



**550 Ontario Street South,
Transportation Impact Study,
Parking Study and Transportation
Demand Management**

Paradigm Transportation Solutions Limited

September 2021



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550 Ontario Street South, Transportation Impact Study, Parking Study and Transportation Demand Management



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Executive Summary

Content

Korsiak Urban Planning retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study, Parking Study and Transportation Demand Management (TDM) Report for a mixed-use development located at 550 Ontario Street South in the Town of Milton.

The study includes an analysis of existing traffic conditions, a description of the proposed development, analysis of future traffic forecasts, parking demand analysis, and outlines recommendations to improve future traffic conditions and strategies to reduce dependency on single occupancy vehicle travel.

Development Concept

The development concept includes approximately 649 residential units and approximately 2,039 m² of non-residential land uses (e.g., retail land uses) in three buildings ranging in height from 4-24 storeys. The site's parking supply is approximately 848 spaces.

Vehicle access is proposed by a private driveway to Ontario Street South and Derry Road. The Ontario Street South driveway is proposed as right-in/right-out with turning restrictions enforced through use of a raised centre median. The Derry Road driveway is proposed without turning restrictions. Build-out is anticipated to occur by Year 2024; timing is subject to market conditions.

Conclusions

The main findings and conclusions of this study are as follows:

Traffic Impact Study:

- ▶ **Existing Traffic Operations:** The study area intersections are currently operating at acceptable levels of service during the AM and PM peak hours. The following intersections are operating with localized congestion:
 - Ontario Street South and Laurier Avenue;
 - Ontario Street South and Derry Road; and
 - Regional Road 25 and Louis St. Laurent Avenue.
- ▶ **Site Generated Traffic:** The site is forecast to generate approximately 188 AM peak hour trips and approximately 286 PM peak hour trips. Comparing the trip generation estimate the site's existing trip generation (AM = 88 trips, PM = 272 trips) the development concept is anticipated to increase the site's AM peak



hour trip generation by approximately 100 AM peak hour and 14 PM peak hour trips.

- ▶ **Background Traffic Operations:** The study area intersections are forecast to continue to operate at acceptable levels of service during the AM and PM peak hours. The following intersections are operating with localized congestion;
 - Ontario Street South and Laurier Avenue from year 2031;
 - Ontario Street South and Derry Road from year 2024;
 - Derry Road and South Driveway from year 2024;
 - Santa Maria Boulevard/Commercial Street and Derry Road from year 2024; and
 - Regional Road 25 and Louis St. Laurent Avenue from year 2024.
- ▶ **Future Total Traffic Operations:** The study area intersections are forecast to continue to operate at acceptable levels of service during the AM and PM peak hours. The following intersections are operating with localized congestion;
 - Ontario Street South and Laurier Avenue from year 2029;
 - Ontario Street South and Derry Road from year 2024;
 - Derry Road and South Driveway from year 2024;
 - Santa Maria Boulevard/Commercial Street and Derry Road from year 2024; and
 - Regional Road 25 and Louis St. Laurent Avenue from year 2024.
- ▶ **Remedial Measures:** The following remedial measures were evaluated to mitigate the forecast capacity issues based on the Total 2031 horizon:
 - Ontario Street South and Laurier Avenue: northbound, eastbound, and westbound left-turn signal timing phase;
 - Santa Maria Boulevard/Commercial Street and Derry Road: northbound and southbound left-turn signal timing phase; and
 - Derry Road and South Driveway: southbound left-turn lane.
- ▶ **Access, Circulation and Functional Design:** The site is designed to accommodate the intended design vehicles. No conflicts with the on-site geometry are identified.

Traffic Demand Management

- ▶ The site concept plan includes a robust TDM program that can assist in mitigating the site's transportation and parking impacts on the adjacent road network, promote a strong and vibrant economy, and create a livable community that has a balanced transportation network.



Parking Study

- ▶ The site's proposed parking supply is identified as 848 spaces (1.30 spaces per unit) allocated as 796 underground spaces and 52 visitor spaces.
- ▶ Based on the Town's Zoning By-law, the site requires 973 spaces (811 occupant spaces and 162 visitor/ commercial spaces).
- ▶ The ITE Parking Generation Manual indicates a parking demand of 450 spaces (389 occupant spaces and 61 commercial spaces).
- ▶ The City of Kitchener parking rates indicate a parking demand of 643 spaces (584 occupant spaces and 58 commercial spaces).
- ▶ The proposed TDM program is estimated to result in 16.6% reduction in parking generation. The forecast parking demand for the site is calculated to be 811 spaces, using the Town's zoning requirements.
- ▶ Using several different methodologies, the proposed development is estimated to have a parking demand in the order of 450 spaces to 811 spaces, depending upon the methodology used to forecast the demand. The proposed parking supply of 848 is expected to accommodate the site's forecast parking demand.

Recommendations

Based on the findings of this study, the following is recommended:

- ▶ The road authority monitor future traffic volumes along the Derry Road and Ontario Street South corridors and optimize the signal timings accordingly. The need for signal timing improvements at the study area intersections are noted to occur with or without the development of the subject site;
- ▶ The developer consider the addition of a southbound left-turn lane to the Derry Road and South Driveway intersection to improve operations; and
- ▶ The road authority consider adding protected permissive left-turn signal timing phases at the following locations:
 - Ontario Street South at Laurier Avenue – northbound, eastbound, and westbound left-turns; and
 - Santa Maria Boulevard/Commercial Street and Derry Road – northbound and southbound left-turns.



Contents

1	Introduction.....	1
1.1	Overview.....	1
2	Existing Conditions.....	3
2.1	Roadway Network.....	3
2.2	Transit Service.....	5
2.3	Active Transportation Network.....	5
2.4	Traffic Volumes.....	9
2.5	Traffic Operations.....	12
3	Development Concept.....	15
3.1	Site Description.....	15
3.2	Site Generated Traffic.....	17
4	Future Traffic Conditions.....	22
4.1	Road Network Improvements.....	22
4.2	Forecast Traffic.....	22
4.2	Background Traffic Operations.....	41
4.2.1	2024 Horizon.....	41
4.2.2	2029 Horizon.....	43
4.2.3	2031 Horizon.....	45
4.2.4	2031 Horizon with Background Development Growth.....	48
4.3	Total Traffic Operations.....	51
4.3.1	2024 Horizon.....	51
4.3.2	2029 Horizon.....	54
4.3.3	2031 Horizon.....	56
4.3.4	2031 Horizon with Background Development Growth.....	59
4.4	Future Traffic Conditions Summary.....	62
5	Remedial Measures.....	64
5.1	Ontario Street South and Laurier Avenue.....	64
5.2	Ontario Street South and Derry Road.....	64
5.3	Derry Road and South Driveway.....	64
5.4	Santa Maria Boulevard/Commercial Street and Derry Road.....	64
5.5	Regional Road 25 and Louis St. Laurent Avenue.....	65
5.6	Operations with Improvements (Year 2031).....	65
6	Site Circulation.....	68
7	Transportation Demand Management.....	76
7.1	Transportation Demand Management Techniques.....	76
7.2	Pre-Occupancy Strategies.....	76
7.2.1	Transit.....	76
7.2.2	Cycling.....	77
7.2.3	Shared Parking.....	77



7.3	Post-Occupancy Strategies	77
7.3.1	On-Site Transit Support	77
7.3.2	TDM Coordinator	77
7.3.3	Car Share Program.....	77
7.3.4	Unbundled Parking	77
7.4	TDM Checklist Study	78
8	Parking Study	79
8.1	Proposed Parking Supply	79
8.2	Parking Demand Estimates	79
8.2.1	Zoning By-Law Requirements.....	79
8.2.2	Parking Guidelines Comparison.....	79
8.3	Parking Reduction	81
8.4	Summary	82
9	Conclusions and Recommendations	83
9.1	Conclusions	83
9.2	Recommendations	85

Appendices

Appendix A	Pre-Study Consultation Materials
Appendix B	Turning Movement Count Data
Appendix C	Existing Traffic Operations Reports
Appendix D	Proxy Site Survey Data
Appendix E	2024 Background Traffic Operations Reports
Appendix F	2029 Background Traffic Operations Reports
Appendix G	2031 Background Traffic Operations Reports
Appendix H	2031 Background Development Growth Traffic Operations Reports
Appendix I	2024 Future Total Traffic Operations Reports
Appendix J	2029 Future Total Traffic Operations Reports
Appendix K	2031 Future Total Traffic Operations Reports
Appendix L	2031 Future Total with Background Development Growth Traffic Operations Reports
Appendix M	2031 Future Total Traffic Operations with Improvements Reports
Appendix N	City of Kitchener PARTS TDM Checklist



Figures

Figure 1.1:	Study Area and Subject Development Location.....	2
Figure 2.1:	Existing Lane Configuration and Traffic Control.....	4
Figure 2.2:	Existing Transit Network.....	6
Figure 2.3:	ROPA 48 Map: Functional Plan of Major Transportation Facilities.....	7
Figure 2.4:	Existing Transit Stops Within 500 m of the Subject Site .	8
Figure 2.5:	Existing Traffic Volumes – AM Peak Hour	10
Figure 2.6:	Existing Traffic Volumes – PM Peak Hour	11
Figure 3.1:	Site Concept Plan	16
Figure 3.2:	Site Generated Traffic – AM Peak Hour.....	20
Figure 3.3:	Site Generated Traffic – PM Peak Hour	21
Figure 4.1:	Development Concept Block Plan	24
Figure 4.2:	Background Traffic (Year 2024) – AM Peak Hour	25
Figure 4.3:	Background Traffic (Year 2024) – PM Peak Hour	26
Figure 4.4:	Background Traffic (Year 2029) – AM Peak Hour	27
Figure 4.5:	Background Traffic (Year 2029) – PM Peak Hour	28
Figure 4.6:	Background Traffic (Year 2031) – AM Peak Hour	29
Figure 4.7:	Background Traffic (Year 2031) – PM Peak Hour	30
Figure 4.8:	Background Traffic (Year 2031) – Background Development Growth – AM Peak Hour	31
Figure 4.9:	Background Traffic (Year 2031) – Background Development Growth – PM Peak Hour.....	32
Figure 4.10:	Total Traffic (Year 2024) – AM Peak Hour	33
Figure 4.11:	Total Traffic (Year 2024) – PM Peak Hour.....	34
Figure 4.12:	Total Traffic (Year 2029) – AM Peak Hour	35
Figure 4.13:	Total Traffic (Year 2029) – PM Peak Hour.....	36
Figure 4.14:	Total Traffic (Year 2031) – AM Peak Hour	37
Figure 4.15:	Total Traffic (Year 2031) – PM Peak Hour.....	38
Figure 4.16:	Total Traffic (Year 2031) – Background Development Growth – AM Peak Hour	39
Figure 4.17:	Total Traffic (Year 2031) – Background Development Growth – PM Peak Hour.....	40
Figure 6.1:	AutoTURN – Fire Truck	69
Figure 6.2:	AutoTURN – Halton Front End Loader	70
Figure 6.3:	AutoTURN – Loading Zone	71
Figure 6.4:	AutoTURN – Passenger Car East Driveway.....	72
Figure 6.5:	AutoTURN – Passenger Car East Driveway Layby.....	73
Figure 6.6:	AutoTURN – Passenger Car UG Ramps.....	74
Figure 6.7:	AutoTURN – Passenger Car UG Ramps 2 & 3	75



Tables

Table 2.1: Existing Count Data Summary 9

Table 2.1: Existing Intersection Operations 14

Table 3.1: Trip Generation – Proxy Site Survey..... 17

Table 3.2: ITE Trip Generation Rate Comparison..... 18

Table 3.3: Estimated Trip Generation..... 18

Table 3.4: Estimated Trip Distribution 19

Table 4.2: 2024 Background Traffic Operations 42

Table 4.3: 2029 Background Traffic Operations 44

Table 4.4: 2031 Background Traffic Operations 47

**Table 4.5: 2031 Background Traffic Operations – Background
Development Growth 50**

Table 4.6: 2024 Total Traffic Operations 53

Table 4.7: 2029 Total Traffic Operations 55

Table 4.8: 2031 Total Traffic Operations 58

**Table 4.9: 2031 Total Traffic Operations – Background Development
Growth 61**

Table 4.10: 2024 to 2031 Critical Movement Summary..... 62

**Table 4.11: Background Growth and Background Development
Unique Critical Movements..... 63**

Table 5.1: 2031 Future Total Traffic Operations – Improvements 67

Table 8.1: Zoning By-Law Parking Requirement..... 79

Table 8.2: ITE Parking Generation..... 80

Table 8.3: City of Kitchener Parking Generation 81



1 Introduction

1.1 Overview

Korsiak Urban Planning retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study, Parking Study and Transportation Demand Management (TDM) Report for a mixed-use development located at 550 Ontario Street South in the Town of Milton.

Figure 1.1 illustrates the location of the subject site. The subject site is an existing commercial plaza containing approximately 3,524 m² of retail/commercial land uses.

The scope of the study includes:

- ▶ An assessment of the current traffic and site conditions within the study area;
- ▶ Estimates of background traffic growth;
- ▶ Estimates of additional traffic generated by the subject site;
- ▶ Analyses of the impact of the future traffic on the surrounding road network;
- ▶ Determining the site's parking needs and providing recommendations to mitigate parking demands; and
- ▶ Assess site circulation for heavy vehicles; and
- ▶ Recommendations to mitigate the site generated traffic in a satisfactory manner, if required.

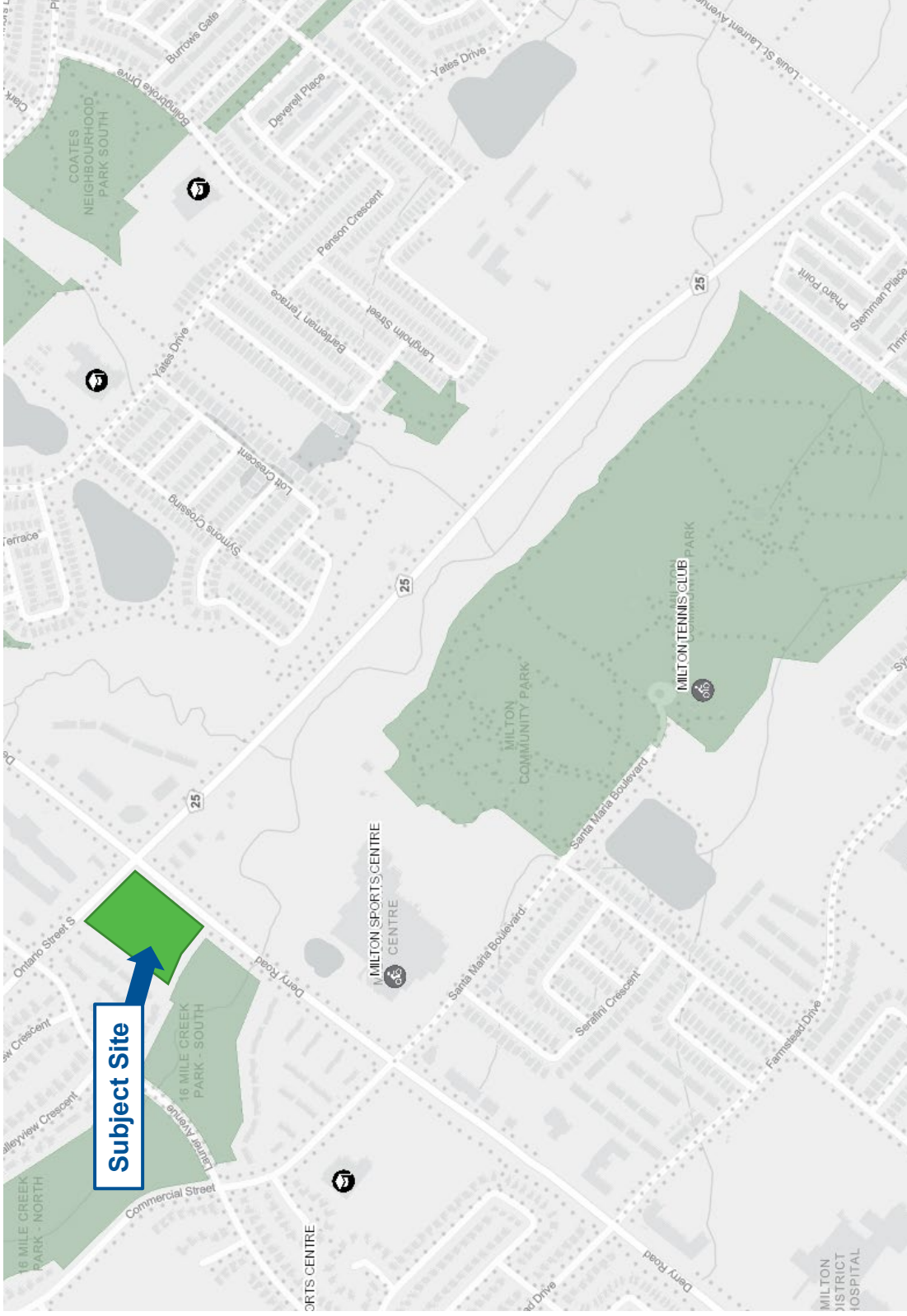
Appendix A contains the pre-study consultation material and responses from the Town and the Region. This report follows the Halton Region TIS guidelines¹.

The study area intersections assessed in this study include:

- ▶ Ontario Street South and Derry Road (signalized);
- ▶ Ontario Street South and Laurier Avenue (signalized);
- ▶ Regional Road 25 and Louis St. Laurent Avenue (signalized);
- ▶ Derry Road and Santa Maria Boulevard (signalized); and
- ▶ the proposed site driveway connections to Ontario Street South and Derry Road.

¹ Transportation Impact Study Guidelines, *Halton Region*, January 2015





Study Area and Subject Development Location

550 Ontario Street S, Mixed-use Development
190237

Figure 1.1

2 Existing Conditions

2.1 Roadway Network

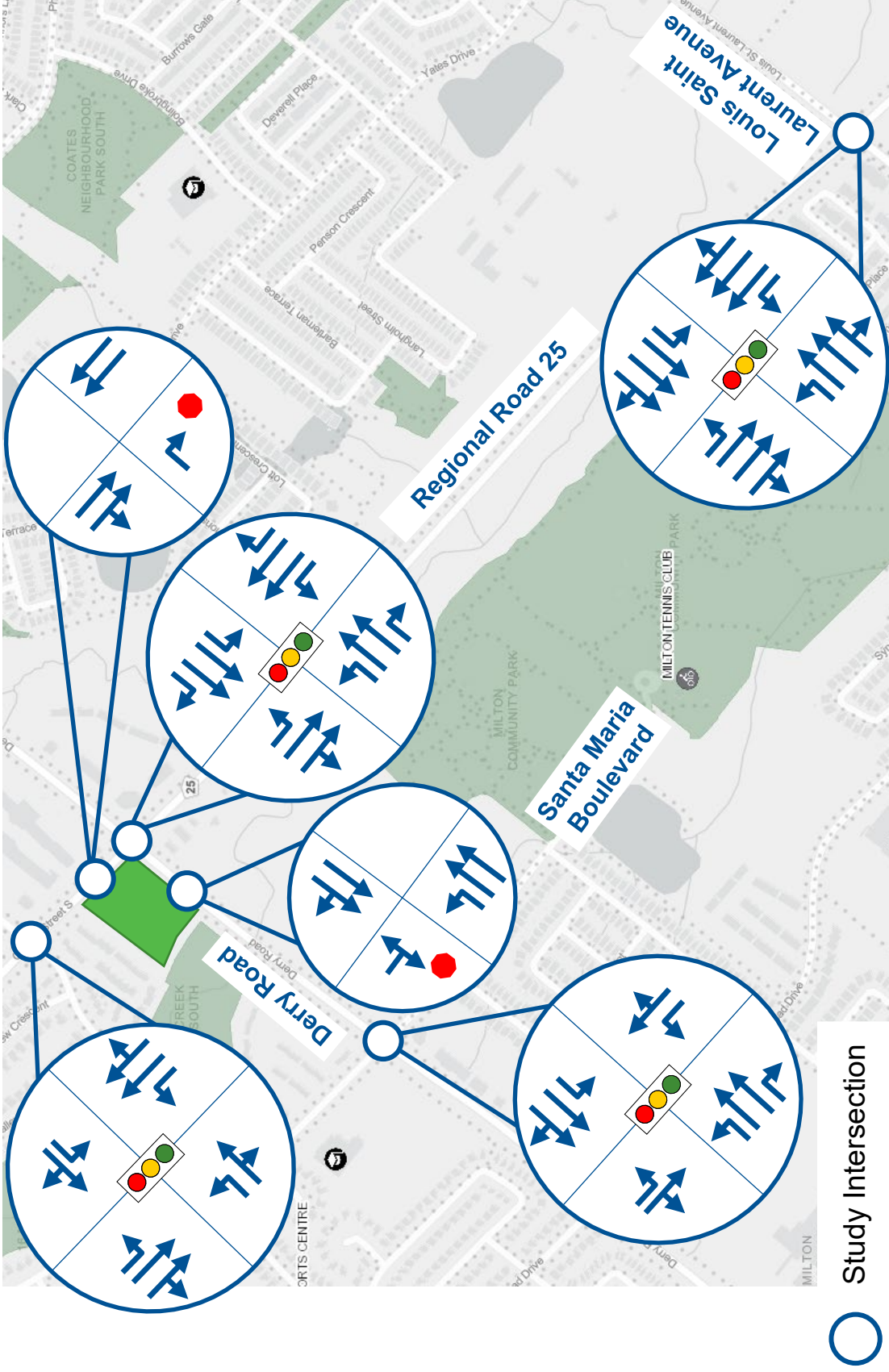
The roadways of interest, classified as per the Town of Milton Official Plan², within the study area include:

- ▶ **Ontario Street South** is a north-south roadway, classified as a multi-purpose arterial road. It has a four-lane urban cross-section and a posted speed limit of 50 km/hr. The intersections with Laurier Avenue and Derry Road are signalized.
- ▶ **Regional Road 25** is a north-south roadway, classified as a major arterial. It has a four-lane urban cross-section and a posted speed limit of 70 km/hr south of Derry Road. The intersections with Louis St. Laurent Avenue is signalized.
- ▶ **Derry Road** is an east-west major arterial roadway. It has a four-lane urban cross-section with a posted speed limit of 60 km/hr;
- ▶ **Laurier Avenue** is an east-west collector roadway. It has a two-lane urban cross-section with a posted speed limit of 50 km/hr;
- ▶ **Louis St. Laurent Avenue** is an east-west minor arterial. It has a four-lane urban cross-section with a posted speed limit of 60 km/hr;
- ▶ **Santa Maria Boulevard** is a north-south collector roadway. It has a two-lane urban cross-section. The statutory 50 km/hr speed limit is assumed. A flashing 40 km/hr zone is located near the Our Lady of Victory Catholic Elementary School.

Figure 2.1 illustrates the existing lane configurations and traffic control at the study area intersections.

² *Town of Milton Official Plan: Schedule F*, Town of Milton, August 2008





○ Study Intersection



Existing Lane Configurations and Traffic Control

2.2 Transit Service

Milton Transit operates six routes (2, 5, 7, 8, 9 and 10) within the study area. Service is provided Monday – Saturday with headways of 30 to 60-minute headways. All routes are connected to Milton GO located at 780 Main St E. It is noted that Ontario Street and Regional Road 25 are apart of the “Higher Order Transit Corridor” as per the Halton Regional Official Plan Amendment (ROPA) 48³.

Existing transit stops are present on all four quadrants of the Ontario Street South and Derry Road intersection.

Figure 2.2 illustrates the existing transit network. **Figure 2.3** illustrates the ROPA 48 Functional Plan of Major Transportation Facilities. **Figure 2.4** illustrates the existing transit stops within 500 m of the subject site.

2.3 Active Transportation Network

There are sidewalks on both sides of:

- ▶ Laurier Avenue;
- ▶ Commercial Street; and
- ▶ Ontario Street South.

Sidewalks are present on the west side of Santa Maria Boulevard and a multi-use trail is present on the east side.

All signalized intersections have marked pedestrian crosswalks and pedestrian signal heads are provided. There are no marked pedestrian crossings provided outside of the signalized intersections.

Cycling infrastructure is provided within the study area on the following roads:

- ▶ Ontario Street South – a multi-use trail on the east side of the road, between Derry Road and Louis St. Laurent Avenue;
- ▶ Derry Road – a multi-use trail on both sides of the road;
- ▶ Louis St. Laurent Avenue – a multi-use trail on both sides of the road; and
- ▶ Santa Maria Boulevard – a multi-use trail on the east side of the road.

Travel by bicycle to/from the subject site is not restricted by any access-controlled roadways and cyclists are permitted to ride on all roadways within the study area.

³ Halton Regional Official Plan Amendment 48, *Region of Halton*, February 2021



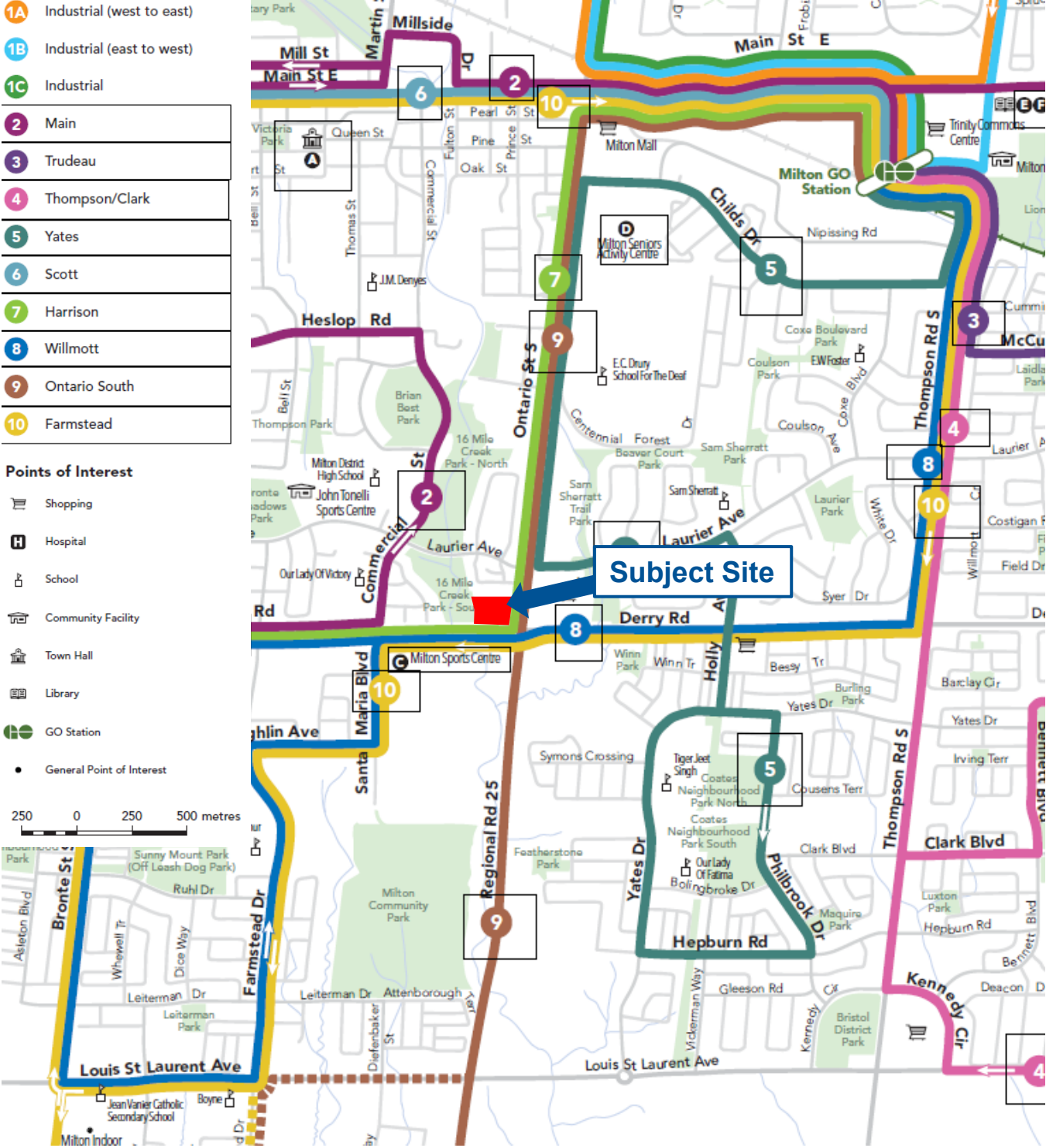
Routes

- 1A Industrial (west to east)
- 1B Industrial (east to west)
- 1C Industrial
- 2 Main
- 3 Trudeau
- 4 Thompson/Clark
- 5 Yates
- 6 Scott
- 7 Harrison
- 8 Willmott
- 9 Ontario South
- 10 Farmstead

Points of Interest

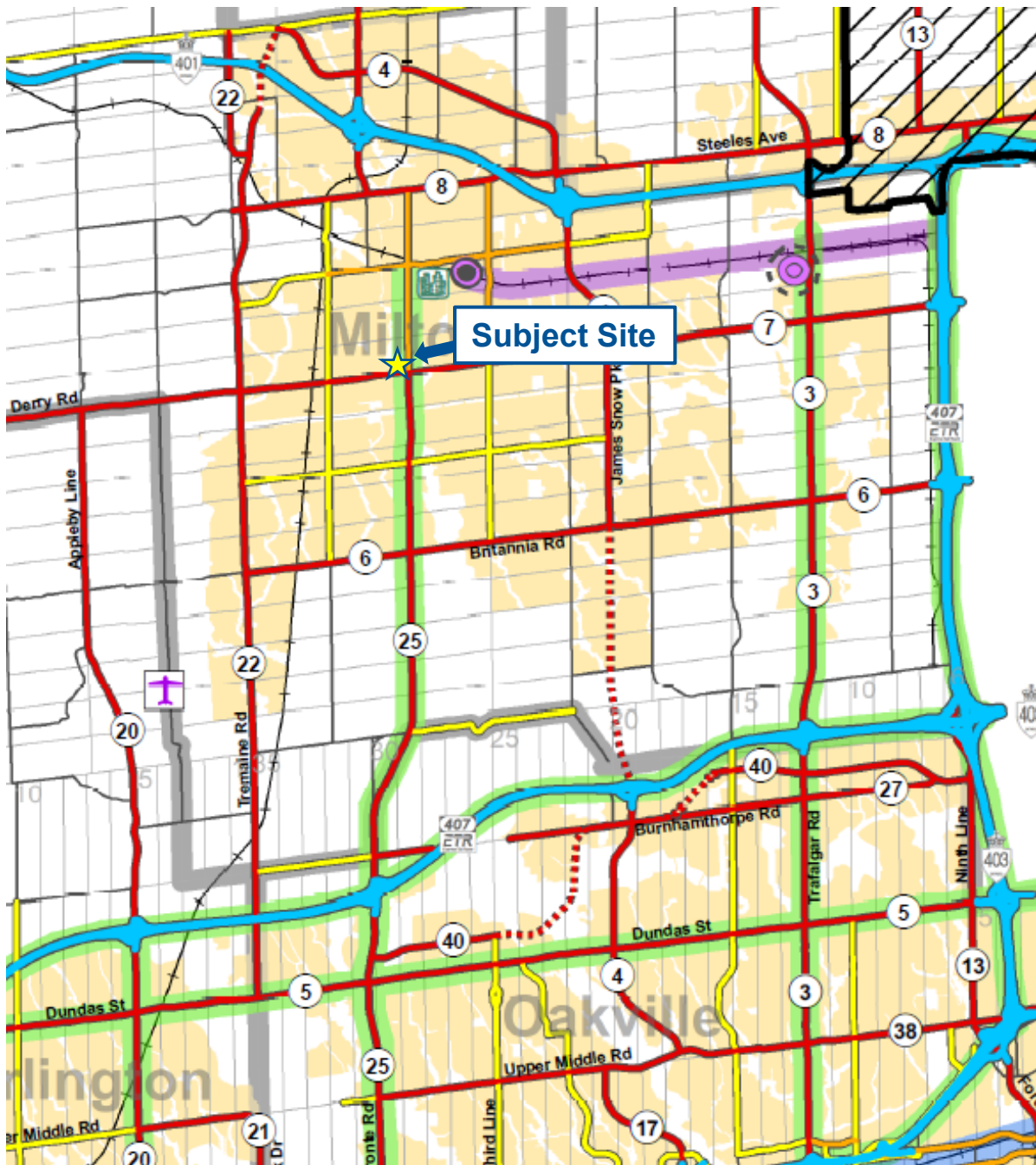
- Shopping
- Hospital
- School
- Community Facility
- Town Hall
- Library
- GO Station
- General Point of Interest

250 0 250 500 metres



Existing Transit Network

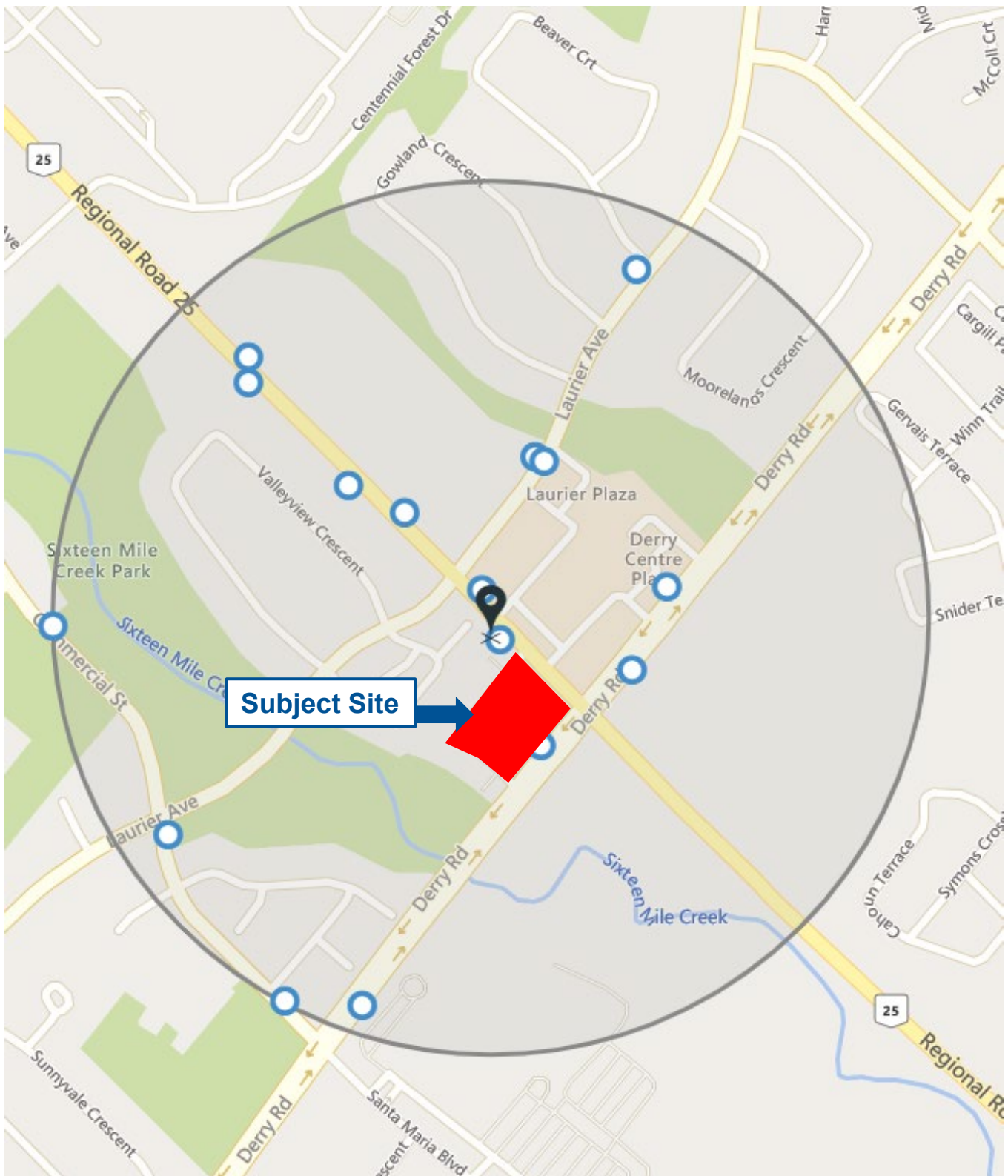
Figure 2.2



- | | | | |
|---|-------------------------|-------------------------------|-------------------------|
| Urban Growth Centre | Rail Line | Hamlet Area | Provincial Highway |
| Major Transit Station | Major Road | Urban Area | Major Arterial |
| Proposed Major Transit Station | Lot and Concession Line | Higher Order Transit Corridor | Multi-Purpose Arterial |
| Airport | Municipal Boundary | Commuter Rail Corridor | Minor Arterial |
| HPBATS / GTA West Corridor Protection Area
Under Appeal - See OMB Case No. PL 140744 | | Priority Transit Corridor | Provincial Freeway |
| | | | Proposed Major Arterial |



ROPA 48 Map 3: Functional Plan of Major Transportation Facilities



Existing Transit Stops Within 500 m of the Subject Site

2.4 Traffic Volumes

Table 2.1 summarizes the location and peak hour of the existing Turning Movement Count (TMC) data used in the analysis. The data was collected using Miovision Scout Unit technology in November 2019. **Appendix B** contains the detailed existing count data.

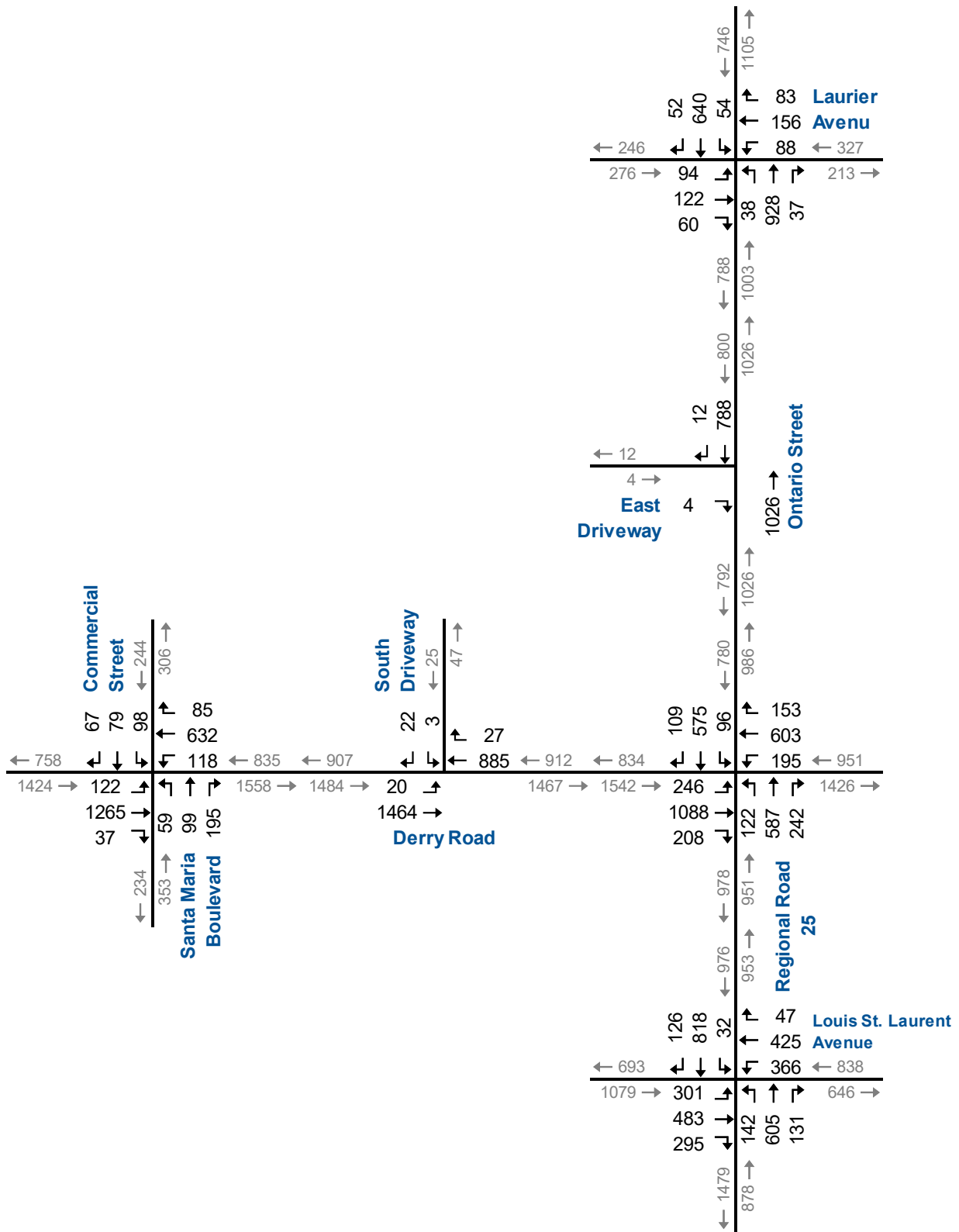
Figure 2.5 and **Figure 2.6** illustrate the existing weekday AM and PM peak hour traffic volumes at the study area intersections, respectively.

The existing commercial plaza is generating approximately 88 vehicle trips per hour during the AM peak hour and 272 vehicle trips per hour during the PM peak hour.

