0.23	0.11	0.10	0.15	0.02	0.20

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	1280	97	48	341	5	14	10	23	4	2	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	4795		1547	4255		1243	1362		1460	1254	
Flt Permitted	0.53	1.00		0.17	1.00		0.73	1.00		0.74	1.00	
Satd. Flow (perm)	942	4795		275	4255		954	1362		1131	1254	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	152	1306	99	49	348	5	14	10	23	4	2	40
RTOR Reduction (vph)	0	6	0	0	1	0	0	20	0	0	34	0
Lane Group Flow (vph)	152	1399	0	49	352	0	14	13	0	4	8	0
Confl. Peds. (#/hr)	3					3	3					3
Heavy Vehicles (%)	8%	8%	11%	18%	23%	20%	46%	11%	33%	25%	50%	28%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	107.0	107.0		107.0	107.0		20.0	20.0		20.0	20.0	
Effective Green, g (s)	107.0	107.0		107.0	107.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.76	0.76		0.76	0.76		0.14	0.14		0.14	0.14	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	719	3664		210	3252		136	194		161	179	
v/s Ratio Prot		c0.29			0.08			0.01			0.01	
v/s Ratio Perm	0.16			0.18			c0.01			0.00		
v/c Ratio	0.21	0.38		0.23	0.11		0.10	0.07		0.02	0.04	
Uniform Delay, d1	4.6	5.5		4.7	4.2		52.2	51.9		51.6	51.7	
Progression Factor	0.21	0.19		1.24	0.95		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.2		2.6	0.1		1.5	0.7		0.3	0.5	
Delay (s)	1.5	1.3		8.4	4.1		53.7	52.6		51.9	52.2	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		1.3			4.6			52.9			52.2	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	1206	50	435	13	39	4	16
v/c Ratio	0.17	0.38	0.21	0.15	0.06	0.11	0.01	0.05
Control Delay	7.4	11.0	14.2	11.4	43.9	20.1	43.0	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	11.0	14.2	11.4	43.9	20.1	43.0	20.9
Queue Length 50th (m)	12.7	88.0	6.3	19.1	2.9	2.2	0.9	0.4
Queue Length 95th (m)	24.5	86.1	11.4	22.3	8.8	12.0	4.2	6.7
Internal Link Dist (m)		278.5		341.9		126.6		117.6
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	629	3182	238	2896	236	350	310	331
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.38	0.21	0.15	0.06	0.11	0.01	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	1101	81	49	390	36	13	10	28	4	2	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.89		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1798	4680		1643	4258		1360	1480		1822	1447	
Flt Permitted	0.49	1.00		0.20	1.00		0.75	1.00		0.73	1.00	
Satd. Flow (perm)	927	4680		352	4258		1069	1480		1403	1447	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	107	1123	83	50	398	37	13	10	29	4	2	14
RTOR Reduction (vph)	0	6	0	0	8	0	0	23	0	0	11	0
Lane Group Flow (vph)	107	1200	0	50	427	0	13	16	0	4	5	0
Confl. Peds. (#/hr)	3		1	1		3	5		1	1		5
Heavy Vehicles (%)	1%	11%	7%	11%	23%	3%	33%	0%	19%	0%	50%	8%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	95.0	95.0		95.0	95.0		31.0	31.0		31.0	31.0	
Effective Green, g (s)	95.0	95.0		95.0	95.0		31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.68	0.68		0.68	0.68		0.22	0.22		0.22	0.22	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	629	3175		238	2889		236	327		310	320	
v/s Ratio Prot		c0.26			0.10			0.01			0.00	
v/s Ratio Perm	0.12			0.14			c0.01			0.00		
v/c Ratio	0.17	0.38		0.21	0.15		0.06	0.05		0.01	0.02	
Uniform Delay, d1	8.2	9.7		8.4	8.0		43.0	42.9		42.6	42.6	
Progression Factor	0.81	1.11		1.34	1.48		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.3		2.0	0.1		0.4	0.3		0.1	0.1	
Delay (s)	7.2	11.1		13.3	12.0		43.4	43.2		42.6	42.7	
Level of Service	A	B		B	B		D	D		D	D	
Approach Delay (s)		10.8			12.2			43.3			42.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	13	1149	30	572	11	20	27	12
v/c Ratio	0.03	0.39	0.12	0.20	0.03	0.05	0.13	0.04
Control Delay	1.2	1.7	7.9	5.6	39.4	20.5	42.1	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.2	1.7	7.9	5.6	39.4	20.5	42.1	26.4
Queue Length 50th (m)	0.1	3.3	1.5	9.5	2.3	1.0	5.8	1.0
Queue Length 95th (m)	m0.3	4.2	m5.2	18.9	7.4	7.7	14.1	6.4
Internal Link Dist (m)		341.9		193.9		128.4		78.4
Turn Bay Length (m)	35.0		45.0		35.0		35.0	
Base Capacity (vph)	486	2976	256	2813	370	384	211	294
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.39	0.12	0.20	0.03	0.05	0.13	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	980	100	28	463	74	10	5	14	25	5	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.89		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	4567		1753	4305		1825	1454		1049	1126	
Flt Permitted	0.43	1.00		0.21	1.00		0.75	1.00		0.74	1.00	
Satd. Flow (perm)	749	4567		395	4305		1440	1454		822	1126	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	13	1043	106	30	493	79	11	5	15	27	5	7
RTOR Reduction (vph)	0	9	0	0	15	0	0	11	0	0	5	0
Lane Group Flow (vph)	13	1140	0	30	557	0	11	9	0	27	7	0
Confl. Peds. (#/hr)	3		2	2		3						
Heavy Vehicles (%)	9%	14%	3%	4%	18%	24%	0%	0%	23%	74%	40%	67%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	91.0	91.0		91.0	91.0		36.0	36.0		36.0	36.0	
Effective Green, g (s)	91.0	91.0		91.0	91.0		36.0	36.0		36.0	36.0	
Actuated g/C Ratio	0.65	0.65		0.65	0.65		0.26	0.26		0.26	0.26	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	486	2968		256	2798		370	373		211	289	
v/s Ratio Prot		c0.25			0.13			0.01			0.01	
v/s Ratio Perm	0.02			0.08			0.01			c0.03		
v/c Ratio	0.03	0.38		0.12	0.20		0.03	0.02		0.13	0.02	
Uniform Delay, d1	8.7	11.4		9.3	9.8		38.9	38.9		39.9	38.9	
Progression Factor	0.13	0.12		0.71	0.60		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4		0.9	0.1		0.1	0.1		1.2	0.2	
Delay (s)	1.2	1.7		7.5	6.1		39.1	39.0		41.2	39.0	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		1.7			6.2			39.0			40.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	162	510	271	28	127	119	181	917	89	399	1433	374
v/c Ratio	0.66	0.73	0.57	0.18	0.39	0.40	0.61	0.46	0.11	0.77	0.61	0.41
Control Delay	68.9	23.3	10.2	36.6	59.1	5.0	69.3	29.3	0.3	66.6	27.4	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.9	23.3	10.2	36.6	59.1	5.0	69.3	29.3	0.3	66.6	27.4	3.8
Queue Length 50th (m)	14.9	69.6	49.6	5.5	17.1	0.0	25.2	65.8	0.0	55.3	105.2	0.0
Queue Length 95th (m)	27.7	78.4	79.2	12.2	26.1	2.4	36.6	91.5	0.0	69.9	140.6	19.0
Internal Link Dist (m)		193.9			206.9			193.9			185.2	
Turn Bay Length (m)	55.0			45.0			85.0		50.0	100.0		125.0
Base Capacity (vph)	274	1004	568	155	636	401	325	1973	774	591	2339	915
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.51	0.48	0.18	0.20	0.30	0.56	0.46	0.11	0.68	0.61	0.41

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	490	260	27	122	114	174	880	85	383	1376	359
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	8.0	8.0	3.0	8.0	8.0	5.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.95	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2745	3349	1262	1340	2874	1184	3052	4334	1476	3372	4561	1429
Flt Permitted	0.95	1.00	1.00	0.46	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	2745	3349	1262	655	2874	1184	3052	4334	1476	3372	4561	1429
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	162	510	271	28	127	119	181	917	89	399	1433	374
RTOR Reduction (vph)	0	0	214	0	0	104	0	0	49	0	0	185
Lane Group Flow (vph)	162	510	57	28	127	15	181	917	40	399	1433	189
Confl. Peds. (#/hr)	23		5	5		23	4		20	20		4
Heavy Vehicles (%)	29%	9%	27%	36%	27%	32%	16%	21%	5%	5%	15%	12%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8			2			6
Actuated Green, G (s)	12.5	29.2	29.2	20.9	17.3	17.3	13.6	62.5	62.5	21.7	70.6	70.6
Effective Green, g (s)	12.5	29.2	29.2	20.9	17.3	17.3	13.6	62.5	62.5	21.7	70.6	70.6
Actuated g/C Ratio	0.09	0.21	0.21	0.15	0.12	0.12	0.10	0.45	0.45	0.15	0.50	0.50
Clearance Time (s)	6.0	8.0	8.0	3.0	8.0	8.0	5.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	245	698	263	115	355	146	296	1934	658	522	2300	720
v/s Ratio Prot	c0.06	c0.15		0.01	0.04		0.06	0.21		c0.12	c0.31	
v/s Ratio Perm			0.04	0.03		0.01			0.03			0.13
v/c Ratio	0.66	0.73	0.21	0.24	0.36	0.10	0.61	0.47	0.06	0.76	0.62	0.26
Uniform Delay, d1	61.7	51.7	45.9	51.7	56.3	54.4	60.7	27.2	22.0	56.7	25.1	19.8
Progression Factor	0.92	0.33	1.13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	3.7	0.4	1.1	0.6	0.3	3.7	0.8	0.2	6.6	1.3	0.9
Delay (s)	62.8	20.9	52.5	52.8	56.9	54.8	64.4	28.0	22.2	63.3	26.4	20.7
Level of Service	E	C	D	D	E	D	E	C	C	E	C	C
Approach Delay (s)		37.1			55.5			33.1			32.1	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues
3: Kennedy Rd & Courtneypark Dr E

12/18/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	187	613	121	358	1562	256	144	1105	362	149	753	104
v/c Ratio	0.85	0.68	0.33	0.85	0.83	0.45	0.50	0.86	0.68	0.84	0.64	0.19
Control Delay	65.3	56.2	10.2	36.7	24.3	4.9	27.3	50.6	25.6	66.8	41.2	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.3	56.2	10.2	36.7	24.3	4.9	27.3	50.6	25.6	66.8	41.2	6.9
Queue Length 50th (m)	33.5	58.1	0.0	31.3	131.5	11.0	22.3	149.7	42.4	25.8	92.5	0.6
Queue Length 95th (m)	#75.0	72.2	16.8	m#87.3	124.6	m12.1	35.8	178.3	81.1	#63.7	114.3	13.2
Internal Link Dist (m)		190.6			519.5			142.2			201.4	
Turn Bay Length (m)	65.0		50.0	95.0		50.0	100.0		50.0	85.0		50.0
Base Capacity (vph)	221	904	371	419	1879	564	298	1280	530	179	1182	558
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.68	0.33	0.85	0.83	0.45	0.48	0.86	0.68	0.83	0.64	0.19