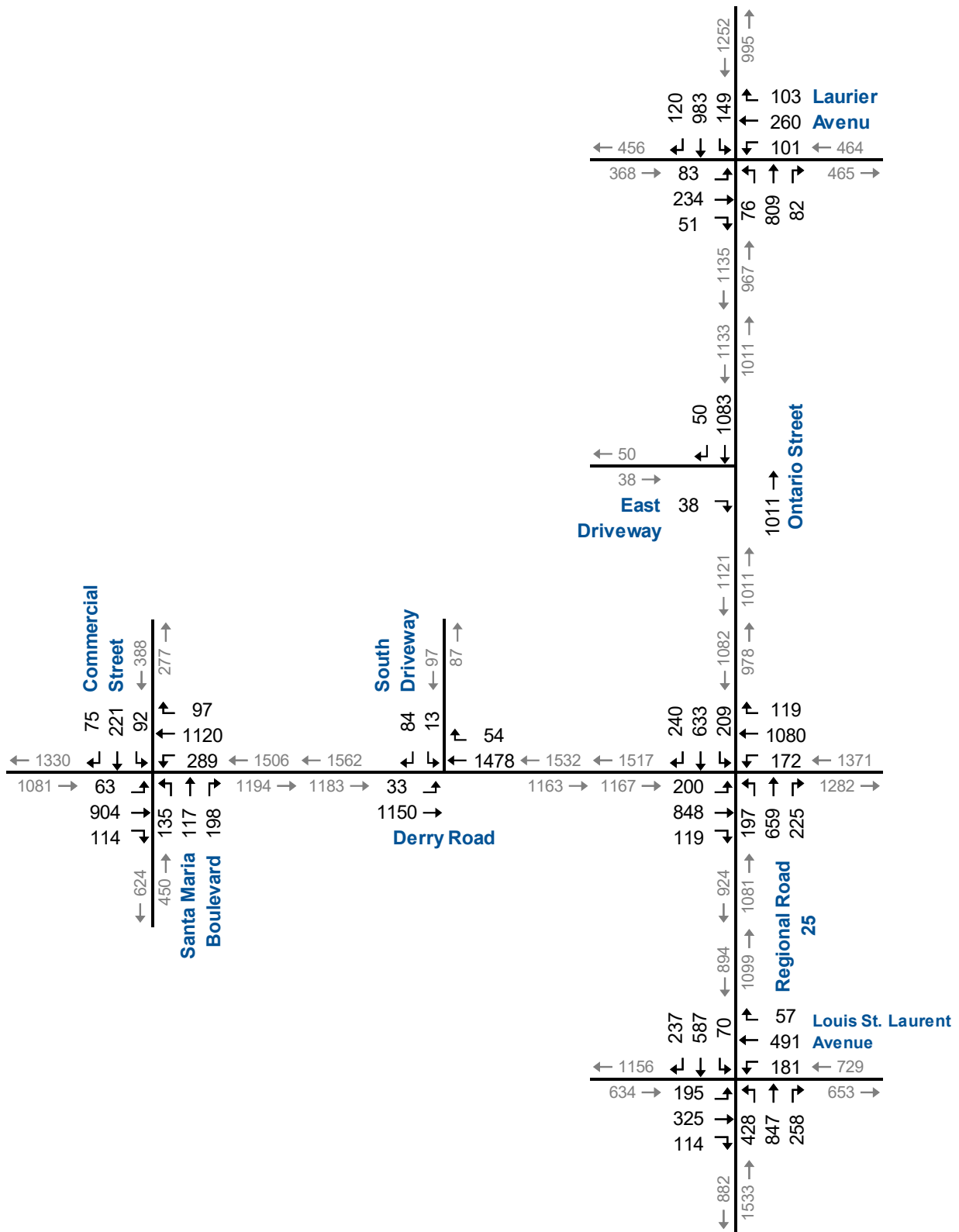
TABLE 2.1: EXISTING COUNT DATA SUMMARY

Location	Peak Hour (Start Time)	
	AM Peak Hour	PM Peak Hour
Ontario Street South and Laurier Avenue	7:45 AM	4:45 PM
Ontario Street South and East Driveway	7:30 AM	4:30 PM
Ontario Street South and Derry Road	7:30 AM	5:00 PM
South Driveway and Derry Road	8:00 AM	4:30 PM
Santa Maria Boulevard/Commercial Street and Derry Road	7:30 AM	4:45 PM
Regional Road 25 and Louis St. Laurent Avenue	7:30 AM	5:00 PM





Existing Traffic Volumes – AM Peak Hour



Existing Traffic Volumes – PM Peak Hour

2.5 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the efficiency of traffic flow at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles desiring to make a movement, compared to the estimated capacity for that movement. The capacity is based on several criteria related to the opposing traffic flows. The highest possible rating is LOS A, under which the average total delay is equal or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds at signalized intersections (50 seconds at unsignalized intersections), the movement is considered to have a LOS F and remedial measures are usually implemented if they are feasible.

Capacity is evaluated in terms of the ratio of demand flow to capacity with an at-capacity condition represented by a volume-to-capacity ratio of 1.00 (i.e., volume demand equals capacity).

The operations of the study area intersections were evaluated using the existing lane configurations, traffic controls and the existing peak hour volumes.

The existing traffic conditions have been assessed using Synchro 10 / SimTraffic 9 and HCM 6th procedures. The intersection analysis considered the following measures of performance:

- ▶ The LOS for each turning movement. LOS is based on the average control delay per vehicle;
- ▶ The volume to capacity ratio for each intersection; and
- ▶ 95th percentile queue length (m).

Movements are considered critical under the following conditions:

- ▶ Volume/capacity (V/C) ratios for overall intersection operations, through movements, or shared through/turning movements increased to 0.85 or above;
- ▶ V/C ratios for exclusive movements increased to 0.95 or above; or
- ▶ Unsignalized intersections Level of service (LOS), based on average delay per vehicle, on individual movements exceeds LOS "D"; or
- ▶ Queues for an individual movement are projected to exceed available turning lane storage.



Table 2.2 summarizes the existing traffic operations. The following critical movements are noted:

- ▶ **Ontario Street South and Derry Road:**
 - Eastbound through/right-turn – AM peak hour, v/c ratio greater than 0.85; and
 - Westbound through/right-turn – PM peak hour, v/c ratio greater than 0.85.
- ▶ **Derry Road and South Driveway:**
 - Southbound left/right-turn – PM peak hour, LOS F.
- ▶ **Regional Road 25 and Louis St. Laurent Avenue:**
 - Eastbound through – AM peak hour, LOS E, v/c greater than 0.85.
 - Eastbound right-turn – AM and PM peak hour, LOS E, AM peak hour, v/c greater than 0.85.
 - Westbound left-turn – AM and PM peak hour, queue length exceeds storage.
 - Westbound through/right-turn – PM peak hour, LOS E, v/c ratio greater than 0.85.

Appendix C contains the supporting detailed Synchro reports.



TABLE 2.1: EXISTING INTERSECTION OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS Delay 39 V/C 0.42 Q 10 Stor. 15 Avail. 5	D A C C	32	D A C C	32	D A C C	32	B B B B	11	B A A A	10	D A A A	10	B 16				
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q Stor. Avail.		B 11					A 0		A 0		A 0		A 0				
	Ontario Street & Derry Road	TCS	LOS Delay 27 V/C 0.64 Q 24 Stor. 65 Avail. 41	C D C D	40	D C C D	35	C C C C	33	C C C C	33	C D C D	39	D D D D	38	D 37				
	Derry Road & South Driveway	TWSC	LOS Delay 10 V/C 0.03 Q 1 Stor. 15 Avail. 14	A A	A 0	A A	A 0					C 19	>	>	>	>	C 19			
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay 23 V/C 0.32 Q 11 Stor. 25 Avail. 14	C C B C	26	C B B B	16	C A D D	35	D D A C	30	A C C C	30	D D D D	37	C 25				
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay 30 V/C 0.63 Q 35 Stor. 45 Avail. 10	C E E D	50	D D D D	43	C C C C	32	C D C D	34	C D C D	43	D D D D	42	D 42				
	Ontario Street & Laurier Avenue	TCS	LOS Delay 46 V/C 0.48 Q 12 Stor. 15 Avail. 3	D A C D	35	D A D D	38	C C C B	20	B B B B	14	B B B B	14	B B B B	14	C 22				
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q Stor. Avail.		B 13					A 0		A 0		A 0		A 0				
	Ontario Street & Derry Road	TCS	LOS Delay 49 V/C 0.83 Q 28 Stor. 65 Avail. 37	D D C D	38	C D C D	46	D D C D	36	C C C C	36	C D C D	46	D D D D	42	D 42				
PM Peak Hour	Derry Road & South Driveway	TWSC	LOS Delay 14 V/C 0.07 Q 2 Stor. 15 Avail. 13	B A	A 0	A A	A 0					F 52	>	>	>	F 52				
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay 32 V/C 0.29 Q 8 Stor. 25 Avail. 17	C C C C	26	C B B C	21	D A D D	40	D A C C	34	A C C C	34	D C C C	38	C 27				
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay 48 V/C 0.74 Q 34 Stor. 45 Avail. 11	D D E D	53	D E E E	64	C C C C	23	C C C C	23	C C C C	29	D D D D	37					
	Ontario Street & Laurier Avenue	TCS	LOS Delay 39 V/C 0.42 Q 10 Stor. 15 Avail. 5	D A C C	32	D A C C	32	B B B B	11	B A A A	10	D A A A	10	B 16						

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 V/C - Volume to Capacity Ratio
 Q - 95th Percentile Queue Length (m)
 Stor. - Existing Storage (m)
 Avail. - Available Storage (m)
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 </> - Shared with through movement



3 Development Concept

3.1 Site Description

The subject site is located at 550 Ontario Street South in the Town of Milton. The subject site is an existing commercial plaza containing approximately 3,524 m² of retail/commercial land uses. The landowner is proposing to redevelop the site as mixed-use. **Figure 3.1** illustrates the proposed site plan.

The concept plan includes:

- ▶ **Building 1:** 24-storey building containing approximately 337 residential units and 667 m² of retail use within the first two floors;
- ▶ **Building 2:** 19-storey building containing approximately 225 residential units and 1,322 m² of retail use within the first two floors;
- ▶ **Building 3:** 4-storey building with approximately 87 residential units;

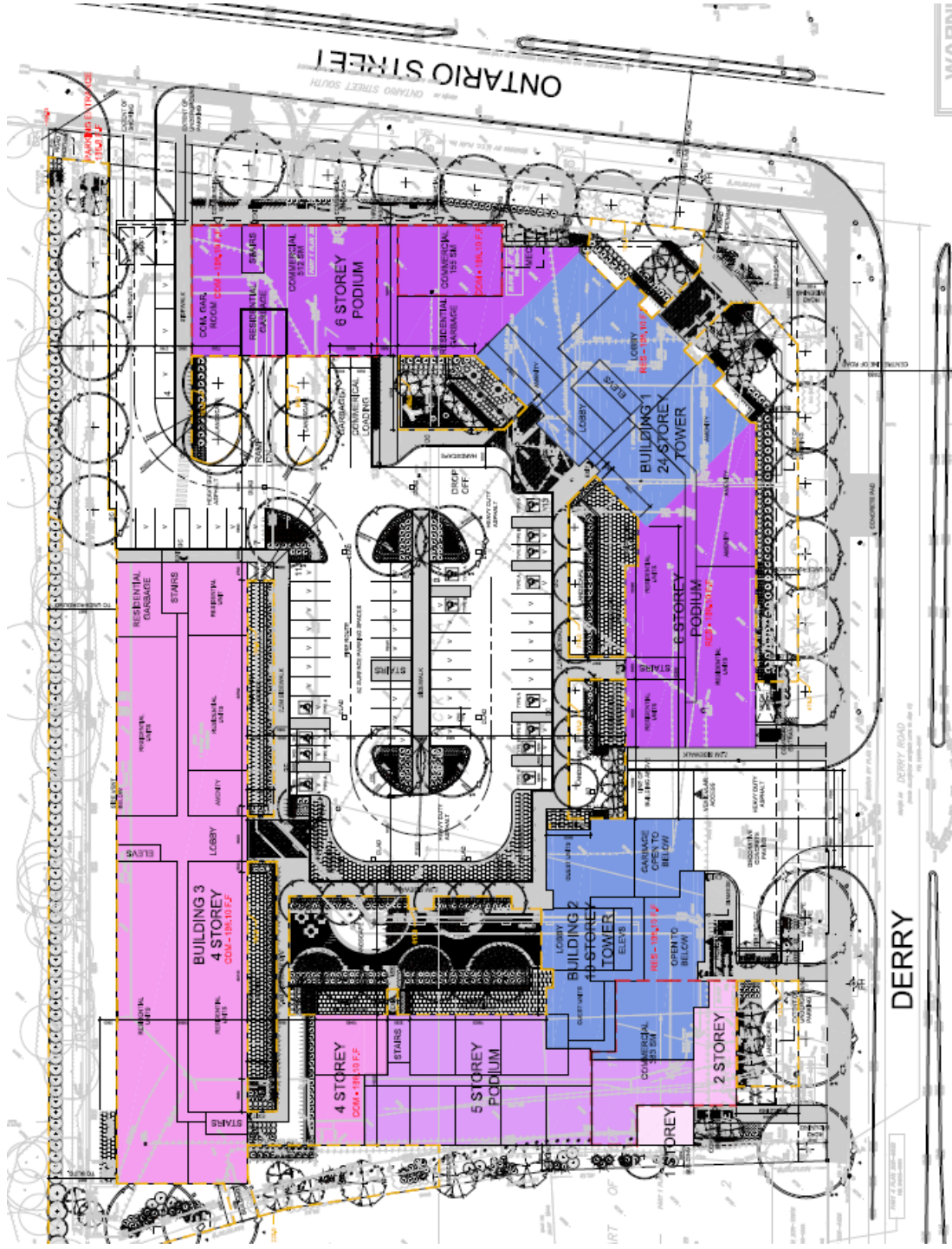
The site's parking supply is approximately 848 spaces.

Vehicle access is proposed by a private driveway to Ontario Street South and Derry Road. The Ontario Street South driveway is proposed as right-in/right-out with turning restrictions enforced through use of a raised centre median. The Ontario Street South driveway is located approximately 70 metres north of Derry Road. The driveway approach is assumed to operate under stop control.

The Derry Road driveway is proposed without turning restrictions and is located approximately 80 metres west of Derry Road. The driveway approach is assumed to operate under stop control.

Build-out is anticipated to occur by Year 2024; timing is subject to market conditions.





Site Concept Plan

Figure 3.1

3.2 Site Generated Traffic

The vehicle trips generated by the site concept were estimated for the AM and PM peak hours using proxy site data. The proxy site data was compared to the Institute of Transportation Engineers (ITE) Trip Generation⁴ data. It was found that the rates from the proxy site data were similar to the ITE rates and were used to remain conservative.

A proxy site trip generation survey was conducted at 1940 Ironstone Drive in the City of Burlington. The survey was conducted over three days in February 2020. An average trip rate of 0.29 and 0.44 trips per unit was calculated for the AM and PM peak hours, respectively. **Table 3.1** summarizes the proxy site survey. **Appendix D** contains the TMC data and analysis from the proxy sites.

TABLE 3.1: TRIP GENERATION – PROXY SITE SURVEY

Date	AM Peak Hour			PM Peak Hour		
	In	Out	Sum	In	Out	Sum
Wed. 26 February 2020.	10	41	51	47	33	80
Thurs. 27 February 2020.	9	50	59	58	32	90
Fri. 28 February 2020.	21	49	70	63	45	108
Average	13	47	60	56	37	93
Average Rate Per Unit	0.06	0.23	0.29	0.26	0.18	0.44

⁴ Trip Generation Manual 10th Edition Institute of Transportation Engineers Washington DC .



The proxy site data is compared to ITE trip generation data. **Table 3.2** compares the ITE average rates for Land Use Code (LUC) 222 (Multifamily Housing (High-Rise)), LUC 231 (Multi-Family Mid Rise - First Floor Commercial) and LUC 232 (High-Rise Residential with 1st-Floor Commercial) to the proxy site data.

TABLE 3.2: ITE TRIP GENERATION RATE COMPARISON

Data	AM Peak Hour		PM Peak Hour	
	Rate	Inbound Split %	Rate	Inbound Split %
ITE, LUC 222	0.31	24/76	0.36	61/39
ITE, LUC 231	0.30	28/72	0.36	70/30
ITE, LUC 232	0.31	50/50	0.21	50/50
Proxy Site Data	0.29	22/78	0.44	60/40

The proxy site data is similar to the ITE data during the AM peak hour analysis period. The proxy site data is more conservative than the ITE data for the PM peak hour analysis period.

To provide for a conservative analysis, the proxy site trip generation data is used to estimate the site's trip generation. **Table 3.3** summarizes the site's estimated trip generation. No modal split or pass-by trip reductions have been applied. Modal split and pass-by trips are inherent in the proxy site data.

The site is forecast to generate approximately 188 AM peak hour trips and approximately 286 PM peak hour trips. Comparing the trip generation estimate the Site's existing trip generation (AM = 88 trips, PM = 272 trips) the development concept is anticipated to increase the site's AM peak hour trip generation by approximately 100 AM peak hour and 14 PM peak hour trips.

TABLE 3.3: ESTIMATED TRIP GENERATION

Units	AM Peak Hour				PM Peak Hour			
	Rate	In	Out	Sum	Rate	In	Out	Sum
649 Units	0.29	41	147	188	0.44	172	114	286
Total Trips		41	147	188		172	114	286

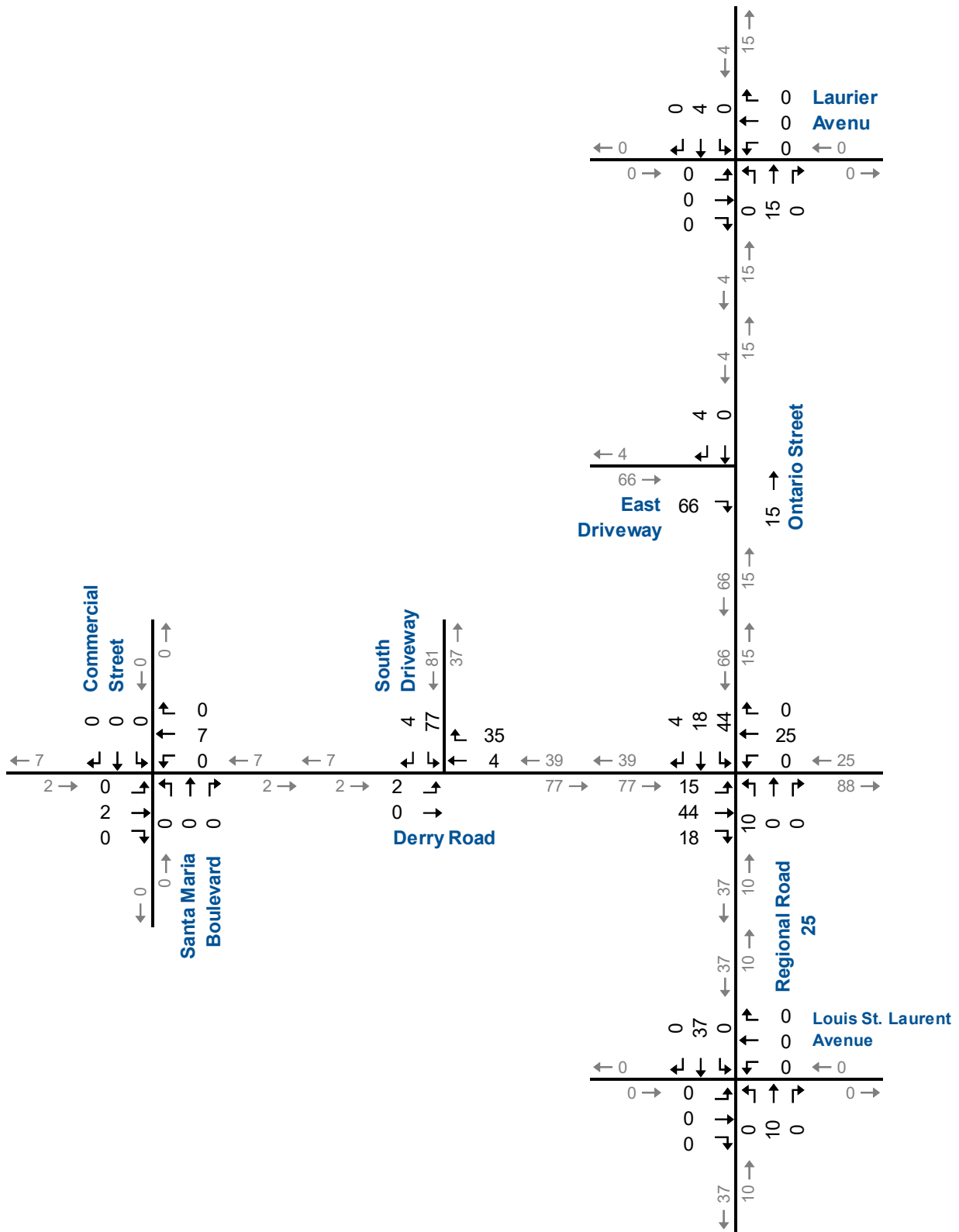


Table 3.4 summarizes the estimated trip distribution. The trip distribution was determined using the Transportation Tomorrow Survey (TTS), based on travel to and from the TTS Zones (Zone 4119, 4120, 4123, 4124, 4125 and 4126) which includes the subject site. **Figure 3.2** and **Figure 3.3** illustrate the site generated traffic assignments.

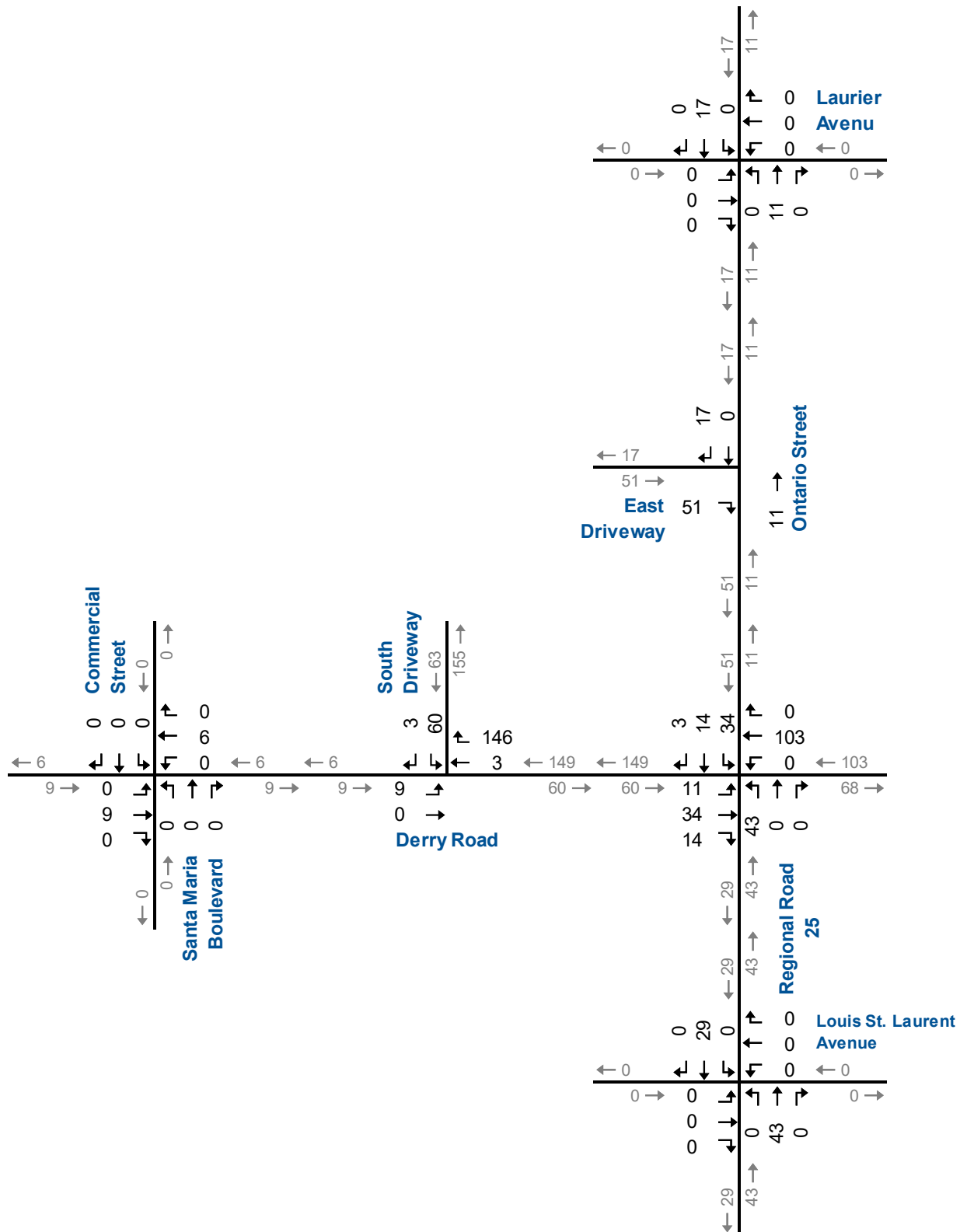
TABLE 3.4: ESTIMATED TRIP DISTRIBUTION

Direction	Distribution
North via Ontario Street South	10%
South via Ontario Street South	25%
East via Derry Road	60%
West via Derry Road	5%
Total	100%





Site Generated Traffic – AM Peak Hour



Site Generated Traffic – PM Peak Hour

4 Future Traffic Conditions

The assessment of future conditions in this section includes the following components:

- ▶ Background traffic growth estimates;
- ▶ Level of service analysis for background traffic (pre-development);
- ▶ Future total traffic estimates; and
- ▶ Level of service analysis for total traffic (post-development).

Traffic forecasts and analysis have been completed for the AM and PM peak hours of the following planning horizons:

- ▶ Year 2024 – Five-year horizon;
- ▶ Year 2029 – Ten-year horizon; and
- ▶ Year 2031 – Ultimate horizon, including completed area infrastructure.

4.1 Road Network Improvements

The Halton Region is planning to widen Regional Road 25 and Derry Road from four to six lanes. The Regional Road 25 widening is planned from Derry Road to Louis St. Laurent Avenue. The planned improvements are assumed to be in place by Year 2029. The Derry Road widening is planned from Tremaine Road to Highway 407. The planned improvements are assumed to be in place by Year 2031.

4.2 Forecast Traffic

The forecast future traffic volumes are estimated to consist of:

- ▶ Removal of the site's existing trip generation;
- ▶ Increased non-site traffic (generalized background traffic growth);
 - North/south of Derry Road – 3% per annum
 - Northbound on Ontario Street South – 2% per annum; and
 - Derry Road and Regional Road 25 - 3%.
 - Background traffic on Derry Road was reduced by 30% during the Year 2024 and Year 2029 horizons to account for displaced traffic resulting from the planned widening of Britannia Road and Main Street.
- ▶ Traffic generated by adjacent development applications. **Figure 4.1** illustrates the adjacent developments and include:



- Briarwood Residential Development⁵ – GHD, May 2019;
- 405-475 Ontario Street South⁶ – Paradigm, 2013;
- 610 Farmstead Drive⁷ – Paradigm, 2016;
- 7480 Derry Road⁸ – GHD, December 2018;
- Bronte West Condominium Residences⁹ – WSP, January 2019;
and
- Boyne Secondary Plan Survey Area¹⁰ – GHD, Sept 2017.

It is noted that approximately 3,700 residential units and 13,100 sq.ft. commercial gross floor area of the proposed buildout area have been completed, causing a trip reduction of 60% applied to effected trips.

- ▶ Traffic generated by the subject site.

The generalized background traffic growth rates and the adjacent development applications were identified by Town and Region Staff during pre-study consultation.

As the background developments are forecast to generate a considerable volume of traffic, the inclusion of that traffic in addition to the general background traffic growth would be too conservative and would cause double counting of future traffic.

To avoid this, the 2024, 2029 and 2031 horizons were analysed with only the general background growth traffic, and an additional 2031 horizon with only the background development traffic was analysed, providing analyses of the possible scenarios without being overly conservative, per Region comments.

Figure 4.2 to Figure 4.9 illustrates the forecast background traffic volumes. **Figure 4.10 to Figure 4.17** illustrates the forecast total traffic volumes.

⁵ Derry Road at Ontario Street South, *GHD*, July 2018

⁶ Hallawest Developments Milton Inc., *Paradigm Transportation Solutions Limited*, November 2014

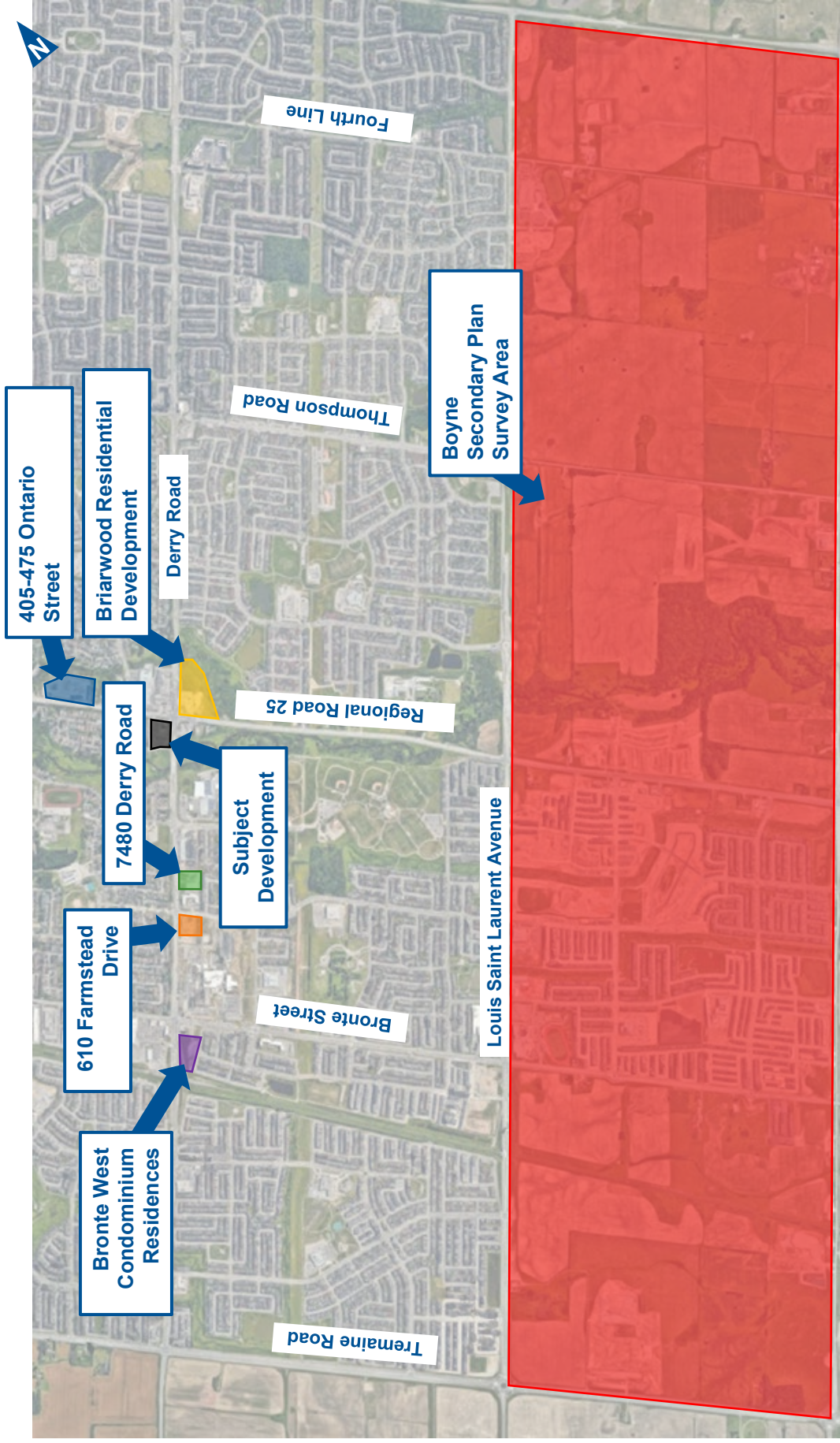
⁷ Derry Road and Farmstead Drive Transportation Impact and Parking Study, *Paradigm Transportation Solutions Limited*, June 2016

⁸ Traffic Impact Study, 7480 Derry Road, *GHD*

⁹ Transportation Impact Study Update, Derry Road And Bronte Street South, *WSP*, May 2018

¹⁰ Report for Milton Phase 3 Landowners Group - Boyne Secondary Plan Survey Area, *GHD*, September 2017

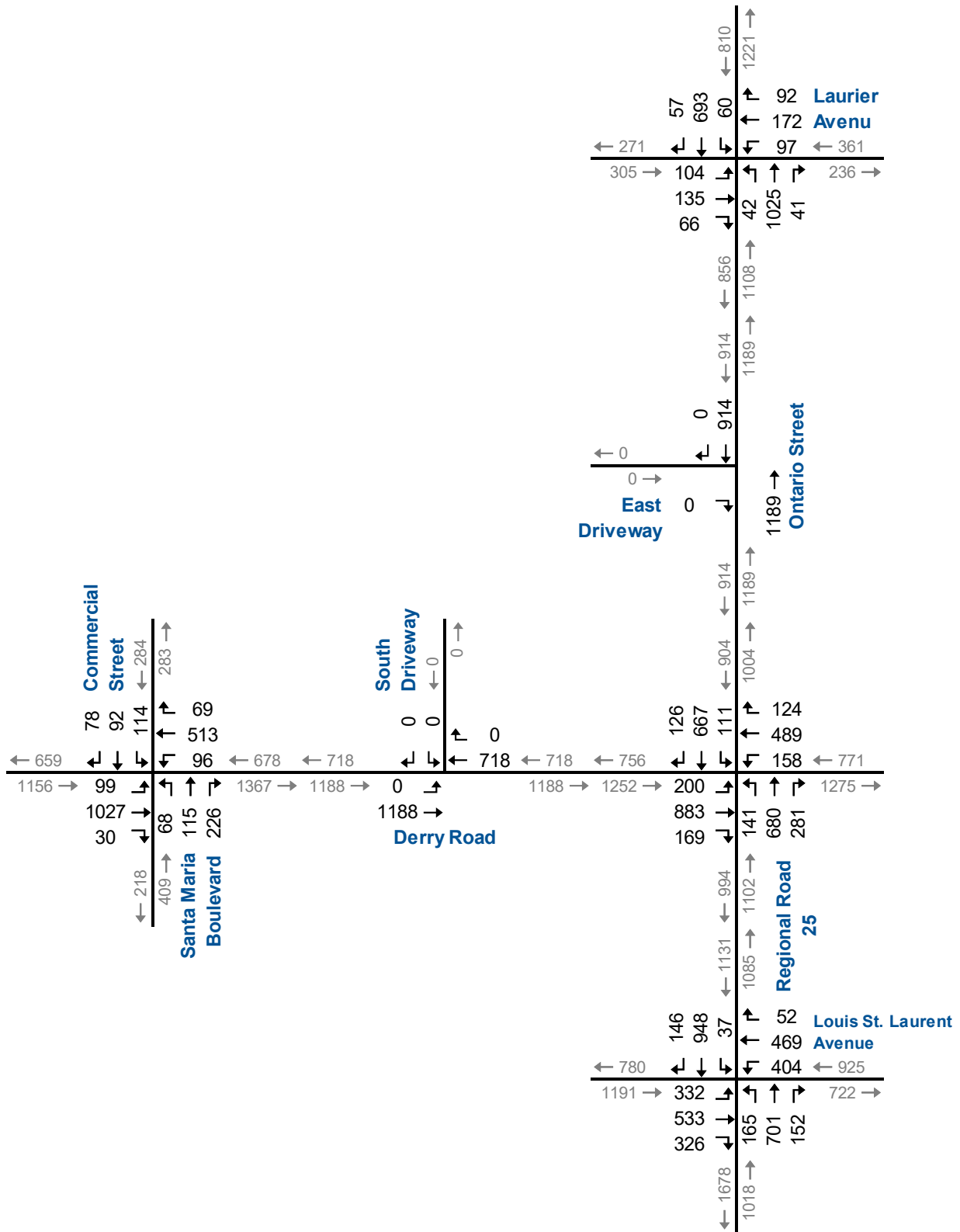




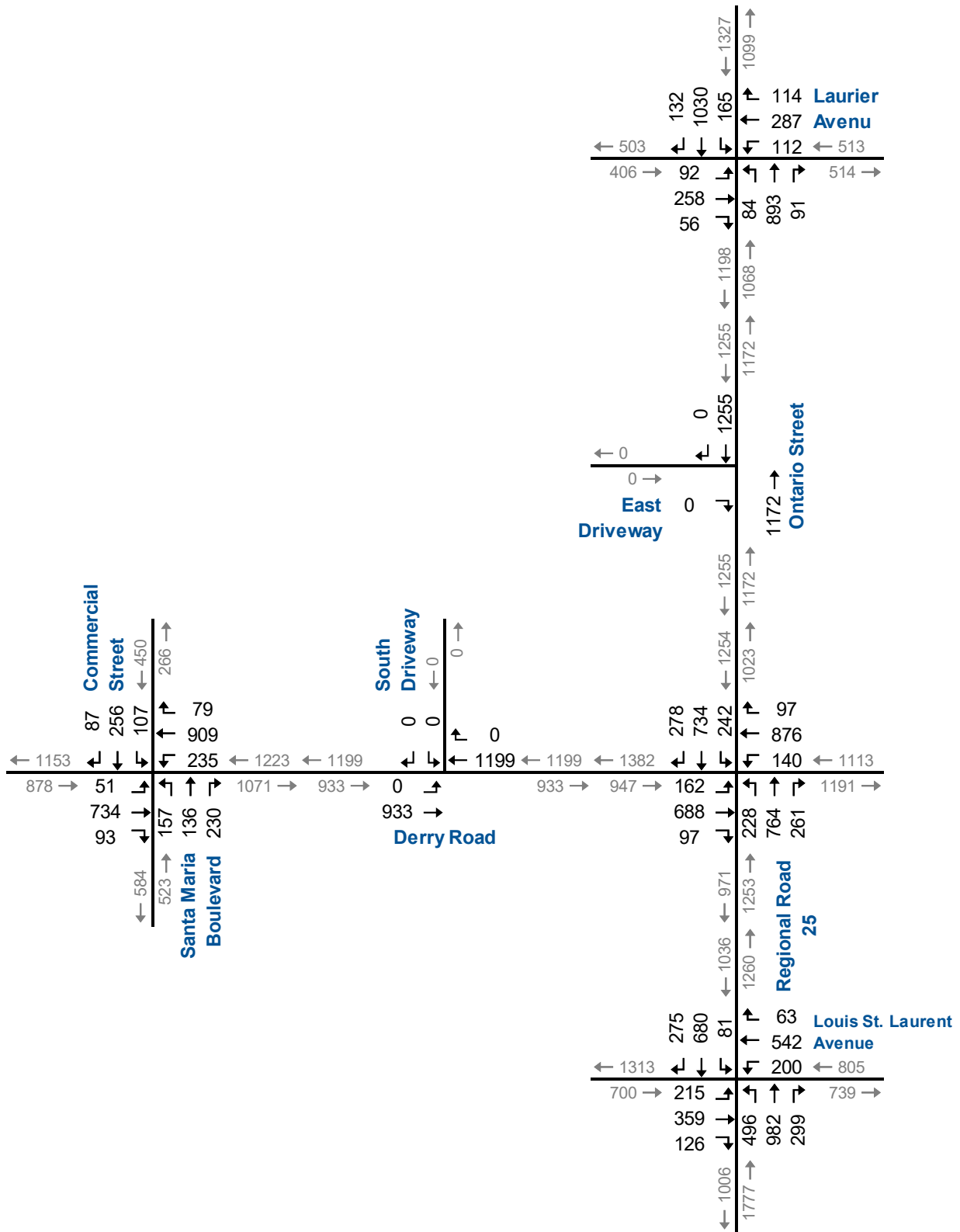
Development Concept Block Plan

Figure 4.1

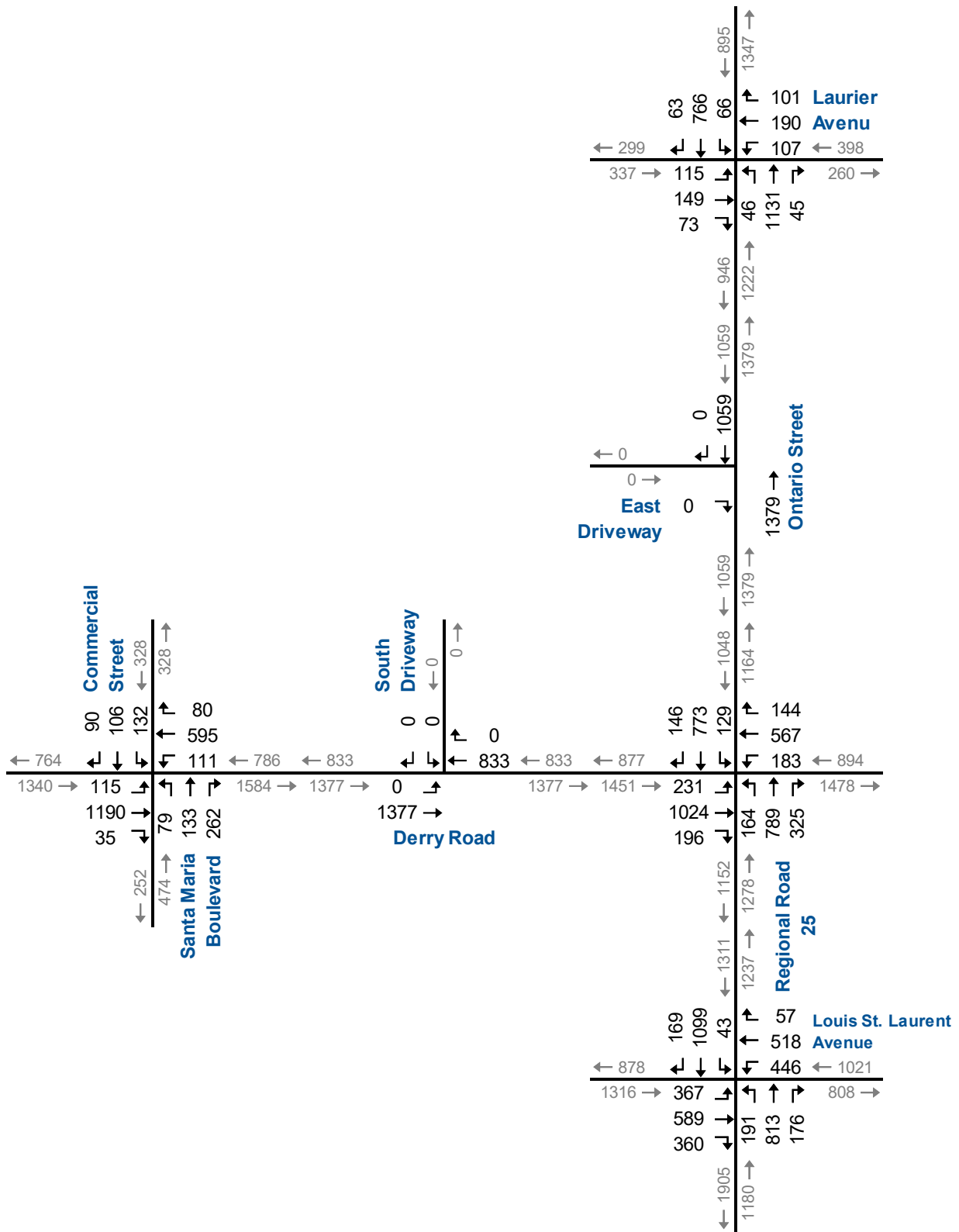




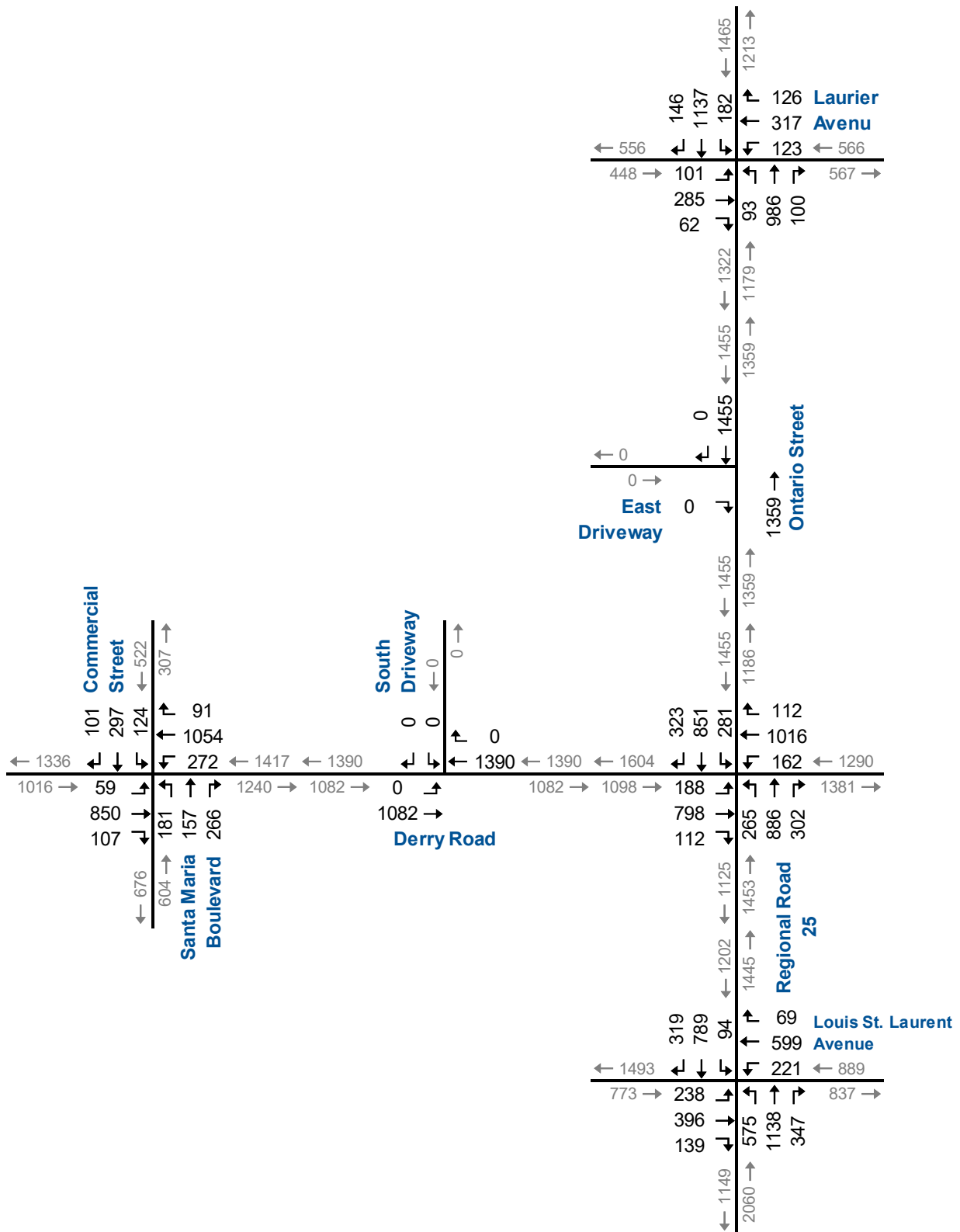
Background Traffic (Year 2024) – AM Peak Hour