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	558	110	326	1421	233	131	1006	329	136	685	95
Ideal Flow (vphpl)	1900	1900	1900	1900	2150	1900	1900	2050	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1738	4521	1374	1425	5599	1421	1703	3647	1166	1615	3380	1410
Flt Permitted	0.14	1.00	1.00	0.25	1.00	1.00	0.23	1.00	1.00	0.08	1.00	1.00
Satd. Flow (perm)	261	4521	1374	376	5599	1421	405	3647	1166	139	3380	1410
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	187	613	121	358	1562	256	144	1105	362	149	753	104
RTOR Reduction (vph)	0	0	97	0	0	87	0	0	121	0	0	66
Lane Group Flow (vph)	187	613	24	358	1562	169	144	1105	241	149	753	38
Confl. Peds. (#/hr)	9		8	8		9	28		2	2		28
Heavy Vehicles (%)	5%	16%	16%	28%	6%	12%	7%	8%	38%	13%	8%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	41.0	28.0	28.0	63.0	47.0	47.0	60.1	49.1	49.1	59.9	49.0	49.0
Effective Green, g (s)	41.0	28.0	28.0	63.0	47.0	47.0	60.1	49.1	49.1	59.9	49.0	49.0
Actuated g/C Ratio	0.29	0.20	0.20	0.45	0.34	0.34	0.43	0.35	0.35	0.43	0.35	0.35
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	213	904	274	408	1879	477	275	1279	408	174	1183	493
v/s Ratio Prot	0.08	0.14		c0.20	0.28		0.04	c0.30		c0.07	0.22	
v/s Ratio Perm	0.17		0.02	c0.19		0.12	0.18		0.21	0.30		0.03
v/c Ratio	0.88	0.68	0.09	0.88	0.83	0.35	0.52	0.86	0.59	0.86	0.64	0.08
Uniform Delay, d1	40.7	51.8	45.6	29.5	42.8	35.1	26.5	42.3	37.2	33.9	38.1	30.4
Progression Factor	1.00	1.00	1.00	0.87	0.50	0.20	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	36.5	4.1	0.6	14.2	2.6	1.2	1.8	7.9	6.2	31.5	2.6	0.3
Delay (s)	77.2	55.9	46.2	39.9	24.2	8.1	28.3	50.3	43.4	65.4	40.7	30.7
Level of Service	E	E	D	D	C	A	C	D	D	E	D	C
Approach Delay (s)		59.0			24.9			46.8			43.3	
Approach LOS		E			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	365	882	1972	666	74	260
v/c Ratio	0.70	0.25	0.84	0.67	0.32	0.54
Control Delay	28.1	3.8	49.3	25.2	64.2	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	3.8	49.3	25.2	64.2	11.3
Queue Length 50th (m)	78.3	29.4	174.8	83.7	10.1	0.0
Queue Length 95th (m)	m108.4	21.1	191.6	124.0	18.2	14.5
Internal Link Dist (m)		519.5	363.3		106.3	
Turn Bay Length (m)	95.0			240.0		
Base Capacity (vph)	520	3498	2349	997	233	479
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.25	0.84	0.67	0.32	0.54

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	358	864	1933	613	73	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1601	4334	4768	1570	2724	2818
Flt Permitted	0.06	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	94	4334	4768	1570	2724	2818
Peak-hour factor, PHF	0.98	0.98	0.98	0.92	0.98	0.98
Adj. Flow (vph)	365	882	1972	666	74	260
RTOR Reduction (vph)	0	0	0	224	0	238
Lane Group Flow (vph)	365	882	1972	442	74	22
Heavy Vehicles (%)	14%	21%	10%	4%	30%	2%
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Actuated Green, G (s)	113.0	113.0	69.0	69.0	12.0	12.0
Effective Green, g (s)	113.0	113.0	69.0	69.0	12.0	12.0
Actuated g/C Ratio	0.81	0.81	0.49	0.49	0.09	0.09
Clearance Time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	517	3498	2349	773	233	241
v/s Ratio Prot	c0.21	0.20	c0.41			
v/s Ratio Perm	0.36			0.28	c0.03	0.01
v/c Ratio	0.71	0.25	0.84	0.57	0.32	0.09
Uniform Delay, d1	36.3	3.3	30.7	25.1	60.2	59.0
Progression Factor	0.65	1.11	1.50	2.79	1.00	1.00
Incremental Delay, d2	6.2	0.1	2.6	2.0	3.6	0.8
Delay (s)	29.9	3.8	48.7	72.1	63.7	59.7
Level of Service	C	A	D	E	E	E
Approach Delay (s)		11.4	54.6		60.6	
Approach LOS		B	D		E	

Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	9	717	282	721	2386	171	184	189	106
v/c Ratio	0.17	0.61	0.44	0.93	0.74	0.72	0.62	0.28	0.23
Control Delay	60.3	49.6	11.7	36.5	34.0	66.2	57.0	6.5	41.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	49.6	11.7	36.5	34.0	66.2	57.0	6.5	41.7
Queue Length 50th (m)	1.5	52.6	5.5	179.4	217.9	45.8	47.8	0.0	22.6
Queue Length 95th (m)	m6.8	67.7	23.9	m156.4	m182.6	#80.3	75.7	10.5	38.9
Internal Link Dist (m)		363.3			449.2		100.0		68.8
Turn Bay Length (m)	20.0		240.0	160.0					
Base Capacity (vph)	53	1177	640	841	3211	238	297	678	466
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.61	0.44	0.86	0.74	0.72	0.62	0.28	0.23

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	681	268	685	2267	0	258	79	180	0	90	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	0.88		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00		1.00	
Satd. Flow (prot)	1789	4334	1601	1772	4995		1313	1499	2145		1854	
Flt Permitted	0.11	1.00	1.00	0.26	1.00		0.69	0.77	1.00		1.00	
Satd. Flow (perm)	198	4334	1601	478	4995		952	1189	2145		1854	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	717	282	721	2386	0	272	83	189	0	95	11
RTOR Reduction (vph)	0	0	205	0	0	0	0	0	142	0	3	0
Lane Group Flow (vph)	9	717	77	721	2386	0	171	184	47	0	103	0
Heavy Vehicles (%)	2%	21%	2%	3%	5%	2%	32%	2%	34%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	38.0	38.0	38.0	90.0	90.0		35.0	35.0	35.0		35.0	
Effective Green, g (s)	38.0	38.0	38.0	90.0	90.0		35.0	35.0	35.0		35.0	
Actuated g/C Ratio	0.27	0.27	0.27	0.64	0.64		0.25	0.25	0.25		0.25	
Clearance Time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	53	1176	434	760	3211		238	297	536		463	
v/s Ratio Prot		0.17		c0.33	0.48						0.06	
v/s Ratio Perm	0.05		0.05	c0.28			c0.18	0.15	0.02			
v/c Ratio	0.17	0.61	0.18	0.95	0.74		0.72	0.62	0.09		0.22	
Uniform Delay, d1	39.0	44.5	39.0	27.1	17.1		48.0	46.6	40.3		41.7	
Progression Factor	1.14	1.02	1.92	1.47	1.95		1.00	1.00	1.00		1.00	
Incremental Delay, d2	6.7	2.3	0.9	3.1	0.1		9.9	3.8	0.1		1.1	
Delay (s)	51.0	47.8	75.9	42.8	33.6		57.9	50.4	40.3		42.8	
Level of Service	D	D	E	D	C		E	D	D		D	
Approach Delay (s)		55.7			35.7			49.3			42.8	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	114	463	187	27	2054	621	1439	34	82	677	497
v/c Ratio	0.88	0.25	0.29	0.10	1.18	1.20	1.00	0.07	0.68	0.79	0.83
Control Delay	109.0	18.1	3.1	34.2	125.4	155.3	66.3	0.2	51.5	55.4	44.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.0	18.1	3.1	34.2	125.4	155.3	66.3	0.2	51.5	55.4	44.2
Queue Length 50th (m)	24.7	13.5	0.6	4.5	~243.6	~106.9	~208.6	0.0	12.0	92.2	99.0
Queue Length 95th (m)	#56.7	17.1	0.9	m8.8	#271.5	#143.9	#260.3	0.0	#30.5	115.2	#155.3
Internal Link Dist (m)		449.2			466.9		171.2			190.6	
Turn Bay Length (m)	120.0		100.0	50.0		80.0		50.0	130.0		85.0
Base Capacity (vph)	129	1888	654	282	1736	519	1437	519	121	861	596
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.25	0.29	0.10	1.18	1.20	1.00	0.07	0.68	0.79	0.83

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	435	176	25	1757	174	584	1353	32	77	636	467
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	3.0	7.0	3.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1332	4334	1260	1608	4939		3309	3659	1189	1601	3259	1489
Flt Permitted	0.08	1.00	1.00	0.48	1.00		0.95	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	108	4334	1260	806	4939		3309	3659	1189	182	3259	1489
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	114	463	187	27	1869	185	621	1439	34	82	677	497
RTOR Reduction (vph)	0	0	106	0	8	0	0	0	21	0	0	68
Lane Group Flow (vph)	114	463	81	27	2046	0	621	1439	13	82	677	429
Confl. Peds. (#/hr)	1		6	6		1	6		10	10		6
Heavy Vehicles (%)	37%	21%	27%	13%	4%	11%	7%	5%	34%	14%	12%	8%
Turn Type	pm+pt	NA	Perm	Perm	NA		Prot	NA	Perm	pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4		4	8					2	6		6
Actuated Green, G (s)	61.0	61.0	61.0	49.0	49.0		22.0	55.0	55.0	43.0	37.0	46.0
Effective Green, g (s)	61.0	61.0	61.0	49.0	49.0		22.0	55.0	55.0	43.0	37.0	46.0
Actuated g/C Ratio	0.44	0.44	0.44	0.35	0.35		0.16	0.39	0.39	0.31	0.26	0.33
Clearance Time (s)	3.0	8.0	8.0	8.0	8.0		5.0	7.0	7.0	3.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	125	1888	549	282	1728		519	1437	467	116	861	489
v/s Ratio Prot	c0.06	0.11			c0.41		c0.19	c0.39		0.03	0.21	0.06
v/s Ratio Perm	0.34		0.06	0.03					0.01	0.19		0.23
v/c Ratio	0.91	0.25	0.15	0.10	1.18		1.20	1.00	0.03	0.71	0.79	0.88
Uniform Delay, d1	35.1	25.0	23.8	30.6	45.5		59.0	42.5	26.1	39.5	47.8	44.3
Progression Factor	2.41	0.71	0.67	1.08	0.92		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.7	0.3	0.5	0.6	88.0		106.0	24.1	0.1	30.4	7.2	16.2
Delay (s)	133.3	18.1	16.4	33.5	130.1		165.0	66.6	26.2	69.9	55.0	60.5
Level of Service	F	B	B	C	F		F	E	C	E	D	E
Approach Delay (s)		34.8			128.9			95.1			58.1	
Approach LOS		C			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	91.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	108.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	592	64	1784	145	72	8	164
v/c Ratio	0.42	0.21	0.13	0.56	0.55	0.17	0.02	0.39
Control Delay	24.4	1.8	3.9	4.3	53.2	12.1	38.6	38.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	1.8	3.9	4.3	53.2	12.1	38.6	38.6
Queue Length 50th (m)	0.8	4.6	1.9	19.9	34.7	1.7	1.7	31.5
Queue Length 95th (m)	m9.2	5.2	m3.9	23.4	58.0	14.0	6.1	52.9
Internal Link Dist (m)		466.9		278.5		123.7		151.6
Turn Bay Length (m)	45.0		30.0		35.0		35.0	
Base Capacity (vph)	79	2798	478	3209	266	412	358	425
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.21	0.13	0.56	0.55	0.17	0.02	0.39

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	486	53	58	1622	2	132	7	58	7	12	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1294	4340		1690	4992		1657	1381		1817	1542	
Flt Permitted	0.09	1.00		0.42	1.00		0.58	1.00		0.71	1.00	
Satd. Flow (perm)	124	4340		743	4992		1006	1381		1358	1542	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	33	534	58	64	1782	2	145	8	64	8	13	151
RTOR Reduction (vph)	0	9	0	0	0	0	0	47	0	0	18	0
Lane Group Flow (vph)	33	583	0	64	1784	0	145	25	0	8	146	0
Confl. Peds. (#/hr)	1					1	1		3	3		1
Heavy Vehicles (%)	41%	17%	38%	8%	5%	50%	10%	33%	17%	0%	18%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	90.0	90.0		90.0	90.0		37.0	37.0		37.0	37.0	
Effective Green, g (s)	90.0	90.0		90.0	90.0		37.0	37.0		37.0	37.0	
Actuated g/C Ratio	0.64	0.64		0.64	0.64		0.26	0.26		0.26	0.26	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	79	2790		477	3209		265	364		358	407	
v/s Ratio Prot		0.13			c0.36			0.02			0.09	
v/s Ratio Perm	0.27			0.09			c0.14			0.01		
v/c Ratio	0.42	0.21		0.13	0.56		0.55	0.07		0.02	0.36	
Uniform Delay, d1	12.2	10.3		9.8	13.9		44.3	38.6		38.1	41.8	
Progression Factor	0.58	0.17		0.34	0.26		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.1	0.2		0.5	0.6		7.9	0.4		0.1	2.4	
Delay (s)	22.2	1.9		3.8	4.3		52.2	39.0		38.2	44.3	
Level of Service	C	A		A	A		D	D		D	D	
Approach Delay (s)		3.0			4.2			47.8			44.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	12	677	46	1806	74	52	31	131
v/c Ratio	0.10	0.22	0.12	0.54	0.27	0.14	0.10	0.33
Control Delay	11.4	8.6	4.5	7.2	47.7	14.6	43.9	37.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	8.6	4.5	7.2	47.7	14.6	43.9	37.8
Queue Length 50th (m)	0.7	16.1	3.7	73.9	17.0	1.3	6.9	23.8
Queue Length 95th (m)	3.1	25.0	m7.0	78.4	29.5	10.7	14.7	39.1
Internal Link Dist (m)		278.5		341.9		126.6		117.6
Turn Bay Length (m)	35.0		35.0		35.0		35.0	
Base Capacity (vph)	118	3028	400	3317	273	382	302	395
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.22	0.12	0.54	0.27	0.14	0.10	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	544	24	39	1514	3	62	5	39	26	14	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1823	4504		1485	4939		1771	1517		1737	1635	
Flt Permitted	0.09	1.00		0.38	1.00		0.64	1.00		0.72	1.00	
Satd. Flow (perm)	177	4504		596	4939		1197	1517		1322	1635	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	12	648	29	46	1802	4	74	6	46	31	17	114
RTOR Reduction (vph)	0	3	0	0	0	0	0	35	0	0	22	0
Lane Group Flow (vph)	12	674	0	46	1806	0	74	17	0	31	109	0
Confl. Peds. (#/hr)	6		6	6		6	7		6	6		7
Heavy Vehicles (%)	0%	15%	27%	22%	6%	67%	2%	20%	6%	4%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	94.0	94.0		94.0	94.0		32.0	32.0		32.0	32.0	
Effective Green, g (s)	94.0	94.0		94.0	94.0		32.0	32.0		32.0	32.0	
Actuated g/C Ratio	0.67	0.67		0.67	0.67		0.23	0.23		0.23	0.23	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	3024		400	3316		273	346		302	373	
v/s Ratio Prot		0.15			c0.37			0.01			c0.07	
v/s Ratio Perm	0.07			0.08			0.06			0.02		
v/c Ratio	0.10	0.22		0.12	0.54		0.27	0.05		0.10	0.29	
Uniform Delay, d1	8.1	8.9		8.2	11.9		44.4	42.1		42.7	44.7	
Progression Factor	1.10	0.96		0.47	0.55		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.2		0.5	0.6		2.4	0.3		0.7	2.0	
Delay (s)	10.6	8.7		4.3	7.1		46.8	42.4		43.3	46.6	
Level of Service	B	A		A	A		D	D		D	D	
Approach Delay (s)		8.7			7.0			45.0			46.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2	808	28	1696	74	72	83	38
v/c Ratio	0.02	0.27	0.08	0.53	0.22	0.13	0.29	0.09
Control Delay	10.5	13.1	13.1	15.4	43.9	0.5	45.7	25.7
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	10.5	13.1	13.1	15.5	43.9	0.5	45.7	25.7
Queue Length 50th (m)	0.2	51.2	2.7	65.7	16.4	0.0	18.7	4.2
Queue Length 95th (m)	m0.9	43.2	m3.7	69.2	27.6	0.0	30.6	11.9
Internal Link Dist (m)		341.9		193.9		128.4		78.4
Turn Bay Length (m)	35.0		45.0		35.0		35.0	
Base Capacity (vph)	88	3035	360	3175	334	562	289	415
Starvation Cap Reductn	0	0	0	504	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.27	0.08	0.63	0.22	0.13	0.29	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	631	31	23	1373	18	61	0	59	68	16	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1216	4612		1601	4831		1735	1541		1547	1607	
Flt Permitted	0.11	1.00		0.33	1.00		0.73	1.00		0.71	1.00	
Satd. Flow (perm)	135	4612		549	4831		1338	1541		1156	1607	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	2	770	38	28	1674	22	74	0	72	83	20	18
RTOR Reduction (vph)	0	4	0	0	1	0	0	54	0	0	14	0
Lane Group Flow (vph)	2	804	0	28	1695	0	74	18	0	83	25	0
Confl. Peds. (#/hr)	5					5	1					1
Heavy Vehicles (%)	50%	13%	11%	14%	8%	31%	5%	0%	6%	18%	7%	14%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	92.0	92.0		92.0	92.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	92.0	92.0		92.0	92.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66		0.25	0.25		0.25	0.25	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	88	3030		360	3174		334	385		289	401	
v/s Ratio Prot		0.17			c0.35			0.01			0.02	
v/s Ratio Perm	0.01			0.05			0.06			c0.07		
v/c Ratio	0.02	0.27		0.08	0.53		0.22	0.05		0.29	0.06	
Uniform Delay, d1	8.4	10.0		8.7	12.7		41.7	39.8		42.4	40.0	
Progression Factor	1.15	1.30		1.43	1.17		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.2		0.3	0.4		1.5	0.2		2.5	0.3	
Delay (s)	10.1	13.2		12.7	15.3		43.2	40.1		44.9	40.3	
Level of Service	B	B		B	B		D	D		D	D	
Approach Delay (s)		13.2			15.2			41.7			43.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	424	228	204	98	749	635	609	2101	35	179	968	153
v/c Ratio	1.11	0.22	0.35	0.29	0.97	0.85	0.88	1.08	0.06	0.72	0.76	0.31
Control Delay	115.2	30.6	7.0	30.5	80.5	43.6	68.8	85.0	0.2	79.7	50.6	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.2	30.6	7.0	30.5	80.5	43.6	68.8	85.0	0.2	79.7	50.6	5.4
Queue Length 50th (m)	~67.9	28.6	20.9	16.7	109.3	124.5	85.0	~236.9	0.0	25.3	90.1	0.0
Queue Length 95th (m)	#96.1	41.7	41.2	29.0	#149.4	#179.8	#115.2	#265.0	0.0	#40.8	106.8	12.4
Internal Link Dist (m)		193.9			206.9			193.9			185.2	
Turn Bay Length (m)	55.0			45.0			85.0		50.0	100.0		125.0
Base Capacity (vph)	382	1015	578	342	769	744	689	1950	598	248	1281	501
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.22	0.35	0.29	0.97	0.85	0.88	1.08	0.06	0.72	0.76	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	399	214	192	92	704	597	572	1975	33	168	910	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	2500	1900	1950	1900	1900	1900	1900
Total Lost time (s)	6.0	8.0	8.0	3.0	8.0	5.0	3.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3350	3230	1394	1649	3476	2014	3219	4893	1278	3100	4601	1359
Flt Permitted	0.95	1.00	1.00	0.61	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	325	3230	1394	1058	3476	2014	3219	4893	1278	160	4601	1359
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	424	228	204	98	749	635	609	2101	35	179	968	153
RTOR Reduction (vph)	0	0	140	0	0	98	0	0	21	0	0	110
Lane Group Flow (vph)	424	228	64	98	749	537	609	2101	14	179	968	43
Confl. Peds. (#/hr)	7		11	11		7	3		13	13		3
Heavy Vehicles (%)	11%	13%	14%	10%	5%	5%	10%	10%	23%	22%	14%	18%
Turn Type	Prot	NA	Perm	pm+pt	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4	8		8			2			6
Actuated Green, G (s)	16.0	44.0	44.0	37.0	31.0	42.2	30.0	55.8	55.8	11.2	39.0	39.0
Effective Green, g (s)	16.0	44.0	44.0	37.0	31.0	42.2	30.0	55.8	55.8	11.2	39.0	39.0
Actuated g/C Ratio	0.11	0.31	0.31	0.26	0.22	0.30	0.21	0.40	0.40	0.08	0.28	0.28
Clearance Time (s)	6.0	8.0	8.0	3.0	8.0	5.0	3.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	382	1015	438	304	769	607	689	1950	509	248	1281	378
v/s Ratio Prot	c0.13	0.07		0.01	c0.22	0.07	c0.19	c0.43		0.06	0.21	
v/s Ratio Perm			0.05	0.07		0.20			0.01			0.03
v/c Ratio	1.11	0.22	0.15	0.32	0.97	0.89	0.88	1.08	0.03	0.72	0.76	0.11
Uniform Delay, d1	62.0	35.4	34.5	40.3	54.1	46.6	53.3	42.1	25.6	62.9	46.1	37.6
Progression Factor	0.60	0.84	1.19	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	78.8	0.5	0.7	2.8	26.7	17.1	15.4	44.8	0.1	16.6	4.2	0.6
Delay (s)	116.0	30.4	41.7	43.1	80.8	63.7	68.7	86.9	25.7	79.5	50.3	38.2
Level of Service	F	C	D	D	F	E	E	F	C	E	D	D
Approach Delay (s)		75.5			71.0			82.1			52.9	
Approach LOS		E			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	72.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Queues
3: Kennedy Road & Derry Road East

7/14/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	165	1674	173	595	975	226	72	290	278	360	1111	154
v/c Ratio	1.03	1.07	0.32	1.12	0.38	0.27	0.50	0.30	0.48	0.75	0.91	0.29
Control Delay	126.4	88.3	16.9	122.7	16.0	4.0	37.5	38.4	6.7	45.9	58.2	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.4	88.3	16.9	122.7	16.0	4.0	37.5	38.4	6.7	45.9	58.2	14.6
Queue Length 50th (m)	~48.7	~187.1	14.3	~105.0	45.9	7.0	12.0	31.8	0.0	70.3	154.3	10.4
Queue Length 95th (m)	#94.6	#216.5	33.5	#142.4	66.4	14.0	22.2	44.2	21.0	97.2	#184.6	27.7
Internal Link Dist (m)		267.1			518.3			268.1			273.7	
Turn Bay Length (m)	105.0		140.0	220.0		225.0	60.0		75.0	95.0		100.0
Base Capacity (vph)	160	1569	548	532	2561	849	145	1015	601	478	1241	546
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	1.07	0.32	1.12	0.38	0.27	0.50	0.29	0.46	0.75	0.90	0.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	1624	168	577	946	219	70	281	270	349	1078	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2500	1900	1900	2300	2150	1900
Total Lost time (s)	8.0	8.0	8.0	5.0	8.0	8.0	3.0	7.6	7.6	3.0	8.0	8.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1706	4948	1512	3052	4856	1408	2125	3230	1306	2065	3897	1498
Flt Permitted	0.28	1.00	1.00	0.95	1.00	1.00	0.09	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	506	4948	1512	3052	4856	1408	212	3230	1306	1149	3897	1498
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	165	1674	173	595	975	226	72	290	278	360	1111	154
RTOR Reduction (vph)	0	0	69	0	0	108	0	0	194	0	0	69
Lane Group Flow (vph)	165	1674	104	595	975	118	72	290	84	360	1111	85
Heavy Vehicles (%)	7%	6%	8%	16%	8%	16%	13%	13%	25%	7%	6%	9%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Actuated Green, G (s)	43.8	43.8	43.8	24.4	73.2	73.2	46.2	42.2	42.2	49.8	43.8	43.8
Effective Green, g (s)	43.8	43.8	43.8	24.4	73.2	73.2	46.2	42.2	42.2	49.8	43.8	43.8
Actuated g/C Ratio	0.31	0.31	0.31	0.17	0.52	0.52	0.33	0.30	0.30	0.36	0.31	0.31
Clearance Time (s)	8.0	8.0	8.0	5.0	8.0	8.0	3.0	7.6	7.6	3.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	158	1548	473	531	2538	736	124	973	393	447	1219	468
v/s Ratio Prot		c0.34		c0.19	0.20		0.02	0.09		c0.03	c0.29	
v/s Ratio Perm	0.33		0.07			0.08	0.17		0.06	0.25		0.06
v/c Ratio	1.04	1.08	0.22	1.12	0.38	0.16	0.58	0.30	0.21	0.81	0.91	0.18
Uniform Delay, d1	48.1	48.1	35.5	57.8	19.9	17.4	37.5	37.5	36.5	40.0	46.2	35.0
Progression Factor	1.00	1.00	1.00	0.96	0.78	1.53	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	83.8	48.3	1.1	73.7	0.4	0.4	6.8	0.2	0.3	10.2	10.3	0.2
Delay (s)	131.9	96.4	36.5	129.5	15.9	27.0	44.2	37.7	36.8	50.2	56.6	35.2
Level of Service	F	F	D	F	B	C	D	D	D	D	E	D
Approach Delay (s)		94.2			54.9			38.0			53.1	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	65.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	2052	1360	765	711
v/c Ratio	0.69	0.47	0.76	0.83
Control Delay	9.4	10.9	50.0	49.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.4	10.9	50.0	49.8
Queue Length 50th (m)	45.3	57.3	98.8	94.6
Queue Length 95th (m)	m49.4	73.5	113.0	112.7
Internal Link Dist (m)	518.3	377.8	224.2	
Turn Bay Length (m)				
Base Capacity (vph)	2987	2879	1190	1003
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	0.69	0.47	0.64	0.71