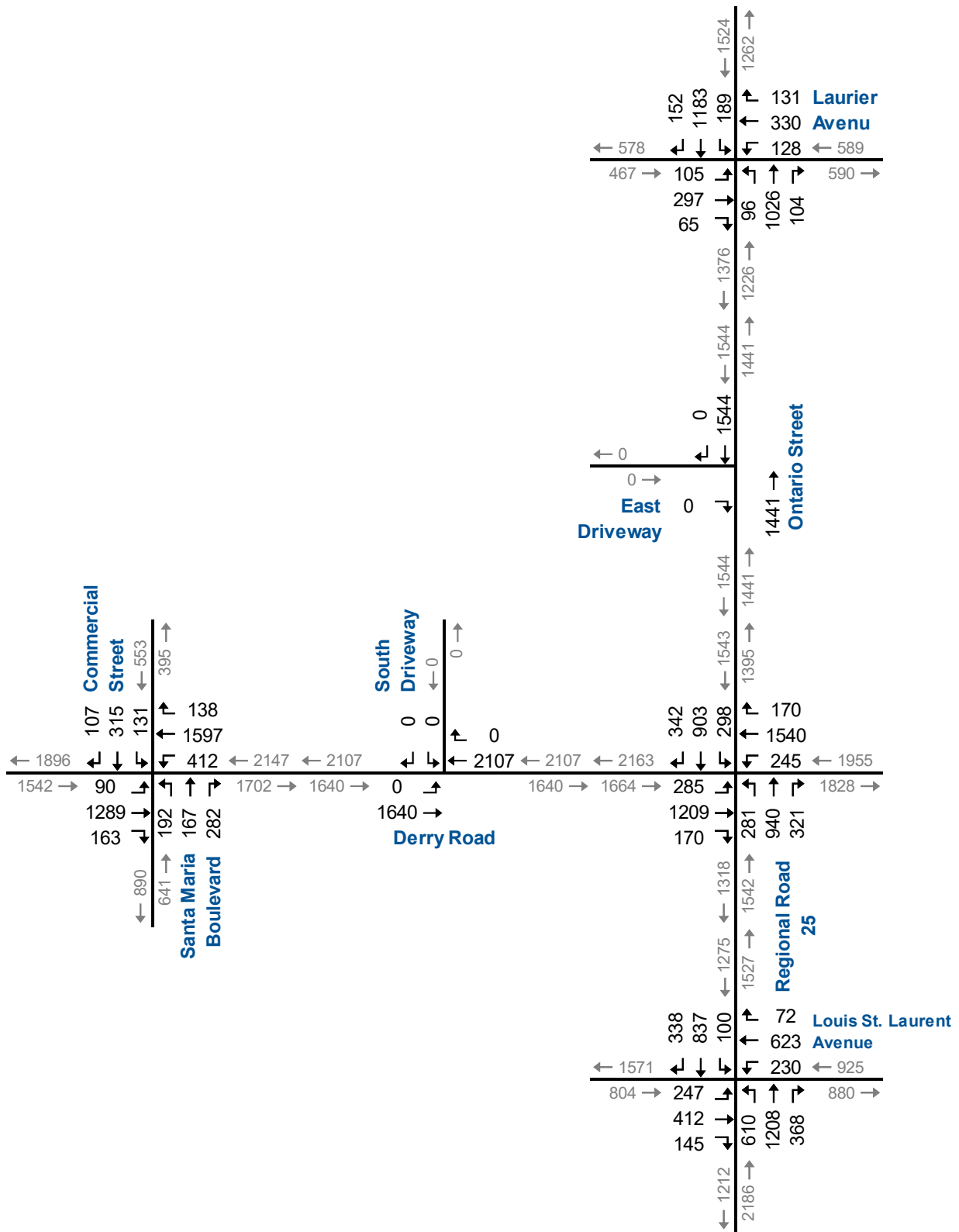
Background Traffic (Year 2024) – PM Peak Hour



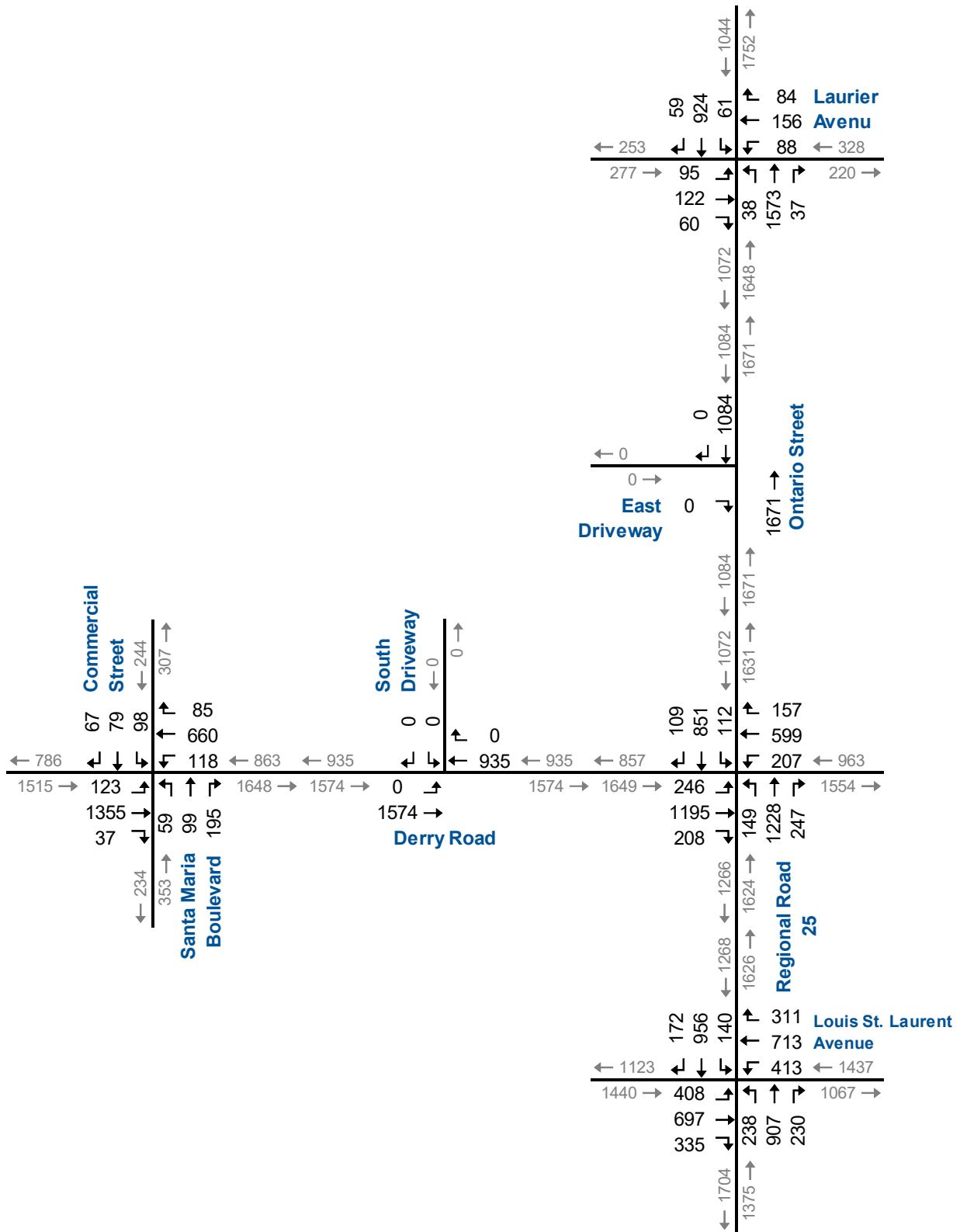
Background Traffic (Year 2029) – AM Peak Hour



Background Traffic (Year 2029) – PM Peak Hour

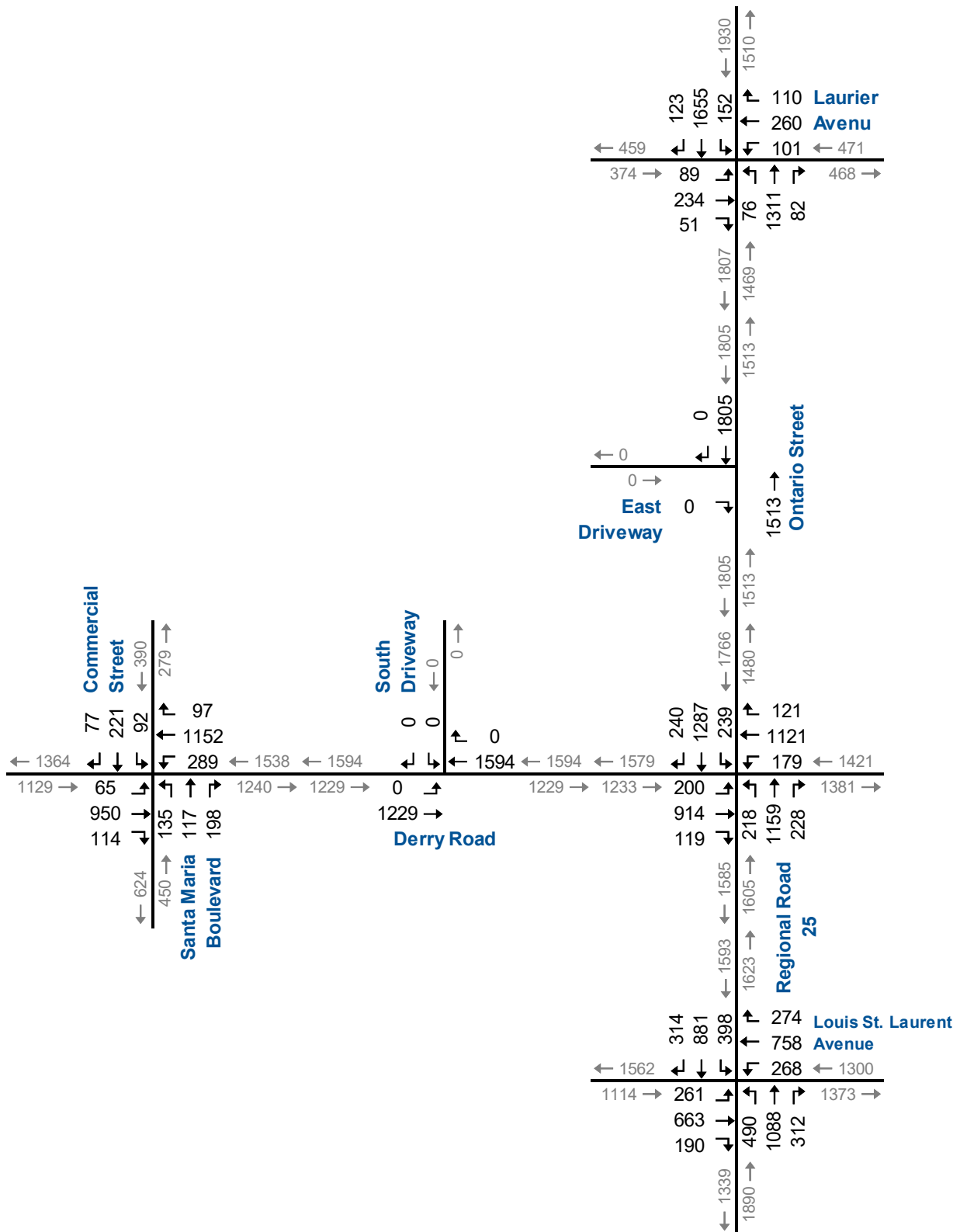


Background Traffic (Year 2031) – PM Peak Hour

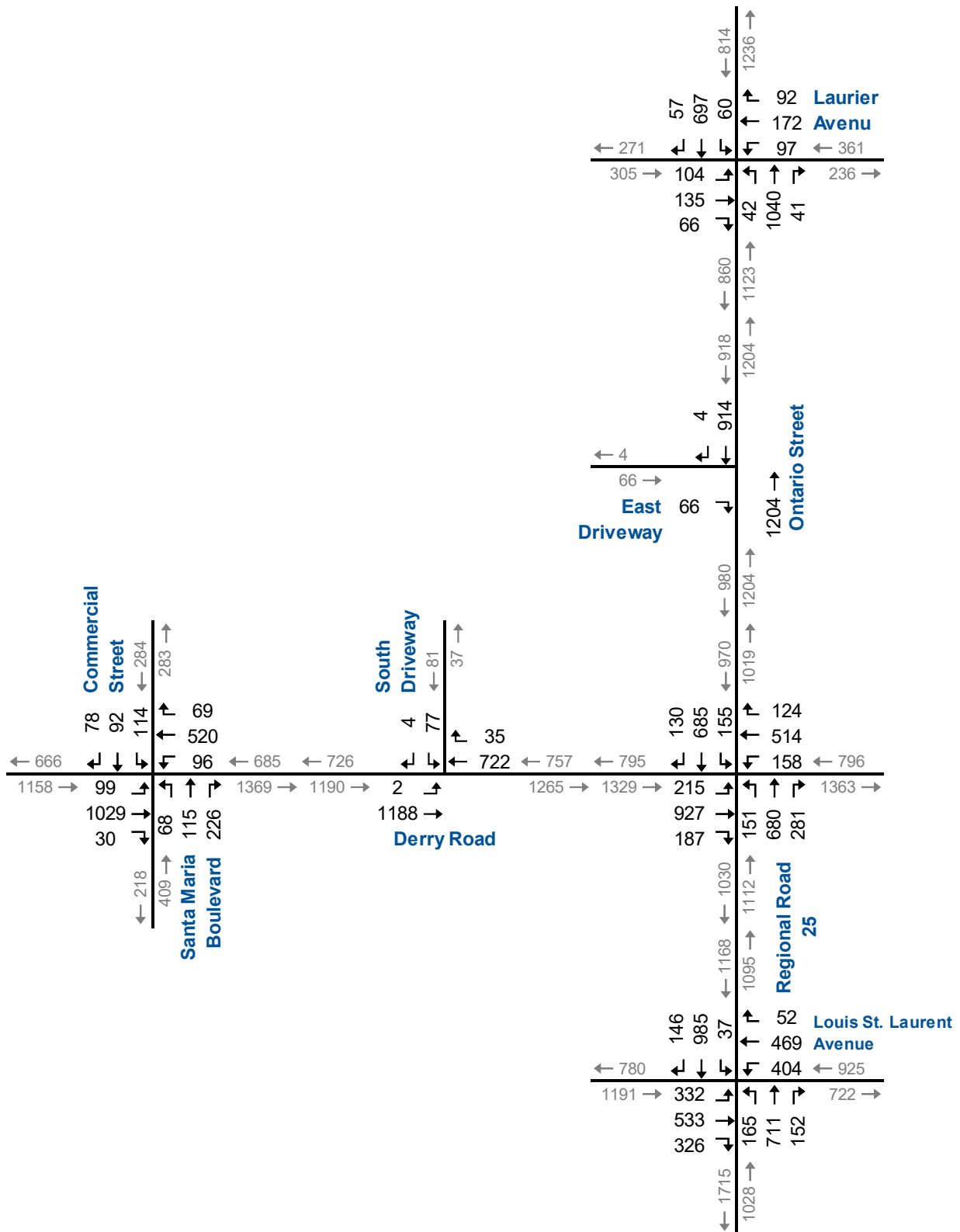


**Background Traffic (Year 2031) –
Background Development Growth –
AM Peak Hour**

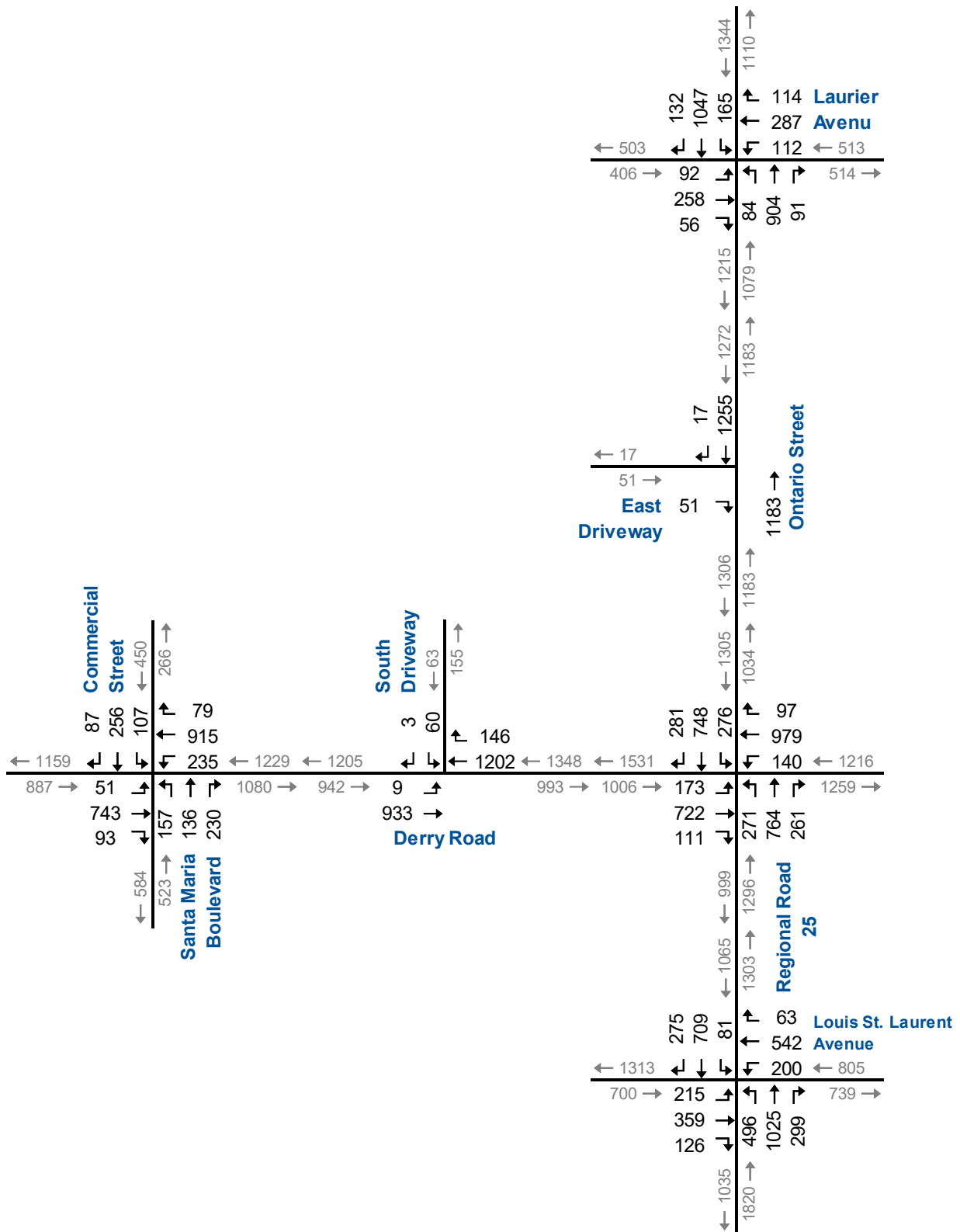




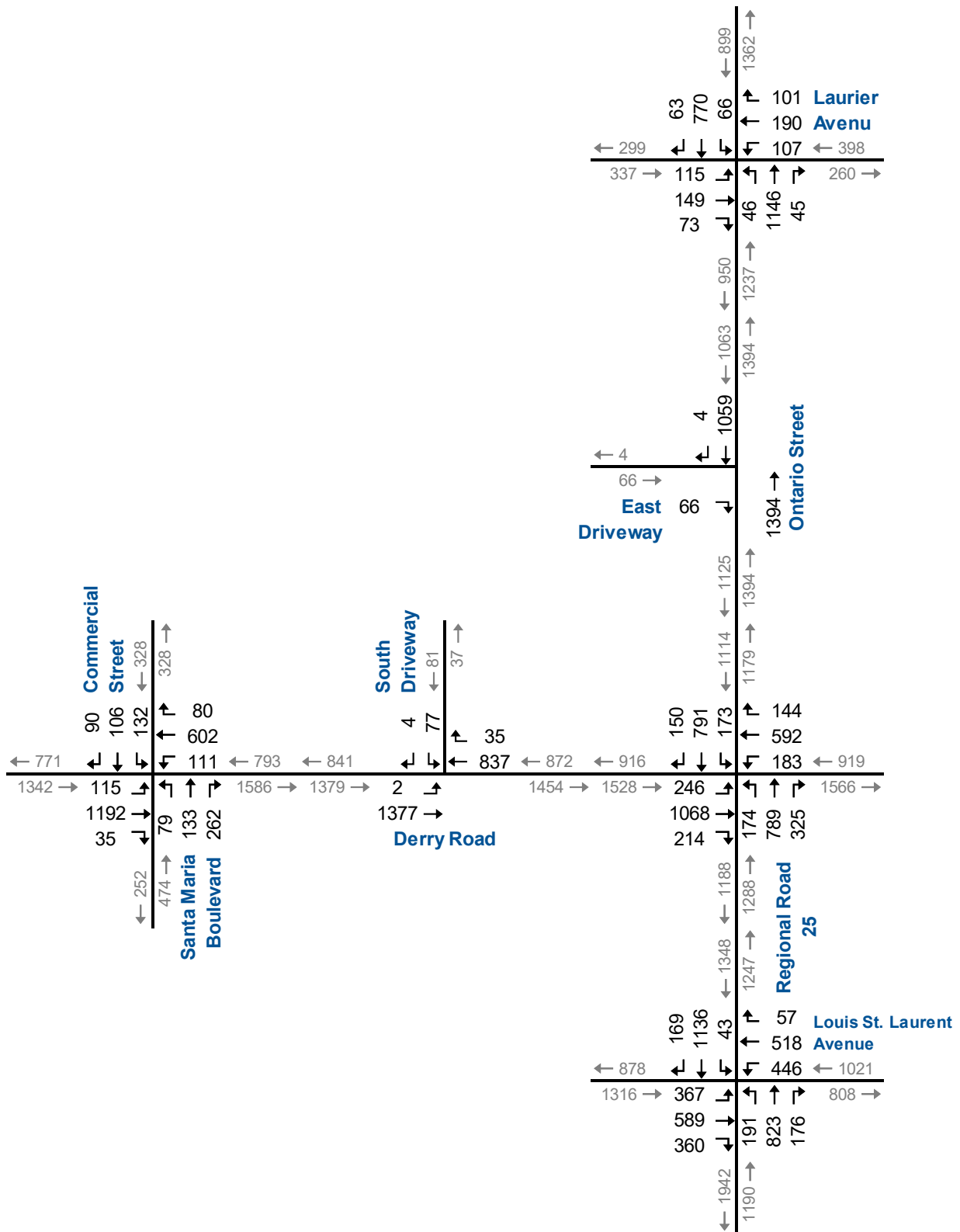
Background Traffic (Year 2031) – Background Development Growth – PM Peak Hour



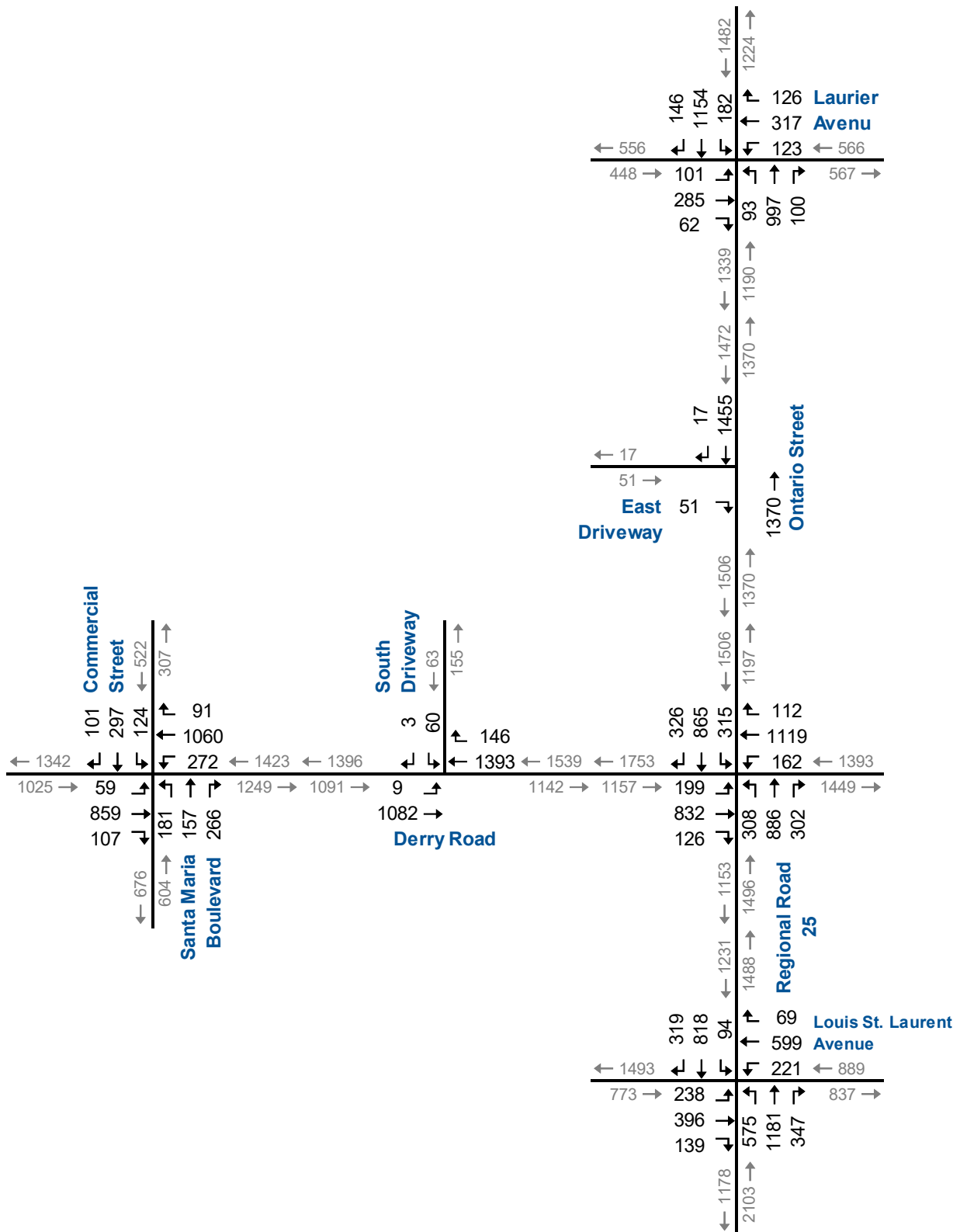
Total Traffic (Year 2024) – AM Peak Hour



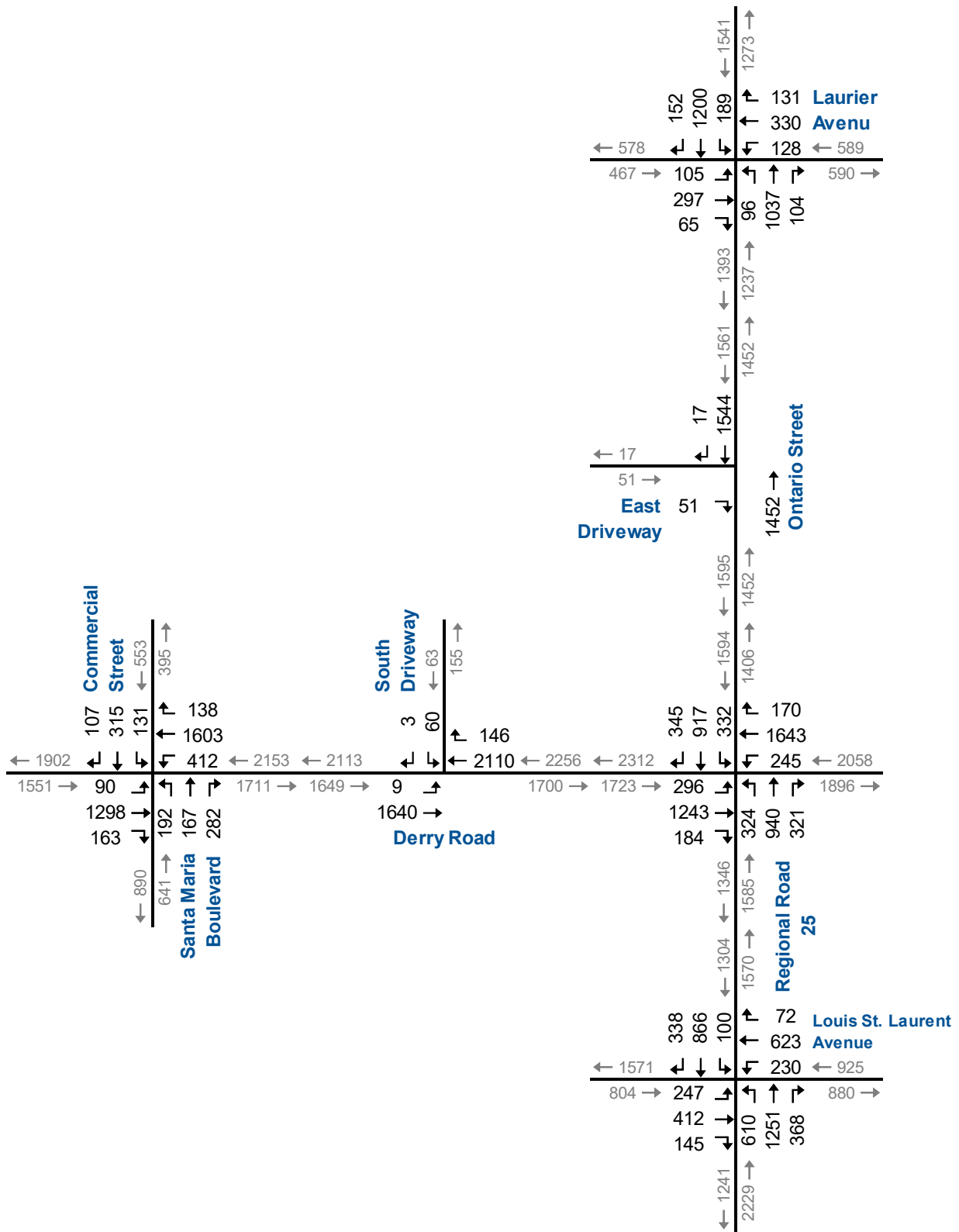
Total Traffic (Year 2024) – PM Peak Hour



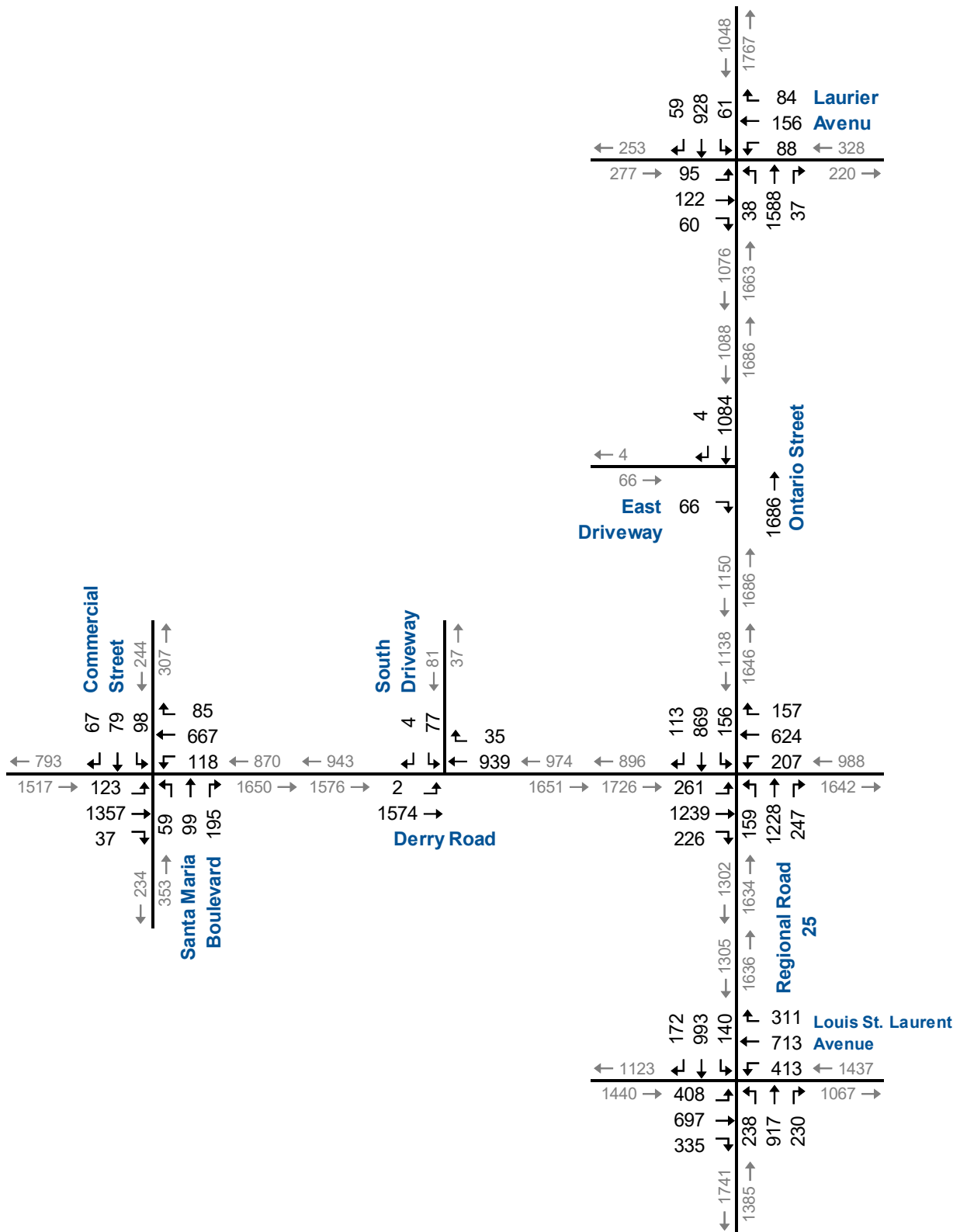
Total Traffic (Year 2029) – AM Peak Hour



Total Traffic (Year 2029) – PM Peak Hour

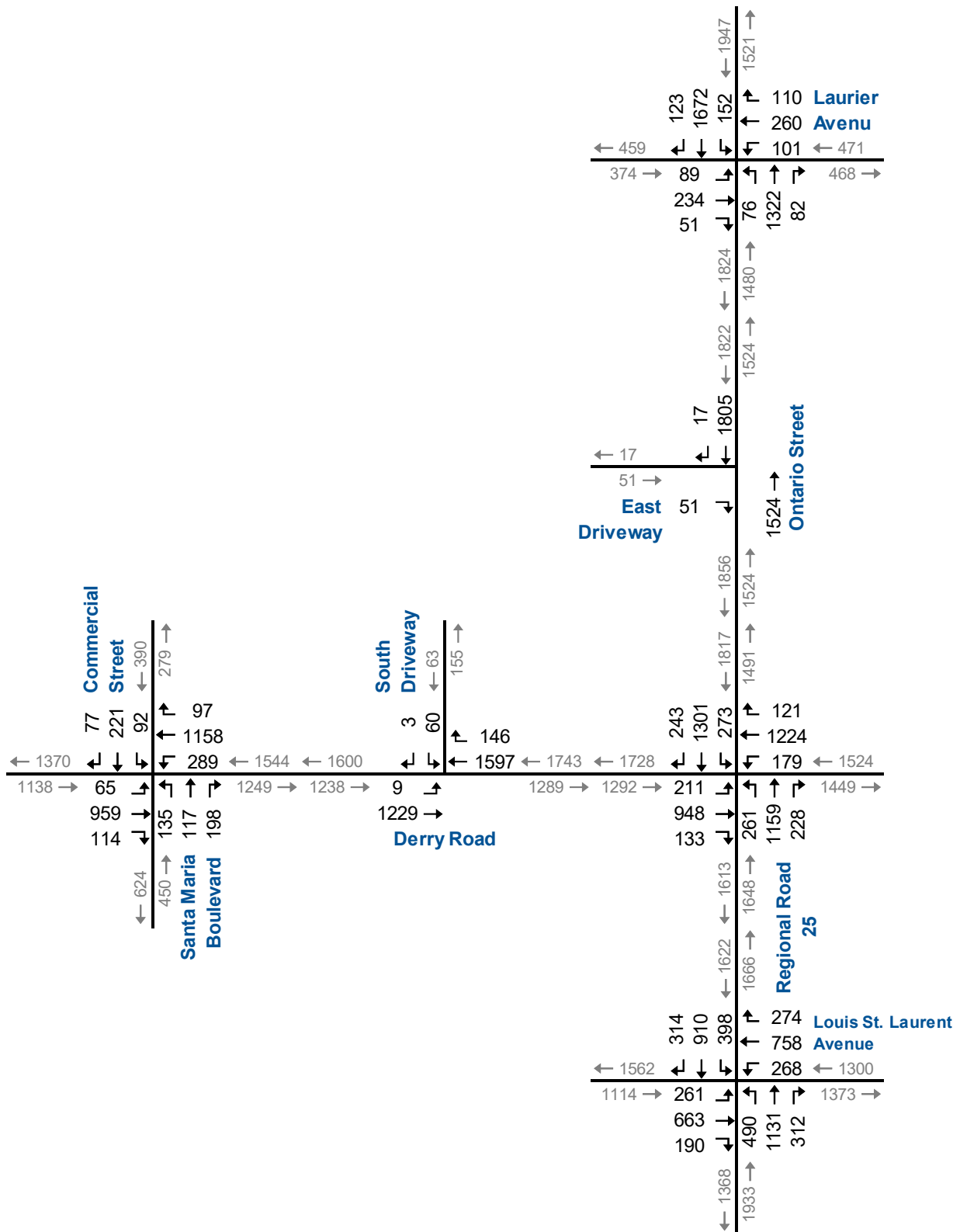


Total Traffic (Year 2031) – PM Peak Hour



**Total Traffic (Year 2031) –
Background Development Growth –
AM Peak Hour**





Total Traffic (Year 2031) – Background Development Growth – PM Peak Hour

4.2 Background Traffic Operations

4.2.1 2024 Horizon

The study area intersection operational analyses followed the same methodology used for the existing conditions analyses. **Table 4.2** summarizes the background traffic operations. The following critical movements are noted:

- ▶ **Ontario Street South and Derry Road:**
 - Eastbound left-turn – PM peak hour, LOS F, and v/c greater than 0.90; and
 - Westbound through – PM peak hour, LOS E, and v/c ratio greater than 0.85.
- ▶ **Santa Maria Boulevard/Commercial Street and Derry Road:**
 - Northbound left-turn – PM peak hour, LOS E, queue length exceeds storage; and
 - Southbound left-turn – AM and PM peak hour, LOS E, queue length exceeds storage.
- ▶ **Regional Road 25 and Louis St. Laurent Avenue:**
 - Overall – AM peak hour, LOS E;
 - Eastbound left-turn – PM peak hour, LOS E;
 - Eastbound through – AM and PM peak hour, LOS E. AM peak hour, v/c greater than 0.85;
 - Eastbound right-turn – AM and PM peak hour, LOS E, AM peak hour, v/c greater than 0.85;
 - Westbound left-turn – AM and PM peak hour, queue length exceeds storage, AM peak hour, LOS F, and v/c ratio greater than 1.00;
 - Westbound through/right-turn – PM peak hour, LOS F, v/c ratio greater than 0.85;
 - Northbound left-turn – PM peak hour, LOS E, queue length exceeds storage; and
 - Southbound left-turn – AM and PM peak hour, LOS E, queue length exceeds storage.