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1888	1251	0	704	654
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0	7.0
Lane Util. Factor		0.91	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		4902	4725		3471	2790
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		4902	4725		3471	2790
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2052	1360	0	765	711
RTOR Reduction (vph)	0	0	0	0	0	51
Lane Group Flow (vph)	0	2052	1360	0	765	660
Heavy Vehicles (%)	2%	7%	11%	2%	2%	3%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		85.3	85.3		40.7	40.7
Effective Green, g (s)		85.3	85.3		40.7	40.7
Actuated g/C Ratio		0.61	0.61		0.29	0.29
Clearance Time (s)		7.0	7.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2986	2878		1009	811
v/s Ratio Prot		c0.42	0.29		0.22	
v/s Ratio Perm						c0.24
v/c Ratio		0.69	0.47		0.76	0.81
Uniform Delay, d1		18.4	15.0		45.2	46.1
Progression Factor		0.46	0.66		1.00	1.00
Incremental Delay, d2		0.4	0.5		3.3	6.3
Delay (s)		8.9	10.3		48.5	52.4
Level of Service		A	B		D	D
Approach Delay (s)		8.9	10.3		50.4	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	107.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	2535	1226	621	1517
v/c Ratio	1.01	0.57	0.46	1.37
Control Delay	39.1	7.0	32.3	207.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.1	7.0	32.3	207.7
Queue Length 50th (m)	~134.8	30.0	64.6	~316.5
Queue Length 95th (m)	#290.7	17.8	81.2	#363.2
Internal Link Dist (m)	377.8	410.9	103.4	
Turn Bay Length (m)				
Base Capacity (vph)	2521	2149	1348	1105
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.01	0.57	0.46	1.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2383	0	0	1152	584	1426
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0			7.0	7.0	7.0
Lane Util. Factor	0.91			0.91	0.97	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	5043			4299	3372	2763
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	5043			4299	3372	2763
Peak-hour factor, PHF	0.94	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	2535	0	0	1226	621	1517
RTOR Reduction (vph)	0	0	0	0	0	1
Lane Group Flow (vph)	2535	0	0	1226	621	1516
Heavy Vehicles (%)	4%	2%	2%	22%	5%	4%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	70.0			70.0	56.0	56.0
Effective Green, g (s)	70.0			70.0	56.0	56.0
Actuated g/C Ratio	0.50			0.50	0.40	0.40
Clearance Time (s)	7.0			7.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2521			2149	1348	1105
v/s Ratio Prot	c0.50			0.29	0.18	
v/s Ratio Perm						c0.55
v/c Ratio	1.01			0.57	0.46	1.37
Uniform Delay, d1	35.0			24.5	30.9	42.0
Progression Factor	0.62			0.25	1.00	1.00
Incremental Delay, d2	16.6			0.9	1.1	173.3
Delay (s)	38.3			7.0	32.0	215.3
Level of Service	D			A	C	F
Approach Delay (s)	38.3			7.0	162.1	
Approach LOS	D			A	F	

Intersection Summary			
HCM 2000 Control Delay	76.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	107.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	364	1555	626	203	916	37	115	324	33	761	251
v/c Ratio	0.81	0.75	0.82	0.88	0.55	0.06	0.71	0.31	0.15	0.88	0.51
Control Delay	23.2	42.9	33.3	91.6	12.1	0.2	87.5	30.3	42.7	62.1	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	42.9	33.3	91.6	12.1	0.2	87.5	30.3	42.7	62.1	10.4
Queue Length 50th (m)	61.8	146.3	107.3	45.2	16.7	0.0	16.4	30.4	7.1	107.0	3.4
Queue Length 95th (m)	m54.7	m125.4	m85.9	#87.5	22.0	m0.0	#30.3	43.0	16.6	#138.3	27.6
Internal Link Dist (m)		410.9			1342.9			365.8		212.8	
Turn Bay Length (m)	190.0		195.0	215.0		75.0	275.0		90.0		75.0
Base Capacity (vph)	535	2081	766	243	1672	589	163	1032	214	869	488
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.75	0.82	0.84	0.55	0.06	0.71	0.31	0.15	0.88	0.51

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	353	1508	607	197	889	36	112	235	80	32	738	243
Ideal Flow (vphpl)	2075	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1812	4948	1541	1630	4483	1384	2855	2883		1426	3380	1219
Flt Permitted	0.21	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.56	1.00	1.00
Satd. Flow (perm)	404	4948	1541	142	4483	1384	2855	2883		834	3380	1219
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	364	1555	626	203	916	37	115	242	82	33	761	251
RTOR Reduction (vph)	0	0	118	0	0	23	0	23	0	0	0	175
Lane Group Flow (vph)	364	1555	508	203	916	14	115	301	0	33	761	76
Heavy Vehicles (%)	10%	6%	6%	12%	17%	18%	24%	19%	30%	28%	8%	34%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6				4		4
Actuated Green, G (s)	77.0	58.9	58.9	67.3	52.2	52.2	8.0	49.0		36.0	36.0	36.0
Effective Green, g (s)	77.0	58.9	58.9	67.3	52.2	52.2	8.0	49.0		36.0	36.0	36.0
Actuated g/C Ratio	0.55	0.42	0.42	0.48	0.37	0.37	0.06	0.35		0.26	0.26	0.26
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	441	2081	648	228	1671	516	163	1009		214	869	313
v/s Ratio Prot	c0.13	0.31		c0.10	0.20		c0.04	0.10			c0.23	
v/s Ratio Perm	0.32		0.33	c0.33		0.01				0.04		0.06
v/c Ratio	0.83	0.75	0.78	0.89	0.55	0.03	0.71	0.30		0.15	0.88	0.24
Uniform Delay, d1	20.3	34.3	35.1	36.9	34.6	27.8	64.8	33.0		40.2	49.9	41.2
Progression Factor	1.22	1.23	1.33	1.87	0.31	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	0.2	0.9	27.1	1.0	0.1	13.0	0.8		1.5	12.0	1.8
Delay (s)	25.9	42.4	47.6	96.2	11.8	27.9	77.9	33.8		41.8	61.9	43.1
Level of Service	C	D	D	F	B	C	E	C		D	E	D
Approach Delay (s)		41.3			27.1			45.3			56.7	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	341	2168	156	444	924	24	67	927	417	169	1605	177
v/c Ratio	0.77	1.02	0.27	1.09	0.68	0.05	0.39	0.66	0.69	0.76	0.99	0.33
Control Delay	80.6	55.3	2.3	126.8	46.1	0.2	70.6	45.6	21.0	85.9	67.3	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.6	55.3	2.3	126.8	46.1	0.2	70.6	45.6	21.0	85.9	67.3	8.5
Queue Length 50th (m)	41.1	~235.1	4.3	~70.9	82.9	0.0	9.3	82.4	35.1	24.1	~177.1	3.3
Queue Length 95th (m)	57.0	#263.3	m6.3	#104.6	100.9	0.0	17.4	98.1	75.0	#40.6	#206.6	21.0
Internal Link Dist (m)		1342.9			444.1			341.5			298.1	
Turn Bay Length (m)	160.0		120.0	225.0		120.0	100.0		90.0	130.0		100.0
Base Capacity (vph)	501	2118	581	408	1363	455	172	1395	601	223	1616	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.02	0.27	1.09	0.68	0.05	0.39	0.66	0.69	0.76	0.99	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	321	2038	147	417	869	23	63	871	392	159	1509	166
Ideal Flow (vphpl)	1900	2500	1900	2150	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3190	6449	1512	3577	4483	1142	3026	4641	1361	3133	4856	1296
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3190	6449	1512	3577	4483	1142	3026	4641	1361	3133	4856	1296
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	341	2168	156	444	924	24	67	927	417	169	1605	177
RTOR Reduction (vph)	0	0	86	0	0	17	0	0	190	0	0	107
Lane Group Flow (vph)	341	2168	71	444	924	7	67	927	227	169	1605	70
Heavy Vehicles (%)	11%	7%	8%	12%	17%	43%	17%	13%	20%	13%	8%	26%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	19.4	45.0	45.0	16.0	41.6	41.6	6.4	43.1	43.1	9.9	46.6	46.6
Effective Green, g (s)	19.4	45.0	45.0	16.0	41.6	41.6	6.4	43.1	43.1	9.9	46.6	46.6
Actuated g/C Ratio	0.14	0.32	0.32	0.11	0.30	0.30	0.05	0.31	0.31	0.07	0.33	0.33
Clearance Time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	442	2072	486	408	1332	339	138	1428	418	221	1616	431
v/s Ratio Prot	0.11	c0.34		c0.12	0.21		0.02	0.20		c0.05	c0.33	
v/s Ratio Perm			0.05			0.01			0.17			0.05
v/c Ratio	0.77	1.05	0.15	1.09	0.69	0.02	0.49	0.65	0.54	0.76	0.99	0.16
Uniform Delay, d1	58.2	47.5	33.8	62.0	43.6	34.8	65.2	41.9	40.3	63.9	46.5	32.9
Progression Factor	1.20	0.64	0.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	32.4	0.6	70.4	3.0	0.1	2.7	1.0	1.4	14.5	20.7	0.2
Delay (s)	77.1	62.5	5.3	132.4	46.6	34.9	67.9	42.9	41.7	78.4	67.2	33.1
Level of Service	E	E	A	F	D	C	E	D	D	E	E	C
Approach Delay (s)		61.0			73.7			43.8			65.1	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	61.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues
3: Kennedy Road & Derry Road East

10/14/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	262	1065	80	433	2390	514	119	1047	451	154	389	148
v/c Ratio	1.21	0.68	0.15	0.88	1.04	0.76	0.41	0.96	0.66	1.10	0.31	0.22
Control Delay	159.8	44.7	1.7	69.8	57.7	24.9	43.2	66.0	16.2	136.2	31.8	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	159.8	44.7	1.7	69.8	57.7	24.9	43.2	66.0	16.2	136.2	31.8	5.0
Queue Length 50th (m)	~66.9	95.0	0.0	60.1	~260.5	72.8	26.0	149.8	28.1	~29.9	39.9	0.0
Queue Length 95th (m)	#122.3	111.3	2.9	#85.7	#288.1	141.2	45.2	#193.1	67.0	#75.5	53.2	13.7
Internal Link Dist (m)		267.1			518.3			268.1			273.7	
Turn Bay Length (m)	105.0		140.0	220.0		225.0	60.0		75.0	95.0		100.0
Base Capacity (vph)	217	1558	536	505	2308	673	289	1092	682	140	1235	682
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.68	0.15	0.86	1.04	0.76	0.41	0.96	0.66	1.10	0.31	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	259	1054	79	429	2366	509	118	1037	446	152	385	147
Ideal Flow (vphpl)	2500	1900	1900	1900	2050	1900	1900	1900	1900	2050	1900	1900
Total Lost time (s)	3.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2224	4948	1432	3079	5441	1420	1674	3476	1458	1840	3288	1570
Flt Permitted	0.09	1.00	1.00	0.95	1.00	1.00	0.52	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	212	4948	1432	3079	5441	1420	920	3476	1458	166	3288	1570
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	262	1065	80	433	2390	514	119	1047	451	154	389	148
RTOR Reduction (vph)	0	0	55	0	0	71	0	0	224	0	0	92
Lane Group Flow (vph)	262	1065	25	433	2390	443	119	1047	227	154	389	56
Heavy Vehicles (%)	8%	6%	14%	15%	4%	15%	9%	5%	12%	7%	11%	4%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Actuated Green, G (s)	53.1	44.1	44.1	22.3	59.4	59.4	44.0	44.0	44.0	52.6	52.6	52.6
Effective Green, g (s)	53.1	44.1	44.1	22.3	59.4	59.4	44.0	44.0	44.0	52.6	52.6	52.6
Actuated g/C Ratio	0.38	0.32	0.32	0.16	0.42	0.42	0.31	0.31	0.31	0.38	0.38	0.38
Clearance Time (s)	3.0	8.0	8.0	5.0	8.0	8.0	7.6	7.6	7.6	3.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	209	1558	451	490	2308	602	289	1092	458	134	1235	589
v/s Ratio Prot	c0.08	0.22		0.14	c0.44			0.30		c0.05	0.12	
v/s Ratio Perm	c0.39		0.02			0.31	0.13		0.16	c0.38		0.04
v/c Ratio	1.25	0.68	0.06	0.88	1.04	0.74	0.41	0.96	0.50	1.15	0.31	0.09
Uniform Delay, d1	36.1	41.9	33.4	57.6	40.3	33.7	37.8	47.1	39.0	39.0	30.9	28.3
Progression Factor	1.00	1.00	1.00	0.97	0.81	0.75	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	147.1	2.5	0.2	11.6	25.1	5.0	1.0	17.9	0.8	123.4	0.1	0.1
Delay (s)	183.3	44.3	33.7	67.5	57.8	30.3	38.8	65.0	39.8	162.4	31.1	28.4
Level of Service	F	D	C	E	E	C	D	E	D	F	C	C
Approach Delay (s)		69.6			54.8			56.1			59.8	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	58.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	109.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1505	2857	210	381
v/c Ratio	0.42	0.79	0.38	0.83
Control Delay	19.2	9.9	52.4	69.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	19.2	9.9	52.4	69.9
Queue Length 50th (m)	118.6	122.2	26.5	57.1
Queue Length 95th (m)	m134.6	m131.1	37.9	75.5
Internal Link Dist (m)	518.3	377.8	224.2	
Turn Bay Length (m)				
Base Capacity (vph)	3590	3624	638	528
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.79	0.33	0.72

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1460	2771	0	204	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0	7.0
Lane Util. Factor		0.91	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		4948	4995		3190	2613
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		4948	4995		3190	2613
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1505	2857	0	210	381
RTOR Reduction (vph)	0	0	0	0	0	6
Lane Group Flow (vph)	0	1505	2857	0	210	375
Heavy Vehicles (%)	2%	6%	5%	2%	11%	10%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		101.6	101.6		24.4	24.4
Effective Green, g (s)		101.6	101.6		24.4	24.4
Actuated g/C Ratio		0.73	0.73		0.17	0.17
Clearance Time (s)		7.0	7.0		7.0	7.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3590	3624		555	455
v/s Ratio Prot		0.30	c0.57		0.07	
v/s Ratio Perm						c0.14
v/c Ratio		0.42	0.79		0.38	0.82
Uniform Delay, d1		7.6	12.3		51.1	55.7
Progression Factor		2.39	0.72		1.00	1.00
Incremental Delay, d2		0.2	0.5		0.4	11.6
Delay (s)		18.3	9.4		51.5	67.3
Level of Service		B	A		D	E
Approach Delay (s)		18.3	9.4		61.7	
Approach LOS		B	A		E	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	1130	2810	1001	474
v/c Ratio	0.40	0.98	0.95	0.60
Control Delay	5.2	16.2	65.7	30.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.2	16.2	65.7	30.9
Queue Length 50th (m)	19.3	148.4	140.0	43.6
Queue Length 95th (m)	20.6	m139.0	#181.8	64.0
Internal Link Dist (m)	377.8	410.9	103.4	
Turn Bay Length (m)				
Base Capacity (vph)	2792	2871	1049	790
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	0.40	0.98	0.95	0.60

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1062	0	0	2641	941	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0			7.0	7.0	7.0
Lane Util. Factor	0.91			0.91	0.97	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	4768			4902	3340	2194
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	4768			4902	3340	2194
Peak-hour factor, PHF	0.94	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	1130	0	0	2810	1001	474
RTOR Reduction (vph)	0	0	0	0	0	101
Lane Group Flow (vph)	1130	0	0	2810	1001	373
Heavy Vehicles (%)	10%	2%	2%	7%	6%	31%
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	82.0			82.0	44.0	44.0
Effective Green, g (s)	82.0			82.0	44.0	44.0
Actuated g/C Ratio	0.59			0.59	0.31	0.31
Clearance Time (s)	7.0			7.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2792			2871	1049	689
v/s Ratio Prot	0.24			c0.57	c0.30	
v/s Ratio Perm						0.17
v/c Ratio	0.40			0.98	0.95	0.54
Uniform Delay, d1	15.7			28.2	47.0	39.7
Progression Factor	0.30			0.47	1.00	1.00
Incremental Delay, d2	0.4			2.1	18.7	3.0
Delay (s)	5.2			15.4	65.8	42.7
Level of Service	A			B	E	D
Approach Delay (s)	5.2			15.4	58.3	
Approach LOS	A			B	E	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	113	1196	111	91	1817	54	1295	1573	32	277	485
v/c Ratio	1.00	0.75	0.20	0.61	1.03	0.10	1.09	0.92	0.68	0.41	1.11
Control Delay	121.7	28.2	4.2	44.1	55.5	0.4	103.0	42.4	112.4	50.4	117.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	121.7	28.2	4.2	44.1	55.5	0.4	103.0	42.4	112.4	50.4	117.0
Queue Length 50th (m)	20.6	52.2	1.1	7.3	~200.9	0.0	~207.8	205.7	8.2	35.3	~128.3
Queue Length 95th (m)	#59.1	93.5	5.7	m18.6	#230.9	m0.2	#249.5	#247.1	#27.0	49.3	#196.5
Internal Link Dist (m)		410.9			1342.9			365.8		212.8	
Turn Bay Length (m)	190.0		195.0	215.0		75.0	275.0		90.0		75.0
Base Capacity (vph)	113	1586	542	149	1759	557	1186	1702	47	669	435
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.75	0.20	0.61	1.03	0.10	1.09	0.92	0.68	0.41	1.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	1124	104	86	1708	51	1217	1222	257	30	260	456
Ideal Flow (vphpl)	2075	1900	1900	1900	1975	1900	2500	1900	1900	1900	1900	2100
Total Lost time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1510	4725	1396	1722	5242	1445	4613	3380		1587	3230	1687
Flt Permitted	0.09	1.00	1.00	0.11	1.00	1.00	0.95	1.00		0.14	1.00	1.00
Satd. Flow (perm)	135	4725	1396	208	5242	1445	4613	3380		230	3230	1687
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	113	1196	111	91	1817	54	1295	1300	273	32	277	485
RTOR Reduction (vph)	0	0	74	0	0	36	0	13	0	0	0	86
Lane Group Flow (vph)	113	1196	37	91	1817	18	1295	1561	0	32	277	399
Heavy Vehicles (%)	32%	11%	17%	6%	4%	13%	1%	5%	6%	15%	13%	7%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6				4		4
Actuated Green, G (s)	53.0	47.0	47.0	53.0	47.0	47.0	36.0	70.0		29.0	29.0	29.0
Effective Green, g (s)	53.0	47.0	47.0	53.0	47.0	47.0	36.0	70.0		29.0	29.0	29.0
Actuated g/C Ratio	0.38	0.34	0.34	0.38	0.34	0.34	0.26	0.50		0.21	0.21	0.21
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	110	1586	468	143	1759	485	1186	1690		47	669	349
v/s Ratio Prot	c0.04	0.25		0.03	c0.35		c0.28	0.46			0.09	
v/s Ratio Perm	0.34		0.03	0.21		0.01				0.14		c0.24
v/c Ratio	1.03	0.75	0.08	0.64	1.03	0.04	1.09	0.92		0.68	0.41	1.14
Uniform Delay, d1	39.8	41.4	31.7	31.0	46.5	31.3	52.0	32.5		51.2	48.1	55.5
Progression Factor	1.46	0.60	0.61	1.10	0.54	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	89.0	3.1	0.3	8.0	29.3	0.1	54.9	10.0		58.2	1.9	92.6
Delay (s)	146.9	28.0	19.7	42.2	54.5	31.4	106.9	42.5		109.4	50.0	148.1
Level of Service	F	C	B	D	D	C	F	D		F	D	F
Approach Delay (s)		36.8			53.3			71.6			112.3	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	64.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	453	1626	43	377	1076	139	111	2328	708	132	666	152
v/c Ratio	0.88	1.02	0.09	1.08	0.80	0.30	0.53	1.06	0.97	0.74	0.41	0.26
Control Delay	97.9	58.3	0.3	128.9	54.3	11.4	73.2	79.2	50.9	88.5	34.8	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.9	58.3	0.3	128.9	54.3	11.4	73.2	79.2	50.9	88.5	34.8	5.6
Queue Length 50th (m)	64.7	~165.8	0.0	~60.0	103.2	3.8	15.6	~258.1	128.5	18.9	50.7	0.0
Queue Length 95th (m)	m#86.2	m#202.6	m0.2	#91.9	120.4	20.7	25.7	#285.2	#214.2	#34.1	62.4	14.7
Internal Link Dist (m)		1342.9			444.1			341.5			298.1	
Turn Bay Length (m)	160.0		120.0	225.0		120.0	100.0		90.0	130.0		100.0
Base Capacity (vph)	525	1593	494	348	1350	459	214	2202	733	179	1621	585
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	1.02	0.09	1.08	0.80	0.30	0.52	1.06	0.97	0.74	0.41	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	417	1496	40	347	990	128	102	2142	651	121	613	140
Ideal Flow (vphpl)	2150	2300	1900	1900	2050	1900	1900	2300	1900	1900	1900	1900
Total Lost time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3676	5720	1471	3052	5338	1458	3340	6046	1484	3133	4521	1361
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3676	5720	1471	3052	5338	1458	3340	6046	1484	3133	4521	1361
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	453	1626	43	377	1076	139	111	2328	708	132	666	152
RTOR Reduction (vph)	0	0	31	0	0	90	0	0	193	0	0	97
Lane Group Flow (vph)	453	1626	12	377	1076	49	111	2328	515	132	666	55
Heavy Vehicles (%)	9%	11%	11%	16%	6%	12%	6%	5%	10%	13%	16%	20%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	19.6	39.0	39.0	16.0	35.4	35.4	8.8	51.0	51.0	8.0	50.2	50.2
Effective Green, g (s)	19.6	39.0	39.0	16.0	35.4	35.4	8.8	51.0	51.0	8.0	50.2	50.2
Actuated g/C Ratio	0.14	0.28	0.28	0.11	0.25	0.25	0.06	0.36	0.36	0.06	0.36	0.36
Clearance Time (s)	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	514	1593	409	348	1349	368	209	2202	540	179	1621	488
v/s Ratio Prot	0.12	c0.28		c0.12	0.20		0.03	c0.39		c0.04	0.15	
v/s Ratio Perm			0.01			0.03			0.35			0.04
v/c Ratio	0.88	1.02	0.03	1.08	0.80	0.13	0.53	1.06	0.95	0.74	0.41	0.11
Uniform Delay, d1	59.1	50.5	36.7	62.0	48.9	40.4	63.6	44.5	43.4	65.0	33.8	30.0
Progression Factor	1.39	0.63	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.0	26.1	0.1	72.4	5.0	0.7	2.6	36.4	27.5	14.6	0.2	0.1
Delay (s)	96.1	57.7	36.8	134.4	53.9	41.2	66.2	80.9	70.8	79.6	33.9	30.1
Level of Service	F	E	D	F	D	D	E	F	E	E	C	C
Approach Delay (s)		65.5			71.9			78.1			39.7	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	68.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Appendix J
Weaving Analysis Results