Appendix E contains the detailed Synchro reports.



TABLE 4.2: 2024 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall		
				Eastbound				Westbound				Northbound				Southbound						
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach			
AM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 28 0.37 8 15 7	A 21 0.40 10 -	C 21 0.40 10 -	C 23 0.29 6 35 29	C 25 0.52 14 -	A 22 0.52 14 -	C 22 0.52 14 -	C 23 0.11 2 15 13	B 14 0.58 9 -	B 14 0.58 9 -	B 14 0.14 2 -	C 21 0.23 4 40 36	B 12 0.41 8 -	B 12 0.41 8 -	B 12 0.41 8 -	B 12 0.41 8 -	B 16		
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			A 0 0.00 0	A 0 0.00 0								A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0		
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 25 0.51 20 65 45	D 40 0.74 65 -	C 31 0.33 21 35 14	D 36 0.63 16 35 19	C 30 0.44 32 -	C 33 0.26 16 -	C 31 0.26 16 -	C 32 0.49 13 45 29	C 30 0.51 40 70 57	C 32 0.52 40 -	C 32 0.49 35 -	C 30 0.26 11 -	C 26 0.43 61 -	D 39 0.67 61 -	D 39 0.67 61 -	D 39 0.67 61 -	D 38 0.67 61 -	C 34	
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	A 0 0.00 0 15 15	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -				A 0 0.00 0 -						A 0	
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	B 19 0.22 8 25 17	C 22 0.59 45 -	B 15 0.04 2 35 33	C 22 0.33 4 25 21	B 17 0.29 15 -	B 14 0.30 16 -	B 14 0.30 16 -	B 14 0.30 16 -	B 14 0.18 9 25 16	D 35 0.63 48 -	D 38 0.63 48 -	D 38 0.63 48 -	D 38 0.53 22 20 -2	E 56 0.30 20 -	C 30 0.30 20 -	C 30 0.30 20 -	C 30 0.30 20 -	D 41 0.30 20 -	C 25
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 31 0.69 43 45 2	E 72 0.93 107 -	E 73 0.93 100 -	E 61 1.03 101 20 -81	F 92 1.03 101 20 -	D 39 0.48 40 -	D 39 0.49 41 -	D 39 0.49 41 -	E 62 0.81 26 50 24	D 49 0.59 55 -	D 38 0.28 21 -	C 33 0.28 21 -	D 39 0.17 5 50 45	E 63 0.94 105 -	C 39 0.32 23 50 -	C 39 0.32 23 50 -	E 59 0.32 23 50 -	E 55	
PM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	D 36 0.41 10 15 5	A 24 0.52 21 -	C 24 0.52 21 -	C 26 0.38 10 35 25	C 26 0.67 29 -	C 26 0.67 29 -	C 27 0.67 29 -	C 27 0.38 9 15 6	C 26 0.68 35 -	C 26 0.68 35 -	C 26 0.68 35 -	C 26 0.58 8 40 32	B 19 0.64 29 -	B 18 0.64 29 -	B 18 0.64 29 -	B 18 0.64 29 -	B 18 0.64 29 -	C 23	
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			A 0 0.00 0	A 0 0.00 0								A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0		
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	F 81 0.91 34 65 31	D 46 0.74 56 -	D 36 0.24 14 35 21	D 51 0.63 19 35 16	D 38 0.94 88 -	E 62 0.26 14 -	D 37 0.26 14 -	D 37 0.26 14 -	E 57 0.74 22 70 48	C 33 0.52 42 -	C 28 0.41 28 -	C 27 0.41 28 -	C 28 0.67 20 -	C 23 0.71 70 -	C 34 0.71 68 -	C 34 0.71 68 -	C 32 0.71 68 -	D 41	
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	A 0 0.00 0 15 15	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -				A 0 0.00 0 -						A 0	
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 24 0.18 5 25 20	C 23 0.46 33 -	B 19 0.13 8 35 27	C 23 0.56 13 25 12	B 17 0.48 30 -	B 16 0.48 31 -	B 16 0.48 31 -	B 17 0.65 32 25 -7	E 60 0.66 52 -	D 39 0.66 52 -	D 39 0.66 52 -	D 46 0.52 21 -1	E 57 0.58 46 -	D 37 0.58 46 -	D 37 0.58 46 -	D 37 0.58 46 -	D 41 0.58 46 -	C 27	
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	E 58 0.81 44 45 1	E 60 0.72 53 -	E 61 0.74 53 -	E 60 0.68 35 20 -15	D 47 0.91 81 -	F 84 0.92 83 -	F 85 0.92 83 -	F 85 0.92 83 -	E 75 0.97 77 50 -27	E 60 0.55 56 -	C 22 0.37 31 -	C 22 0.37 31 -	C 34 0.31 10 50 40	D 27 0.54 53 -	D 37 0.48 44 -	D 37 0.48 44 -	D 36 0.48 44 -	D 46	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 V/C - Volume to Capacity Ratio
 Q - 95th Percentile Queue Length (m)
 Stor. - Existing Storage (m)
 Avail. - Available Storage (m)
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 </> - Shared with through movement



4.2.2 2029 Horizon

The study area intersection operational analyses followed the same methodology used for the existing conditions analyses. **Table 4.3** summarizes the background traffic operations. The following critical movements are noted:

▶ **Ontario Street South and Derry Road:**

- Westbound through – PM peak hour, v/c ratio greater than 0.85; and
- Northbound left-turn – PM peak hour, LOS E, and v/c ratio greater than 0.90.

▶ **Santa Maria Boulevard/Commercial Street and Derry Road:**

- Northbound left-turn – PM peak hour, LOS E, and queue length exceeds storage; and
- Southbound left-turn – AM and PM peak hour, queue length exceeds storage. PM peak hour, LOS E.

▶ **Regional Road 25 and Louis St. Laurent Avenue:**

- Overall – AM peak hour, LOS E;
- Eastbound through – AM peak hour, LOS F, and v/c greater than 0.85;
- Eastbound right-turn – AM peak hour, LOS F, and v/c greater than 0.85;
- Westbound left-turn – AM and PM peak hour, queue length exceeds storage. AM peak hour, LOS E;
- Northbound left-turn – PM peak hour, LOS E, v/c greater than 1.00, and queue length exceeds storage;
- Southbound through – AM peak hour, LOS F, and v/c greater than 1.00; and
- Southbound right-turn – PM peak hour, LOS E, and queue length exceeds storage.

Appendix F contains the detailed Synchro reports.



TABLE 4.3: 2029 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 34 0.45 10 15 5	A 24 0.43 14 -	C 24 0.43 14 -	C 27 0.34 9 26	C 30 0.56 20 -	A 25 0.56 20 -	C 25 0.20 -	C 26 0.13 17 13	B 16 0.62 17 -	B 16 0.62 18 -	B 16 0.62 18 -	B 16 0.30 6 40 34	C 26 0.44 13 -	B 13 0.44 13 -	B 13 0.44 13 -	B 14 0.14 -	B 18	
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			A 0 0.00 0	A 0 0.00 0						A 0 0.00 0			A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 20 0.54 17 65 48	C 32 0.71 64 -	C 25 0.31 20 -	C 30 0.68 16 35 19	C 27 0.41 31 -	C 25 0.24 15 45 30	C 27 0.65 21 70 49	D 37 0.56 38 -	D 38 0.75 51 58 -	D 38 0.75 51 70 -	D 41 0.55 16 -	C 34 0.72 51 -	D 46 0.73 57 -	D 46 0.73 57 -	D 46 0.73 57 -	D 46 0.73 57 -	D 46 0.73 57 -	D 36
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	A 0 0.00 0 15 15	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					A 0 0.00 0 -						A 0
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 22 0.29 10 25 15	C 25 0.69 58 -	B 16 0.05 2 33	C 25 0.45 6 25 19	B 14 0.34 19 -	B 14 0.34 19 -	B 15 0.23 11 25 14	D 37 0.73 60 -	D 43 0.73 60 -	D 43 0.73 60 -	D 42 0.75 32 20 -12	E 78 0.35 24 -	C 31 0.35 24 -	C 31 0.35 24 -	C 31 0.35 24 -	C 31 0.35 24 -	D 50 0.35 24 -	C 28
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 30 0.69 45 45 0	F 84 0.99 130 -	F 86 0.99 122 -	E 70 0.95 73 20 -53	E 33 0.45 39 -	C 33 0.46 40 -	D 48 0.84 34 50 16	D 55 0.58 46 -	D 41 0.40 29 -	D 41 0.40 29 -	D 44 0.23 7 50 43	D 40 1.06 101 -	F 99 0.52 34 -	D 53 0.52 34 -	D 53 0.52 34 -	F 92 0.52 34 -	E 65	
	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	D 37 0.45 11 15 4	A 23 0.53 24 -	C 23 0.53 24 -	C 26 0.41 12 35 23	A 26 0.68 34 -	C 26 0.68 34 -	C 27 0.55 14 15 1	D 48 0.81 53 -	C 35 0.81 54 -	C 35 0.81 54 -	D 36 0.74 14 40 26	C 31 0.73 44 -	C 23 0.73 45 -	C 23 0.73 45 -	C 23 0.73 45 -	C 23 0.73 45 -	C 24	C 29
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			A 0 0.00 0	A 0 0.00 0							A 0 0.00 0			A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	D 53 0.84 28 65 37	D 38 0.68 57 -	C 30 0.22 14 21	D 40 0.59 17 35 18	C 30 0.88 86 -	C 31 0.24 14 31	D 44 0.91 45 70 25	E 62 0.57 41 -	D 43 0.65 48 -	D 43 0.65 48 -	D 43 0.81 37 -	D 39 0.74 61 -	D 40 0.74 61 -	D 45 0.74 64 -	D 45 0.74 64 -	D 41 0.74 64 -	D 42	
Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	A 0 0.00 0 15 15	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					A 0 0.00 0 -						A 0	
Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	D 37 0.29 9 25 16	C 32 0.64 52 -	C 25 0.18 10 25	C 32 0.75 23 2	C 23 0.61 49 -	C 23 0.61 50 -	C 24 0.68 35 -10	E 58 0.66 55 -	C 35 0.66 55 -	C 35 0.66 55 -	D 42 0.54 23 -3	D 54 0.58 49 -	C 32 0.58 49 -	C 32 0.58 49 -	C 32 0.58 49 -	C 32 0.58 49 -	D 38	C 31	
Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	D 44 0.78 36 45 9	D 46 0.65 45 -	D 46 0.66 45 -	D 45 0.65 29 20 -9	D 53 0.82 62 -	D 53 0.82 63 -	D 49 1.02 121 50 -71	E 76 0.53 44 -	C 28 0.51 42 -	C 29 0.51 42 -	D 41 0.40 13 50 8	D 36 0.71 46 -	D 49 0.90 77 -	E 56 0.90 77 -	E 56 0.90 77 -	E 56 0.90 77 -	D 47		

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 V/C - Volume to Capacity Ratio
 Q - 95th Percentile Queue Length (m)
 Stor. - Existing Storage (m)
 Avail. - Available Storage (m)
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 </> - Shared with through movement



4.2.3 2031 Horizon

The study area intersection operational analyses followed the same methodology used for the existing conditions analyses. **Table 4.4** summarizes the background traffic operations. The following critical movements are noted:

- ▶ **Ontario Street South and Laurier Avenue:**
 - Northbound left-turn – PM peak hour, LOS E, and queue length exceeds storage; and
 - Southbound left-turn – PM peak hour, LOS E.
- ▶ **Ontario Street South and Derry Road:**
 - Eastbound left-turn – PM peak hour, LOS F, and v/c ratio greater than 1.00;
 - Westbound left-turn – AM peak hour, LOS E, and queue length exceeds storage;
 - Westbound through – PM peak hour, v/c ratio greater than 0.85;
 - Northbound left-turn – AM peak hour, LOS E. PM peak hour, v/c ratio greater than 0.85 and queue length exceeds storage;
 - Northbound right-turn – AM and PM peak hour, LOS E;
 - Southbound left-turn – PM peak hour, LOS E, and v/c ratio greater than 0.90;
 - Southbound through – AM peak hour, LOS E; and
 - Southbound right-turn – AM peak hour, LOS E.
- ▶ **Santa Maria Boulevard/Commercial Street and Derry Road:**
 - Westbound left-turn – PM peak hour, LOS F, v/c ratio greater than 1.00 and queue length exceeds storage;
 - Northbound left-turn – PM peak hour, LOS F, v/c ratio greater than 1.00 and queue length exceeds storage; and
 - Southbound left-turn – AM and PM peak hour, LOS F and queue length exceeds storage. PM peak hour, v/c ratio greater than 1.00.
- ▶ **Regional Road 25 and Louis St. Laurent Avenue:**
 - Overall – AM peak hour, LOS E;
 - Eastbound left-turn – AM peak hour, LOS F, and queue length exceeds storage;
 - Eastbound through/right-turn – AM peak hour, LOS F, and v/c greater than 0.85;
 - Westbound left-turn – AM and PM peak hour, queue length exceeds storage. AM peak hour, LOS F and v/c greater than 1.00;



- Northbound left-turn – AM peak hour, LOS E. PM peak hour, LOS F, v/c greater than 1.00, and queue length exceeds storage;
- Southbound through – AM peak hour, LOS F, and v/c greater than 1.00; and
- Southbound right-turn –PM peak hour, LOS F, v/c greater than 0.95 and queue length exceeds storage.

Appendix G contains the detailed Synchro reports.



TABLE 4.4: 2031 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 34 0.46 11 15 4	A 23 0.44 15 -	C 23 0.44 15 -	C 27 0.44 15 -	C 30 0.35 10 35 25	A 25 0.57 21 -	C 25 0.57 21 -	C 26 0.57 21 -	B 18 0.15 3 15 12	B 17 0.65 21 -	B 17 0.65 21 -	B 17 0.65 21 -	C 29 0.33 7 40 33	B 14 0.47 15 -	B 14 0.47 15 -	B 15 0.47 15 -	B 19	
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			A 0 0.00 0	A 0 0.00 0									A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 25 0.79 28 65 37	C 34 0.77 68 -	C 30 0.49 35 35 -	C 32 0.49 35 -	E 55 0.91 40 35 -5	C 29 0.45 32 -	C 29 0.38 26 45 19	C 34 0.38 26 45 19	E 41 0.83 30 70 40	D 41 0.63 42 -	E 61 0.85 69 70 1	D 48 0.85 69 70 1	D 48 0.85 69 70 1	D 54 0.73 23 -	E 55 0.85 62 -	E 65 0.85 71 -	E 58 0.85 71 -	D 41
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	A 0 0.00 0 15 15	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					A 0 0.00 0 -			> > > > >	A 0	
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 34 0.58 23 25 2	C 28 0.76 68 -	B 18 0.07 4 35 31	C 29 0.07 4 35 31	D 40 0.77 16 25 9	B 15 0.36 20 21	B 15 0.36 20 21	B 18 0.36 20 21	D 39 0.25 13 25 12	D 45 0.76 68 -	D 45 0.76 68 -	D 44 0.76 68 -	F 98 0.87 40 20 -20	C 32 0.37 26 -	C 32 0.37 26 -	C 32 0.37 26 -	E 58 0.37 26 -	C 30
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 31 0.75 49 45 -4	F 84 0.99 140 -	F 86 0.99 130 -	E 70 0.99 130 -	F 117 1.10 115 20 -95	D 37 0.50 46 -	D 37 0.51 47 -	E 72 0.51 47 -	E 67 0.89 42 50 8	D 42 0.58 49 -	D 40 0.40 32 -	D 46 0.40 32 -	D 40 0.25 8 50 42	F 40 1.03 104 -	D 52 0.51 36 50 14	F 82 0.51 36 50 14	E 68 0.51 36 50 14	
PM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	D 38 0.46 12 15 3	A 23 0.53 26 -	C 23 0.53 26 -	C 26 0.53 26 -	C 26 0.42 13 35 22	A 26 0.69 36 -	C 26 0.69 36 -	C 27 0.69 36 -	E 59 0.64 17 15 -2	D 37 0.83 58 -	D 36 0.83 59 -	D 38 0.83 59 -	E 56 0.87 22 40 18	C 26 0.78 52 -	C 26 0.78 53 -	C 30 0.78 53 -	C 32	
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			A 0 0.00 0	A 0 0.00 0						A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0		
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	F 106 1.06 64 65 1	D 37 0.71 57 -	C 32 0.34 21 35 14	D 49 0.34 21 35 14	D 42 0.82 31 35 4	D 47 0.91 86 -	C 32 0.36 22 23	D 45 0.36 22 23	F 155 1.19 86 70 -16	D 43 0.70 49 -	E 57 0.80 61 70 9	E 67 0.80 61 70 9	E 67 0.80 61 70 9	E 62 0.93 53 -	D 47 0.84 73 -	D 55 0.84 77 -	D 52 0.84 77 -	D 52
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	A 0 0.00 0 15 15	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					A 0 0.00 0 -			> > > > >	A 0	
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	D 48 0.56 16 25 9	C 30 0.62 50 -	C 24 0.26 16 35 19	C 30 0.26 16 35 19	F 88 1.05 70 25 -45	B 17 0.57 36 -	B 18 0.57 40 -	C 31 0.57 40 -	F 177 1.16 72 25 -	D 52 0.84 81 -	D 52 0.84 81 -	F 90 0.84 81 -	F 147 1.03 47 20 -27	D 45 0.74 68 -	D 45 0.74 68 -	E 69 0.74 68 -	D 43	
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	D 47 0.80 39 45 6	D 46 0.66 48 -	D 47 0.67 47 -	D 47 0.67 47 -	D 36 0.67 32 20 -12	D 54 0.83 67 -	D 54 0.83 68 -	D 50 0.83 68 -	F 108 1.11 157 50 -	C 30 0.58 50 -	C 32 0.55 48 -	D 52 0.55 48 -	D 37 0.43 14 50 36	D 52 0.76 52 -	F 91 0.97 92 50 -42	E 61 0.97 92 50 -42	D 53	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 V/C - Volume to Capacity Ratio
 Q - 95th Percentile Queue Length (m)
 Stor. - Existing Storage (m)
 Avail. - Available Storage (m)
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 </> - Shared with through movement



4.2.4 2031 Horizon with Background Development Growth

The study area intersection operational analyses followed the same methodology used for the existing conditions analyses. **Table 4.5** summarizes the background traffic operations. The following critical movements are noted:

- ▶ **Ontario Street South and Laurier Avenue:**
 - Northbound left-turn – PM peak hour, LOS E, and queue length exceeds storage;
 - Northbound through/right-turn – PM peak hour, v/c ratio greater than 0.85; and
 - Southbound through/right-turn – PM peak hour, v/c ratio greater than 0.85.
- ▶ **Ontario Street South and Derry Road:**
 - Northbound left-turn – PM peak hour, LOS F, and v/c ratio greater than 0.85;
 - Southbound left-turn – AM peak hour, LOS E;
 - Southbound through/right-turn – PM peak hour, LOS E, and v/c ratio greater than 0.85; and
 - Southbound right-turn – AM peak hour, LOS E.
- ▶ **Santa Maria Boulevard/Commercial Street and Derry Road:**
 - Northbound left-turn – PM peak hour, queue length exceeds storage.
- ▶ **Regional Road 25 and Louis St. Laurent Avenue:**
 - Overall – AM and PM peak hour, LOS E;
 - Eastbound left-turn – AM and PM peak hour, LOS F, v/c greater than 0.95 and queue length exceeds storage;
 - Eastbound through/right-turn – AM peak hour, LOS F, and v/c greater than 1.00. PM peak hour, LOS E;
 - Westbound left-turn – AM and PM peak hour, queue length exceeds storage. AM peak hour, LOS F and v/c greater than 1.00;
 - Westbound through/right-turn – AM and PM peak hour, LOS F, v/c greater than 1.00;
 - Northbound left-turn – AM and PM peak hour, queue length exceeds storage. PM peak hour, LOS F and v/c greater than 1.00;
 - Northbound through/right-turn – PM peak hour, queue length exceeds storage. PM peak hour, LOS F and v/c greater than 1.00;
 - Southbound left-turn – PM peak hour, LOS F, v/c greater than 0.95, and queue length exceeds storage;



- Southbound through – AM and PM peak hour, LOS E, and v/c greater than 0.85; and
- Southbound right-turn – PM peak hour, LOS F, v/c greater than 0.95 and queue length exceeds storage.

Appendix H contains the detailed Synchro reports.



TABLE 4.5: 2031 BACKGROUND TRAFFIC OPERATIONS – BACKGROUND DEVELOPMENT GROWTH

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS	C	C	C	C	C	C	C	C	B	C	C	C	D	B	B	B	B	B
			Delay	32	24	24	27	29	25	25	26	16	20	20	20	39	12	12	14	19	19
			V/C	0.37	0.40	0.40		0.29	0.52	0.52		0.12	0.80	0.81		0.40	0.50	0.50			
			Q	8	11	11		7	16	16		2	22	22		8	10	10			
	Stor.	15	-	-		35	-	-		15	-	-		40	-	-		-	-		
	Avail.	7	-	-		28	-	-		13	-	-		32	-	-		-	-		
	Ontario Street & East Driveway	TWSC	LOS			A	A						A				A	A	A	A	A
			Delay			0	0						0				0	0	0	0	0
			V/C			0.00	0						0.00				0.00	0.00	0	0	0
Q					0	0						0				0	0	0	0	0	
Ontario Street & Derry Road	TCS	LOS	B	C	C	C	C	C	C	C	D	D	D	D	E	D	E	E	E	D	
		Delay	17	26	23	24	23	23	23	23	43	55	45	45	64	54	62	62	57	39	
		V/C	0.51	0.54	0.31		0.68	0.28	0.25		0.70	0.92	0.61		0.79	0.83	0.83				
		Q	16	41	20		15	19	15		21	76	40		22	59	69				
Stor.	65	-	35		35	-	45		70	-	70		-	-	-		-	-			
Avail.	49	-	15		20	-	30		49	-	30		-	-	-		-	-			
Derry Road & South Driveway	TWSC	LOS	A	A		A		A	A	A					A		>	>	A		
		Delay	0	0		0		0	0	0					0		>	>	0		
		V/C	0.00	0.00				0.00	0.00						0.00		>	>			
		Q	0	0			0	0	0		0				0		>	>			
Stor.	15	-	-		-	-	-		-	-	-		-	-	-		-	-			
Avail.	15	-	-		-	-	-		-	-	-		-	-	-		-	-			
Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS	C	C	B	C	B	B	B	B	C	D	D	D	D	C	C	C	D	C	
		Delay	22	23	16	22	18	14	14	14	34	36	36	36	48	30	30	30	37	23	
		V/C	0.31	0.55	0.05		0.45	0.26	0.27		0.15	0.53	0.53		0.38	0.26	0.26				
		Q	11	41	2		7	14	14		8	40	40		17	17	17				
Stor.	25	-	35		25	-	-		25	-	-		20	-	-		-	-			
Avail.	14	-	33		18	-	-		17	-	-		3	-	-		-	-			
Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS	F	F	F	F	F	F	F	F	E	D	D	D	D	E	D	E	E	E	
		Delay	92	98	99	96	88	89	90	89	70	47	48	48	46	60	52	57	74	74	
		V/C	1.01	1.03	1.03		1.00	1.00	1.00		0.91	0.66	0.53		0.64	0.85	0.49				
		Q	89	155	147		88	148	142		52	56	44		25	70	34				
Stor.	45	-	-		20	-	-		50	-	50		50	-	50		-	-			
Avail.	-44	-	-		-68	-	-		-2	-	6		25	-	16		-	-			
PM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS	D	C	C	C	C	C	C	C	E	D	D	D	C	C	D	D	D	D
			Delay	35	24	24	26	31	26	26	27	80	43	43	43	34	35	37	36	37	37
			V/C	0.40	0.50	0.50		0.35	0.66	0.66		0.75	0.93	0.93		0.75	0.93	0.95			
			Q	9	19	19		9	27	27		16	70	73		10	70	77			
	Stor.	15	-	-		35	-	-		15	-	-		40	-	-		-	-		
	Avail.	6	-	-		26	-	-		-1	-	-		30	-	-		-	-		
	Ontario Street & East Driveway	TWSC	LOS			A	A						A				A	A	A	A	A
			Delay			0	0						0				0	0	0	0	0
			V/C			0.00	0						0.00				0.00	0.00	0	0	0
Q					0	0						0				0	0	0	0	0	
Ontario Street & Derry Road	TCS	LOS	C	C	C	C	C	C	C	C	F	D	D	D	D	E	F	F	E	D	
		Delay	29	31	28	30	24	34	28	32	110	46	42	42	48	71	83	83	72	49	
		V/C	0.68	0.50	0.22		0.55	0.62	0.24		1.05	0.81	0.53		0.85	1.01	1.01				
		Q	20	37	14		16	49	14		56	63	35		36	114	128				
Stor.	65	-	35		35	-	45		70	-	70		-	-	-		-	-			
Avail.	45	-	21		19	-	31		14	-	35		-	-	-		-	-			
Derry Road & South Driveway	TWSC	LOS	A	A		A		A	A	A					A		>	>	A		
		Delay	0	0		0		0	0	0					0		>	>	0		
		V/C	0.00	0.00				0.00	0.00						0.00		>	>			
		Q	0	0			0	0	0		0				0		>	>			
Stor.	15	-	-		-	-	-		-	-	-		-	-	-		-	-			
Avail.	15	-	-		-	-	-		-	-	-		-	-	-		-	-			
Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS	C	C	C	C	B	B	B	B	D	D	D	D	D	D	D	D	D	C	
		Delay	24	23	20	23	20	14	15	16	53	39	39	43	51	37	37	40	24	24	
		V/C	0.26	0.42	0.16		0.69	0.41	0.41		0.52	0.59	0.59		0.40	0.52	0.52				
		Q	7	30	10		18	22	25		26	46	46		17	42	42				
Stor.	25	-	35		25	-	-		25	-	-		20	-	-		-	-			
Avail.	18	-	25		7	-	-		-1	-	-		3	-	-		-	-			
Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS	F	E	E	E	D	F	F	F	F	E	E	E	E	E	F	F	E	E	
		Delay	91	59	59	67	55	98	98	89	82	58	62	65	80	65	102	76	74	74	
		V/C	0.97	0.84	0.84		0.87	1.03	1.03		1.00	0.87	0.78		0.98	0.88	0.98				
		Q	60	94	92		47	154	148		122	78	71		97	68	97				
Stor.	45	-	-		20	-	-		50	-	50		50	-	50		-	-			
Avail.	-15	-	-		-27	-	-		-72	-	-21		-47	-	-47		-47	-47			

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 V/C - Volume to Capacity Ratio
 Q - 95th Percentile Queue Length (m)
 Stor. - Existing Storage (m)
 Avail. - Available Storage (m)
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 </> - Shared with through movement



4.3 Total Traffic Operations

4.3.1 2024 Horizon

The study area intersection operational analyses followed the same methodology used for the background conditions analyses.

The study area intersection operational analyses followed the same methodology used for the existing conditions analyses. **Table 4.6** summarizes the total traffic operations. The following critical movements are noted:

- ▶ **Ontario Street South and Derry Road:**
 - Eastbound left-turn – PM peak hour, LOS F, and v/c greater than 1.00;
 - Westbound through – PM peak hour, LOS E, and v/c ratio greater than 0.85; and
 - Northbound left-turn – PM peak hour, LOS E, and v/c greater than 0.95.
- ▶ **Derry Road and South Driveway:**
 - Southbound left/right-turn – AM and PM peak hour, LOS F.
- ▶ **Santa Maria Boulevard/Commercial Street and Derry Road:**
 - Northbound left-turn – PM peak hour, LOS E, queue length exceeds storage; and
 - Southbound left-turn – AM and PM peak hour, LOS E, queue length exceeds storage.
- ▶ **Regional Road 25 and Louis St. Laurent Avenue:**
 - Overall – AM peak hour, LOS E;
 - Eastbound left-turn – PM peak hour, LOS E;
 - Eastbound through – AM and PM peak hour, LOS E, AM peak hour, v/c greater than 0.85;
 - Eastbound right-turn – AM and PM peak hour, LOS E, AM peak hour, v/c greater than 0.85;
 - Westbound left-turn – AM and PM peak hour, queue length exceeds storage, AM peak hour, LOS F, and v/c ratio greater than 1.00;
 - Westbound through/right-turn – PM peak hour, LOS F, v/c ratio greater than 0.85;
 - Northbound left-turn – PM peak hour, LOS E, queue length exceeds storage; and
 - Southbound left-turn – AM peak hour, LOS E, queue length exceeds storage.



It is noted that the site traffic has little impact on the operations of the intersections compared to the background traffic operations.

Appendix I contains the detailed Synchro reports.



TABLE 4.6: 2024 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 33 0.41 9 15 6	A 24 0.41 13 -	C 24 0.41 13 -	C 27 0.27 13 -	C 29 0.31 8 35 27	A 25 0.54 18 -	C 25 0.54 18 -	C 26 0.11 2 15 13	B 14 0.55 11 -	B 14 0.55 11 -	B 14 0.55 11 -	B 14 0.23 4 40 36	B 11 0.39 9 -	B 11 0.39 9 -	B 12 0.39 9 -	B 16 0.39 9 -	
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			B 12 0.12 3							A 0 0.00 0		A 0 0.00 0		A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 27 0.57 22 65 43	D 45 0.83 75 -	C 34 0.38 25 35	D 40 0.40 25 16	D 37 0.68 19 35 16	D 36 0.50 35 -	C 34 0.28 16 45 29	D 36 0.26 14 70 56	C 32 0.53 42 -	C 33 0.50 36 70 34	C 31 0.50 15 -	C 25 0.52 61 -	D 38 0.66 61 -	D 38 0.66 61 -	D 36 0.66 61 -	D 36 0.66 61 -	
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	A 9 0.00 0 15 15	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					F 93 0.71 28 -			> > > > >	F 93 > > > >	
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	B 19 0.22 8 25 17	C 23 0.59 45 -	B 15 0.04 2 35 33	C 22 0.22 4 25 21	B 17 0.33 4 25 21	B 14 0.30 16 -	B 14 0.30 16 -	B 14 0.30 16 -	B 14 0.18 9 25 16	D 35 0.63 48 48	D 38 0.63 48 -	D 38 0.63 48 -	D 38 0.53 22 20 -2	E 56 0.30 20 -	C 30 0.30 20 -	C 30 0.30 20 -	D 41 0.30 20 -
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 32 0.69 44 45 1	E 76 0.94 112 -	E 78 0.94 105 -	E 64 0.64 104 20 -84	F 41 1.04 104 20 -	D 40 0.49 41 -	D 40 0.49 42 -	D 40 0.49 42 -	E 65 0.83 26 50 24	D 51 0.58 56 -	D 32 0.28 21 50 29	D 32 0.17 4 50 46	E 68 0.95 112 -	D 38 0.32 23 50 27	E 61 0.32 23 50 27	E 57 0.32 23 50 27	
PM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	D 36 0.41 10 15 5	A 24 0.52 21 -	C 24 0.52 21 -	C 26 0.38 10 35 25	C 26 0.67 29 -	C 26 0.67 29 -	C 27 0.39 9 15 6	C 33 0.73 40 -	C 29 0.73 40 -	C 29 0.73 40 -	C 29 0.54 7 40 33	B 18 0.64 30 -	B 18 0.64 30 -	B 18 0.65 30 -	B 18 0.65 30 -	B 18 0.65 30 -	
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			B 15 0.12 3							A 0 0.00 0		A 0 0.00 0		A 0 0.00 0	A 0 0.00 0		
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	F 119 1.04 46 65 19	D 39 0.66 52 -	C 32 0.24 14 35 21	D 52 0.64 18 35 17	D 41 0.93 18 -	E 56 0.23 92 -	C 33 0.23 13 45 32	D 52 0.97 50 70 20	E 77 0.58 48 -	C 32 0.46 32 70 38	C 41 0.46 29 -	C 33 0.78 29 -	D 40 0.77 80 -	D 40 0.77 77 -	D 38 0.77 77 -	D 46 0.77 77 -	
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	B 12 0.02 1 15 14	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					F 144 0.81 30 -			> > > > >	F 144 > > > >	
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 24 0.18 5 25 20	C 23 0.47 34 -	B 19 0.13 8 35 27	C 23 0.57 14 25 11	B 17 0.48 30 -	B 16 0.48 31 -	B 16 0.48 31 -	B 17 0.60 32 -7	E 60 0.66 52 -	D 39 0.66 52 -	D 39 0.66 52 -	D 46 0.52 21 -1	E 57 0.58 46 -	D 37 0.58 46 -	D 37 0.58 46 -	D 41 0.58 46 -	
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	D 46 0.75 34 45 11	D 48 0.65 43 -	D 48 0.66 43 -	D 48 0.63 28 20 -8	E 39 0.82 58 -	E 56 0.82 60 -	E 56 0.82 60 -	D 52 0.95 70 50 -20	E 57 0.63 59 -	C 24 0.40 31 19	C 35 0.33 10 50 40	C 30 0.70 60 -	D 44 0.60 46 -	D 44 0.60 46 -	D 43 0.60 46 -	D 42 0.60 46 -	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 V/C - Volume to Capacity Ratio
 Q - 95th Percentile Queue Length (m)
 Stor. - Existing Storage (m)
 Avail. - Available Storage (m)
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 </> - Shared with through movement



4.3.2 2029 Horizon

The study area intersection operational analyses followed the same methodology used for the existing conditions analyses. **Table 4.7** summarizes the total traffic operations. The following critical movements are noted:

- ▶ **Ontario Street South and Laurier Avenue:**
 - Eastbound left-turn – PM peak hour, LOS F, and v/c greater than 0.85;
- ▶ **Ontario Street South and Derry Road:**
 - Westbound through – PM peak hour, v/c ratio greater than 0.85;
 - Northbound left-turn – PM peak hour, LOS E; and
 - Southbound right-turn – PM peak hour, LOS E.
- ▶ **Derry Road and South Driveway:**
 - Southbound left/right-turn – AM and PM peak hour, LOS F, and v/c greater than 1.00.
- ▶ **Santa Maria Boulevard/Commercial Street and Derry Road:**
 - Northbound left-turn – PM peak hour, LOS E, and queue length exceeds storage; and
 - Southbound left-turn – AM and PM peak hour, queue length exceeds storage. AM peak hour, LOS E.
- ▶ **Regional Road 25 and Louis St. Laurent Avenue:**
 - Overall – AM and PM peak hour, LOS E;
 - Eastbound through – AM peak hour, LOS E, and v/c greater than 0.85;
 - Eastbound right-turn – AM peak hour, LOS E, and v/c greater than 0.85;
 - Westbound left-turn – AM and PM peak hour, queue length exceeds storage. AM peak hour, LOS F, and v/c greater than 1.00;
 - Northbound left-turn – AM and PM peak hour, LOS E. PM peak hour, v/c greater than 1.00, and queue length exceeds storage;
 - Southbound through – AM peak hour, LOS E, and v/c greater than 0.85; and
 - Southbound right-turn – PM peak hour, LOS E, and queue length exceeds storage.

It is noted that the site traffic has little impact on the operations of the intersections compared to the background traffic operations.

Appendix J contains the detailed Synchro reports.



TABLE 4.7: 2029 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 32 0.44 10 15 5	A 23 0.42 14 -	C 23 0.42 14 -	C 26 0.33 8 27	C 28 0.55 19 -	C 24 0.55 19 -	C 25 0.13 6 13	B 17 0.64 2 15	B 16 0.64 17 -	B 16 0.64 17 -	B 16 0.30 6 34	C 27 0.45 12 -	B 13 0.45 13 -	B 13 0.45 13 -	B 14 0.13 13 -	B 18	
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			B 13 0.13 3						A 0 0.00 0		A 0 0.00 0		A 0 0.00 0		A 0 0.00 0	A 0	
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 21 0.58 20 65 45	D 35 0.76 71 -	C 27 0.35 23 35 12	C 32 0.31 17 35 18	C 29 0.45 34 -	C 27 0.25 16 45 29	C 29 0.67 22 70 48	D 37 0.56 38 -	D 38 0.75 58 70 12	D 51 0.41 25 53 -	D 41 0.60 49 -	D 46 0.73 25 -	D 52 0.74 59 -	D 47 0.74 59 -	D 47 0.74 59 -	D 37	
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	A 10 0.00 0 15 15	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					F 198 1.01 41 -	> > > > >	> > > > >	F 198		
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 22 0.29 10 25 15	C 25 0.69 58 -	B 16 0.05 2 35 33	C 25 0.45 6 25 19	B 14 0.35 19 -	B 14 0.35 19 -	B 15 0.23 11 25 14	D 37 0.73 60 -	D 43 0.73 60 -	D 43 0.73 60 -	D 42 0.75 32 20 -12	E 78 0.35 24 -	C 31 0.35 24 -	C 31 0.35 24 -	C 31 0.35 24 -	D 50 0.35 24 -	C 28
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 29 0.71 44 45 1	E 70 0.94 118 -	E 72 0.94 110 -	E 59 1.04 115 20 -95	D 36 0.47 42 -	D 36 0.48 44 -	E 62 0.86 37 50 13	D 41 0.55 46 -	D 40 0.37 28 50 22	D 40 0.37 28 50 22	D 44 0.22 7 50 43	E 39 0.99 94 -	D 76 0.47 32 50 18	D 49 0.47 32 50 18	E 72 0.47 32 50 18	E 60	
	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	F 97 0.88 26 15 -11	A 36 0.68 40 -	D 36 0.68 40 -	D 49 0.66 20 35 15	A 53 0.88 67 -	D 50 0.88 67 -	D 51 0.42 11 15 4	C 33 0.66 43 -	C 24 0.66 43 -	C 24 0.66 43 -	C 25 0.57 8 40 32	B 17 0.62 32 -	B 16 0.62 33 -	B 16 0.62 33 -	B 16 0.62 33 -	B 16 0.62 33 -	C 28
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			C 16 0.14 4						A 0 0.00 0		A 0 0.00 0		A 0 0.00 0		A 0 0.00 0	A 0	
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	D 50 0.86 27 65 38	C 32 0.61 52 -	C 26 0.22 14 35 21	C 34 0.66 20 35 15	D 39 0.94 102 -	D 54 0.23 14 45 31	D 50 1.05 72 70 -2	F 98 0.64 44 -	D 51 0.73 54 70 16	D 51 0.73 54 70 16	D 55 0.91 52 -	D 55 0.85 72 -	D 58 0.85 76 -	D 52 0.85 76 -	D 52 0.85 76 -	D 49	
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	B 14 0.02 1 15 14	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					F 322 1.21 42 -	> > > > >	> > > > >	F 322		
Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	D 37 0.30 9 25 16	C 32 0.65 52 -	C 25 0.18 10 35 25	C 32 0.76 23 2 -	C 29 0.62 50 -	C 23 0.62 50 -	C 24 0.58 35 25 -10	E 58 0.66 55 -	C 35 0.66 55 -	C 35 0.66 55 -	D 42 0.54 23 -3	D 54 0.58 49 -	C 32 0.58 49 -	C 32 0.58 49 -	C 32 0.58 49 -	D 38 0.58 49 -	C 31	
Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	D 44 0.78 36 45 9	D 46 0.65 45 -	D 46 0.66 45 -	D 45 0.65 29 20 -9	D 36 0.82 62 -	D 53 0.82 63 -	D 53 0.82 63 -	D 49 1.03 124 50 -74	E 78 0.55 46 -	C 28 0.51 42 50 8	C 29 0.51 42 50 8	D 42 0.40 13 50 37	D 36 0.74 50 -	E 77 0.90 77 50 -27	E 56 0.90 77 50 -27	D 47		

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 V/C - Volume to Capacity Ratio
 Q - 95th Percentile Queue Length (m)
 Stor. - Existing Storage (m)
 Avail. - Available Storage (m)
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 </> - Shared with through movement



4.3.3 2031 Horizon

The study area intersection operational analyses followed the same methodology used for the existing conditions analyses. **Table 4.8** summarizes the total traffic operations. The following critical movements are noted:

- ▶ **Ontario Street South and Laurier Avenue:**
 - Eastbound left-turn – AM peak hour, queue length exceeds storage; and
 - Northbound left-turn – PM peak hour, LOS E, and queue length exceeds storage.
- ▶ **Ontario Street South and Derry Road:**
 - Eastbound left-turn – PM peak hour, LOS F, v/c ratio greater than 1.00. AM and PM peak hour, queue length exceeds storage;
 - Eastbound right-turn – AM peak hour, queue length exceeds storage;
 - Westbound left-turn – AM peak hour, queue length exceeds storage;
 - Westbound through – PM peak hour, v/c ratio greater than 0.85;
 - Westbound right-turn – PM peak hour, queue length exceeds storage;
 - Northbound left-turn – PM peak hour, LOS F, v/c ratio greater than 1.00 and queue length exceeds storage;
 - Northbound right-turn – AM and PM peak hour, LOS E. PM peak hour, queue length exceeds storage;
 - Southbound left-turn – PM peak hour, LOS F, and v/c greater than 1.00;
 - Southbound through – PM peak hour, v/c ratio greater than 0.85; and
 - Southbound right-turn – PM peak hour, LOS E.
- ▶ **Derry Road and South Driveway:**
 - Eastbound left-turn – PM peak hour, LOS E; and
 - Southbound left/right-turn – AM and PM peak hour, LOS F, and v/c greater than 1.00.
- ▶ **Santa Maria Boulevard/Commercial Street and Derry Road:**
 - Eastbound left-turn – AM peak hour, queue length exceeds storage;
 - Westbound left-turn – PM peak hour, LOS F, and v/c ratio greater than 1.00. AM and PM peak hour queue length exceeds storage;



- Northbound left-turn – PM peak hour, LOS F, v/c ratio greater than 1.00 and queue length exceeds storage; and
- Southbound left-turn – AM and PM peak hour, LOS F and queue length exceeds storage. PM peak hour, v/c ratio greater than 1.00.
- ▶ **Regional Road 25 and Louis St. Laurent Avenue:**
 - Overall – AM peak hour, LOS E;
 - Eastbound left-turn – AM peak hour, LOS F, and queue length exceeds storage;
 - Eastbound through/right-turn – AM peak hour, LOS F, and v/c greater than 0.85;
 - Westbound left-turn – AM and PM peak hour, queue length exceeds storage. AM peak hour, LOS F and v/c greater than 1.00;
 - Northbound left-turn – AM peak hour, LOS E, and queue length exceeds storage. PM peak hour, LOS F, v/c greater than 1.00, and queue length exceeds storage;
 - Southbound through – AM peak hour, LOS F, and v/c greater than 1.00; and
 - Southbound right-turn – AM and PM peak hour, queue length exceeds storage. PM peak hour, LOS F, and v/c greater than 0.95.

It is noted that the site traffic has little impact on the operations of the intersections compared to the background traffic operations.

Appendix K contains the detailed Synchro reports.



TABLE 4.8: 2031 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall		
				Eastbound				Westbound				Northbound				Southbound						
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach			
AM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 33 0.45 19 15 -4	A 22 0.43 25 -	C 22 0.43 25 -	C 26 0.43 25 -	C 29 0.35 16 35 19	A 24 0.56 34 -	C 24 0.56 34 -	C 25 0.56 34 -	B 18 0.15 5 15 10	B 18 0.67 37 -	B 18 0.67 38 -	B 18 0.67 38 -	B 18 0.67 38 -	C 30 0.34 13 40 27	B 14 0.48 26 -	B 14 0.48 26 -	B 15 0.48 26 -	B 19	
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			B 14 0.14 4							A 0 0.00 0			A 0 0.00 0		A 0 0.00 0		A 0 0.00 0	A 0	
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	D 38 0.86 72 65 -7	D 48 0.93 133 -	D 38 0.60 76 -	D 45 0.60 76 -35	D 53 0.90 72 35 -37	C 34 0.54 67 -	C 35 0.44 53 -	C 38 0.44 53 -8	D 44 0.75 47 20 23	D 40 0.61 70 -	E 57 0.82 103 -	D 45 0.82 103 -33	D 41 0.72 47 -	D 47 0.76 91 -	D 47 0.76 99 -	D 47 0.76 99 -	D 47 0.76 99 -	D 47 0.76 99 -	D 44
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	C 18 0.01 0 15 15	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					F 404 1.46 55 -			> > > > >	F 404		
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 35 0.58 43 25 -18	C 28 0.76 104 -	B 18 0.07 8 -	C 29 0.07 8 -27	D 40 0.78 28 25 -3	B 15 0.36 35 -	B 15 0.36 39 -	B 18 0.36 39 -	D 39 0.25 22 25 3	D 45 0.76 105 -	D 45 0.76 105 -	D 44 0.76 105 -	F 98 0.87 69 20 -49	C 32 0.37 47 -	C 32 0.37 47 -	C 32 0.37 47 -	C 32 0.37 47 -	E 58	C 30
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 31 0.75 79 45 -34	E 77 0.96 184 -	E 79 0.96 173 -	E 65 0.96 173 -	F 123 1.12 200 20 -180	D 37 0.50 76 -	D 37 0.50 77 -	D 37 0.50 77 -	E 75 0.50 77 -	E 67 0.89 71 50 -21	D 42 0.58 81 -	D 40 0.40 56 -6	D 46 0.40 56 -6	D 40 0.25 13 50 37	F 40 1.06 165 -	D 52 0.51 63 -	F 90	E 69	
	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	D 38 0.46 12 15 3	A 23 0.53 26 -	C 23 0.53 26 -	C 26 0.53 26 -	C 26 0.42 13 35 22	A 26 0.69 36 -	C 26 0.69 36 -	C 27 0.69 36 -	E 61 0.66 18 15 -3	D 44 0.89 69 -	D 44 0.89 70 -	D 45 0.89 70 -	D 38 0.80 17 40 23	C 27 0.78 54 -	C 27 0.78 55 -	C 28 0.78 55 -	C 28 0.78 55 -	C 33	
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			C 17 0.15 4							A 0 0.00 0		A 0 0.00 0		A 0 0.00 0		A 0 0.00 0		A 0	
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	F 124 1.11 71 65 -6	D 35 0.69 56 -	C 30 0.34 22 13	D 50 0.34 22 13	D 40 0.82 29 35 6	D 48 0.93 92 -	C 31 0.34 21 -24	D 45 0.34 21 -24	F 258 1.44 130 70 -60	D 43 0.70 49 -	E 57 0.80 61 70 9	F 90 0.80 61 70 9	F 126 1.13 89 -	D 54 0.90 81 -	E 64 0.90 87 -	E 64 0.90 87 -	E 64 0.90 87 -	E 63	
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	E 47 0.10 2 15 13	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					F 790 2.10 55 -			> > > > >	F 790		
Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	D 49 0.56 17 25 8	C 30 0.62 50 -	C 24 0.26 16 -	C 30 0.26 16 -19	F 89 1.06 71 -46	B 17 0.57 36 -	B 18 0.57 40 -	B 31 0.57 40 -	F 177 1.16 72 25 -47	D 52 0.84 81 -	D 52 0.84 81 -	F 90 0.84 81 -	F 147 1.03 47 20 -27	D 45 0.74 68 -	D 45 0.74 68 -	D 45 0.74 68 -	E 69	D 43		
Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	D 47 0.80 39 45 6	D 46 0.66 48 -	D 47 0.67 47 -	D 47 0.67 47 -	D 36 0.67 32 20 -12	D 54 0.83 67 -	D 54 0.83 68 -	D 50 0.83 68 -	D 50 1.12 160 50 -110	F 112 1.12 52 -	C 30 0.60 52 -	C 32 0.55 48 2	D 53 0.55 48 2	D 37 0.43 14 50 36	D 53 0.97 55 -	F 91 0.97 92 -	E 62	D 54		

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 V/C - Volume to Capacity Ratio
 Q - 95th Percentile Queue Length (m)
 Stor. - Existing Storage (m)
 Avail. - Available Storage (m)
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 </> - Shared with through movement



4.3.4 2031 Horizon with Background Development Growth

The study area intersection operational analyses followed the same methodology used for the existing conditions analyses. **Table 4.9** summarizes the total traffic operations. The following critical movements are noted:

- ▶ **Ontario Street South and Laurier Avenue:**
 - Northbound left-turn – PM peak hour, LOS F, and queue length exceeds storage;
 - Northbound through/right-turn – PM peak hour, v/c ratio greater than 0.85; and
 - Southbound through/right-turn – PM peak hour, v/c ratio greater than 0.85.
- ▶ **Ontario Street South and Derry Road:**
 - Eastbound right-turn – AM peak hour, queue length exceeds storage;
 - Northbound left-turn – PM peak hour, LOS F, and v/c ratio greater than 0.85;
 - Northbound through – PM peak hour, v/c ratio greater than 0.85;
 - Southbound left-turn – AM peak hour, LOS E;
 - Southbound through – PM peak hour, v/c ratio greater than 0.85; and
 - Southbound right-turn – AM peak hour, LOS E.
- ▶ **Derry Road and South Driveway:**
 - Southbound left/right-turn – AM and PM peak hour, LOS F, and v/c greater than 1.00.
- ▶ **Santa Maria Boulevard/Commercial Street and Derry Road:**
 - Northbound left-turn – PM peak hour, queue length exceeds storage.
- ▶ **Regional Road 25 and Louis St. Laurent Avenue:**
 - Overall – AM and PM peak hour, LOS E;
 - Eastbound left-turn – AM and PM peak hour, LOS F, v/c greater than 0.95 and queue length exceeds storage;
 - Eastbound through/right-turn – AM peak hour, LOS F, and v/c greater than 1.00. PM peak hour, LOS E;
 - Westbound left-turn – AM and PM peak hour, queue length exceeds storage. AM peak hour, LOS F and v/c greater than 1.00;
 - Westbound through/right-turn – AM and PM peak hour, LOS F, v/c greater than 1.00;



- Northbound left-turn – AM and PM peak hour, queue length exceeds storage. AM peak hour, LOS E and v/c greater than 0.90. PM peak hour, LOS F and v/c greater than 1.00;
- Northbound through – PM peak hour, LOS E and v/c greater than 0.85;
- Northbound right-turn – PM peak hour, queue length exceeds storage. PM peak hour, LOS F and v/c greater than 1.00;
- Southbound left-turn – PM peak hour, LOS F, v/c greater than 0.95, and queue length exceeds storage;
- Southbound through – AM and PM peak hour, LOS E, and v/c greater than 0.85; and
- Southbound right-turn – PM peak hour, LOS F, v/c greater than 0.95 and queue length exceeds storage.

It is noted that the site traffic has little impact on the operations of the intersections compared to the background traffic operations.

Appendix L contains the detailed Synchro reports.



TABLE 4.9: 2031 TOTAL TRAFFIC OPERATIONS – BACKGROUND DEVELOPMENT GROWTH

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall		
				Eastbound				Westbound				Northbound				Southbound						
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach			
AM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	C 30 0.36 14 15 1	C 23 0.39 20 -	C 23 0.39 20 -	C 26 0.39 20 -	C 28 0.28 11 35 24	C 24 0.52 26 -	C 24 0.52 26 -	C 25 0.52 26 -	B 16 0.12 3 15 12	C 21 0.82 40 -	C 21 0.83 40 -	C 21 0.83 40 -	D 40 0.41 14 40 26	B 12 0.51 18 -	B 12 0.51 19 -	B 14 0.51 19 -	B 20 0.51 19 -		
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			B 14 0.13 4							A 0 0.00 0			A 0 0.00 0			A 0 0.00 0			
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 21 0.58 38 65 27	C 32 0.63 82 -	C 28 0.38 46 35 -11	C 30 0.38 46 35 -11	C 28 0.73 33 35 2	C 28 0.34 40 -	C 28 0.28 32 45 13	C 28 0.28 32 45 13	D 36 0.64 36 70 34	D 51 0.90 110 -	D 44 0.59 68 70 2	D 49 0.59 68 70 2	D 49 0.59 68 70 2	D 48 0.76 44 -	D 46 0.74 88 -	D 51 0.75 98 -	D 48 0.75 98 -	D 39 0.75 98 -	
	Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	B 14 0.01 0 15 15	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					F 88 0.70 28 -			> > > > >	F 88 0.70 28 -		
	Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 22 0.31 20 25 5	C 23 0.55 70 -	B 16 0.05 4 31	C 22 0.05 4 31	B 18 0.45 12 25 13	B 14 0.26 24 -	B 14 0.27 26 -	B 14 0.27 26 -	B 14 0.27 26 -	C 34 0.15 14 25 11	D 36 0.53 69 -	D 36 0.53 69 -	D 36 0.53 69 -	D 48 0.38 31 20 -11	C 30 0.26 32 -	C 30 0.26 32 -	C 30 0.26 32 -	D 37 0.26 32 -	C 23 0.26 32 -
	Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	F 92 1.01 132 45 -87	F 90 1.01 206 -	F 91 1.01 197 -	F 91 1.01 197 -	F 97 1.03 138 20 -118	F 89 1.00 204 -	F 90 1.00 196 -	F 92 1.00 196 -	F 92 1.00 196 -	E 75 0.93 86 50 -36	D 49 0.70 93 -	D 50 0.56 75 50 -25	D 54 0.56 75 50 -25	D 54 0.56 75 50 -25	D 43 0.61 42 50 8	E 62 0.89 113 50 -	D 52 0.49 61 50 -11	E 59 0.49 61 50 -11	E 74 0.49 61 50 -11
	Ontario Street & Laurier Avenue	TCS	LOS Delay V/C Q Stor. Avail.	D 35 0.40 9 15 6	C 24 0.50 19 -	C 24 0.50 19 -	C 26 0.50 19 -	C 26 0.35 9 35 26	C 26 0.66 27 -	C 26 0.66 27 -	C 27 0.66 27 -	C 27 0.66 27 -	F 84 0.77 17 15 -2	D 51 0.97 83 -	D 52 0.97 87 -	D 53 0.97 87 -	D 53 0.97 87 -	C 27 0.70 8 40 32	D 36 0.94 74 -	D 39 0.96 81 -	D 37 0.96 81 -	D 40 0.96 81 -
	Ontario Street & East Driveway	TWSC	LOS Delay V/C Q			C 21 0.18 5							A 0 0.00 0			A 0 0.00 0			A 0 0.00 0			
	Ontario Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 32 0.72 21 65 44	C 29 0.49 37 -	C 26 0.23 14 35 21	C 30 0.23 14 35 21	C 23 0.55 16 35 19	C 33 0.66 52 -	C 27 0.23 14 45 31	C 32 0.23 14 45 31	C 32 0.23 14 45 31	F 184 1.26 88 70 -18	D 50 0.86 68 -	D 44 0.57 37 70 33	D 70 0.57 37 70 33	F 88 1.01 61 -	F 94 1.08 130 -	F 105 1.08 143 -	F 96 1.08 143 -	E 60 1.08 143 -	
Derry Road & South Driveway	TWSC	LOS Delay V/C Q Stor. Avail.	D 27 0.05 2 15 13	A 0 0.00 0 -		A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -	A 0 0.00 0 -					F 156 0.84 32 -			> > > > >	F 156 0.84 32 -		
Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS Delay V/C Q Stor. Avail.	C 24 0.26 7 25 18	C 23 0.42 30 -	C 20 0.16 10 35 25	C 23 0.16 10 35 25	B 20 0.70 18 7	B 14 0.41 22 -	B 15 0.41 25 -	B 16 0.41 25 -	B 16 0.41 25 -	D 53 0.52 26 25 -1	D 39 0.59 46 -	D 39 0.59 46 -	D 43 0.59 46 -	D 51 0.40 20 3	D 37 0.52 42 -	D 37 0.52 42 -	D 37 0.52 42 -	D 40 0.52 42 -	C 24 0.52 42 -	
Regional Road 25 & Louis St. Laurent Avenue	TCS	LOS Delay V/C Q Stor. Avail.	F 91 0.97 60 45 -15	E 59 0.84 94 -	E 59 0.84 92 -	E 67 0.84 92 -	D 55 0.87 47 20 -27	F 98 1.03 154 -	F 98 1.03 148 -	F 89 1.03 148 -	F 89 1.03 148 -	F 85 1.01 125 50 -75	E 61 0.90 84 -	E 62 0.78 71 50 -21	E 68 0.78 71 50 -21	E 68 0.78 71 50 -21	F 85 1.00 101 50 -51	E 68 0.91 71 50 -	F 102 0.98 97 50 -47	E 79 0.98 97 50 -47	E 75 0.98 97 50 -47	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 V/C - Volume to Capacity Ratio
 Q - 95th Percentile Queue Length (m)
 Stor. - Existing Storage (m)
 Avail. - Available Storage (m)
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 </> - Shared with through movement



4.4 Future Traffic Conditions Summary

Under the 2024 to 2031 background and total horizons, using the background growth rates, there were several critical movements which occurred over several horizons. **Table 4.10** summarizes the critical movements and under which horizon they began.

TABLE 4.10: 2024 TO 2031 CRITICAL MOVEMENT SUMMARY

Intersection	Critical Movement	Critical Horizon Year
Ontario Street South and Laurier Avenue	EBL	Year 2029 Total Traffic
	NBL	Year 2029 Total Traffic
Ontario Street South and Derry Road	EBL	Year 2024 Background Traffic
	WBL	Year 2031 Background Traffic
	WBT	Year 2024 Background Traffic
	WBR	Year 2031 Total Traffic
	NBL	Year 2031 Background Traffic
	NBR	Year 2031 Background Traffic
	SBL	Year 2031 Background Traffic
	SBT	Year 2031 Background Traffic
	SBR	Year 2031 Background Traffic
Derry Road and South Driveway	EBL	Year 2031 Background Traffic
	SBL/R	Year 2024 Total Traffic
Santa Maria Boulevard/Commercial Street and Derry Road	EBL	Year 2031 Total Traffic
	WBL	Year 2031 Background Traffic
	NBL	Year 2024 Background Traffic
	SBL	Year 2024 Background Traffic
Regional Road 25 and Louis St. Laurent Avenue	Overall	Year 2024 Background Traffic
	EBL	Year 2024 Background Traffic
	WBT/R	Year 2024 Background Traffic
	WBL	Year 2024 Background Traffic
	WBT/R	Year 2024 Background Traffic
	NBL	Year 2024 Background Traffic
	SBR	Year 2024 Background Traffic



Additionally, under the 2031 total horizons there were some differences in critical movements between the background growth and background development scenarios. **Table 4.11** summarizes critical movements unique to the two scenarios.

TABLE 4.11: BACKGROUND GROWTH AND BACKGROUND DEVELOPMENT UNIQUE CRITICAL MOVEMENTS

Intersection	Critical Movement	Growth Scenario
Ontario Street South and Laurier Avenue	EBL	Generalized Growth
	NBT/R	Development Growth
	SBT/R	Development Growth
Ontario Street South and Derry Road	EBL	Generalized Growth
	WBL	Generalized Growth
	WBT	Generalized Growth
	WBR	Generalized Growth
	NBT	Development Growth
Derry Road and South Driveway	EBL	Generalized Growth
Santa Maria Boulevard/Commercial Street and Derry Road	EBL	Generalized Growth
	WBL	Generalized Growth
	SBL	Generalized Growth
Regional Road 25 and Louis St. Laurent Avenue	WBT/R	Development Growth
	NBT	Development Growth
	NBR	Development Growth
	SBL	Development Growth



5 Remedial Measures

5.1 Ontario Street South and Laurier Avenue

The intersection of Ontario Street South and Laurier Avenue is experiencing capacity constraints under 2029 Background conditions. The capacity constraints are expected to continue to occur with the expected growth in non-site generated traffic.

To mitigate the capacity issues, the road authority could consider the addition of a northbound, eastbound, and westbound left-turn phase.

The Region and Town should continue to regularly monitor operations at this intersection regardless of whether the development proceeds.

5.2 Ontario Street South and Derry Road

The intersection of Ontario Street South and Derry Road is experiencing capacity constraints under existing conditions, as noted in **Section 2**. The capacity constraints are expected to continue to occur with the expected growth in non-site generated traffic. The additional traffic related to the subject development has little impact on the conditions at this intersection under the 2031 Total horizon as it represents about 2.5 – 3.7% of the total traffic.

The Region and Town should continue to regularly monitor traffic operations at this intersection the regardless of whether the development proceeds.

5.3 Derry Road and South Driveway

The intersection of Derry Road and South Driveway is experiencing capacity constraints under 2024 Total conditions. The capacity constraints are expected to continue to occur with the expected growth in non-site generated traffic.

To mitigate the capacity issues, the road authority could consider the addition of a southbound left-turn lane. However, as the east/west road, Derry Road, has such a large cross section and such high traffic volumes, this entrance should be considered as a right-in / right-out entrance, similar to the East Driveway.

The Region and Town should continue to regularly monitor operations at this intersection regardless of whether the development proceeds.

5.4 Santa Maria Boulevard/Commercial Street and Derry Road

The intersection of Santa Maria Boulevard/Commercial Street and Derry Road is experiencing capacity constraints under existing conditions, as noted



in **Section 2**. The capacity constraints are expected to continue to occur with the expected growth in non-site generated traffic. The additional traffic related to the subject development has little impact on the conditions at this intersection under the 2031 Total horizon as it represents about 0.2 – 0.3% of the total traffic.

To mitigate the capacity issues, the road authority could consider the addition of a northbound / southbound left-turn phase and increasing the westbound left-turn lane storage length.

The Region and Town should continue to regularly monitor traffic operations at this intersection the regardless of whether the development proceeds.

5.5 Regional Road 25 and Louis St. Laurent Avenue

The intersection of Ontario Street South and Derry Road is experiencing capacity constraints under existing conditions, as noted in **Section 2**. The capacity constraints are expected to continue to occur with the expected growth in non-site generated traffic. The additional traffic related to the subject development has little impact on the conditions at this intersection under the 2031 Total horizon as it represents about 0.9 – 1.4% of the total traffic.

The Region and Town should continue to regularly monitor traffic operations at this intersection the regardless of whether the development proceeds.

5.6 Operations with Improvements (Year 2031)

The traffic operations under the 2031 total traffic horizon were reanalysed with the following remedial measures in place:

- ▶ Ontario Street South and Laurier Avenue: northbound, eastbound, and westbound left-turn phasing;
- ▶ Santa Maria Boulevard/Commercial Street and Derry Road: northbound, and southbound left-turn phasing; and
- ▶ Derry Road and South Driveway: southbound left-turn lane.

Table 5.2 summarizes the total traffic operations. The following critical movements are expected to remain in place:

- ▶ **Ontario Street South and Laurier Avenue:**
 - Westbound right-turn – PM peak hour, LOS E.
- ▶ **Derry Road and South Driveway:**
 - Eastbound left-turn – PM peak hour, LOS E; and
 - Southbound left/right-turn – AM and PM peak hour, LOS F, and v/c greater than 1.00.



► **Santa Maria Boulevard/Commercial Street and Derry Road:**

- Eastbound through – AM and PM peak hour, v/c ratio greater than 0.85;
- Westbound left-turn – PM peak hour, queue length exceeds storage;
- Northbound left-turn – PM peak hour, queue length exceeds storage;
- Northbound right-turn – PM peak hour, LOS E; and
- Southbound right-turn – PM peak hour, LOS E.

Appendix M contains the supporting detailed Synchro 10 reports.

The remedial measures improve operations but logicalized capacity issues are anticipated to occur. The capacity issues are typical for major arterial roadways during peak hours. The road authority should continue to regularly monitor traffic operations at these intersections, making sure to optimize signal timings to improve operations.



TABLE 5.1: 2031 FUTURE TOTAL TRAFFIC OPERATIONS – IMPROVEMENTS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS	C	A	C	C	C	A	C	C	B	B	B	B	C	B	B	B	B
			Delay	34	23	23	27	30	25	25	26	18	17	17	17	30	14	14	15	19
			V/C	0.46	0.44	0.44		0.35	0.57	0.57		0.15	0.66	0.66		0.34	0.47	0.47		
			Q	11	15	15		10	21	21		3	21	22		7	15	15		
	Stor.	15	-	-		35	-	-		15	-	-		40	-	-				
	Avail.	4	-	-		25	-	-		12	-	-		33	-	-				
	Derry Road & South Driveway	TWSC	LOS	C	A		A		A	A	A					F		B	F	
			Delay	18	0		0	0	0	0	0					402		15.4	382	
			V/C	0.01	0.00			0.00	0.00							1.43		0.01		
Q			0	0		0	0								52		0			
Stor.	15	-			-	-							-		-					
Avail.	15	-			-	-							-		-					
Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS	C	D	C	D	D	C	C	C	C	D	D	D	C	C	C	C	D	
		Delay	24	44	24	42	53	29	26	32	33	55	55	51	32	25	25	28	39	
		V/C	0.56	0.93	0.09		0.83	0.48	0.21		0.20	0.84	0.84		0.58	0.30	0.30			
		Q	15	96	5		23	34	13		11	78	78		15	21	21			
Stor.	25	-	35		25	-	-		25	-	-		20	-	-					
Avail.	10	-	30		2	-	-		14	-	-		5	-	-					
PM Peak Hour	Ontario Street & Laurier Avenue	TCS	LOS	D	A	D	D	A	E	E	C	D	C	C	C	D	D	C	D	
			Delay	43	38	38	39	40	64	64	59	26	35	35	34	27	36	36	35	39
			V/C	0.67	0.71	0.71		0.57	0.94	0.94		0.52	0.79	0.79		0.69	0.84	0.85		
			Q	13	46	46		8	86	86		7	65	67		14	82	84		
	Stor.	15	-	-		35	-	-		15	-	-		40	-	-				
	Avail.	2	-	-		27	-	-		8	-	-		26	-	-				
	Derry Road & South Driveway	TWSC	LOS	E	A		A		A	A	A					F		C	F	
			Delay	47	0		0	0	0	0	0					786		26.3	750	
			V/C	0.10	0.00			0.00	0.00							2.07		0.02		
Q			2	0		0	0								53		1			
Stor.	15	-			-	-							-		-					
Avail.	13	-			-	-							-		-					
Santa Maria Boulevard/Commercial Street & Derry Road	TCS	LOS	C	D	D	D	D	C	C	C	D	E	E	E	D	E	E	E	D	
		Delay	31	54	38	51	49	30	22	33	45	70	70	62	46	76	76	69	46	
		V/C	0.46	0.92	0.39		0.91	0.72	0.21		0.78	0.93	0.93		0.70	0.95	0.95			
		Q	10	79	23		62	63	13		28	98	98		20	98	98			
Stor.	25	-	35		25	-	-		25	-	-		20	-	-					
Avail.	15	0	12		-37	0	-		-3	-	-		0	-	-					

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

Avail. - Available Storage (m)

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

</> - Shared with through movement



6 Site Circulation

The site circulation of vehicles at the proposed site driveway and throughout the subject site was assessed using AutoTURN swept path analysis software. The following design vehicles were assumed:

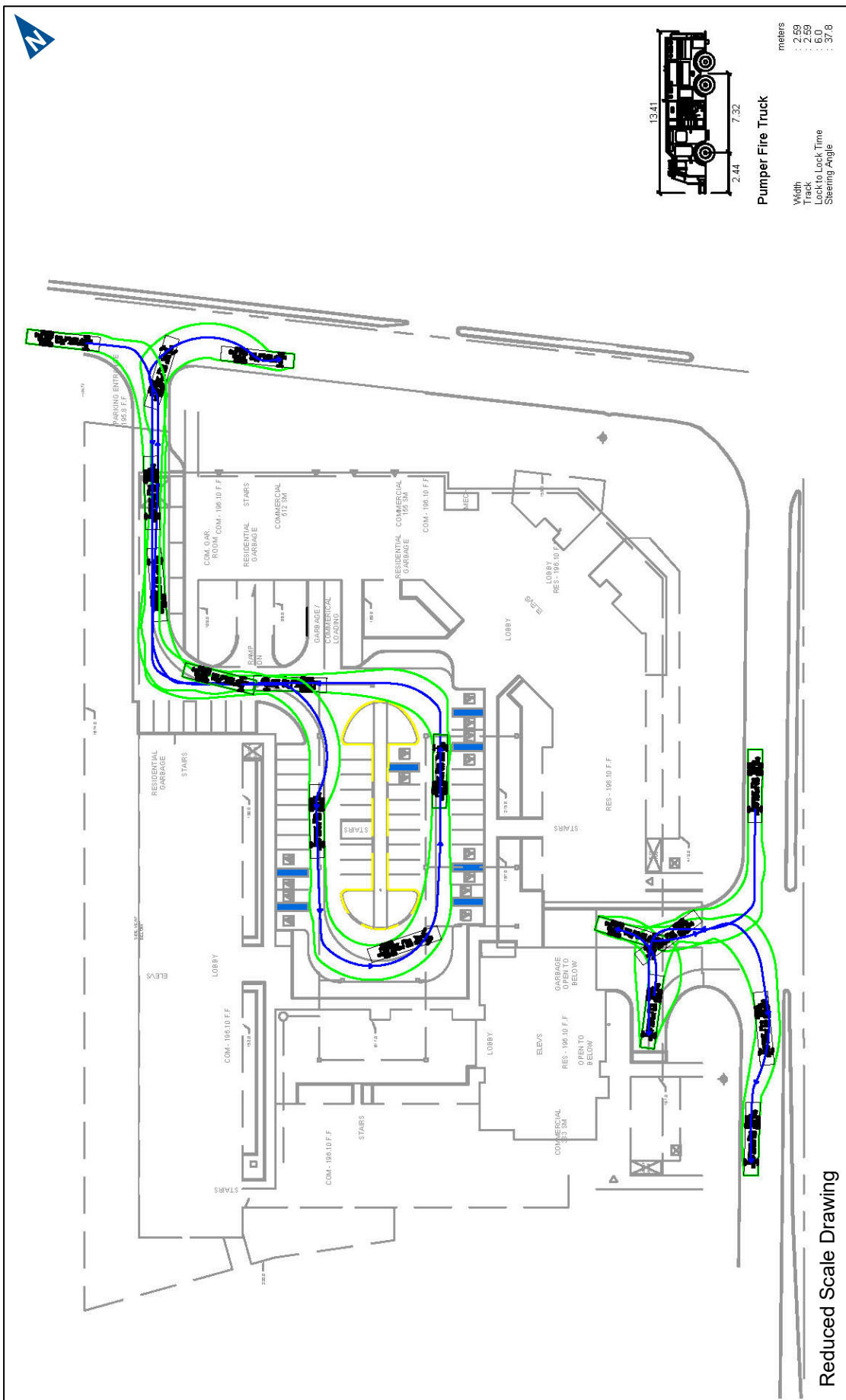
- ▶ Passenger Car – Transportation Association of Canada (TAC)¹¹ Passenger Car (TAC P);
- ▶ Moving Truck – TAC Heavy Single Unit Truck (HSU);
- ▶ Garbage Truck – Halton Front End Loader; and
- ▶ Fire Truck - Pumper Fire Truck¹².

In summary no conflicts have been identified. **Figure 6.1 – Figure 6.8** illustrate the vehicle maneuvering diagrams.

¹¹ 2.4 – *Design Vehicles - Geometric Design Guide for Canadian Roads*, Transportation Association of Canada, June 2017.

¹² *Guide for the Geometric Design of Driveways – NCHRP Report 659*, National Cooperative Highway Research Program, 2010.