HCS+: Freeway Weaving Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	A.S.
Agency/Co.:	Stantec Consulting Ltd.
Date Performed:	25/04/2015
Analysis Time Period:	AM Peak Hour
Freeway/Dir of Travel:	Highway 410 - NB Direction
Weaving Location:	Courtneypark Dr - Derry Rd.
Jurisdiction:	MTO
Analysis Year:	Future 2031
Description:	Courtneypark Drive Class EA

Inputs

Freeway free-flow speed, SFF	110	km/h
Weaving number of lanes, N	5	
Weaving segment length, L	750	m
Terrain type	Level	
Grade		%
Length		km
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.33	
Weaving ratio, R	0.11	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	5299	0	2344	312	veh/h
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	
Peak 15-min volume, v15	1352	0	598	80	v
Trucks and buses	13	2	13	0	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.939	0.990	0.939	1.000	
Driver population factor, fP	1.00	1.00	1.00	1.00	
Flow rate, v	5758	0	2547	318	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.00
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
d (Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.56	0.39
Weaving and non-weaving speeds, Si	84.30	91.68
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.66
Maximum number of lanes, Nw (max) (Exhibit 24-7)		3.50

Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	89.09	km/h
Weaving segment density, D	19.36	pc/km/ln
Level of service, LOS	C	
Capacity of base condition, cb	11111	pc/h
Capacity as a 15-minute flow rate, c	10433	pc/h
Capacity as a full-hour volume, ch	10224	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	2865	4000	a
Average flow rate (pc/h/ln)	1724	2350	b
Volume ratio, VR	0.33	0.80	c
Weaving ratio, R	0.11	N/A	d
Weaving length (m)	750	750	e

Notes:

a. Weaving segments longer than 750 m. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

HCS+: Freeway Weaving Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	A.S.
Agency/Co.:	Stantec Consulting Ltd.
Date Performed:	25/04/2015
Analysis Time Period:	PM Peak Hour
Freeway/Dir of Travel:	Highway 410 - NB Direction
Weaving Location:	Courtneypark Dr - Derry Rd.
Jurisdiction:	MTO
Analysis Year:	Future 2031
Description:	Courtneypark Drive Class EA

Inputs

Freeway free-flow speed, SFF	110	km/h
Weaving number of lanes, N	5	
Weaving segment length, L	750	m
Terrain type	Level	
Grade		%
Length		km
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.23	
Weaving ratio, R	0.34	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	8290	0	1608	867	veh/h
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	
Peak 15-min volume, v15	2115	0	410	221	v
Trucks and buses	11	2	11	2	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.948	0.990	0.948	0.990	
Driver population factor, fP	1.00	1.00	1.00	1.00	
Flow rate, v	8924	0	1731	893	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.00
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
d (Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.57	0.32
Weaving and non-weaving speeds, Si	83.78	95.31
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.06
Maximum number of lanes, Nw (max) (Exhibit 24-7)		3.50

Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	92.42	km/h
Weaving segment density, D	24.99	pc/km/ln
Level of service, LOS	E	
Capacity of base condition, cb	11720	pc/h
Capacity as a 15-minute flow rate, c	11109	pc/h
Capacity as a full-hour volume, ch	10887	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	2624	4000	a
Average flow rate (pc/h/ln)	2309	2350	b
Volume ratio, VR	0.23	0.80	c
Weaving ratio, R	0.34	N/A	d
Weaving length (m)	750	750	e

Notes:

a. Weaving segments longer than 750 m. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Appendix K
Interim Alternative Analysis Results

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	268	1760	1084	332	406	470
v/c Ratio	0.76	0.52	0.44	0.43	0.60	0.50
Control Delay	12.4	11.8	30.6	10.3	55.1	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	11.8	30.6	10.3	55.1	5.9
Queue Length 50th (m)	28.8	144.4	78.5	19.9	53.1	0.0
Queue Length 95th (m)	m30.8	m132.4	107.9	m37.6	70.3	15.3
Internal Link Dist (m)		519.5	363.3		106.3	
Turn Bay Length (m)	95.0			95.0		
Base Capacity (vph)	501	3396	2441	766	680	939
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.52	0.44	0.43	0.60	0.50

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	252	1654	1019	312	382	442
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1313	4902	4601	1150	3404	2818
Flt Permitted	0.21	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	286	4902	4601	1150	3404	2818
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	268	1760	1084	332	406	470
RTOR Reduction (vph)	0	0	0	156	0	376
Lane Group Flow (vph)	268	1760	1084	176	406	94
Heavy Vehicles (%)	39%	7%	14%	42%	4%	2%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	97.0	97.0	74.3	74.3	28.0	28.0
Effective Green, g (s)	97.0	97.0	74.3	74.3	28.0	28.0
Actuated g/C Ratio	0.69	0.69	0.53	0.53	0.20	0.20
Clearance Time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	342	3396	2441	610	680	563
v/s Ratio Prot	c0.11	0.36	0.24		c0.12	
v/s Ratio Perm	c0.43			0.15		0.03
v/c Ratio	0.78	0.52	0.44	0.29	0.60	0.17
Uniform Delay, d1	11.2	10.3	20.2	18.2	50.9	46.3
Progression Factor	0.55	1.11	1.40	3.78	1.00	1.00
Incremental Delay, d2	5.0	0.2	0.5	1.0	3.8	0.6
Delay (s)	11.2	11.7	28.8	69.7	54.7	47.0
Level of Service	B	B	C	E	D	D
Approach Delay (s)		11.7	38.4		50.6	
Approach LOS		B	D		D	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	91	1791	225	78	647	391	385	848	59
v/c Ratio	0.29	0.86	0.30	0.57	0.32	0.84	0.86	0.69	0.09
Control Delay	18.1	21.8	5.8	45.9	18.7	56.0	59.3	26.5	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	21.8	5.8	45.9	18.7	56.0	59.3	26.5	8.4
Queue Length 50th (m)	9.5	71.4	5.5	13.5	34.0	102.5	102.4	75.5	1.0
Queue Length 95th (m)	m20.4	96.6	16.6	29.5	43.5	#160.6	#162.9	101.5	10.2
Internal Link Dist (m)		363.3			449.2		155.5		89.6
Turn Bay Length (m)	20.0		50.0	75.0					
Base Capacity (vph)	315	2077	744	151	2030	468	448	1221	660
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.86	0.30	0.52	0.32	0.84	0.86	0.69	0.09

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	87	1719	216	75	621	0	735	10	814	0	6	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	0.88		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		1.00	
Satd. Flow (prot)	1789	4902	1601	1472	4004		1605	1614	2711		1630	
Flt Permitted	0.39	1.00	1.00	0.06	1.00		0.72	0.69	1.00		1.00	
Satd. Flow (perm)	744	4902	1601	99	4004		1214	1165	2711		1630	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.92	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	91	1791	225	78	647	0	766	10	848	0	6	53
RTOR Reduction (vph)	0	0	66	0	0	0	0	0	176	0	33	0
Lane Group Flow (vph)	91	1791	159	78	647	0	391	385	672	0	26	0
Heavy Vehicles (%)	2%	7%	2%	24%	31%	2%	8%	2%	6%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	59.3	59.3	59.3	71.0	71.0		54.0	54.0	54.0		54.0	
Effective Green, g (s)	59.3	59.3	59.3	71.0	71.0		54.0	54.0	54.0		54.0	
Actuated g/C Ratio	0.42	0.42	0.42	0.51	0.51		0.39	0.39	0.39		0.39	
Clearance Time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	315	2076	678	135	2030		468	449	1045		628	
v/s Ratio Prot		c0.37		c0.04	0.16						0.02	
v/s Ratio Perm	0.12		0.10	0.25			0.32	c0.33	0.25			
v/c Ratio	0.29	0.86	0.23	0.58	0.32		0.84	0.86	0.64		0.04	
Uniform Delay, d1	26.5	36.7	25.8	26.2	20.3		39.0	39.5	35.1		26.9	
Progression Factor	0.58	0.47	0.38	1.49	0.90		1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.0	4.4	0.7	5.7	0.4		12.2	14.9	1.4		0.1	
Delay (s)	17.4	21.5	10.5	44.9	18.6		51.2	54.3	36.5		27.0	
Level of Service	B	C	B	D	B		D	D	D		C	
Approach Delay (s)		20.1			21.4			44.3			27.0	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues
6: Courtneypark Dr E & HWY 410 West Terminal

9/15/2014

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	365	882	1972	666	74	260
v/c Ratio	0.71	0.25	0.84	0.66	0.32	0.54
Control Delay	33.3	2.3	13.9	3.4	64.2	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	2.3	13.9	3.4	64.2	11.3
Queue Length 50th (m)	75.0	9.9	44.5	0.0	10.1	0.0
Queue Length 95th (m)	m112.1	17.6	97.2	22.3	18.2	14.5
Internal Link Dist (m)		519.5	363.3		106.3	
Turn Bay Length (m)	95.0			95.0		
Base Capacity (vph)	517	3498	2349	1007	233	479
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.25	0.84	0.66	0.32	0.54

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	358	864	1933	613	73	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1601	4334	4768	1570	2724	2818
Flt Permitted	0.05	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	88	4334	4768	1570	2724	2818
Peak-hour factor, PHF	0.98	0.98	0.98	0.92	0.98	0.98
Adj. Flow (vph)	365	882	1972	666	74	260
RTOR Reduction (vph)	0	0	0	233	0	238
Lane Group Flow (vph)	365	882	1972	433	74	22
Heavy Vehicles (%)	14%	21%	10%	4%	30%	2%
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Actuated Green, G (s)	118.0	113.0	69.0	69.0	12.0	12.0
Effective Green, g (s)	118.0	113.0	69.0	69.0	12.0	12.0
Actuated g/C Ratio	0.84	0.81	0.49	0.49	0.09	0.09
Clearance Time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	517	3498	2349	773	233	241
v/s Ratio Prot	c0.21	0.20	c0.41			
v/s Ratio Perm	0.39			0.28	c0.03	0.01
v/c Ratio	0.71	0.25	0.84	0.56	0.32	0.09
Uniform Delay, d1	28.8	3.3	30.7	24.9	60.2	59.0
Progression Factor	0.72	0.64	0.37	0.15	1.00	1.00
Incremental Delay, d2	6.2	0.1	2.6	1.9	3.6	0.8
Delay (s)	27.0	2.2	13.8	5.8	63.7	59.7
Level of Service	C	A	B	A	E	E
Approach Delay (s)		9.5	11.8		60.6	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	9	717	282	721	2386	171	184	189	106
v/c Ratio	0.17	0.61	0.45	0.93	0.74	0.72	0.62	0.28	0.23
Control Delay	59.8	47.6	11.6	34.4	36.6	66.2	57.0	6.5	41.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	47.6	11.6	34.4	36.6	66.2	57.0	6.5	41.7
Queue Length 50th (m)	1.7	52.6	4.4	180.7	233.4	45.8	47.8	0.0	22.6
Queue Length 95th (m)	m7.0	69.3	29.8	m158.8	m196.0	#80.3	75.7	10.5	38.9
Internal Link Dist (m)		363.3			449.2		100.0		68.8
Turn Bay Length (m)	20.0		50.0	75.0					
Base Capacity (vph)	53	1177	630	841	3211	238	297	678	466
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.61	0.45	0.86	0.74	0.72	0.62	0.28	0.23