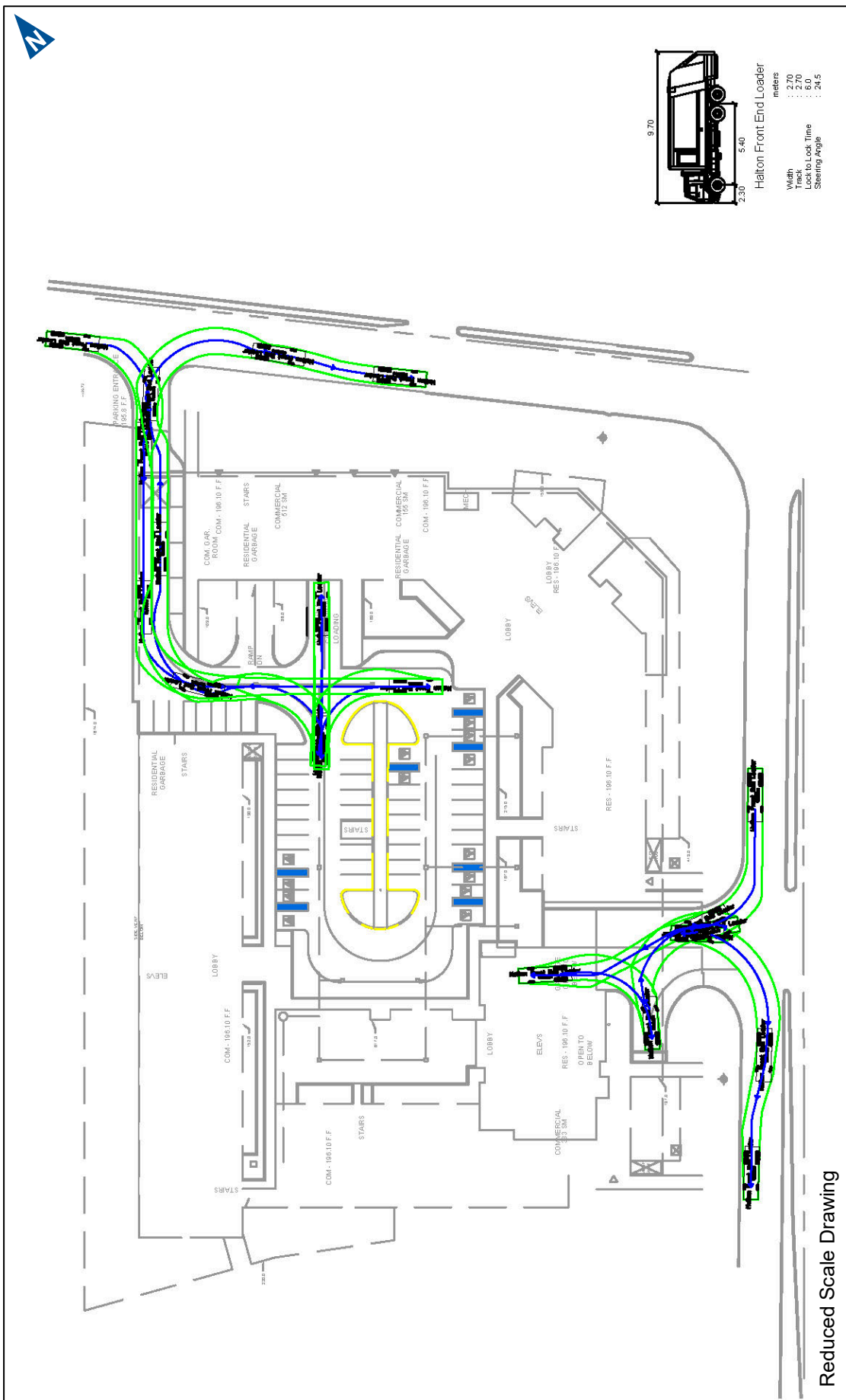




AutoTURN – Fire Truck

550 Ontario Street S, Mixed-use Development
190237

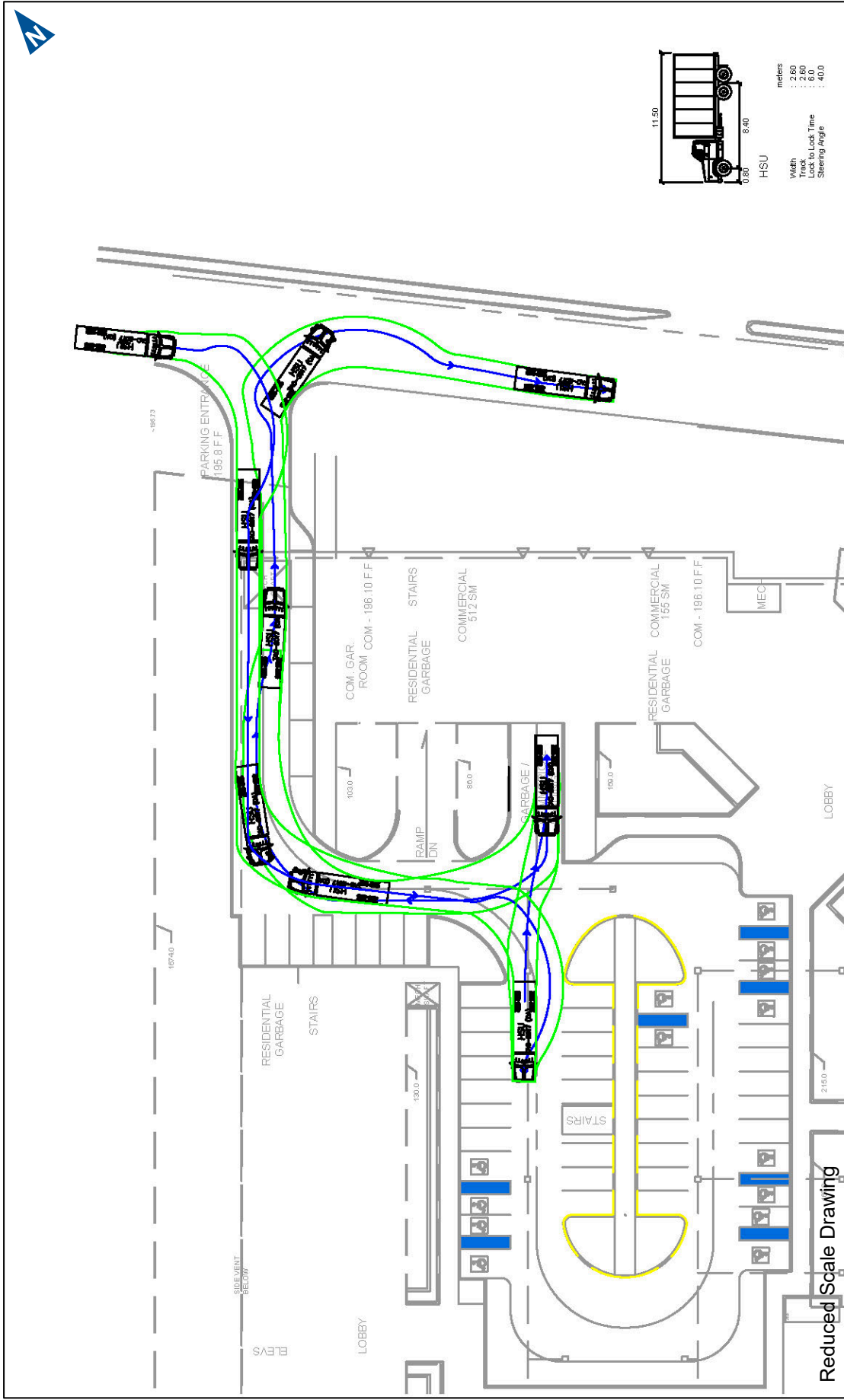
Figure 6.1



AutoTURN – Halton Front End Loader

550 Ontario Street S, Mixed-use Development
190237

Figure 6.2

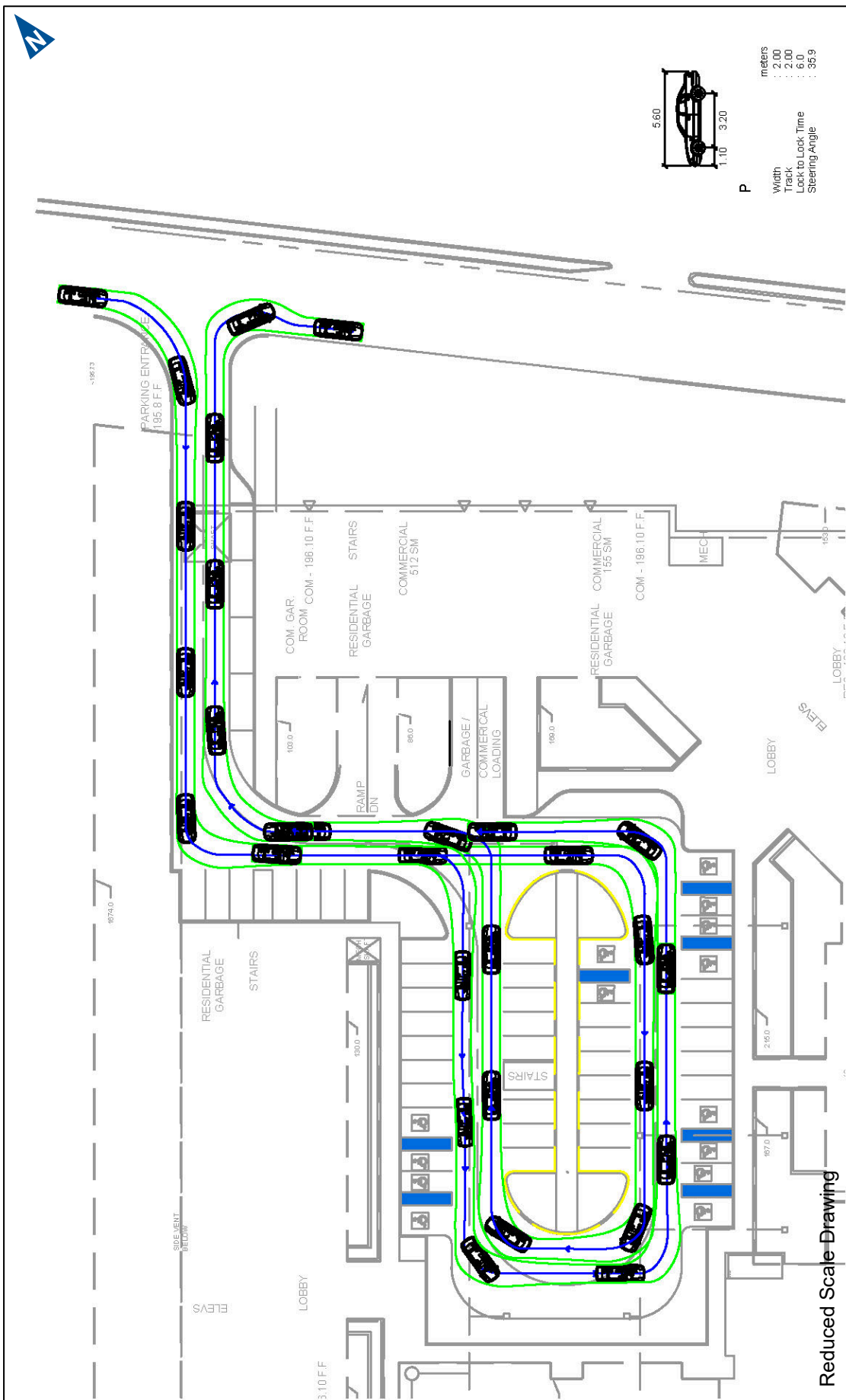


Reduced Scale Drawing



AutoTURN – Loading Zone

Figure 6.3



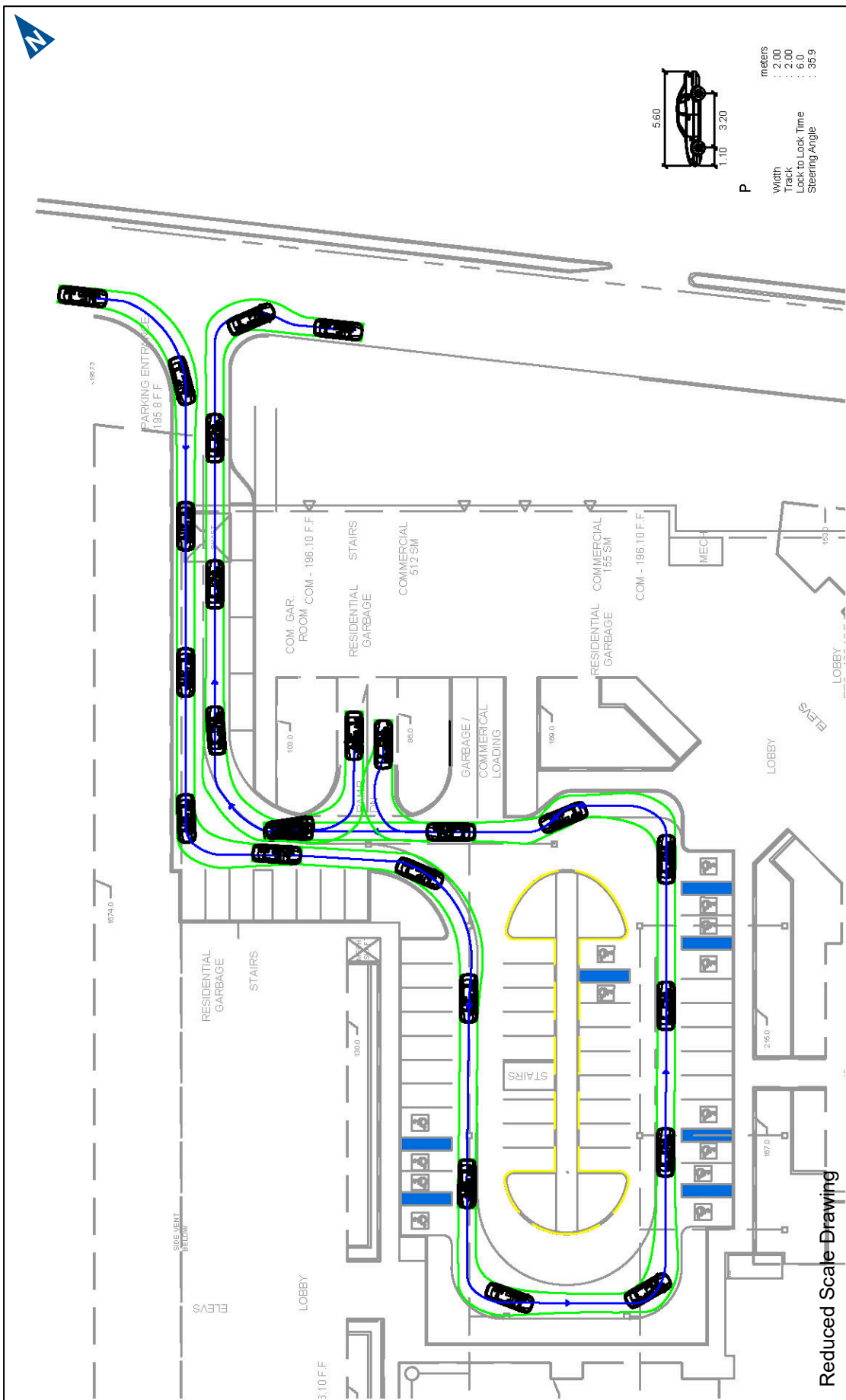
Reduced Scale Drawing



AutoTURN – Passenger Car East Driveway

550 Ontario Street S, Mixed-use Development
190237

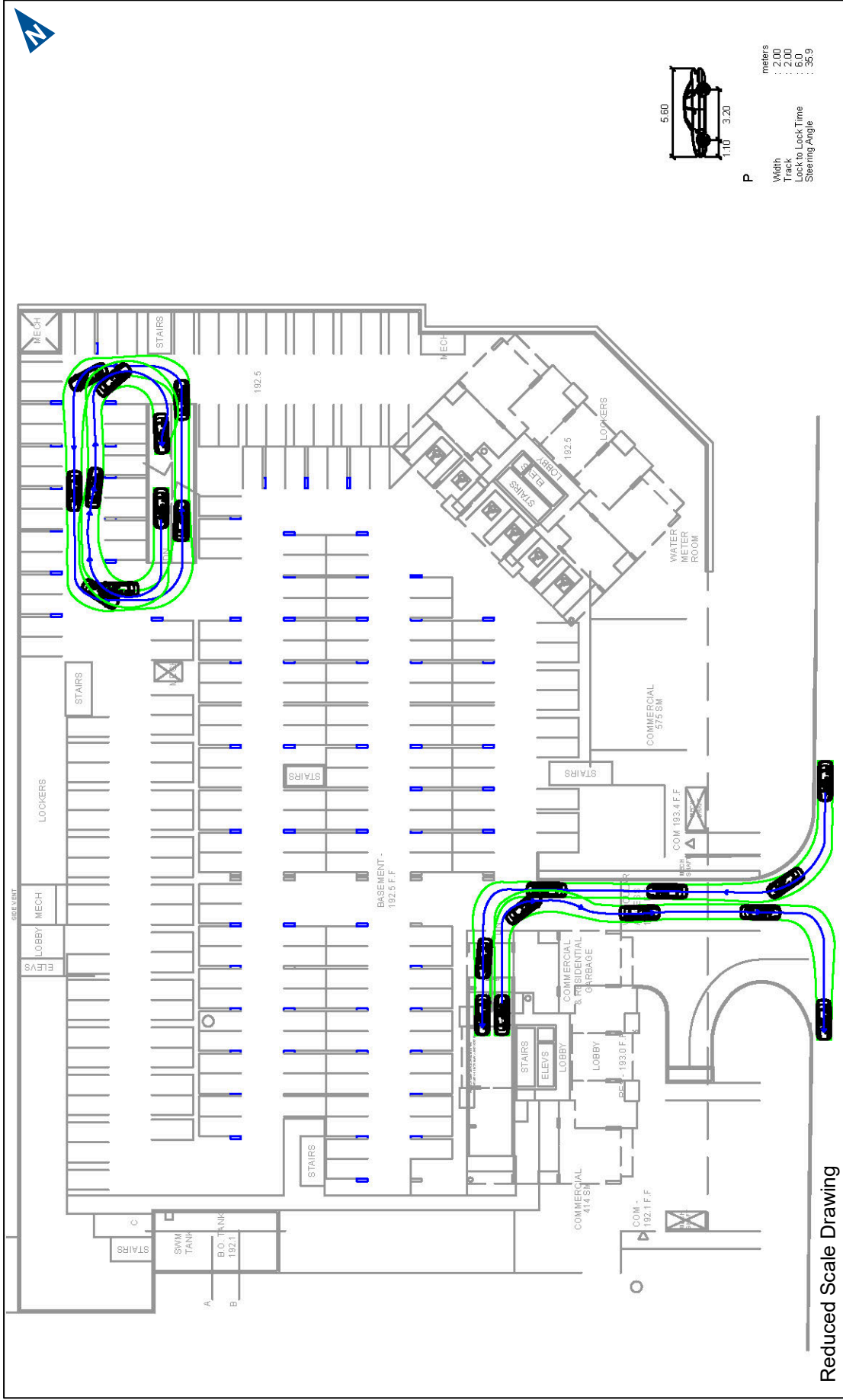
Figure 6.4



AutoTURN – Passenger Car East Driveway Layby

Figure 6.5





AutoTURN – Passenger Car UG Ramps

550 Ontario Street S, Mixed-use Development
190237

Figure 6.6



AutoTURN – Passenger Car UG Ramps 2 & 3

550 Ontario Street S, Mixed-use Development
 190237

Figure 6.7

7 Transportation Demand Management

7.1 Transportation Demand Management Techniques

Transportation Demand Management (TDM) refers to ways of making the capacity of our roads more efficient by reducing vehicle demand. TDM approaches consider how people's choices of travel mode are affected by land use patterns, development design, parking availability, parking cost, and the relative cost, convenience, and availability of alternative modes of travel. Various TDM strategies are used to influence those factors so that the alternatives are more competitive with driving alone and potentially reduce reliance on motor vehicles.

TDM strategies at a development can be divided into two basic categories:

- ▶ **Pre-occupancy:** things that need to be done while a development is being designed and built; and
- ▶ **Post-occupancy:** things that can be done once people are using the development.

The pre-occupancy actions are critical as they are most likely to determine how attractive, convenient, and safe alternative travel will be once the site is occupied. Before a site is occupied, it can be designed to be convenient and safe for pedestrians and cyclists, and vehicle parking can be provided to meet but not exceed demand.

After the development is built, incentives can be offered, but those incentives will not work as well if the site and its surroundings are oriented to cars. The incentives generally include subsidies to use transit, access to rideshare programs, and information about where and how to use alternatives.

7.2 Pre-Occupancy Strategies

7.2.1 Transit

The development facilitates on-site pedestrian access to the municipal sidewalk network, which in turn, provides access to the transit stops. The development is located within 500 metres of six existing Milton Transit routes, described in **Section 2.2**.

The site proxy to transit network will help encourage residents to utilize transit as access is within walking distance. Transit service will be a significant factor contributing to a reduction of automobile trips to/from the site.



7.2.2 Cycling

The development will be providing bicycle parking through secure storage lockers. The supply of short-term and long-term bicycle parking will be designed to match the Town's zoning requirements.

The Town's zoning requirements for bicycle parking is 0.2 bicycle parking per residential unit and bicycle parking equivalent to 3% of vehicle parking requirements for commercial land uses. A total of 155 bicycle parking spaces are required.

7.2.3 Shared Parking

The site's parking supply for residential visitors and commercial/retail visitors will be shared, removing an over supply of parking for visitors, and encouraging visitors to use other methods of travel to the site.

7.3 Post-Occupancy Strategies

7.3.1 On-Site Transit Support

The owner should investigate the feasibility of providing access to real-time transit information for area transit routes, that this information be readily available in public areas of the development.

7.3.2 TDM Coordinator

The building owner should look to delegate an interested individual or require the property manager to act as a coordinator for the TDM measures. The TDM coordinator will provide information for the Car Share programs and administer access to the secured bicycle parking. It is expected that a representative of the Town will be available to assist the TDM coordinator to help get the programs started during the early stages of operations.

7.3.3 Car Share Program

Car share programs, such as Enterprise CarShare and Zipcar, provide the availability of a shared vehicle, allowing residents who normally would not need a vehicle for their daily activities to be comfortable with the decision to not own a vehicle. The owner should consider providing a parking space as a designated car share space, pending demand. The owner should liaise with the car share providers, to determine the feasibility of providing a vehicle stored on site.

7.3.4 Unbundled Parking

Unbundled parking is the supply of parking as a separate charge to the occupants. For residential units, this means parking spaces would be sold separately from the units. As all residents would not want to pay additional



fees to be able to park a vehicle at the building, this would encourage them to use separate modes of travel.

7.4 TDM Checklist Study

To determine parking reductions to the Town's parking requirements, The City of Kitchener "TDM Checklist", as part of their "Planning around Rapid Transit" (PARTS) program, was used. PARTS was created to assist in assessing whether developments are planned in such a manner to support the overall objectives of the Town to increase transit use and to reduce SOV travel.

Under the TDM Checklist, the development is eligible for a parking reduction of approximately 4.1% based on the mixed-use nature of the site for the commercial/ residential spaces. Additionally, the development is eligible for a parking reduction of approximately 12.5% based upon TDM initiatives.

Overall, the site is eligible for an approximate 16.6% reduction for the development, requiring a total of 811 parking spaces.

Appendix N contains the City of Kitchener PARTS TDM Checklist.



8 Parking Study

8.1 Proposed Parking Supply

The site's proposed total vehicle parking supply of 848 spaces is comprised of 796 structured spaces and 52 at grade spaces. The occupant and visitor parking supply is allocated as follows:

- ▶ Occupant parking – 686 spaces; and
- ▶ Visitor parking – 162 spaces.

Visitor parking is inclusive of all land uses (e.g., residential, and retail). Persons using visitor parking are assumed to live off site and are only visiting the site on a temporary basis (e.g., shopping, visiting friends, working, etc.).

8.2 Parking Demand Estimates

8.2.1 Zoning By-Law Requirements

The Comprehensive Zoning By-law 016-2014 (zoning by-law) parking requirements apply to the entire Town. The zoning by-law prescribes parking ratios for apartment buildings for occupants and visitors. The following parking ratios are noted:

- ▶ Mixed-Use Building - 1.25 spaces per dwelling unit; and
- ▶ The greater of 0.25 parking spaces per residential dwelling unit for visitor parking or 1.00 parking space per 25 m² of gross floor area for the non-residential component in a mixed-use building.

Table 8.1 summarizes the site's zoning by-law parking requirements for the current site concept plan. The site's zoning by-law parking requirement is calculated to be approximately 973 spaces (811 occupant spaces and 162 visitor spaces). The site's parking supply is considered deficient by 125 spaces.

TABLE 8.1: ZONING BY-LAW PARKING REQUIREMENT

Land Use (Units)	Space	Rate	Calculation
Mixed-Use Building (649 Units)	Occupant	1.25 per unit	811
	Visitor	0.25 per unit	162
Non-Residential (GFA m ²)	Visitor	1.00 per 25 m ²	82*
Total			973

*0.25 spaces per residential dwelling > Non-Residential requirement.

8.2.2 Parking Guidelines Comparison



There are numerous industry associations that are dedicated to the survey and review of parking requirements related to various land uses. These associations, such as the Institute of Transportation Engineers (ITE), collect, review, and publish information related to parking demand, supply, and appropriate design standards.

An accepted industry standard for the determination of potential parking demand is ITE's Parking Generation Manual¹³. ITE provides data on surveys across the USA and Canada of peak parking demand for different land uses.

ITE Parking Generation is regarded as a reliable source for measured parking demands when local data cannot be readily collected at similar land uses. The following land use codes were used:

- ▶ 222 – Multifamily Housing, High Rise (Bedrooms);
- ▶ 820 – Shopping Center (1,000 sq.ft. GFA).

The setting variable of being located within half a mile (\pm 800 m) of rail transit (when available) was also used to determine the parking demand.

Table 8.2 summarizes the estimated peak parking generation for the subject site. ITE data does not aggregate the parking generation data by occupant or visitor. The data is inclusive for both occupant and visitor parking demands.

The site's parking demand using the ITE methodology is estimated to be approximately 450 parking spaces. The site's parking demand is forecast to be less than the proposed supply.

TABLE 8.2: ITE PARKING GENERATION

Land Use Code	Units	Parking Requirement			
		Rate		Spaces	
		Min	Max	Min	Max
Parking Rates for Units					
222: Multifamily Housing (High-Rise)	649 Units	0.60	0.60	389	389
820: Shopping Center	21.9 1000 Sq. Ft.	1.45	2.76	32	61
	Total Spaces			421	450
Parking Rates for Beds					
222: Multifamily Housing (High-Rise)	1024 Beds	0.30	0.30	307	307
820: Shopping Center	21.9 1000 Sq. Ft.	1.45	2.76	32	61
	Total Spaces			339	368

Similar cities, such as the City of Kitchener (Kitchener), have developed parking rates¹⁴ and are also able to give insight into the parking requirements of the site. The setting variable of being located within an urban growth centre or a mixed-use zone was used to estimate the parking demand.

¹³ *Parking Generation: 4th Edition*, Institute of Transportation Engineers, 2010

¹⁴ *By-law Number 2019-051*, City of Kitchener, April 2019



Table 8.3 summarizes the estimated peak parking generation for the subject site.

The site's parking demand using the Kitchener rates is estimated to be approximately 643 parking spaces. The site's parking demand is forecast to be less than the proposed supply.

TABLE 8.3: CITY OF KITCHENER PARKING GENERATION

Land Use (Units)	Space	Rate	Calculation
Multiple Residential Buildings (649 Units)	Occupant	0.90 per unit	584
Multi-unit (GFA m ²)	Visitor	1.00 per 35 m ²	59
Total			643

8.3 Parking Reduction

Kitchener has developed a "PARTS TDM Checklist" as part of their Transportation Master Plan. This worksheet was created to assist in assessing whether developments are planned in such a manner to support the overall objectives of the City of Kitchener to increase transit use and to reduce Single Occupant Vehicle (SOV) travel.

With the TDM measures proposed, the site's potential parking reduction is calculated to be 16.6% of the parking requirement. The reduction in parking is related to:

- ▶ Pedestrian & Cyclist Orientation – 1% reduction
 - Development incorporates functional building entrances that are oriented to public space or to locations where pedestrians and transit users arrive from such as a street, square, park, or plaza.
- ▶ Parking – 0% reduction
 - 75% of parking or more is located underground or in a structure – 0% reduction but available for bonusing consideration.
- ▶ Trip Reduction Incentives – 10% reduction
 - The building owner/occupant agrees to charge for parking as a separate cost to occupants – 10% reduction.
- ▶ Non-residential use – 10% commercial reduction
 - Implements paid parking system (e.g., parking permits, paid parking near main entrances, enabled by gate and transponder access, or Pay & Display stations).

Further reductions can be included with the following TDM measures:



- ▶ Reduction of 1 space per 5 bicycle space beyond the minimum zoning requirement;
- ▶ Reduction of 4 (up to 8 maximum) car spaces for each car share vehicle and dedicated parking space provided for non-residential uses;
- ▶ Residential car share can offer reduction of 4 car spaces (up to 132 maximum) for each car share vehicle and dedicated space provided;
- ▶ Reduction of 3 car spaces (up to 11 maximum) for each ride share space provided for non-residential land uses; and
- ▶ Up to 10% car space reduction if building owner/occupant agrees to join local agencies that provides ride matching services, car pooling, and emergency ride home options for all employment land uses.

With the further TDM measures noted above, additional parking reduction could be achieved.

A 16.6% reduction to the staff supported City-Wide Parking Standards rates results in a parking demand of 811 spaces. With 848 spaces proposed the site's parking demand is estimated to be less than the proposed supply and can be accommodated by the site.

Appendix N contains the City of Kitchener TDM Checklist.

8.4 Summary

Using several different methodologies, the proposed development is estimated to have a parking demand in the order of 450 spaces to 973 spaces, depending upon the methodology used to forecast the demand. The proposed parking supply of 848 spaces is sufficient to accommodate the estimated demands.

The transition from an automobile-dependent environment to one that is transit-supportive will require strategies to assist in shifting mode choice and enabling the emergence of a pedestrian-friendly and transit-supportive environment through TDM measures.

To support the proposed parking supply, a shift in travel modes and vehicle ownership for residents plus the integration of TDM measures will be critical to the development's success.



9 Conclusions and Recommendations

9.1 Conclusions

The main findings and conclusions of this study are as follows:

Traffic Impact Study:

- ▶ **Existing Traffic Operations:** The study area intersections are currently operating at acceptable levels of service during the AM and PM peak hours. The following intersections are operating with localized congestion:
 - Ontario Street South and Laurier Avenue;
 - Ontario Street South and Derry Road; and
 - Regional Road 25 and Louis St. Laurent Avenue.
- ▶ **Site Generated Traffic:** The site is forecast to generate approximately 188 AM peak hour trips and approximately 286 PM peak hour trips. Comparing the trip generation estimate the site's existing trip generation (AM = 88 trips, PM = 272 trips) the development concept is anticipated to increase the site's AM peak hour trip generation by approximately 100 AM peak hour and 14 PM peak hour trips.
- ▶ **Background Traffic Operations:** The study area intersections are forecast to continue to operate at acceptable levels of service during the AM and PM peak hours. The following intersections are operating with localized congestion;
 - Ontario Street South and Laurier Avenue from year 2031;
 - Ontario Street South and Derry Road from year 2024;
 - Derry Road and South Driveway from year 2024;
 - Santa Maria Boulevard/Commercial Street and Derry Road from year 2024; and
 - Regional Road 25 and Louis St. Laurent Avenue from year 2024.
- ▶ **Future Total Traffic Operations:** The study area intersections are forecast to continue to operate at acceptable levels of service during the AM and PM peak hours. The following intersections are operating with localized congestion;
 - Ontario Street South and Laurier Avenue from year 2029;
 - Ontario Street South and Derry Road from year 2024;
 - Derry Road and South Driveway from year 2024;
 - Santa Maria Boulevard/Commercial Street and Derry Road from year 2024; and
 - Regional Road 25 and Louis St. Laurent Avenue from year 2024.



- ▶ **Remedial Measures:** The following remedial measures were evaluated to mitigate the forecast capacity issues based on the Total 2031 horizon:
 - Ontario Street South and Laurier Avenue: northbound, eastbound, and westbound left-turn signal timing phase;
 - Santa Maria Boulevard/Commercial Street and Derry Road: northbound and southbound left-turn signal timing phase; and
 - Derry Road and South Driveway: southbound left-turn lane.
- ▶ **Access, Circulation and Functional Design:** The site is designed to accommodate the intended design vehicles. No conflicts with the on-site geometry are identified.

Traffic Demand Management

- ▶ The site concept plan includes a robust TDM program that can assist in mitigating the site's transportation and parking impacts on the adjacent road network, promote a strong and vibrant economy, and create a livable community that has a balanced transportation network.

Parking Study

- ▶ The site's proposed parking supply is identified as 848 spaces (1.30 spaces per unit) allocated as 796 underground spaces and 52 visitor spaces.
- ▶ Based on the Town's Zoning By-law, the site requires 973 spaces (811 occupant spaces and 162 visitor/ commercial spaces).
- ▶ The ITE Parking Generation Manual indicates a parking demand of 450 spaces (389 occupant spaces and 61 commercial spaces).
- ▶ The City of Kitchener parking rates indicate a parking demand of 643 spaces (584 occupant spaces and 58 commercial spaces).
- ▶ The proposed TDM program is estimated to result in 16.6% reduction in parking generation. The forecast parking demand for the site is calculated to be 811 spaces, using the Town's zoning requirements.
- ▶ Using several different methodologies, the proposed development is estimated to have a parking demand in the order of 450 spaces to 811 spaces, depending upon the methodology used to forecast the demand. The proposed parking supply of 848 is expected to accommodate the site's forecast parking demand.



9.2 Recommendations

Based on the findings of this study, the following is recommended:

- ▶ The road authority monitor future traffic volumes along the Derry Road and Ontario Street South corridors and optimize the signal timings accordingly. The need for signal timing improvements at the study area intersections are noted to occur with or without the development of the subject site;
- ▶ The developer consider the addition of a southbound left-turn lane to the Derry Road and South Driveway intersection to improve operations; and
- ▶ The road authority consider adding protected permissive left-turn signal timing phases at the following locations:
 - Ontario Street South at Laurier Avenue – northbound, eastbound, and westbound left-turns; and
 - Santa Maria Boulevard/Commercial Street and Derry Road – northbound and southbound left-turns.



Appendix A

Pre-Study Consultation Materials



Adam Morrison

From: Michael.Turco@milton.ca
Sent: November 1, 2019 11:12 AM
To: Adam Morrison
Cc: Jill Juhlke
Subject: RE: (190237) 550 Ontario St S, RR 25, Milton - Pre-Study Consultation
Attachments: 624 King St W (8 units + commercail) - COK PARTS TDM Checklist_FOR PROPONENTS.xlsm

Hello Adam,

Please see my comments below in **green**:

If you haven't already, please circulate the terms of reference to Halton Region for their comments as well. Derry Road and Regional Road 25 fall under the Region's jurisdiction.

Should you have any questions, please feel free to contact me.

Thank you,



Michael Turco, C.E.T., MITE
Transportation Planning Technologist
150 Mary Street, Milton ON,
905-878-7252 x2363
www.milton.ca

Confidentiality notice: This message and any attachments are intended only for the recipient named above. This message may contain confidential or personal information that may be subject to the Municipal Freedom of Information Act and must not be distributed or disclosed to unauthorized persons. If you received this message in error, please notify the sender immediately. Thank you for your assistance.

From: Adam Morrison <amorrison@ptsl.com>
Sent: Monday, October 21, 2019 3:09 PM
To: Michael Turco <Michael.Turco@milton.ca>
Cc: Jill Juhlke <jjuhlke@ptsl.com>
Subject: (190237) 550 Ontario St S, RR 25, Milton - Pre-Study Consultation

Hello Michael,

Paradigm is undertaking a Transportation Impact Study, Parking Study and Access and Circulation Review for the proposed development on the northwest corner of the intersection of Regional Road 25/Ontario Street South and Derry Road West, Milton, Ontario.

Could you please confirm information on the following below.

We have attached the proposed Site Plan for:

- 696 residential units (within a 28 and 30-story tower);
- 1,179 parking spaces; and
- 40,634 ft² of commercial space.

We would like to scope and confirm the following for the proposed TIS:

- Study area:
 - In assessing the transportation impacts, we intend to analyze the operation of:
 - Regional Road 25/Ontario Street South and Derry Road West (signalized);
 - Ontario Street South and Laurier Avenue (signalized);
 - Regional Road 25 and Louis Saint Laurent Avenue (signalized);
 - Derry Road West and Santa Maria Boulevard (signalized); and
 - Up to two (2) site driveways.
- Approved developments in the area – Residential Development in the southeast corner of Regional Road 25/Ontario Street South and Derry Road West (TIS by GHD) (labelled in the attached “Aerial Photo – Sep 6” PDF) **The following background developments should also be included:**
 - Briarwood Residential Development (SE corner of RR25/Derry) - 585 apartment condo units and 58 townhouse condo units. TIS completed by GHD in May 2019
 - 405-475 Ontario Street – Proposed 151 Townhouse units. TIS completed by Paradigm in 2013.
 - 610 Farmstead Drive– 6 Storey, 170 condominium unit building. TIS completed by Paradigm in 2016
 - 7480 Derry Road – 6 Storey, 160 condominium unit building. TIS completed by GHD in December 2018
 - Bronte West Condominium Residences (near SW corner of Derry/Bronte) – 6 Storey 132 unit condominium building. TIS completed by WSP in January 2019
 - Boyne Secondary Plan Survey Area – the Boyne Road Network Assessment was completed by GHD Sept 2017
- Approved transportation improvements – **Please confirm if any**
- Horizon years:
 - 5-years from the date of the study is commissioned (2024)
- Growth rate – **2% per annum** - please confirm **Please confirm growth rates with Halton Region.**
- Analysis:
 - Use of the Synchro 9 software for LOS, v/c, delay and queue length
 - Please be advised that a PHF of 1.0 should be used to simulate a flat hourly peak for the future background/total scenarios.
- Peak Hours Observed:
 - Weekday AM and PM peak hours.
- Trip Reductions – **Please confirm if any. No modal split trip reductions are to be applied.**
 - ITE rates for residential high-rise and shopping center (LUC 222 and LUC 820). LUC 820 is not a good representation of ground floor commercial trip generation. Proxy data at similar high density mixed-use surrogate sites within Halton Region should be used instead (minimum 2-3 sites). The report must outline the similarities between the proxy site(s) and the proposed site and why they will generate a similar traffic demand. The selection and justification of the survey sites is the responsibility of the consultant

Study Methodology for the Parking Justification section:

- Review the estimated parking demand from ITE Parking Generation Manual, 5th Edition
- Review 2016 TTS Data to determine Auto-Ownership, etc.
- Comparison of the Town’s ZBL parking requirement rates vs other similar municipalities
- A comprehensive TDM plan using the City of Kitchener’s TDM Checklist (see attached). **Through the proposed TDM checklist measures, it must be ensured that the resultant parking requirement in Table C is less than or equal to the proposed parking supply.** All proposed TDM measures must be included in the recommendation section of the report.

Additional scope that must be included in the report:

- Review queueing at each intersection, highlighting where 95th percentile queues are anticipated to exceed available storage space, and determine mitigation measures.
- Site Access Review
- Traffic Signage and Pavement Marking Plan
- Truck Access & Circulation (AutoTURN Swept Path Analysis)
- Review Internal Site Circulation
- Detailed Recommendations regarding on-site/off-site roadway improvements, site access, site circulation, and TDM measures should be made.

Please respond with any information you have available and all comments on the current assumptions made. Additionally, please include **signal timings** for all the listed signalized intersections. **The only signalized study area intersection under the Town's jurisdiction is Ontario Street & Laurier Avenue. A separate email will be sent to you regarding obtaining this signal timing plan.**

Thank you,

Adam Morrison, EIT, MASc

Transportation Consultant



Paradigm Transportation Solutions Limited

150 Pinebush Road, Unit 5A, Cambridge ON N1R 8J2

p: 519.896.3163 x208

e: amorrison@ptsl.com

w: www.ptsl.com

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RECORD OF PRE-SUBMISSION CONSULTATION

Town of Milton
Engineering Services, 2nd Floor
150 Mary Street
Milton, Ontario L9T 6Z5
FAX: 905-876-5029

Transportation Planning Comment – 550 Derry Rd – Mixed-Use Development

Comments Provided By: Michael Turco (905-878-7252 ext. 2363)

Likely Conditions for Approval

1. A Transportation Impact Study and Parking Justification Study are required. The scope of work is to be circulated to the undersigned for approval prior to commencing the studies. PDF's as well as hard copies are to be provided.
2. An intersection road widening in accordance to Town of Milton Standard. No. E-14 (attached) of the Town of Milton Engineering and Parks Standards Manual is required at the intersection of Ontario Street / Regional Road 25 & Derry Road, along the Ontario Street frontage only.
3. 5.0m x 5.0m driveway visibility triangles shall be noted on the plan. The 5.0 metre driveway visibility triangles are to be located on both sides of driveways projected from where the property line meets the driveway. Nothing over 0.6m is permitted within the visibility triangles.
4. As part of a complete application, ensure that truck traffic (garbage/loading) can enter/exit the site in a forward motion and access to the garbage and loading areas are functional. On separate plans, illustrate truck turning movements with one continuous path with AutoTURN and insert the design vehicles on the plan. The site must be able to accommodate the largest design vehicles which will be accessing the property. Please ensure that the design vehicles can enter/exit the site driveway without encroaching opposing travel lanes. Furthermore, the Ontario Street site access must be designed in accordance to Town of Milton Standard No. E-43 and will be limited to right-in, right-out movements only via an existing raised concrete centre median on Ontario Street.
5. Significant consideration must be given to pedestrian circulation. Safe, convenient, and accessible pedestrian connections throughout the parking areas and from the building entrances to the municipal sidewalk/paths are to be provided. A wide sidewalk should be provided along the Ontario Street frontage with pedestrian/cyclist amenities.
6. Traffic signage and pavement markings are to be noted on the plan. Please refer to the Ontario Traffic Manual regarding the type and location of signs and pavement markings (at site plan stage).

7. Guidelines for the underground parking garage include:

- a. Providing a 30cm increase in parking stall width for each obstructed side of parking stalls which are limited on one or both sides by a wall or column;
- b. Providing a minimum aisle width of 6.0m, two-way ramp width of 6.1m, and two-way curved ramp width of 9.1m;
- c. Setting structural columns back 0.5m on both sides of the drive aisle to provide a 7.0m clear aisle width;
- d. Maximum ramp grade should be 12% with appropriate transition grades (must be ½ of the ramp grade for a minimum distance of 3.66m centred on the transition point, to a maximum of 6%);
- e. Convex mirrors should be applied at ramps where opposing motorists cannot readily view each other; and
- f. Providing secure bicycle storage rooms that are sheltered and have limited (protected) access.
- g. Parking stalls shall not be situated perpendicular to each other
- h. For maneuverability in a dead-end aisle, either a back-up space (e.g. hammerhead) at the end of the row, having a depth of 1.2m to 2.4m, or a wider parking space (min. 3.3m) should be provided.

Transportation Documents Required

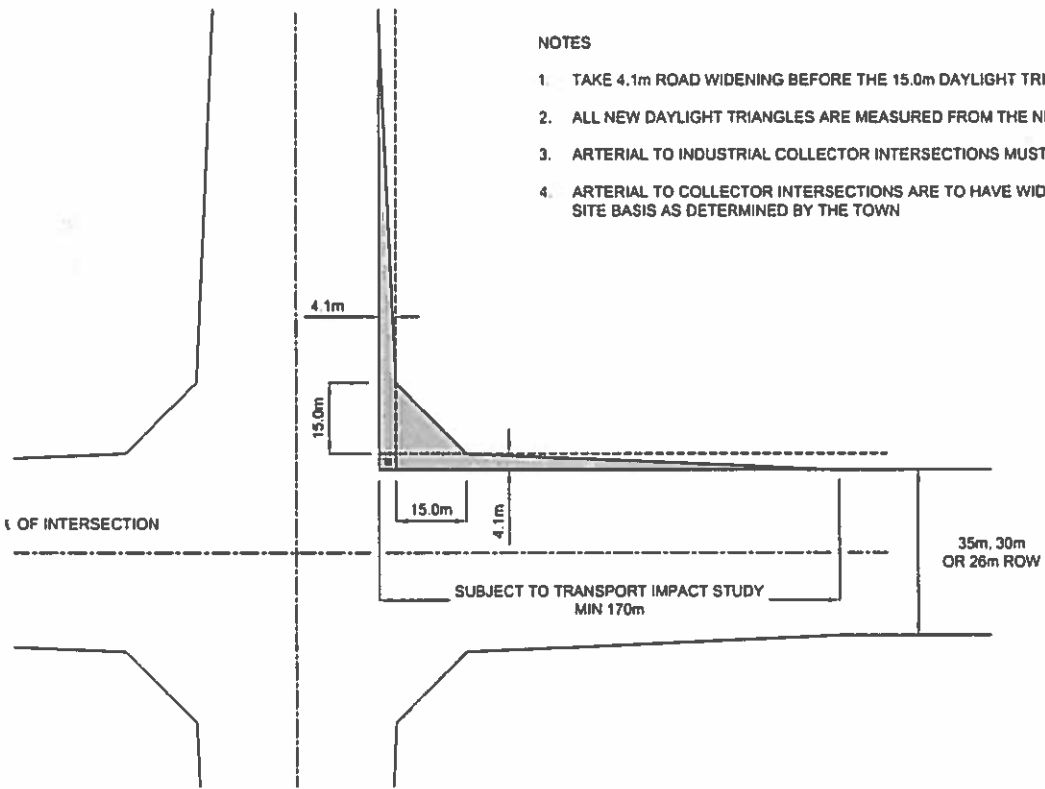
- Transportation Impact Study
- Parking Justification Study
- Traffic Signage & Pavement Marking Plan (at site plan stage)
- Truck Access & Circulation (Auto-Turn Swept Path Analysis)

If you have any questions, please do not hesitate to contact me.

Michael Turco, C.E.T., MITE
Transportation Planning Technologist

NOTES

1. TAKE 4.1m ROAD WIDENING BEFORE THE 15.0m DAYLIGHT TRIANGLE
2. ALL NEW DAYLIGHT TRIANGLES ARE MEASURED FROM THE NEW PROJECTED PROPERTY LINES
3. ARTERIAL TO INDUSTRIAL COLLECTOR INTERSECTIONS MUST HAVE TURNING LANE WIDENINGS
4. ARTERIAL TO COLLECTOR INTERSECTIONS ARE TO HAVE WIDENINGS DETERMINED ON A SITE BY SITE BASIS AS DETERMINED BY THE TOWN



TOWN OF MILTON

INTERSECTION WIDENINGS FOR ARTERIAL (30m & 35m) & COLLECTOR ROADS (25m)

SCALE: N.T.S.

DATE: JUNE 2018

STD. NO E-14



Stirling Todd

From: Michael Turco
Sent: Tuesday, July 30, 2019 9:37 AM
To: Stirling Todd
Subject: FW: 550 Derry Rd - Transportation Pre-Consultation Comments
Attachments: Record of Pre-Submission Consultation - 550 Derry Rd.pdf; Std. No. E-14.pdf

Also, FYI, Milton's T.M.P. preferred alternative (2A) recommends converting two existing curbside lanes on Ontario Street into H.O.V. Lanes in the future. Halton Region's T.M.P. has identified Regional Road 25 / Bronte Road / Ontario Street (Bronte GO Station to Steeles Avenue) as a future Transit Priority Corridor with transit vehicles operating on a 'semi-exclusive/exclusive right-of-way'.

Regards,



Michael Turco, C.E.T., MITE
Transportation Planning Technologist
150 Mary Street, Milton ON,
905-878-7252 x2363
www.milton.ca

From: Michael Turco
Sent: Tuesday, July 30, 2019 9:34 AM
To: Stirling Todd <Stirling.Todd@milton.ca>
Subject: 550 Derry Rd - Transportation Pre-Consultation Comments

Hi Stirling,

Please see attached Transportation pre-consultation comments for the proposed development at 550 Derry Rd. Please circulate the comments to the applicant as I will not be attending the meeting.

Thank you,

Appendix B

Turning Movement Count Data





Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Derry Road & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 1

Turning Movement Data

Start Time	Derry Road Eastbound					Derry Road Westbound					Site Driveway Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	0	403	0	0	403	130	3	0	0	133	0	3	0	1	3	539
7:15 AM	0	375	0	0	375	161	3	1	0	165	0	2	0	2	2	542
7:30 AM	0	400	0	0	400	169	1	0	0	170	0	4	0	0	4	574
7:45 AM	2	399	0	0	401	228	4	0	0	232	0	2	0	3	2	635
Hourly Total	2	1577	0	0	1579	688	11	1	0	700	0	11	0	6	11	2290
8:00 AM	0	369	0	0	369	222	3	0	0	225	1	5	0	2	6	600
8:15 AM	2	354	0	0	356	222	6	0	0	228	1	3	0	0	4	588
8:30 AM	5	359	0	0	364	203	6	0	0	209	1	3	0	1	4	577
8:45 AM	13	382	0	0	395	238	12	0	0	250	0	11	0	4	11	656
Hourly Total	20	1464	0	0	1484	885	27	0	0	912	3	22	0	7	25	2421
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	5	196	1	0	202	181	10	0	0	191	5	7	0	0	12	405
11:15 AM	5	209	1	0	215	176	5	0	0	181	4	9	0	0	13	409
11:30 AM	4	224	0	0	228	167	6	0	0	173	5	8	0	2	13	414
11:45 AM	9	197	0	0	206	188	11	0	0	199	7	15	0	0	22	427
Hourly Total	23	826	2	0	851	712	32	0	0	744	21	39	0	2	60	1655
12:00 PM	17	251	2	0	270	163	18	0	0	181	13	24	0	3	37	488
12:15 PM	23	217	0	1	240	193	19	0	0	212	8	10	0	4	18	470
12:30 PM	15	232	0	0	247	195	14	1	0	210	7	11	0	3	18	475
12:45 PM	14	232	0	0	246	196	8	0	0	204	2	11	0	1	13	463
Hourly Total	69	932	2	1	1003	747	59	1	0	807	30	56	0	11	86	1896
1:00 PM	6	220	1	0	227	214	17	0	0	231	11	12	0	0	23	481
1:15 PM	6	206	0	0	212	183	10	2	0	195	8	34	0	3	42	449
1:30 PM	5	186	1	0	192	196	6	0	0	202	5	11	0	1	16	410
1:45 PM	4	209	0	0	213	176	7	0	0	183	1	14	0	2	15	411
Hourly Total	21	821	2	0	844	769	40	2	0	811	25	71	0	6	96	1751
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	4	260	0	0	264	276	13	0	0	289	4	17	0	0	21	574
3:15 PM	8	279	0	0	287	309	10	0	0	319	3	13	0	2	16	622
3:30 PM	10	292	0	0	302	332	12	0	0	344	3	20	0	0	23	669
3:45 PM	11	259	0	0	270	342	13	0	0	355	2	14	0	5	16	641
Hourly Total	33	1090	0	0	1123	1259	48	0	0	1307	12	64	0	7	76	2506
4:00 PM	10	302	0	0	312	364	7	0	0	371	5	23	0	0	28	711
4:15 PM	2	277	0	0	279	343	6	0	0	349	2	18	0	1	20	648
4:30 PM	5	317	0	0	322	386	11	0	0	397	1	17	0	2	18	737
4:45 PM	7	284	0	0	291	353	10	0	0	363	3	19	0	0	22	676

Hourly Total	24	1180	0	0	1204	1446	34	0	0	1480	11	77	0	3	88	2772
5:00 PM	15	278	0	0	293	376	18	0	0	394	3	16	0	0	19	706
5:15 PM	6	271	0	0	277	363	15	0	0	378	6	32	0	0	38	693
5:30 PM	6	290	1	0	297	372	7	0	0	379	3	15	0	0	18	694
5:45 PM	12	278	0	0	290	361	11	0	0	372	0	10	0	0	10	672
Hourly Total	39	1117	1	0	1157	1472	51	0	0	1523	12	73	0	0	85	2765
Grand Total	231	9007	7	1	9245	7978	302	4	0	8284	114	413	0	42	527	18056
Approach %	2.5	97.4	0.1	-	-	96.3	3.6	0.0	-	-	21.6	78.4	0.0	-	-	-
Total %	1.3	49.9	0.0	-	51.2	44.2	1.7	0.0	-	45.9	0.6	2.3	0.0	-	2.9	-
Lights	230	8756	7	-	8993	7707	299	4	-	8010	111	406	0	-	517	17520
% Lights	99.6	97.2	100.0	-	97.3	96.6	99.0	100.0	-	96.7	97.4	98.3	-	-	98.1	97.0
Mediums	1	232	0	-	233	238	2	0	-	240	3	7	0	-	10	483
% Mediums	0.4	2.6	0.0	-	2.5	3.0	0.7	0.0	-	2.9	2.6	1.7	-	-	1.9	2.7
Articulated Trucks	0	19	0	-	19	33	1	0	-	34	0	0	0	-	0	53
% Articulated Trucks	0.0	0.2	0.0	-	0.2	0.4	0.3	0.0	-	0.4	0.0	0.0	-	-	0.0	0.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	7	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	16.7	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	35	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	83.3	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsI.com

Count Name: Derry Road & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 4

Turning Movement Peak Hour Data (8:00 AM)