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	681	268	685	2267	0	258	79	180	0	90	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.95	0.95	0.88		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00		1.00	
Satd. Flow (prot)	1789	4334	1601	1772	4995		1313	1499	2145		1854	
Flt Permitted	0.11	1.00	1.00	0.26	1.00		0.69	0.77	1.00		1.00	
Satd. Flow (perm)	198	4334	1601	478	4995		952	1189	2145		1854	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	717	282	721	2386	0	272	83	189	0	95	11
RTOR Reduction (vph)	0	0	195	0	0	0	0	0	142	0	3	0
Lane Group Flow (vph)	9	717	87	721	2386	0	171	184	47	0	103	0
Heavy Vehicles (%)	2%	21%	2%	3%	5%	2%	32%	2%	34%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	38.0	38.0	38.0	90.0	90.0		35.0	35.0	35.0		35.0	
Effective Green, g (s)	38.0	38.0	38.0	90.0	90.0		35.0	35.0	35.0		35.0	
Actuated g/C Ratio	0.27	0.27	0.27	0.64	0.64		0.25	0.25	0.25		0.25	
Clearance Time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	53	1176	434	760	3211		238	297	536		463	
v/s Ratio Prot		0.17		c0.33	0.48						0.06	
v/s Ratio Perm	0.05		0.05	c0.28			c0.18	0.15	0.02			
v/c Ratio	0.17	0.61	0.20	0.95	0.74		0.72	0.62	0.09		0.22	
Uniform Delay, d1	39.0	44.5	39.3	27.1	17.1		48.0	46.6	40.3		41.7	
Progression Factor	1.13	0.98	1.48	1.38	2.10		1.00	1.00	1.00		1.00	
Incremental Delay, d2	6.7	2.3	1.0	3.1	0.1		9.9	3.8	0.1		1.1	
Delay (s)	50.5	45.9	59.1	40.4	36.1		57.9	50.4	40.3		42.8	
Level of Service	D	D	E	D	D		E	D	D		D	
Approach Delay (s)		49.6			37.1			49.3			42.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	268	1760	1084	332	406	470
v/c Ratio	0.77	0.72	0.61	0.43	0.70	0.54
Control Delay	30.3	40.7	30.8	12.5	61.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	40.7	30.8	12.5	61.7	6.7
Queue Length 50th (m)	59.6	247.3	140.4	24.9	55.2	0.0
Queue Length 95th (m)	m61.1	m245.4	m152.1	m34.7	72.9	15.9
Internal Link Dist (m)		519.5	363.3		106.3	
Turn Bay Length (m)	95.0			95.0		
Base Capacity (vph)	442	2460	1776	774	583	872
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.72	0.61	0.43	0.70	0.54

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	252	1654	1019	312	382	442
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1313	3411	3202	1150	3404	2818
Flt Permitted	0.19	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	256	3411	3202	1150	3404	2818
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	268	1760	1084	332	406	470
RTOR Reduction (vph)	0	0	0	137	0	389
Lane Group Flow (vph)	268	1760	1084	195	406	81
Heavy Vehicles (%)	39%	7%	14%	42%	4%	2%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	101.0	101.0	77.7	77.7	24.0	24.0
Effective Green, g (s)	101.0	101.0	77.7	77.7	24.0	24.0
Actuated g/C Ratio	0.72	0.72	0.56	0.56	0.17	0.17
Clearance Time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	337	2460	1777	638	583	483
v/s Ratio Prot	c0.11	0.52	0.34		c0.12	
v/s Ratio Perm	c0.46			0.17		0.03
v/c Ratio	0.80	0.72	0.61	0.31	0.70	0.17
Uniform Delay, d1	15.7	11.2	21.0	16.7	54.6	49.5
Progression Factor	1.94	3.47	1.31	3.66	1.00	1.00
Incremental Delay, d2	5.6	0.8	1.1	0.9	6.7	0.7
Delay (s)	35.9	39.7	28.5	62.1	61.3	50.2
Level of Service	D	D	C	E	E	D
Approach Delay (s)		39.2	36.4		55.4	
Approach LOS		D	D		E	

Intersection Summary			
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	91	1791	225	78	647	391	385	848	59
v/c Ratio	0.23	0.99	0.25	0.78	0.28	1.05	1.08	0.91	0.11
Control Delay	9.8	34.1	3.9	69.2	7.8	106.3	115.7	54.0	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	34.1	3.9	69.2	7.8	106.3	115.7	54.0	10.7
Queue Length 50th (m)	6.8	226.2	6.2	8.7	20.8	~123.5	~124.7	111.2	1.2
Queue Length 95th (m)	m12.0	#308.5	m15.6	#36.5	28.1	#189.4	#190.6	#153.0	11.6
Internal Link Dist (m)		363.3			449.2		155.5		89.6
Turn Bay Length (m)	20.0		50.0	75.0					
Base Capacity (vph)	393	1802	892	100	2345	373	357	928	537
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.99	0.25	0.78	0.28	1.05	1.08	0.91	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	87	1719	216	75	621	0	735	10	814	0	6	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95	0.88		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		1.00	
Satd. Flow (prot)	1789	3411	1601	1472	4004		1605	1614	2711		1630	
Flt Permitted	0.39	1.00	1.00	0.05	1.00		0.72	0.69	1.00		1.00	
Satd. Flow (perm)	744	3411	1601	80	4004		1214	1165	2711		1630	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	91	1791	225	78	647	0	766	10	848	0	6	53
RTOR Reduction (vph)	0	0	47	0	0	0	0	0	96	0	37	0
Lane Group Flow (vph)	91	1791	178	78	647	0	391	385	752	0	22	0
Heavy Vehicles (%)	2%	7%	2%	24%	31%	2%	8%	2%	6%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	74.0	74.0	74.0	82.0	82.0		43.0	43.0	43.0		43.0	
Effective Green, g (s)	74.0	74.0	74.0	82.0	82.0		43.0	43.0	43.0		43.0	
Actuated g/C Ratio	0.53	0.53	0.53	0.59	0.59		0.31	0.31	0.31		0.31	
Clearance Time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	393	1802	846	96	2345		372	357	832		500	
v/s Ratio Prot		c0.53		c0.03	0.16						0.01	
v/s Ratio Perm	0.12		0.11	0.44			0.32	c0.33	0.28			
v/c Ratio	0.23	0.99	0.21	0.81	0.28		1.05	1.08	0.90		0.04	
Uniform Delay, d1	17.7	32.8	17.5	31.2	14.3		48.5	48.5	46.5		34.1	
Progression Factor	0.48	0.51	0.35	1.36	0.52		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.9	16.2	0.4	37.7	0.3		60.7	70.2	13.1		0.2	
Delay (s)	9.5	32.9	6.5	79.9	7.7		109.2	118.7	59.6		34.2	
Level of Service	A	C	A	E	A		F	F	E		C	
Approach Delay (s)		29.1			15.5			85.5			34.2	
Approach LOS		C			B			F			C	

Intersection Summary			
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	365	882	1972	666	74	260
v/c Ratio	0.96	0.36	1.00	0.61	0.38	0.59
Control Delay	70.9	4.3	32.6	3.8	68.1	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	4.3	32.6	3.8	68.1	12.8
Queue Length 50th (m)	89.6	28.2	~306.2	11.9	10.2	0.0
Queue Length 95th (m)	m#145.4	29.9	#346.6	19.5	18.5	14.7
Internal Link Dist (m)		519.5	363.3		106.3	
Turn Bay Length (m)	95.0			95.0		
Base Capacity (vph)	382	2478	1967	1088	194	442
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.36	1.00	0.61	0.38	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	358	864	1933	613	73	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1601	3017	3318	1570	2724	2818
Flt Permitted	0.05	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	78	3017	3318	1570	2724	2818
Peak-hour factor, PHF	0.98	0.98	0.98	0.92	0.98	0.98
Adj. Flow (vph)	365	882	1972	666	74	260
RTOR Reduction (vph)	0	0	0	158	0	241
Lane Group Flow (vph)	365	882	1972	508	74	19
Heavy Vehicles (%)	14%	21%	10%	4%	30%	2%
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Actuated Green, G (s)	115.0	115.0	83.0	83.0	10.0	10.0
Effective Green, g (s)	115.0	115.0	83.0	83.0	10.0	10.0
Actuated g/C Ratio	0.82	0.82	0.59	0.59	0.07	0.07
Clearance Time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	379	2478	1967	930	194	201
v/s Ratio Prot	c0.20	0.29	c0.59			
v/s Ratio Perm	0.59			0.32	c0.03	0.01
v/c Ratio	0.96	0.36	1.00	0.55	0.38	0.09
Uniform Delay, d1	48.9	3.2	28.5	17.2	62.0	60.8
Progression Factor	0.91	1.26	0.49	0.30	1.00	1.00
Incremental Delay, d2	32.5	0.3	17.4	1.6	5.6	0.9
Delay (s)	77.0	4.3	31.3	6.7	67.7	61.7
Level of Service	E	A	C	A	E	E
Approach Delay (s)		25.6	25.1		63.0	
Approach LOS		C	C		E	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	9	717	282	721	2386	171	184	189	106
v/c Ratio	0.17	0.78	0.45	0.96	0.71	0.81	0.70	0.30	0.26
Control Delay	43.2	41.8	12.4	37.8	28.7	80.1	65.6	7.1	45.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	41.8	12.4	37.8	28.7	80.1	65.6	7.1	45.2
Queue Length 50th (m)	1.3	60.0	12.0	178.2	200.4	47.6	49.7	0.0	23.5
Queue Length 95th (m)	m4.6	81.8	30.4	m155.4	m168.3	#88.6	#80.3	10.9	40.5
Internal Link Dist (m)		363.3			449.2		100.0		68.8
Turn Bay Length (m)	20.0		50.0	75.0					
Base Capacity (vph)	53	914	627	776	3353	211	263	622	413
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.78	0.45	0.93	0.71	0.81	0.70	0.30	0.26

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	681	268	685	2267	0	258	79	180	0	90	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95	0.88		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00		1.00	
Satd. Flow (prot)	1789	3017	1601	1772	4995		1313	1499	2145		1854	
Flt Permitted	0.09	1.00	1.00	0.20	1.00		0.69	0.77	1.00		1.00	
Satd. Flow (perm)	178	3017	1601	382	4995		952	1189	2145		1854	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	717	282	721	2386	0	272	83	189	0	95	11
RTOR Reduction (vph)	0	0	142	0	0	0	0	0	147	0	3	0
Lane Group Flow (vph)	9	717	140	721	2386	0	171	184	42	0	103	0
Heavy Vehicles (%)	2%	21%	2%	3%	5%	2%	32%	2%	34%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	42.4	42.4	42.4	94.0	94.0		31.0	31.0	31.0		31.0	
Effective Green, g (s)	42.4	42.4	42.4	94.0	94.0		31.0	31.0	31.0		31.0	
Actuated g/C Ratio	0.30	0.30	0.30	0.67	0.67		0.22	0.22	0.22		0.22	
Clearance Time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	53	913	484	739	3353		210	263	474		410	
v/s Ratio Prot		0.24		c0.34	0.48						0.06	
v/s Ratio Perm	0.05		0.09	c0.32			c0.18	0.15	0.02			
v/c Ratio	0.17	0.79	0.29	0.98	0.71		0.81	0.70	0.09		0.25	
Uniform Delay, d1	35.9	44.6	37.3	31.0	14.5		51.8	50.2	43.3		44.9	
Progression Factor	0.90	0.77	0.86	1.25	1.95		1.00	1.00	1.00		1.00	
Incremental Delay, d2	6.5	6.5	1.4	5.5	0.1		20.9	7.9	0.1		1.5	
Delay (s)	38.8	40.9	33.6	44.2	28.3		72.7	58.1	43.4		46.4	
Level of Service	D	D	C	D	C		E	E	D		D	
Approach Delay (s)		38.8			32.0			57.6			46.4	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues
6: Courtneypark Dr E & HWY 410 West Terminal