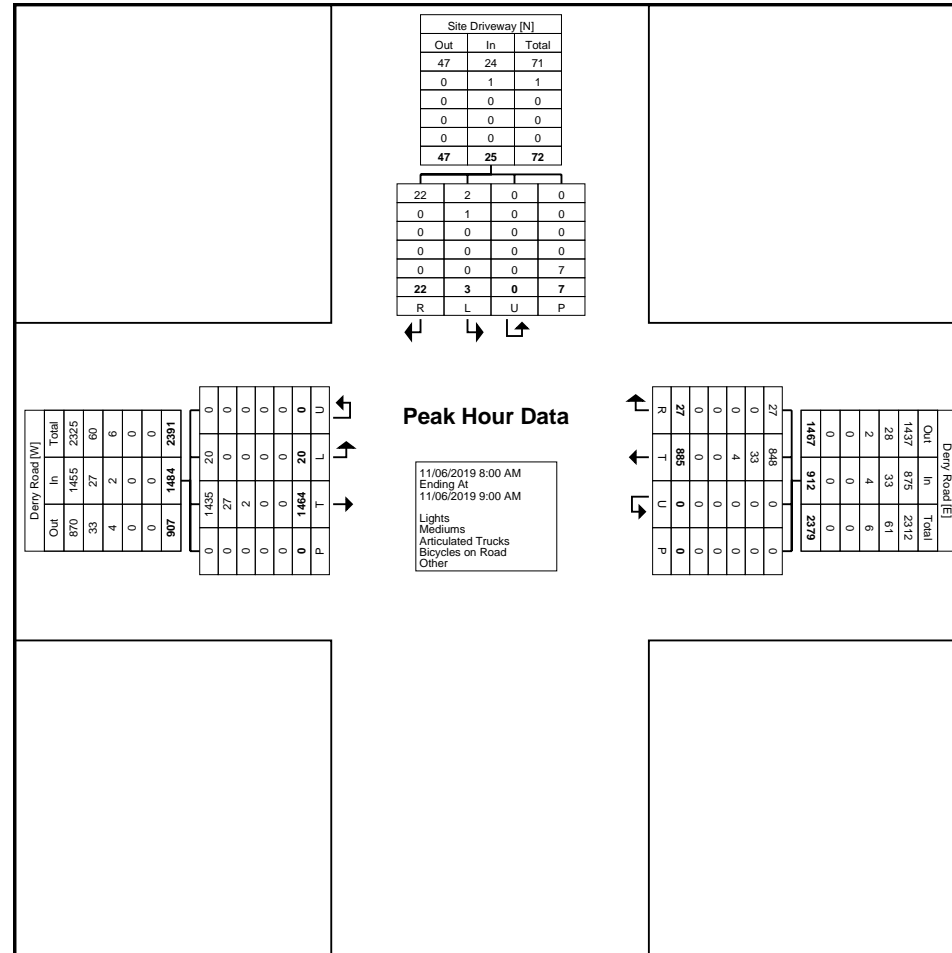
Start Time	Derry Road Eastbound					Derry Road Westbound					Site Driveway Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
8:00 AM	0	369	0	0	369	222	3	0	0	225	1	5	0	2	6	600
8:15 AM	2	354	0	0	356	222	6	0	0	228	1	3	0	0	4	588
8:30 AM	5	359	0	0	364	203	6	0	0	209	1	3	0	1	4	577
8:45 AM	13	382	0	0	395	238	12	0	0	250	0	11	0	4	11	656
Total	20	1464	0	0	1484	885	27	0	0	912	3	22	0	7	25	2421
Approach %	1.3	98.7	0.0	-	-	97.0	3.0	0.0	-	-	12.0	88.0	0.0	-	-	-
Total %	0.8	60.5	0.0	-	61.3	36.6	1.1	0.0	-	37.7	0.1	0.9	0.0	-	1.0	-
PHF	0.385	0.958	0.000	-	0.939	0.930	0.563	0.000	-	0.912	0.750	0.500	0.000	-	0.568	0.923
Lights	20	1435	0	-	1455	848	27	0	-	875	2	22	0	-	24	2354
% Lights	100.0	98.0	-	-	98.0	95.8	100.0	-	-	95.9	66.7	100.0	-	-	96.0	97.2
Mediums	0	27	0	-	27	33	0	0	-	33	1	0	0	-	1	61
% Mediums	0.0	1.8	-	-	1.8	3.7	0.0	-	-	3.6	33.3	0.0	-	-	4.0	2.5
Articulated Trucks	0	2	0	-	2	4	0	0	-	4	0	0	0	-	0	6
% Articulated Trucks	0.0	0.1	-	-	0.1	0.5	0.0	-	-	0.4	0.0	0.0	-	-	0.0	0.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	3	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	42.9	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	57.1	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts.com

Count Name: Derry Road & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 5



Turning Movement Peak Hour Data Plot (8:00 AM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsI.com

Count Name: Derry Road & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 6

Turning Movement Peak Hour Data (12:00 PM)

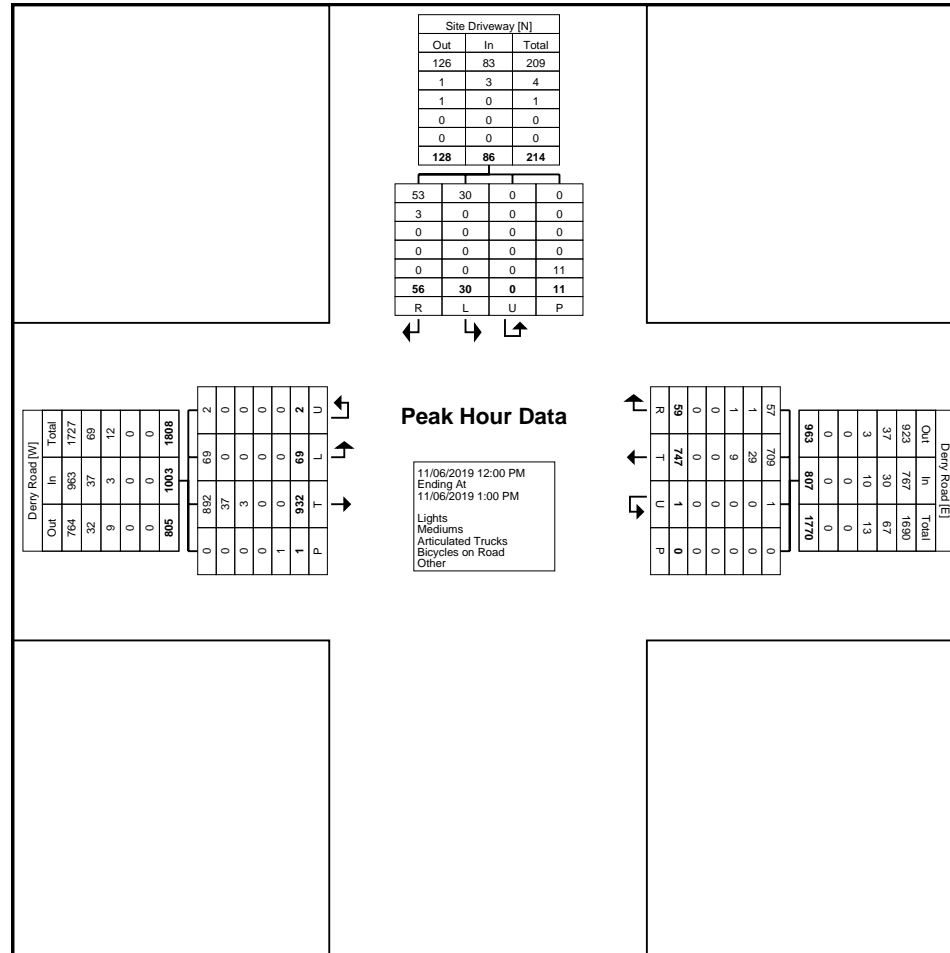
Start Time	Derry Road Eastbound					Derry Road Westbound					Site Driveway Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
12:00 PM	17	251	2	0	270	163	18	0	0	181	13	24	0	3	37	488
12:15 PM	23	217	0	1	240	193	19	0	0	212	8	10	0	4	18	470
12:30 PM	15	232	0	0	247	195	14	1	0	210	7	11	0	3	18	475
12:45 PM	14	232	0	0	246	196	8	0	0	204	2	11	0	1	13	463
Total	69	932	2	1	1003	747	59	1	0	807	30	56	0	11	86	1896
Approach %	6.9	92.9	0.2	-	-	92.6	7.3	0.1	-	-	34.9	65.1	0.0	-	-	-
Total %	3.6	49.2	0.1	-	52.9	39.4	3.1	0.1	-	42.6	1.6	3.0	0.0	-	4.5	-
PHF	0.750	0.928	0.250	-	0.929	0.953	0.776	0.250	-	0.952	0.577	0.583	0.000	-	0.581	0.971
Lights	69	892	2	-	963	709	57	1	-	767	30	53	0	-	83	1813
% Lights	100.0	95.7	100.0	-	96.0	94.9	96.6	100.0	-	95.0	100.0	94.6	-	-	96.5	95.6
Mediums	0	37	0	-	37	29	1	0	-	30	0	3	0	-	3	70
% Mediums	0.0	4.0	0.0	-	3.7	3.9	1.7	0.0	-	3.7	0.0	5.4	-	-	3.5	3.7
Articulated Trucks	0	3	0	-	3	9	1	0	-	10	0	0	0	-	0	13
% Articulated Trucks	0.0	0.3	0.0	-	0.3	1.2	1.7	0.0	-	1.2	0.0	0.0	-	-	0.0	0.7
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	4	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	36.4	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	7	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	63.6	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Derry Road & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 7



Turning Movement Peak Hour Data Plot (12:00 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts.com

Count Name: Derry Road & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 8

Turning Movement Peak Hour Data (4:30 PM)

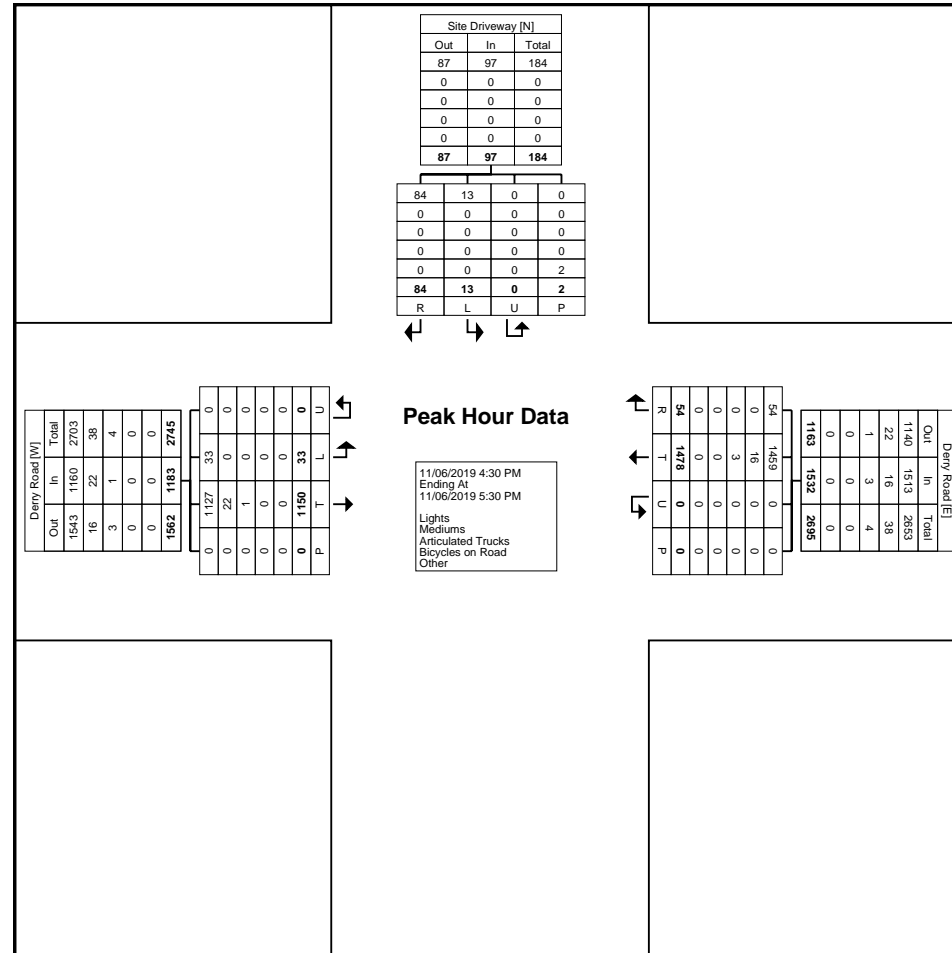
Start Time	Derry Road Eastbound					Derry Road Westbound					Site Driveway Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
4:30 PM	5	317	0	0	322	386	11	0	0	397	1	17	0	2	18	737
4:45 PM	7	284	0	0	291	353	10	0	0	363	3	19	0	0	22	676
5:00 PM	15	278	0	0	293	376	18	0	0	394	3	16	0	0	19	706
5:15 PM	6	271	0	0	277	363	15	0	0	378	6	32	0	0	38	693
Total	33	1150	0	0	1183	1478	54	0	0	1532	13	84	0	2	97	2812
Approach %	2.8	97.2	0.0	-	-	96.5	3.5	0.0	-	-	13.4	86.6	0.0	-	-	-
Total %	1.2	40.9	0.0	-	42.1	52.6	1.9	0.0	-	54.5	0.5	3.0	0.0	-	3.4	-
PHF	0.550	0.907	0.000	-	0.918	0.957	0.750	0.000	-	0.965	0.542	0.656	0.000	-	0.638	0.954
Lights	33	1127	0	-	1160	1459	54	0	-	1513	13	84	0	-	97	2770
% Lights	100.0	98.0	-	-	98.1	98.7	100.0	-	-	98.8	100.0	100.0	-	-	100.0	98.5
Mediums	0	22	0	-	22	16	0	0	-	16	0	0	0	-	0	38
% Mediums	0.0	1.9	-	-	1.9	1.1	0.0	-	-	1.0	0.0	0.0	-	-	0.0	1.4
Articulated Trucks	0	1	0	-	1	3	0	0	-	3	0	0	0	-	0	4
% Articulated Trucks	0.0	0.1	-	-	0.1	0.2	0.0	-	-	0.2	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Derry Road & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 9



Turning Movement Peak Hour Data Plot (4:30 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Derry Road & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 10



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsI.com

Count Name: Derry Road West & Santa Maria Blvd
Site Code:
Start Date: 11/06/2019
Page No: 1

Turning Movement Data

Start Time	Derry Road Eastbound						Derry Road Westbound						Santa Maria Blvd Northbound						Santa Maria Blvd Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	23	361	4	0	1	388	22	96	9	0	0	127	6	4	38	0	1	48	16	13	4	0	0	33	596
7:15 AM	18	300	6	0	0	324	22	105	7	0	1	134	6	17	42	0	1	65	19	10	4	0	0	33	556
7:30 AM	38	357	7	0	5	402	31	147	17	0	1	195	21	26	58	0	4	105	21	7	13	0	0	41	743
7:45 AM	31	300	8	0	2	339	30	153	27	0	2	210	15	25	56	0	0	96	32	22	12	0	0	66	711
Hourly Total	110	1318	25	0	8	1453	105	501	60	0	4	666	48	72	194	0	6	314	88	52	33	0	0	173	2606
8:00 AM	29	315	14	0	0	358	28	171	28	0	0	227	12	27	46	0	0	85	24	21	24	0	4	69	739
8:15 AM	24	293	8	0	1	325	29	161	13	0	0	203	11	21	35	0	1	67	21	29	18	0	1	68	663
8:30 AM	29	323	9	1	0	362	30	169	22	0	0	221	15	20	44	0	0	79	17	22	18	0	2	57	719
8:45 AM	20	281	15	0	1	316	31	158	24	1	0	214	10	17	52	0	0	79	30	44	24	0	3	98	707
Hourly Total	102	1212	46	1	2	1361	118	659	87	1	0	865	48	85	177	0	1	310	92	116	84	0	10	292	2828
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	9	165	10	0	23	184	28	154	9	0	1	191	18	13	37	0	2	68	11	19	12	0	2	42	485
11:15 AM	22	173	10	0	8	205	31	145	12	0	4	188	12	8	31	0	1	51	10	11	10	0	1	31	475
11:30 AM	12	172	13	1	10	198	30	133	16	0	0	179	21	16	51	0	1	88	15	19	13	0	2	47	512
11:45 AM	18	164	14	0	19	196	37	137	12	0	1	186	26	17	40	0	0	83	11	19	10	0	1	40	505
Hourly Total	61	674	47	1	60	783	126	569	49	0	6	744	77	54	159	0	4	290	47	68	45	0	6	160	1977
12:00 PM	17	193	11	2	11	223	39	125	19	0	1	183	33	24	64	0	1	121	18	18	11	0	0	47	574
12:15 PM	16	183	17	0	77	216	42	149	21	0	1	212	38	22	49	0	0	109	12	26	9	0	2	47	584
12:30 PM	15	194	7	0	35	216	37	150	13	0	2	200	17	15	53	0	2	85	15	19	9	0	0	43	544
12:45 PM	22	202	3	0	33	227	42	152	12	0	0	206	24	19	36	0	1	79	6	24	8	0	0	38	550
Hourly Total	70	772	38	2	156	882	160	576	65	0	4	801	112	80	202	0	4	394	51	87	37	0	2	175	2252
1:00 PM	13	175	10	1	76	199	35	166	18	0	3	219	19	20	23	0	2	62	21	26	12	0	1	59	539
1:15 PM	25	170	11	0	10	206	41	142	24	0	1	207	14	15	39	0	0	68	15	22	13	0	0	50	531
1:30 PM	13	140	5	0	4	158	38	155	18	0	1	211	32	16	21	0	0	69	17	19	11	0	1	47	485
1:45 PM	16	181	1	0	2	198	32	149	16	0	0	197	18	10	35	0	0	63	9	17	12	0	0	38	496
Hourly Total	67	666	27	1	92	761	146	612	76	0	5	834	83	61	118	0	2	262	62	84	48	0	2	194	2051
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	26	223	8	0	13	257	37	217	28	1	0	283	13	17	35	0	5	65	17	17	25	0	1	59	664
3:15 PM	12	251	12	0	8	275	42	235	32	0	2	309	20	16	29	0	3	65	32	20	27	0	2	79	728
3:30 PM	16	253	18	1	20	288	38	278	21	0	1	337	8	10	33	0	12	51	23	28	37	0	3	88	764
3:45 PM	18	213	17	0	6	248	56	274	25	0	1	355	18	19	44	0	0	81	23	26	25	0	4	74	758
Hourly Total	72	940	55	1	47	1068	173	1004	106	1	4	1284	59	62	141	0	20	262	95	91	114	0	10	300	2914
4:00 PM	17	250	22	0	1	289	45	308	23	0	2	376	23	14	45	0	2	82	23	28	22	0	0	73	820
4:15 PM	21	197	18	0	4	236	50	281	23	0	6	354	32	18	50	0	0	100	16	32	31	0	1	79	769
4:30 PM	13	259	27	0	3	299	67	290	29	0	4	386	28	24	63	0	7	115	17	46	25	0	4	88	888

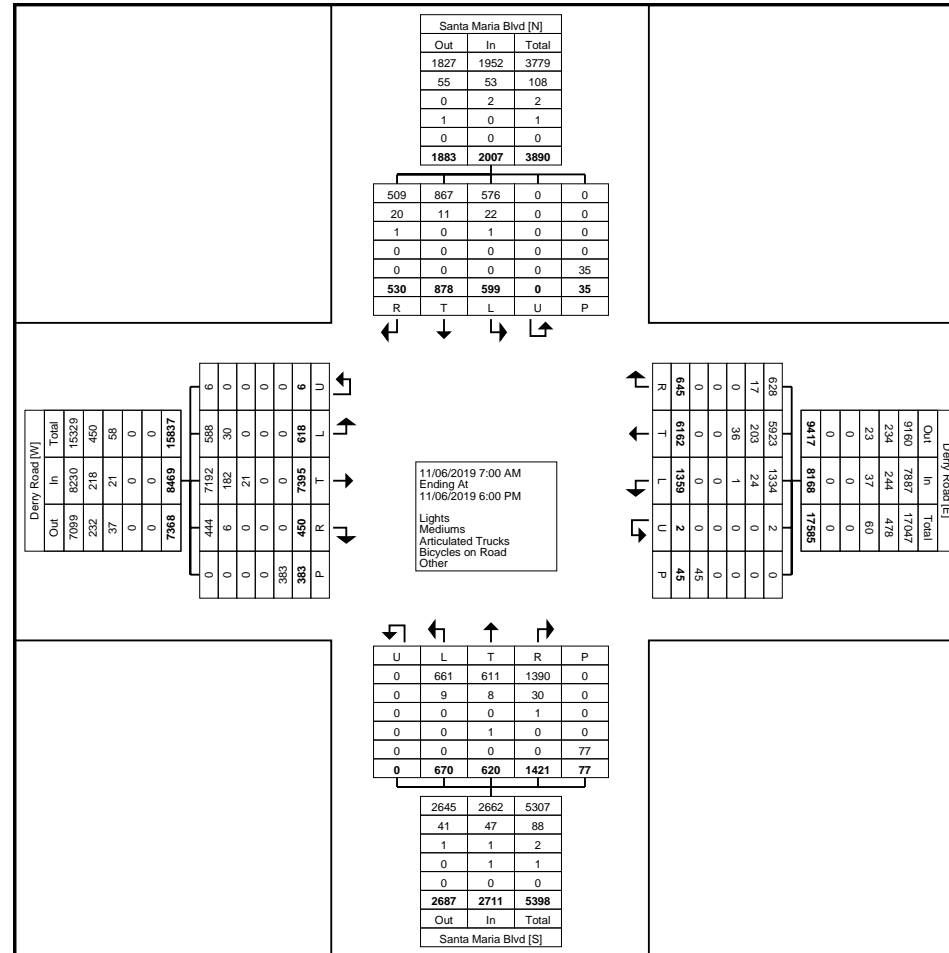
4:45 PM	21	207	23	0	1	251	74	279	22	0	4	375	29	31	38	0	10	98	31	52	24	0	0	107	831
Hourly Total	72	913	90	0	9	1075	236	1158	97	0	16	1491	112	87	196	0	19	395	87	158	102	0	5	347	3308
5:00 PM	15	256	23	0	6	294	67	284	26	0	4	377	27	19	48	0	4	94	22	50	23	0	0	95	860
5:15 PM	15	206	37	0	1	258	70	282	26	0	1	378	37	26	34	0	4	97	25	66	12	0	0	103	836
5:30 PM	12	235	31	0	1	278	78	275	23	0	0	376	42	41	78	0	9	161	14	53	16	0	0	83	898
5:45 PM	22	203	31	0	1	256	80	242	30	0	1	352	25	33	74	0	4	132	16	53	16	0	0	85	825
Hourly Total	64	900	122	0	9	1086	295	1083	105	0	6	1483	131	119	234	0	21	484	77	222	67	0	0	366	3419
Grand Total	618	7395	450	6	383	8469	1359	6162	645	2	45	8168	670	620	1421	0	77	2711	599	878	530	0	35	2007	21355
Approach %	7.3	87.3	5.3	0.1	-	-	16.6	75.4	7.9	0.0	-	-	24.7	22.9	52.4	0.0	-	-	29.8	43.7	26.4	0.0	-	-	-
Total %	2.9	34.6	2.1	0.0	-	39.7	6.4	28.9	3.0	0.0	-	38.2	3.1	2.9	6.7	0.0	-	12.7	2.8	4.1	2.5	0.0	-	9.4	-
Lights	588	7192	444	6	-	8230	1334	5923	628	2	-	7887	661	611	1390	0	-	2662	576	867	509	0	-	1952	20731
% Lights	95.1	97.3	98.7	100.0	-	97.2	98.2	96.1	97.4	100.0	-	96.6	98.7	98.5	97.8	-	-	98.2	96.2	98.7	96.0	-	-	97.3	97.1
Mediums	30	182	6	0	-	218	24	203	17	0	-	244	9	8	30	0	-	47	22	11	20	0	-	53	562
% Mediums	4.9	2.5	1.3	0.0	-	2.6	1.8	3.3	2.6	0.0	-	3.0	1.3	1.3	2.1	-	-	1.7	3.7	1.3	3.8	-	-	2.6	2.6
Articulated Trucks	0	21	0	0	-	21	1	36	0	0	-	37	0	0	1	0	-	1	1	0	1	0	-	2	61
% Articulated Trucks	0.0	0.3	0.0	0.0	-	0.2	0.1	0.6	0.0	0.0	-	0.5	0.0	0.0	0.1	-	-	0.0	0.2	0.0	0.2	-	-	0.1	0.3
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.2	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	6	-	-	-	-	-	6	-	-	-	-	-	2	-	-	-	-	-	2	-	-
% Bicycles on Crosswalk	-	-	-	-	1.6	-	-	-	-	-	13.3	-	-	-	-	-	2.6	-	-	-	-	-	5.7	-	-
Pedestrians	-	-	-	-	377	-	-	-	-	-	39	-	-	-	-	-	75	-	-	-	-	-	33	-	-
% Pedestrians	-	-	-	-	98.4	-	-	-	-	-	86.7	-	-	-	-	-	97.4	-	-	-	-	-	94.3	-	-



Paradigm Transportation Solutions Limited
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Count Name: Derry Road West & Santa Maria Blvd
Site Code:
Start Date: 11/06/2019
Page No: 3





Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Derry Road West & Santa Maria Blvd
Site Code:
Start Date: 11/06/2019
Page No: 4

Turning Movement Peak Hour Data (7:30 AM)

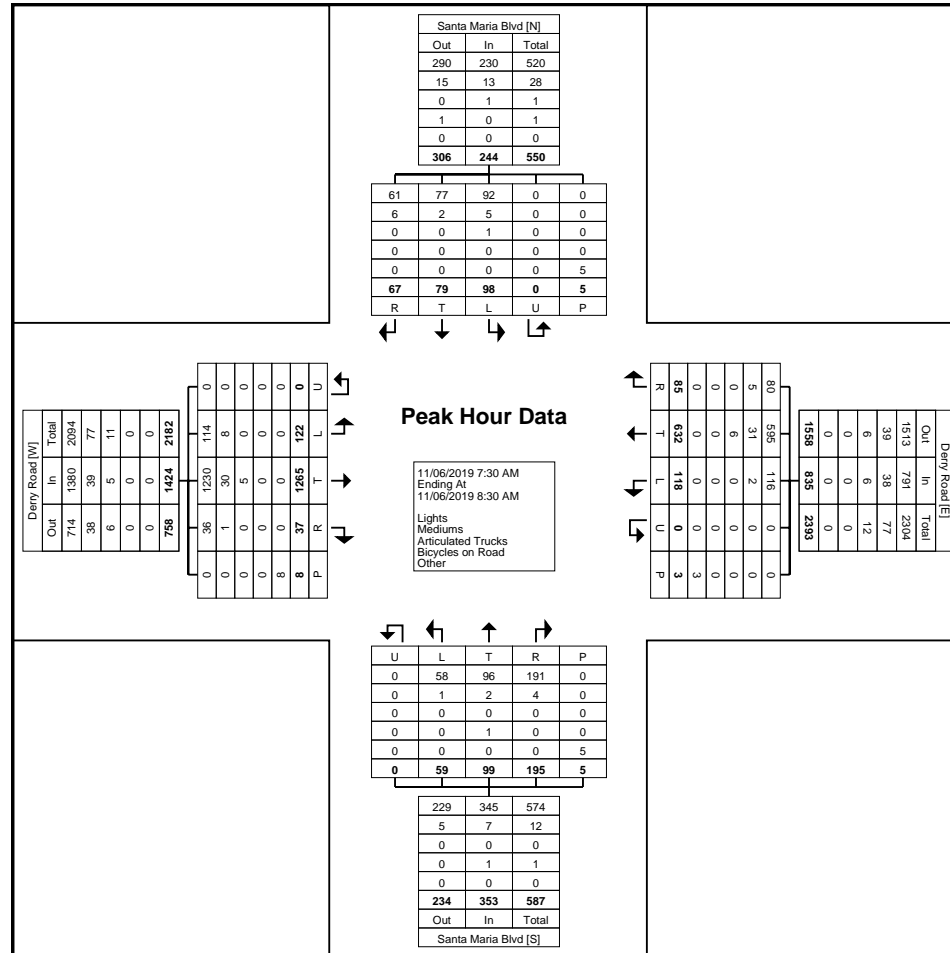
Start Time	Derry Road Eastbound						Derry Road Westbound						Santa Maria Blvd Northbound						Santa Maria Blvd Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:30 AM	38	357	7	0	5	402	31	147	17	0	1	195	21	26	58	0	4	105	21	7	13	0	0	41	743
7:45 AM	31	300	8	0	2	339	30	153	27	0	2	210	15	25	56	0	0	96	32	22	12	0	0	66	711
8:00 AM	29	315	14	0	0	358	28	171	28	0	0	227	12	27	46	0	0	85	24	21	24	0	4	69	739
8:15 AM	24	293	8	0	1	325	29	161	13	0	0	203	11	21	35	0	1	67	21	29	18	0	1	68	663
Total	122	1265	37	0	8	1424	118	632	85	0	3	835	59	99	195	0	5	353	98	79	67	0	5	244	2856
Approach %	8.6	88.8	2.6	0.0	-	-	14.1	75.7	10.2	0.0	-	-	16.7	28.0	55.2	0.0	-	-	40.2	32.4	27.5	0.0	-	-	-
Total %	4.3	44.3	1.3	0.0	-	49.9	4.1	22.1	3.0	0.0	-	29.2	2.1	3.5	6.8	0.0	-	12.4	3.4	2.8	2.3	0.0	-	8.5	-
PHF	0.803	0.886	0.661	0.000	-	0.886	0.952	0.924	0.759	0.000	-	0.920	0.702	0.917	0.841	0.000	-	0.840	0.766	0.681	0.698	0.000	-	0.884	0.961
Lights	114	1230	36	0	-	1380	116	595	80	0	-	791	58	96	191	0	-	345	92	77	61	0	-	230	2746
% Lights	93.4	97.2	97.3	-	-	96.9	98.3	94.1	94.1	-	-	94.7	98.3	97.0	97.9	-	-	97.7	93.9	97.5	91.0	-	-	94.3	96.1
Mediums	8	30	1	0	-	39	2	31	5	0	-	38	1	2	4	0	-	7	5	2	6	0	-	13	97
% Mediums	6.6	2.4	2.7	-	-	2.7	1.7	4.9	5.9	-	-	4.6	1.7	2.0	2.1	-	-	2.0	5.1	2.5	9.0	-	-	5.3	3.4
Articulated Trucks	0	5	0	0	-	5	0	6	0	0	-	6	0	0	0	0	-	0	1	0	0	0	-	1	12
% Articulated Trucks	0.0	0.4	0.0	-	-	0.4	0.0	0.9	0.0	-	-	0.7	0.0	0.0	0.0	-	-	0.0	1.0	0.0	0.0	-	-	0.4	0.4
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.0	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	8	-	-	-	-	-	3	-	-	-	-	-	5	-	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Derry Road West & Santa Maria Blvd
Site Code:
Start Date: 11/06/2019
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsI.com

Count Name: Derry Road West & Santa Maria Blvd
Site Code:
Start Date: 11/06/2019
Page No: 6

Turning Movement Peak Hour Data (12:00 PM)

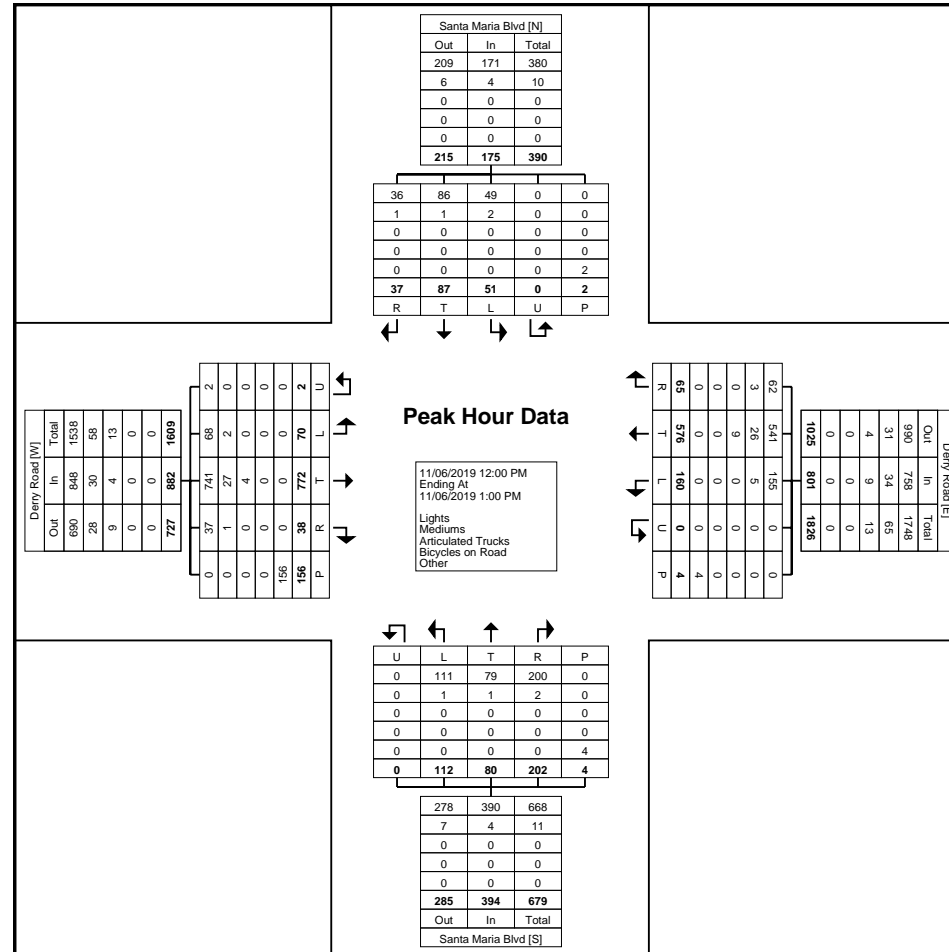
Start Time	Derry Road Eastbound						Derry Road Westbound						Santa Maria Blvd Northbound						Santa Maria Blvd Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	17	193	11	2	11	223	39	125	19	0	1	183	33	24	64	0	1	121	18	18	11	0	0	47	574
12:15 PM	16	183	17	0	77	216	42	149	21	0	1	212	38	22	49	0	0	109	12	26	9	0	2	47	584
12:30 PM	15	194	7	0	35	216	37	150	13	0	2	200	17	15	53	0	2	85	15	19	9	0	0	43	544
12:45 PM	22	202	3	0	33	227	42	152	12	0	0	206	24	19	36	0	1	79	6	24	8	0	0	38	550
Total	70	772	38	2	156	882	160	576	65	0	4	801	112	80	202	0	4	394	51	87	37	0	2	175	2252
Approach %	7.9	87.5	4.3	0.2	-	-	20.0	71.9	8.1	0.0	-	-	28.4	20.3	51.3	0.0	-	-	29.1	49.7	21.1	0.0	-	-	-
Total %	3.1	34.3	1.7	0.1	-	39.2	7.1	25.6	2.9	0.0	-	35.6	5.0	3.6	9.0	0.0	-	17.5	2.3	3.9	1.6	0.0	-	7.8	-
PHF	0.795	0.955	0.559	0.250	-	0.971	0.952	0.947	0.774	0.000	-	0.945	0.737	0.833	0.789	0.000	-	0.814	0.708	0.837	0.841	0.000	-	0.931	0.964
Lights	68	741	37	2	-	848	155	541	62	0	-	758	111	79	200	0	-	390	49	86	36	0	-	171	2167
% Lights	97.1	96.0	97.4	100.0	-	96.1	96.9	93.9	95.4	-	-	94.6	99.1	98.8	99.0	-	-	99.0	96.1	98.9	97.3	-	-	97.7	96.2
Mediums	2	27	1	0	-	30	5	26	3	0	-	34	1	1	2	0	-	4	2	1	1	0	-	4	72
% Mediums	2.9	3.5	2.6	0.0	-	3.4	3.1	4.5	4.6	-	-	4.2	0.9	1.3	1.0	-	-	1.0	3.9	1.1	2.7	-	-	2.3	3.2
Articulated Trucks	0	4	0	0	-	4	0	9	0	0	-	9	0	0	0	0	-	0	0	0	0	0	-	0	13
% Articulated Trucks	0.0	0.5	0.0	0.0	-	0.5	0.0	1.6	0.0	-	-	1.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.6
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	1.3	-	-	-	-	-	25.0	-	-	-	-	-	25.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	154	-	-	-	-	-	3	-	-	-	-	-	3	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	98.7	-	-	-	-	-	75.0	-	-	-	-	-	75.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
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Count Name: Derry Road West & Santa Maria Blvd
Site Code:
Start Date: 11/06/2019
Page No: 7



Turning Movement Peak Hour Data Plot (12:00 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsI.com

Count Name: Derry Road West & Santa Maria Blvd
Site Code:
Start Date: 11/06/2019
Page No: 8

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Derry Road Eastbound						Derry Road Westbound						Santa Maria Blvd Northbound						Santa Maria Blvd Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	21	207	23	0	1	251	74	279	22	0	4	375	29	31	38	0	10	98	31	52	24	0	0	107	831
5:00 PM	15	256	23	0	6	294	67	284	26	0	4	377	27	19	48	0	4	94	22	50	23	0	0	95	860
5:15 PM	15	206	37	0	1	258	70	282	26	0	1	378	37	26	34	0	4	97	25	66	12	0	0	103	836
5:30 PM	12	235	31	0	1	278	78	275	23	0	0	376	42	41	78	0	9	161	14	53	16	0	0	83	898
Total	63	904	114	0	9	1081	289	1120	97	0	9	1506	135	117	198	0	27	450	92	221	75	0	0	388	3425
Approach %	5.8	83.6	10.5	0.0	-	-	19.2	74.4	6.4	0.0	-	-	30.0	26.0	44.0	0.0	-	-	23.7	57.0	19.3	0.0	-	-	-
Total %	1.8	26.4	3.3	0.0	-	31.6	8.4	32.7	2.8	0.0	-	44.0	3.9	3.4	5.8	0.0	-	13.1	2.7	6.5	2.2	0.0	-	11.3	-
PHF	0.750	0.883	0.770	0.000	-	0.919	0.926	0.986	0.933	0.000	-	0.996	0.804	0.713	0.635	0.000	-	0.699	0.742	0.837	0.781	0.000	-	0.907	0.954
Lights	59	888	114	0	-	1061	287	1105	96	0	-	1488	135	117	194	0	-	446	90	220	75	0	-	385	3380
% Lights	93.7	98.2	100.0	-	-	98.1	99.3	98.7	99.0	-	-	98.8	100.0	100.0	98.0	-	-	99.1	97.8	99.5	100.0	-	-	99.2	98.7
Mediums	4	14	0	0	-	18	2	12	1	0	-	15	0	0	4	0	-	4	2	1	0	0	-	3	40
% Mediums	6.3	1.5	0.0	-	-	1.7	0.7	1.1	1.0	-	-	1.0	0.0	0.0	2.0	-	-	0.9	2.2	0.5	0.0	-	-	0.8	1.2
Articulated Trucks	0	2	0	0	-	2	0	3	0	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	5
% Articulated Trucks	0.0	0.2	0.0	-	-	0.2	0.0	0.3	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	11.1	-	-	-	-	-	0.0	-	-	-	-	-	3.7	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	8	-	-	-	-	-	9	-	-	-	-	-	26	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	88.9	-	-	-	-	-	100.0	-	-	-	-	-	96.3	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Derry Road West & Santa Maria
Blvd
Site Code:
Start Date: 11/06/2019
Page No: 10



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Ontario Street & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 1

Turning Movement Data

Start Time	Site Driveway Eastbound					Ontario Street Northbound					Ontario Street Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	1	0	0	1	0	203	0	0	203	180	2	0	0	182	386
7:15 AM	0	2	0	0	2	0	197	0	0	197	191	4	0	0	195	394
7:30 AM	0	1	0	0	1	0	247	0	0	247	194	4	0	0	198	446
7:45 AM	0	1	0	0	1	0	265	0	0	265	206	0	0	0	206	472
Hourly Total	0	5	0	0	5	0	912	0	0	912	771	10	0	0	781	1698
8:00 AM	0	0	0	0	0	0	249	0	0	249	179	4	0	0	183	432
8:15 AM	0	2	0	0	2	0	265	0	0	265	209	4	0	0	213	480
8:30 AM	0	7	0	0	7	0	245	0	0	245	174	7	0	0	181	433
8:45 AM	0	5	0	0	5	0	227	0	0	227	152	13	0	0	165	397
Hourly Total	0	14	0	0	14	0	986	0	0	986	714	28	0	0	742	1742
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	3	0	0	3	0	150	0	0	150	145	6	0	0	151	304
11:15 AM	0	3	0	0	3	1	178	0	0	179	142	10	0	0	152	334
11:30 AM	0	4	0	0	4	0	183	0	0	183	152	8	0	1	160	347
11:45 AM	0	8	0	0	8	0	195	0	0	195	175	20	0	0	195	398
Hourly Total	0	18	0	0	18	1	706	0	0	707	614	44	0	1	658	1383
12:00 PM	0	15	0	0	15	0	186	0	0	186	185	9	0	1	194	395
12:15 PM	0	11	0	0	11	0	160	0	0	160	166	9	0	0	175	346
12:30 PM	0	15	0	0	15	0	205	0	0	205	186	9	0	0	195	415
12:45 PM	0	9	0	0	9	0	195	0	0	195	142	16	0	0	158	362
Hourly Total	0	50	0	0	50	0	746	0	0	746	679	43	0	1	722	1518
1:00 PM	0	8	0	0	8	0	151	0	0	151	152	12	0	1	164	323
1:15 PM	0	25	0	0	25	0	182	0	0	182	171	18	0	0	189	396
1:30 PM	0	10	0	0	10	0	167	0	0	167	153	8	0	0	161	338
1:45 PM	0	6	0	0	6	0	182	0	0	182	137	11	0	1	148	336
Hourly Total	0	49	0	0	49	0	682	0	0	682	613	49	0	2	662	1393
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	0	10	0	0	10	0	244	0	0	244	209	12	0	0	221	475
3:15 PM	0	14	0	0	14	0	271	0	0	271	206	11	0	0	217	502
3:30 PM	0	4	0	0	4	0	246	0	0	246	244	10	0	0	254	504
3:45 PM	0	10	0	0	10	0	262	0	0	262	235	11	0	1	246	518
Hourly Total	0	38	0	0	38	0	1023	0	0	1023	894	44	0	1	938	1999
4:00 PM	0	12	0	0	12	0	244	0	0	244	240	12	0	2	252	508
4:15 PM	0	12	0	0	12	0	273	0	0	273	218	16	0	1	234	519
4:30 PM	0	9	0	0	9	0	227	0	0	227	260	7	0	1	267	503
4:45 PM	0	10	0	2	10	0	272	0	0	272	272	22	0	1	294	576