9/15/2014

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	231	1593	982	297	377	426
v/c Ratio	0.69	0.67	0.54	0.38	0.57	0.48
Control Delay	29.4	7.6	23.5	8.7	55.3	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	7.6	23.5	8.7	55.3	6.1
Queue Length 50th (m)	24.5	45.6	118.6	21.2	49.3	0.0
Queue Length 95th (m)	m22.4	m47.8	m140.5	m30.3	65.8	15.0
Internal Link Dist (m)		519.5	363.3		106.3	
Turn Bay Length (m)	95.0			95.0		
Base Capacity (vph)	443	2387	1828	784	656	887
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.67	0.54	0.38	0.57	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	217	1497	923	279	354	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1313	3411	3202	1150	3404	2818
Flt Permitted	0.22	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	310	3411	3202	1150	3404	2818
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	231	1593	982	297	377	426
RTOR Reduction (vph)	0	0	0	127	0	344
Lane Group Flow (vph)	231	1593	982	170	377	82
Heavy Vehicles (%)	39%	7%	14%	42%	4%	2%
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	98.0	98.0	79.9	79.9	27.0	27.0
Effective Green, g (s)	98.0	98.0	79.9	79.9	27.0	27.0
Actuated g/C Ratio	0.70	0.70	0.57	0.57	0.19	0.19
Clearance Time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	325	2387	1827	656	656	543
v/s Ratio Prot	c0.08	0.47	0.31		c0.11	
v/s Ratio Perm	c0.42			0.15		0.03
v/c Ratio	0.71	0.67	0.54	0.26	0.57	0.15
Uniform Delay, d1	10.7	11.8	18.6	15.1	51.3	47.0
Progression Factor	3.38	0.57	1.15	3.91	1.00	1.00
Incremental Delay, d2	3.8	0.8	0.9	0.8	3.6	0.6
Delay (s)	40.1	7.5	22.4	60.0	54.9	47.6
Level of Service	D	A	C	E	D	D
Approach Delay (s)		11.6	31.1		51.0	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	91	1622	204	70	585	336	333	731	59
v/c Ratio	0.22	0.91	0.23	0.70	0.25	0.88	0.91	0.77	0.11
Control Delay	11.9	22.4	4.6	62.6	14.6	70.4	75.5	40.3	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	22.4	4.6	62.6	14.6	70.4	75.5	40.3	10.5
Queue Length 50th (m)	7.1	89.1	5.2	11.4	28.0	92.8	93.1	84.6	1.1
Queue Length 95th (m)	m13.6	190.2	14.9	#30.0	37.4	#150.6	#153.4	111.1	11.4
Internal Link Dist (m)		363.3			449.2		155.5		89.6
Turn Bay Length (m)	20.0		50.0	75.0					
Base Capacity (vph)	413	1778	881	100	2316	381	366	954	548
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.91	0.23	0.70	0.25	0.88	0.91	0.77	0.11

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	87	1557	196	67	562	0	633	10	702	0	6	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95	0.88		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		1.00	
Satd. Flow (prot)	1789	3411	1601	1472	4004		1605	1614	2711		1630	
Flt Permitted	0.42	1.00	1.00	0.05	1.00		0.72	0.69	1.00		1.00	
Satd. Flow (perm)	792	3411	1601	82	4004		1214	1167	2711		1630	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	91	1622	204	70	585	0	659	10	731	0	6	53
RTOR Reduction (vph)	0	0	46	0	0	0	0	0	102	0	36	0
Lane Group Flow (vph)	91	1622	158	70	585	0	336	333	629	0	23	0
Heavy Vehicles (%)	2%	7%	2%	24%	31%	2%	8%	2%	6%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	73.0	73.0	73.0	81.0	81.0		44.0	44.0	44.0		44.0	
Effective Green, g (s)	73.0	73.0	73.0	81.0	81.0		44.0	44.0	44.0		44.0	
Actuated g/C Ratio	0.52	0.52	0.52	0.58	0.58		0.31	0.31	0.31		0.31	
Clearance Time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	412	1778	834	97	2316		381	366	852		512	
v/s Ratio Prot		c0.48		c0.03	0.15						0.01	
v/s Ratio Perm	0.11		0.10	0.39			0.28	c0.29	0.23			
v/c Ratio	0.22	0.91	0.19	0.72	0.25		0.88	0.91	0.74		0.04	
Uniform Delay, d1	18.1	30.6	17.8	27.4	14.6		45.5	46.1	42.9		33.4	
Progression Factor	0.59	0.49	0.44	1.73	0.98		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.9	6.8	0.4	22.5	0.3		20.6	25.6	3.4		0.2	
Delay (s)	11.5	21.8	8.2	69.9	14.5		66.1	71.7	46.2		33.5	
Level of Service	B	C	A	E	B		E	E	D		C	
Approach Delay (s)		19.8			20.4			57.0			33.5	
Approach LOS		B			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	315	798	1786	575	68	236
v/c Ratio	0.82	0.32	0.91	0.52	0.35	0.56
Control Delay	52.5	4.2	19.0	2.5	67.3	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	4.2	19.0	2.5	67.3	12.8
Queue Length 50th (m)	73.5	25.6	266.3	7.1	9.4	0.0
Queue Length 95th (m)	m#115.6	28.0	291.0	12.1	17.3	14.1
Internal Link Dist (m)		519.5	363.3		106.3	
Turn Bay Length (m)	95.0			95.0		
Base Capacity (vph)	382	2478	1967	1103	194	420
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.32	0.91	0.52	0.35	0.56

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	309	782	1750	529	67	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1601	3017	3318	1570	2724	2818
Flt Permitted	0.05	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	78	3017	3318	1570	2724	2818
Peak-hour factor, PHF	0.98	0.98	0.98	0.92	0.98	0.98
Adj. Flow (vph)	315	798	1786	575	68	236
RTOR Reduction (vph)	0	0	0	173	0	219
Lane Group Flow (vph)	315	798	1786	402	68	17
Heavy Vehicles (%)	14%	21%	10%	4%	30%	2%
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Actuated Green, G (s)	115.0	115.0	83.0	83.0	10.0	10.0
Effective Green, g (s)	115.0	115.0	83.0	83.0	10.0	10.0
Actuated g/C Ratio	0.82	0.82	0.59	0.59	0.07	0.07
Clearance Time (s)	3.0	8.0	8.0	8.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	379	2478	1967	930	194	201
v/s Ratio Prot	c0.17	0.26	c0.54			
v/s Ratio Perm	0.51			0.26	c0.02	0.01
v/c Ratio	0.83	0.32	0.91	0.43	0.35	0.08
Uniform Delay, d1	45.0	3.0	25.1	15.6	61.9	60.7
Progression Factor	0.92	1.30	0.49	0.30	1.00	1.00
Incremental Delay, d2	15.7	0.3	6.0	1.1	4.9	0.8
Delay (s)	56.9	4.2	18.4	5.8	66.8	61.5
Level of Service	E	A	B	A	E	E
Approach Delay (s)		19.1	15.3		62.7	
Approach LOS		B	B		E	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	9	649	256	654	2160	152	165	163	106
v/c Ratio	0.17	0.60	0.36	0.89	0.64	0.72	0.61	0.27	0.26
Control Delay	40.8	31.9	9.5	30.8	26.5	70.7	59.7	7.4	45.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	31.9	9.5	30.8	26.5	70.7	59.7	7.4	45.2
Queue Length 50th (m)	1.2	51.8	8.5	150.9	177.2	41.3	43.5	0.0	23.5
Queue Length 95th (m)	m4.6	70.3	22.8	m142.8	m161.8	#75.2	70.0	10.1	40.5
Internal Link Dist (m)		363.3			449.2		100.0		68.8
Turn Bay Length (m)	20.0		50.0	75.0					
Base Capacity (vph)	54	1086	706	827	3353	211	272	601	413
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.60	0.36	0.79	0.64	0.72	0.61	0.27	0.26

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	617	243	621	2052	0	222	79	155	0	90	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91		0.95	0.95	0.88		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00		1.00	
Satd. Flow (prot)	1789	3017	1601	1772	4995		1313	1523	2145		1854	
Flt Permitted	0.08	1.00	1.00	0.28	1.00		0.69	0.79	1.00		1.00	
Satd. Flow (perm)	150	3017	1601	530	4995		952	1231	2145		1854	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	649	256	654	2160	0	234	83	163	0	95	11
RTOR Reduction (vph)	0	0	131	0	0	0	0	0	127	0	3	0
Lane Group Flow (vph)	9	649	125	654	2160	0	152	165	36	0	103	0
Heavy Vehicles (%)	2%	21%	2%	3%	5%	2%	32%	2%	34%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	50.4	50.4	50.4	94.0	94.0		31.0	31.0	31.0		31.0	
Effective Green, g (s)	50.4	50.4	50.4	94.0	94.0		31.0	31.0	31.0		31.0	
Actuated g/C Ratio	0.36	0.36	0.36	0.67	0.67		0.22	0.22	0.22		0.22	
Clearance Time (s)	8.0	8.0	8.0	3.0	8.0		7.0	7.0	7.0		7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	54	1086	576	716	3353		210	272	474		410	
v/s Ratio Prot		0.22		c0.26	0.43						0.06	
v/s Ratio Perm	0.06		0.08	c0.35			c0.16	0.13	0.02			
v/c Ratio	0.17	0.60	0.22	0.91	0.64		0.72	0.61	0.08		0.25	
Uniform Delay, d1	30.5	36.5	31.1	21.9	13.3		50.5	49.0	43.2		44.9	
Progression Factor	0.86	0.76	0.89	1.68	1.96		1.00	1.00	1.00		1.00	
Incremental Delay, d2	6.3	2.4	0.8	1.9	0.1		11.7	3.8	0.1		1.5	
Delay (s)	32.5	30.0	28.6	38.7	26.2		62.2	52.8	43.2		46.4	
Level of Service	C	C	C	D	C		E	D	D		D	
Approach Delay (s)		29.6			29.1			52.5			46.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Table 1 5-Lane Bridge Alternative Concept 2021 Peak Hour Queues									
Intersection		AM				PM			
		50th Queue	95th Queue	Distance	Blockage ?	50th Queue	95th Queue	Distance	Blockage ?
Highway 410 West Terminal/ Courtneypark Drive E	WBT	119 m	141 m	N/A	No	266 m	291 m	N/A	No
Highway 410 East Terminal/ Courtneypark Drive E	EBT	89 m	190 m	110 m	Yes	52 m	70 m	110 m	No

Table 2 5-Lane Bridge Alternative Concept 2031 Peak Hour Queues									
Intersection		AM				PM			
		50th Queue	95th Queue	Distance	Blockage ?	50th Queue	95th Queue	Distance	Blockage ?
Highway 410 West Terminal/ Courtneypark Drive E	WBT	140 m	152 m	N/A	No	306 m	347 m	N/A	No
Highway 410 East Terminal/ Courtneypark Drive E	EBT	226 m	309 m	110 m	Yes	60 m	82 m	110 m	No

Table 1 6-Lane Bridge Alternative Concept 2031 Peak Hour Queues									
Intersection		AM				PM			
		50th Queue	95th Queue	Distance	Blockage ?	50th Queue	95th Queue	Distance	Blockage ?
Highway 410 West Terminal/ Courtneypark Drive E	WBT	79 m	108 m	120 m	No	45 m	97 m	120 m	No
Highway 410 East Terminal/ Courtneypark Drive E	EBT	71 m	97 m	110 m	No	53 m	69 m	110 m	No