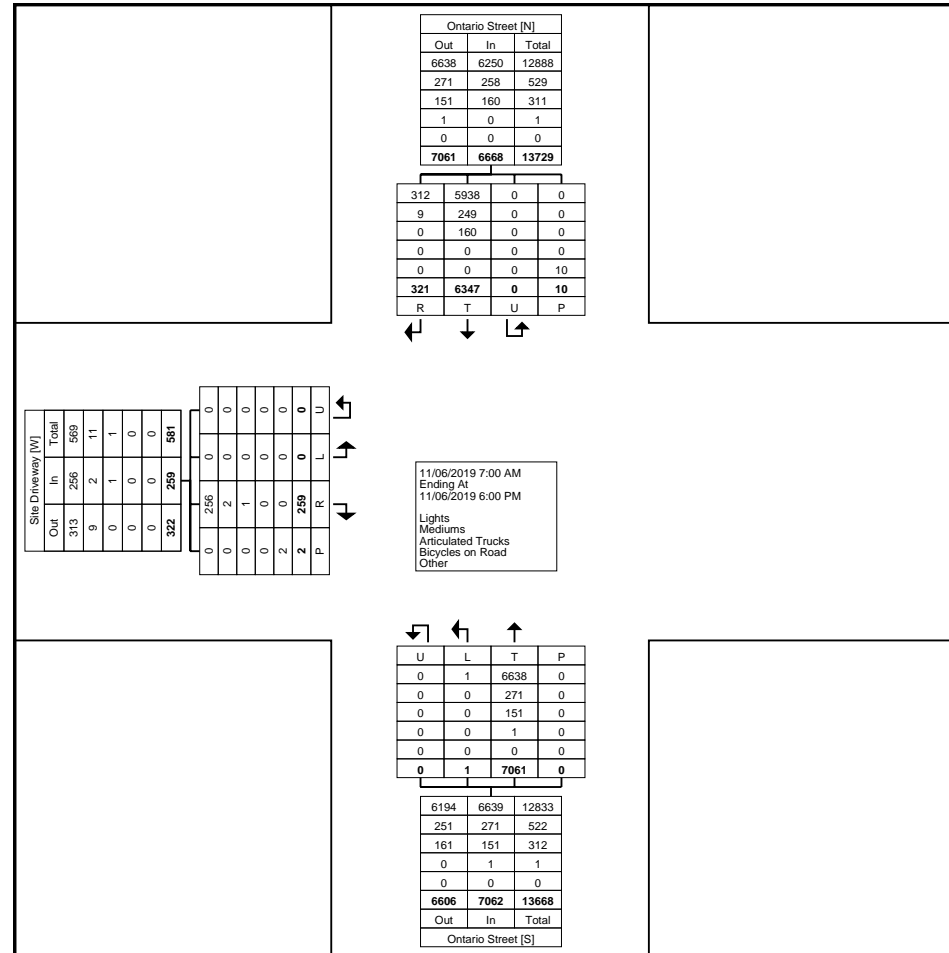
Hourly Total	0	43	0	2	43	0	1016	0	0	1016	990	57	0	5	1047	2106
5:00 PM	0	10	0	0	10	0	228	0	0	228	266	12	0	0	278	516
5:15 PM	0	9	0	0	9	0	284	0	0	284	285	9	0	0	294	587
5:30 PM	0	9	0	0	9	0	216	0	0	216	253	16	0	0	269	494
5:45 PM	0	14	0	0	14	0	262	0	0	262	268	9	0	0	277	553
Hourly Total	0	42	0	0	42	0	990	0	0	990	1072	46	0	0	1118	2150
Grand Total	0	259	0	2	259	1	7061	0	0	7062	6347	321	0	10	6668	13989
Approach %	0.0	100.0	0.0	-	-	0.0	100.0	0.0	-	-	95.2	4.8	0.0	-	-	-
Total %	0.0	1.9	0.0	-	1.9	0.0	50.5	0.0	-	50.5	45.4	2.3	0.0	-	47.7	-
Lights	0	256	0	-	256	1	6638	0	-	6639	5938	312	0	-	6250	13145
% Lights	-	98.8	-	-	98.8	100.0	94.0	-	-	94.0	93.6	97.2	-	-	93.7	94.0
Mediums	0	2	0	-	2	0	271	0	-	271	249	9	0	-	258	531
% Mediums	-	0.8	-	-	0.8	0.0	3.8	-	-	3.8	3.9	2.8	-	-	3.9	3.8
Articulated Trucks	0	1	0	-	1	0	151	0	-	151	160	0	0	-	160	312
% Articulated Trucks	-	0.4	-	-	0.4	0.0	2.1	-	-	2.1	2.5	0.0	-	-	2.4	2.2
Bicycles on Road	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Bicycles on Road	-	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	10	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
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Count Name: Ontario Street & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 3



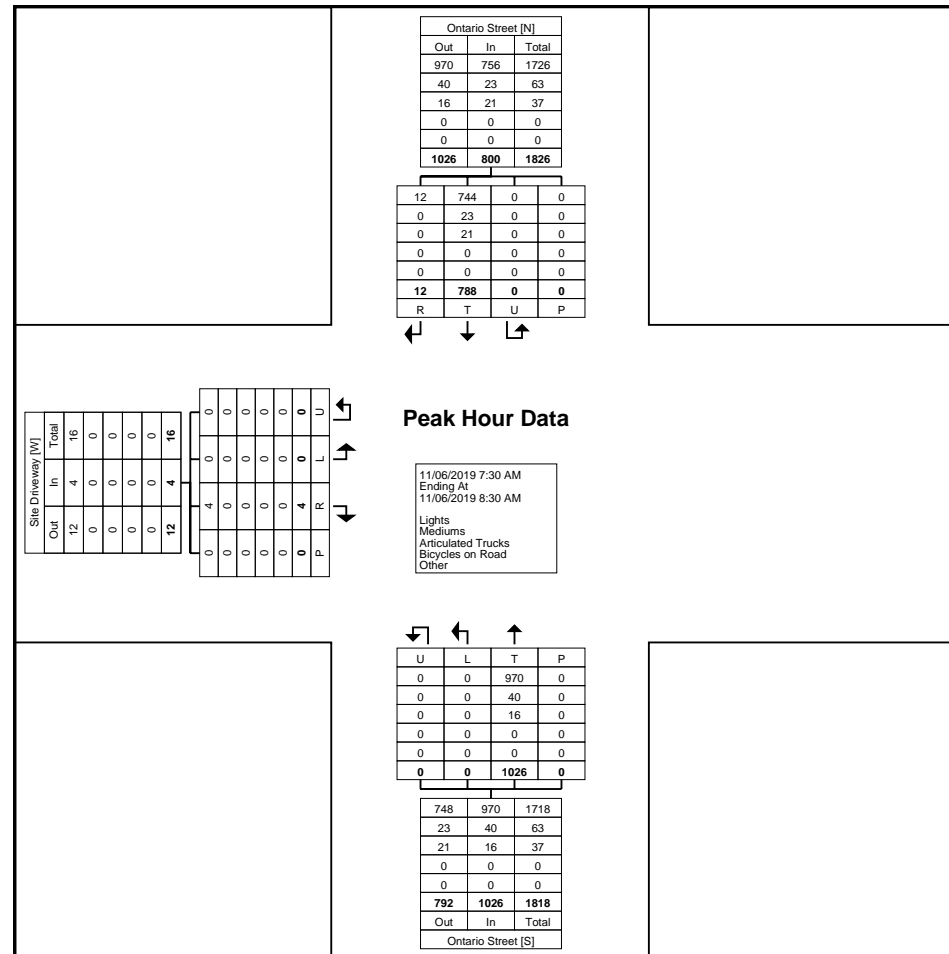
Turning Movement Data Plot



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Count Name: Ontario Street & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)



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Count Name: Ontario Street & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 6

Turning Movement Peak Hour Data (11:45 AM)

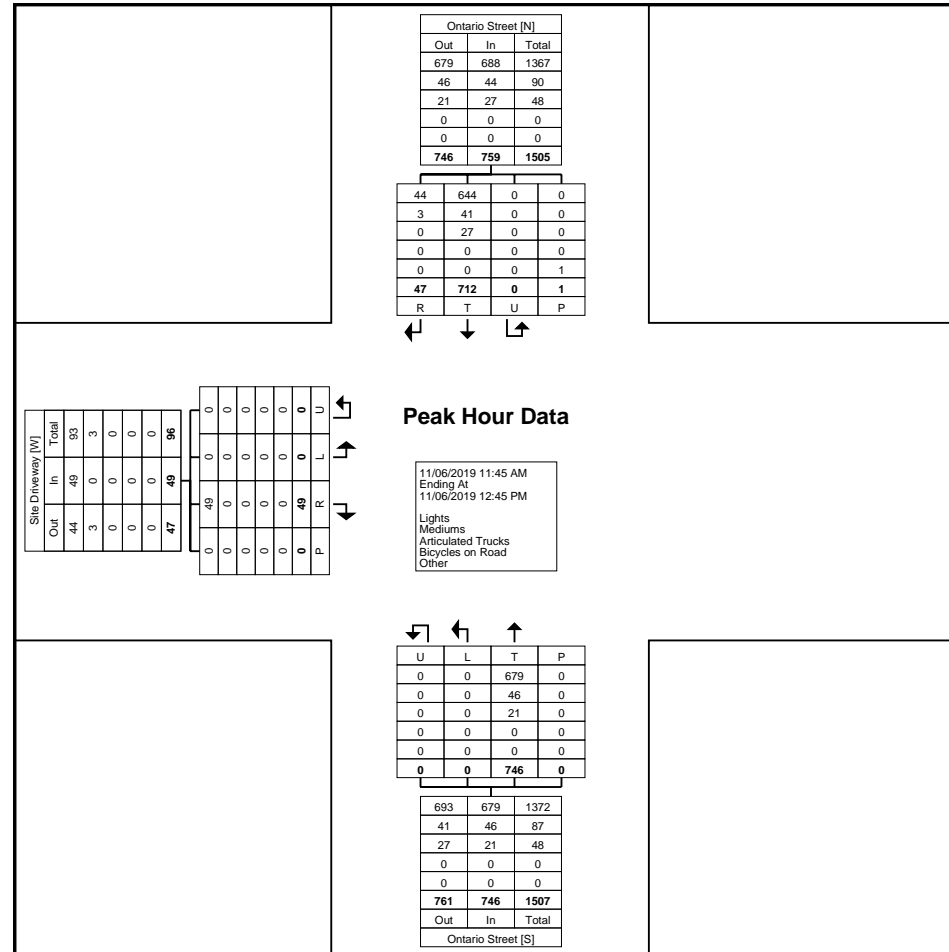
Start Time	Site Driveway Eastbound					Ontario Street Northbound					Ontario Street Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
11:45 AM	0	8	0	0	8	0	195	0	0	195	175	20	0	0	195	398
12:00 PM	0	15	0	0	15	0	186	0	0	186	185	9	0	1	194	395
12:15 PM	0	11	0	0	11	0	160	0	0	160	166	9	0	0	175	346
12:30 PM	0	15	0	0	15	0	205	0	0	205	186	9	0	0	195	415
Total	0	49	0	0	49	0	746	0	0	746	712	47	0	1	759	1554
Approach %	0.0	100.0	0.0	-	-	0.0	100.0	0.0	-	-	93.8	6.2	0.0	-	-	-
Total %	0.0	3.2	0.0	-	3.2	0.0	48.0	0.0	-	48.0	45.8	3.0	0.0	-	48.8	-
PHF	0.000	0.817	0.000	-	0.817	0.000	0.910	0.000	-	0.910	0.957	0.588	0.000	-	0.973	0.936
Lights	0	49	0	-	49	0	679	0	-	679	644	44	0	-	688	1416
% Lights	-	100.0	-	-	100.0	-	91.0	-	-	91.0	90.4	93.6	-	-	90.6	91.1
Mediums	0	0	0	-	0	0	46	0	-	46	41	3	0	-	44	90
% Mediums	-	0.0	-	-	0.0	-	6.2	-	-	6.2	5.8	6.4	-	-	5.8	5.8
Articulated Trucks	0	0	0	-	0	0	21	0	-	21	27	0	0	-	27	48
% Articulated Trucks	-	0.0	-	-	0.0	-	2.8	-	-	2.8	3.8	0.0	-	-	3.6	3.1
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	-	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsI.com

Count Name: Ontario Street & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 7



Turning Movement Peak Hour Data Plot (11:45 AM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Ontario Street & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 8

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Site Driveway Eastbound					Ontario Street Northbound					Ontario Street Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
4:30 PM	0	9	0	0	9	0	227	0	0	227	260	7	0	1	267	503
4:45 PM	0	10	0	2	10	0	272	0	0	272	272	22	0	1	294	576
5:00 PM	0	10	0	0	10	0	228	0	0	228	266	12	0	0	278	516
5:15 PM	0	9	0	0	9	0	284	0	0	284	285	9	0	0	294	587
Total	0	38	0	2	38	0	1011	0	0	1011	1083	50	0	2	1133	2182
Approach %	0.0	100.0	0.0	-	-	0.0	100.0	0.0	-	-	95.6	4.4	0.0	-	-	-
Total %	0.0	1.7	0.0	-	1.7	0.0	46.3	0.0	-	46.3	49.6	2.3	0.0	-	51.9	-
PHF	0.000	0.950	0.000	-	0.950	0.000	0.890	0.000	-	0.890	0.950	0.568	0.000	-	0.963	0.929
Lights	0	38	0	-	38	0	967	0	-	967	1055	50	0	-	1105	2110
% Lights	-	100.0	-	-	100.0	-	95.6	-	-	95.6	97.4	100.0	-	-	97.5	96.7
Mediums	0	0	0	-	0	0	29	0	-	29	22	0	0	-	22	51
% Mediums	-	0.0	-	-	0.0	-	2.9	-	-	2.9	2.0	0.0	-	-	1.9	2.3
Articulated Trucks	0	0	0	-	0	0	15	0	-	15	6	0	0	-	6	21
% Articulated Trucks	-	0.0	-	-	0.0	-	1.5	-	-	1.5	0.6	0.0	-	-	0.5	1.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	-	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-



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Count Name: Ontario Street & Site Driveway
Site Code:
Start Date: 11/06/2019
Page No: 10



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Ontario Street South & Laurier Avenue
Site Code:
Start Date: 11/06/2019
Page No: 1

Turning Movement Data

Start Time	Laurier Avenue Eastbound						Laurier Avenue Westbound						Ontario Street Northbound						Ontario Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	17	8	14	0	1	39	18	22	15	0	0	55	2	195	6	0	0	203	2	158	10	0	0	170	467
7:15 AM	16	23	13	0	0	52	23	19	9	0	2	51	10	193	2	0	0	205	5	160	6	0	1	171	479
7:30 AM	17	25	14	0	0	56	21	19	24	0	0	64	4	235	8	0	1	247	3	158	10	1	0	172	539
7:45 AM	20	31	14	0	0	65	24	42	30	0	3	96	10	241	12	1	2	264	7	169	9	0	6	185	610
Hourly Total	70	87	55	0	1	212	86	102	78	0	5	266	26	864	28	1	3	919	17	645	35	1	7	698	2095
8:00 AM	31	36	22	0	0	89	19	44	15	0	1	78	10	223	4	0	1	237	11	143	10	0	1	164	568
8:15 AM	23	25	12	0	0	60	28	31	18	0	0	77	8	256	9	0	2	273	16	181	22	0	0	219	629
8:30 AM	20	30	12	0	0	62	17	39	20	0	3	76	10	208	12	0	5	230	20	147	11	0	0	178	546
8:45 AM	24	31	12	0	0	67	13	57	24	0	1	94	5	207	15	0	2	227	12	143	19	0	0	174	562
Hourly Total	98	122	58	0	0	278	77	171	77	0	5	325	33	894	40	0	10	967	59	614	62	0	1	735	2305
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	9	28	8	0	1	45	20	28	18	0	0	66	9	114	7	0	7	130	23	130	14	0	3	167	408
11:15 AM	11	16	10	0	0	37	19	20	16	0	1	55	5	169	12	0	1	186	23	124	14	0	1	161	439
11:30 AM	15	23	6	0	0	44	12	30	12	0	0	54	13	158	9	1	8	181	21	138	16	0	1	175	454
11:45 AM	12	29	6	0	1	47	23	26	17	0	1	66	6	169	21	0	2	196	19	176	17	0	1	212	521
Hourly Total	47	96	30	0	2	173	74	104	63	0	2	241	33	610	49	1	18	693	86	568	61	0	6	715	1822
12:00 PM	22	33	4	0	0	59	26	24	18	0	0	68	9	155	11	0	6	175	23	175	17	0	2	215	517
12:15 PM	18	25	12	0	10	55	24	22	20	0	6	66	11	127	9	0	27	147	18	133	23	0	7	174	442
12:30 PM	13	28	5	0	1	46	29	21	18	0	10	68	11	161	13	0	10	185	19	169	11	0	3	199	498
12:45 PM	16	28	7	0	0	51	18	40	18	0	1	76	15	159	13	0	9	187	17	139	15	0	1	171	485
Hourly Total	69	114	28	0	11	211	97	107	74	0	17	278	46	602	46	0	52	694	77	616	66	0	13	759	1942
1:00 PM	17	30	4	0	1	51	18	34	21	0	6	73	5	127	8	0	10	140	23	143	15	0	8	181	445
1:15 PM	22	24	10	0	0	56	19	20	17	0	2	56	6	157	11	0	1	174	27	167	19	0	0	213	499
1:30 PM	14	27	3	0	0	44	21	27	28	0	3	76	7	138	7	1	0	153	21	139	17	0	1	177	450
1:45 PM	18	26	10	0	1	54	9	22	15	0	0	46	5	148	16	1	1	170	18	130	9	0	1	157	427
Hourly Total	71	107	27	0	2	205	67	103	81	0	11	251	23	570	42	2	12	637	89	579	60	0	10	728	1821
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	17	51	16	0	1	84	21	34	20	0	6	75	8	207	18	0	7	233	20	208	32	0	4	260	652
3:15 PM	22	49	6	0	1	77	20	33	27	0	0	80	22	207	19	1	2	249	22	188	30	0	1	240	646
3:30 PM	28	55	15	0	1	98	30	53	35	0	3	118	15	205	16	0	3	236	20	229	19	0	3	268	720
3:45 PM	17	38	13	0	1	68	24	49	30	0	1	103	26	211	21	1	4	259	34	206	22	0	1	262	692
Hourly Total	84	193	50	0	4	327	95	169	112	0	10	376	71	830	74	2	16	977	96	831	103	0	9	1030	2710
4:00 PM	13	42	10	0	1	65	23	49	37	0	1	109	23	181	21	1	0	226	31	218	19	0	3	268	668
4:15 PM	12	51	6	0	0	69	19	72	36	0	3	127	16	237	13	0	2	266	39	195	16	0	3	250	712
4:30 PM	14	65	9	0	2	88	26	67	32	0	1	125	22	177	22	1	1	222	30	236	22	0	4	288	723

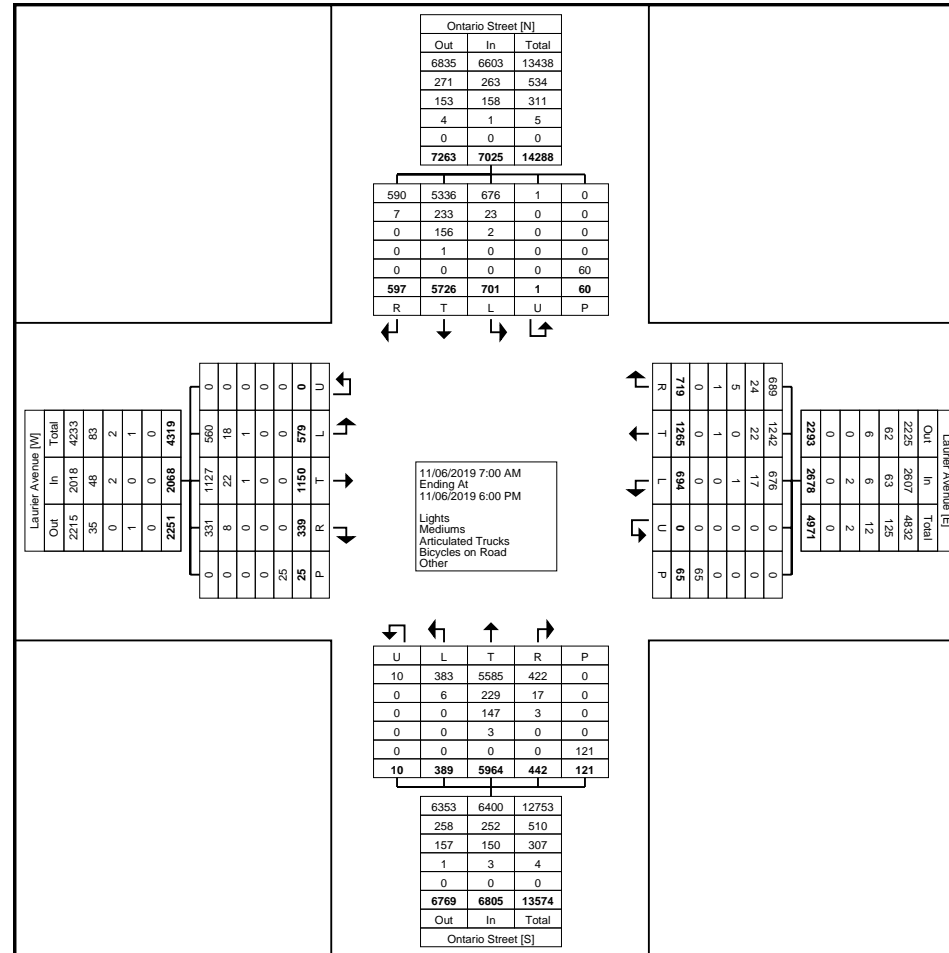
4:45 PM	29	71	13	0	1	113	24	64	35	0	2	123	21	212	16	1	2	250	37	246	29	0	2	312	798
Hourly Total	68	229	38	0	4	335	92	252	140	0	7	484	82	807	72	3	5	964	137	895	86	0	12	1118	2901
5:00 PM	11	52	11	0	0	74	29	58	23	0	2	110	19	184	22	0	1	225	42	256	31	0	0	329	738
5:15 PM	18	54	12	0	1	84	20	67	18	0	3	105	20	225	24	0	4	269	35	256	28	0	0	319	777
5:30 PM	25	57	15	0	0	97	28	71	27	0	1	126	16	188	20	1	0	225	35	225	32	0	1	292	740
5:45 PM	18	39	15	0	0	72	29	61	26	0	2	116	20	190	25	0	0	235	28	241	33	0	1	302	725
Hourly Total	72	202	53	0	1	327	106	257	94	0	8	457	75	787	91	1	5	954	140	978	124	0	2	1242	2980
Grand Total	579	1150	339	0	25	2068	694	1265	719	0	65	2678	389	5964	442	10	121	6805	701	5726	597	1	60	7025	18576
Approach %	28.0	55.6	16.4	0.0	-	-	25.9	47.2	26.8	0.0	-	-	5.7	87.6	6.5	0.1	-	-	10.0	81.5	8.5	0.0	-	-	-
Total %	3.1	6.2	1.8	0.0	-	11.1	3.7	6.8	3.9	0.0	-	14.4	2.1	32.1	2.4	0.1	-	36.6	3.8	30.8	3.2	0.0	-	37.8	-
Lights	560	1127	331	0	-	2018	676	1242	689	0	-	2607	383	5585	422	10	-	6400	676	5336	590	1	-	6603	17628
% Lights	96.7	98.0	97.6	-	-	97.6	97.4	98.2	95.8	-	-	97.3	98.5	93.6	95.5	100.0	-	94.0	96.4	93.2	98.8	100.0	-	94.0	94.9
Mediums	18	22	8	0	-	48	17	22	24	0	-	63	6	229	17	0	-	252	23	233	7	0	-	263	626
% Mediums	3.1	1.9	2.4	-	-	2.3	2.4	1.7	3.3	-	-	2.4	1.5	3.8	3.8	0.0	-	3.7	3.3	4.1	1.2	0.0	-	3.7	3.4
Articulated Trucks	1	1	0	0	-	2	1	0	5	0	-	6	0	147	3	0	-	150	2	156	0	0	-	158	316
% Articulated Trucks	0.2	0.1	0.0	-	-	0.1	0.1	0.0	0.7	-	-	0.2	0.0	2.5	0.7	0.0	-	2.2	0.3	2.7	0.0	0.0	-	2.2	1.7
Bicycles on Road	0	0	0	0	-	0	0	1	1	0	-	2	0	3	0	0	-	3	0	1	0	0	-	1	6
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.1	-	-	0.1	0.0	0.1	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	5	-	-	-	-	-	9	-	-	-	-	-	5	-	-	-	-	-	9	-	-
% Bicycles on Crosswalk	-	-	-	-	20.0	-	-	-	-	-	13.8	-	-	-	-	-	4.1	-	-	-	-	-	15.0	-	-
Pedestrians	-	-	-	-	20	-	-	-	-	-	56	-	-	-	-	-	116	-	-	-	-	-	51	-	-
% Pedestrians	-	-	-	-	80.0	-	-	-	-	-	86.2	-	-	-	-	-	95.9	-	-	-	-	-	85.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Ontario Street South & Laurier Avenue
Site Code:
Start Date: 11/06/2019
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsI.com

Count Name: Ontario Street South & Laurier Avenue
Site Code:
Start Date: 11/06/2019
Page No: 4

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Laurier Avenue Eastbound						Laurier Avenue Westbound						Ontario Street Northbound						Ontario Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:45 AM	20	31	14	0	0	65	24	42	30	0	3	96	10	241	12	1	2	264	7	169	9	0	6	185	610
8:00 AM	31	36	22	0	0	89	19	44	15	0	1	78	10	223	4	0	1	237	11	143	10	0	1	164	568
8:15 AM	23	25	12	0	0	60	28	31	18	0	0	77	8	256	9	0	2	273	16	181	22	0	0	219	629
8:30 AM	20	30	12	0	0	62	17	39	20	0	3	76	10	208	12	0	5	230	20	147	11	0	0	178	546
Total	94	122	60	0	0	276	88	156	83	0	7	327	38	928	37	1	10	1004	54	640	52	0	7	746	2353
Approach %	34.1	44.2	21.7	0.0	-	-	26.9	47.7	25.4	0.0	-	-	3.8	92.4	3.7	0.1	-	-	7.2	85.8	7.0	0.0	-	-	-
Total %	4.0	5.2	2.5	0.0	-	11.7	3.7	6.6	3.5	0.0	-	13.9	1.6	39.4	1.6	0.0	-	42.7	2.3	27.2	2.2	0.0	-	31.7	-
PHF	0.758	0.847	0.682	0.000	-	0.775	0.786	0.886	0.692	0.000	-	0.852	0.950	0.906	0.771	0.250	-	0.919	0.675	0.884	0.591	0.000	-	0.852	0.935
Lights	90	117	59	0	-	266	86	151	76	0	-	313	37	877	36	1	-	951	47	595	52	0	-	694	2224
% Lights	95.7	95.9	98.3	-	-	96.4	97.7	96.8	91.6	-	-	95.7	97.4	94.5	97.3	100.0	-	94.7	87.0	93.0	100.0	-	-	93.0	94.5
Mediums	4	5	1	0	-	10	2	5	5	0	-	12	1	37	1	0	-	39	7	25	0	0	-	32	93
% Mediums	4.3	4.1	1.7	-	-	3.6	2.3	3.2	6.0	-	-	3.7	2.6	4.0	2.7	0.0	-	3.9	13.0	3.9	0.0	-	-	4.3	4.0
Articulated Trucks	0	0	0	0	-	0	0	0	2	0	-	2	0	14	0	0	-	14	0	20	0	0	-	20	36
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	2.4	-	-	0.6	0.0	1.5	0.0	0.0	-	1.4	0.0	3.1	0.0	-	-	2.7	1.5
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	28.6	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	10	-	-	-	-	-	7	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	71.4	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
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Count Name: Ontario Street South & Laurier Avenue
Site Code:
Start Date: 11/06/2019
Page No: 6

Turning Movement Peak Hour Data (11:45 AM)

Start Time	Laurier Avenue Eastbound						Laurier Avenue Westbound						Ontario Street Northbound						Ontario Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:45 AM	12	29	6	0	1	47	23	26	17	0	1	66	6	169	21	0	2	196	19	176	17	0	1	212	521
12:00 PM	22	33	4	0	0	59	26	24	18	0	0	68	9	155	11	0	6	175	23	175	17	0	2	215	517
12:15 PM	18	25	12	0	10	55	24	22	20	0	6	66	11	127	9	0	27	147	18	133	23	0	7	174	442
12:30 PM	13	28	5	0	1	46	29	21	18	0	10	68	11	161	13	0	10	185	19	169	11	0	3	199	498
Total	65	115	27	0	12	207	102	93	73	0	17	268	37	612	54	0	45	703	79	653	68	0	13	800	1978
Approach %	31.4	55.6	13.0	0.0	-	-	38.1	34.7	27.2	0.0	-	-	5.3	87.1	7.7	0.0	-	-	9.9	81.6	8.5	0.0	-	-	-
Total %	3.3	5.8	1.4	0.0	-	10.5	5.2	4.7	3.7	0.0	-	13.5	1.9	30.9	2.7	0.0	-	35.5	4.0	33.0	3.4	0.0	-	40.4	-
PHF	0.739	0.871	0.563	0.000	-	0.877	0.879	0.894	0.913	0.000	-	0.985	0.841	0.905	0.643	0.000	-	0.897	0.859	0.928	0.739	0.000	-	0.930	0.949
Lights	63	115	26	0	-	204	98	93	71	0	-	262	36	553	47	0	-	636	79	590	68	0	-	737	1839
% Lights	96.9	100.0	96.3	-	-	98.6	96.1	100.0	97.3	-	-	97.8	97.3	90.4	87.0	-	-	90.5	100.0	90.4	100.0	-	-	92.1	93.0
Mediums	2	0	1	0	-	3	4	0	1	0	-	5	1	37	6	0	-	44	0	37	0	0	-	37	89
% Mediums	3.1	0.0	3.7	-	-	1.4	3.9	0.0	1.4	-	-	1.9	2.7	6.0	11.1	-	-	6.3	0.0	5.7	0.0	-	-	4.6	4.5
Articulated Trucks	0	0	0	0	-	0	0	0	1	0	-	1	0	22	1	0	-	23	0	26	0	0	-	26	50
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.4	-	-	0.4	0.0	3.6	1.9	-	-	3.3	0.0	4.0	0.0	-	-	3.3	2.5
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	5.9	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	12	-	-	-	-	-	16	-	-	-	-	-	45	-	-	-	-	-	13	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	94.1	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsI.com

Count Name: Ontario Street South & Laurier Avenue
Site Code:
Start Date: 11/06/2019
Page No: 8

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Laurier Avenue Eastbound						Laurier Avenue Westbound						Ontario Street Northbound						Ontario Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	29	71	13	0	1	113	24	64	35	0	2	123	21	212	16	1	2	250	37	246	29	0	2	312	798
5:00 PM	11	52	11	0	0	74	29	58	23	0	2	110	19	184	22	0	1	225	42	256	31	0	0	329	738
5:15 PM	18	54	12	0	1	84	20	67	18	0	3	105	20	225	24	0	4	269	35	256	28	0	0	319	777
5:30 PM	25	57	15	0	0	97	28	71	27	0	1	126	16	188	20	1	0	225	35	225	32	0	1	292	740
Total	83	234	51	0	2	368	101	260	103	0	8	464	76	809	82	2	7	969	149	983	120	0	3	1252	3053
Approach %	22.6	63.6	13.9	0.0	-	-	21.8	56.0	22.2	0.0	-	-	7.8	83.5	8.5	0.2	-	-	11.9	78.5	9.6	0.0	-	-	-
Total %	2.7	7.7	1.7	0.0	-	12.1	3.3	8.5	3.4	0.0	-	15.2	2.5	26.5	2.7	0.1	-	31.7	4.9	32.2	3.9	0.0	-	41.0	-
PHF	0.716	0.824	0.850	0.000	-	0.814	0.871	0.915	0.736	0.000	-	0.921	0.905	0.899	0.854	0.500	-	0.901	0.887	0.960	0.938	0.000	-	0.951	0.956
Lights	82	232	51	0	-	365	100	258	101	0	-	459	75	774	81	2	-	932	147	957	119	0	-	1223	2979
% Lights	98.8	99.1	100.0	-	-	99.2	99.0	99.2	98.1	-	-	98.9	98.7	95.7	98.8	100.0	-	96.2	98.7	97.4	99.2	-	-	97.7	97.6
Mediums	1	2	0	0	-	3	1	1	2	0	-	4	1	21	1	0	-	23	2	21	1	0	-	24	54
% Mediums	1.2	0.9	0.0	-	-	0.8	1.0	0.4	1.9	-	-	0.9	1.3	2.6	1.2	0.0	-	2.4	1.3	2.1	0.8	-	-	1.9	1.8
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	14	0	0	-	14	0	5	0	0	-	5	19
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.7	0.0	0.0	-	1.4	0.0	0.5	0.0	-	-	0.4	0.6
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.4	0.0	-	-	0.2	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	2	-	-
% Bicycles on Crosswalk	-	-	-	-	50.0	-	-	-	-	-	12.5	-	-	-	-	-	28.6	-	-	-	-	-	66.7	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	7	-	-	-	-	-	5	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	50.0	-	-	-	-	-	87.5	-	-	-	-	-	71.4	-	-	-	-	-	33.3	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Ontario Street South & Laurier
Avenue
Site Code:
Start Date: 11/06/2019
Page No: 10



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Regional Road 25 & Louis Saint
Laurent Avenue
Site Code:
Start Date: 11/06/2019
Page No: 1

Turning Movement Data

Start Time	Louis Saint Laurent Avenue Eastbound						Louis Saint Laurent Avenue Westbound						Regional Road 25 Northbound						Regional Road 25 Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	77	71	64	1	0	213	77	40	7	0	0	124	18	116	21	0	0	155	3	187	11	0	0	201	693
7:15 AM	73	82	69	0	0	224	90	34	11	0	0	135	19	102	26	0	0	147	9	188	26	0	0	223	729
7:30 AM	68	97	64	0	0	229	113	57	16	0	0	186	21	153	31	0	0	205	6	211	27	0	1	244	864
7:45 AM	73	130	85	1	0	289	69	106	14	0	0	189	31	152	30	0	0	213	4	207	34	0	0	245	936
Hourly Total	291	380	282	2	0	955	349	237	48	0	0	634	89	523	108	0	0	720	22	793	98	0	1	913	3222
8:00 AM	66	134	75	3	0	278	85	170	12	0	2	267	50	150	41	0	0	241	7	199	31	0	1	237	1023
8:15 AM	94	122	71	1	0	288	99	92	5	0	0	196	40	150	29	0	0	219	15	201	34	0	1	250	953
8:30 AM	62	84	64	6	0	216	60	63	23	0	0	146	33	166	30	0	0	229	7	182	24	0	1	213	804
8:45 AM	69	73	52	4	0	198	67	62	7	0	0	136	39	156	28	0	0	223	11	166	22	0	0	199	756
Hourly Total	291	413	262	14	0	980	311	387	47	0	2	745	162	622	128	0	0	912	40	748	111	0	3	899	3536
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	39	41	31	1	0	112	24	44	9	0	2	77	18	108	16	0	2	142	4	93	14	0	0	111	442
11:15 AM	33	63	38	2	0	136	34	28	11	0	1	73	33	132	27	0	1	192	6	80	26	0	1	112	513
11:30 AM	27	44	24	2	0	97	30	37	13	0	0	80	26	136	16	0	0	178	10	84	23	0	0	117	472
11:45 AM	34	42	35	1	0	112	21	46	5	0	0	72	26	162	30	0	2	218	8	99	23	0	0	130	532
Hourly Total	133	190	128	6	0	457	109	155	38	0	3	302	103	538	89	0	5	730	28	356	86	0	1	470	1959
12:00 PM	28	32	31	0	0	91	36	46	10	0	0	92	35	137	26	0	0	198	11	114	23	0	0	148	529
12:15 PM	34	47	25	0	0	106	30	31	10	0	0	71	34	107	21	0	0	162	8	158	25	0	1	191	530
12:30 PM	36	42	34	2	1	114	35	39	13	0	0	87	25	161	35	0	0	221	9	130	30	0	0	169	591
12:45 PM	36	39	33	2	2	110	26	56	7	0	1	89	25	136	27	0	0	188	7	126	24	0	0	157	544
Hourly Total	134	160	123	4	3	421	127	172	40	0	1	339	119	541	109	0	0	769	35	528	102	0	1	665	2194
1:00 PM	29	50	16	0	0	95	18	46	5	0	0	69	30	120	28	0	0	178	9	131	28	0	0	168	510
1:15 PM	26	42	22	0	1	90	20	38	2	0	0	60	36	142	28	0	0	206	10	124	35	0	0	169	525
1:30 PM	25	27	25	0	0	77	27	40	6	0	0	73	31	112	24	0	0	167	14	117	33	0	0	164	481
1:45 PM	22	40	24	0	0	86	14	34	7	0	0	55	34	121	14	0	0	169	14	121	31	0	0	166	476
Hourly Total	102	159	87	0	1	348	79	158	20	0	0	257	131	495	94	0	0	720	47	493	127	0	0	667	1992
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	51	55	35	1	0	142	47	68	10	0	0	125	67	169	31	0	0	267	7	122	37	0	3	166	700
3:15 PM	53	68	34	2	3	157	29	85	20	1	2	135	59	184	43	0	3	286	5	123	56	0	2	184	762
3:30 PM	48	73	35	0	0	156	54	97	11	1	1	163	63	190	36	0	0	289	11	141	48	0	1	200	808
3:45 PM	70	74	35	2	0	181	59	106	13	0	1	178	60	181	53	0	0	294	16	137	38	0	2	191	844
Hourly Total	222	270	139	5	3	636	189	356	54	2	4	601	249	724	163	0	3	1136	39	523	179	0	8	741	3114
4:00 PM	53	72	33	0	1	158	48	108	13	0	0	169	79	201	47	0	0	327	16	150	57	0	0	223	877
4:15 PM	47	69	31	0	0	147	27	100	11	0	0	138	95	200	65	0	0	360	13	148	51	0	0	212	857
4:30 PM	38	88	28	0	0	154	46	111	9	0	2	166	83	222	64	0	0	369	19	151	50	0	0	220	909

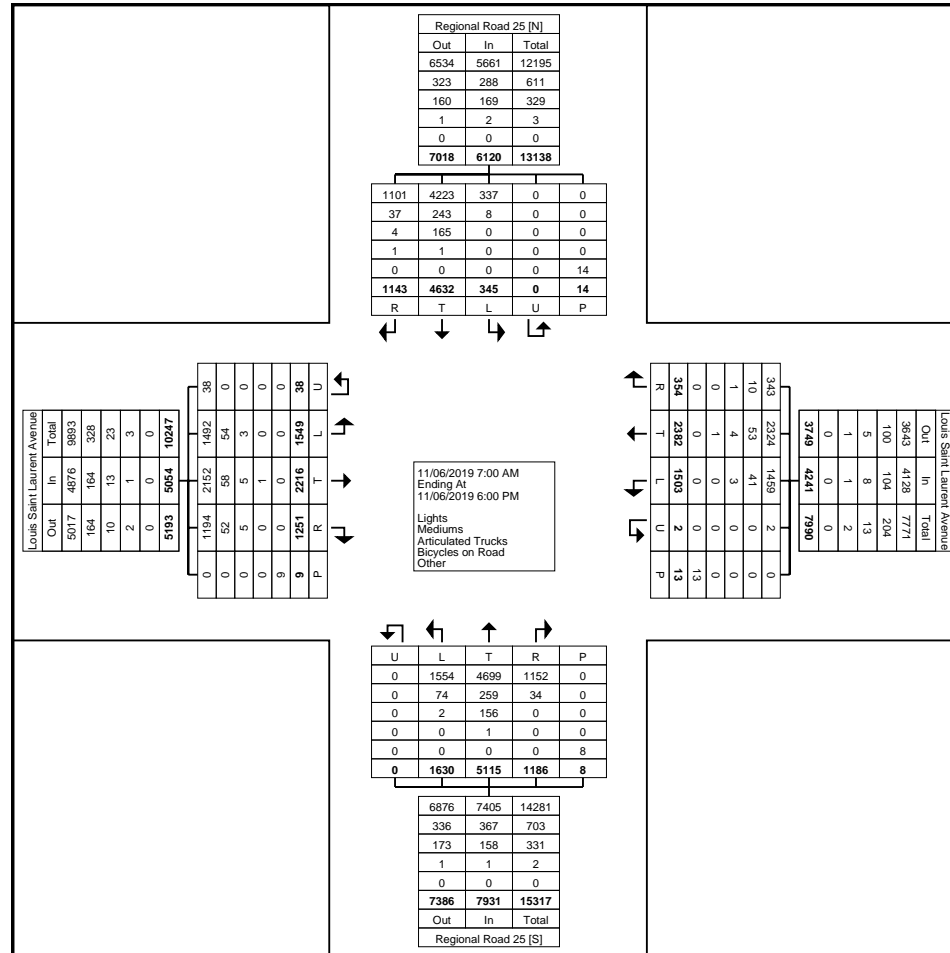
4:45 PM	43	90	24	0	1	157	37	107	17	0	0	161	92	202	61	0	0	355	16	155	45	0	0	216	889
Hourly Total	181	319	116	0	2	616	158	426	50	0	2	634	349	825	237	0	0	1411	64	604	203	0	0	871	3532
5:00 PM	36	85	32	3	0	156	46	120	15	0	0	181	92	231	70	0	0	393	14	168	55	0	0	237	967
5:15 PM	50	68	27	1	0	146	51	129	16	0	1	196	110	196	55	0	0	361	16	149	70	0	0	235	938
5:30 PM	50	80	33	3	0	166	30	118	17	0	0	165	113	209	67	0	0	389	16	143	57	0	0	216	936
5:45 PM	59	92	22	0	0	173	54	124	9	0	0	187	113	211	66	0	0	390	24	127	55	0	0	206	956
Hourly Total	195	325	114	7	0	641	181	491	57	0	1	729	428	847	258	0	0	1533	70	587	237	0	0	894	3797
Grand Total	1549	2216	1251	38	9	5054	1503	2382	354	2	13	4241	1630	5115	1186	0	8	7931	345	4632	1143	0	14	6120	23346
Approach %	30.6	43.8	24.8	0.8	-	-	35.4	56.2	8.3	0.0	-	-	20.6	64.5	15.0	0.0	-	-	5.6	75.7	18.7	0.0	-	-	-
Total %	6.6	9.5	5.4	0.2	-	21.6	6.4	10.2	1.5	0.0	-	18.2	7.0	21.9	5.1	0.0	-	34.0	1.5	19.8	4.9	0.0	-	26.2	-
Lights	1492	2152	1194	38	-	4876	1459	2324	343	2	-	4128	1554	4699	1152	0	-	7405	337	4223	1101	0	-	5661	22070
% Lights	96.3	97.1	95.4	100.0	-	96.5	97.1	97.6	96.9	100.0	-	97.3	95.3	91.9	97.1	-	-	93.4	97.7	91.2	96.3	-	-	92.5	94.5
Mediums	54	58	52	0	-	164	41	53	10	0	-	104	74	259	34	0	-	367	8	243	37	0	-	288	923
% Mediums	3.5	2.6	4.2	0.0	-	3.2	2.7	2.2	2.8	0.0	-	2.5	4.5	5.1	2.9	-	-	4.6	2.3	5.2	3.2	-	-	4.7	4.0
Articulated Trucks	3	5	5	0	-	13	3	4	1	0	-	8	2	156	0	0	-	158	0	165	4	0	-	169	348
% Articulated Trucks	0.2	0.2	0.4	0.0	-	0.3	0.2	0.2	0.3	0.0	-	0.2	0.1	3.0	0.0	-	-	2.0	0.0	3.6	0.3	-	-	2.8	1.5
Bicycles on Road	0	1	0	0	-	1	0	1	0	0	-	1	0	1	0	0	-	1	0	1	1	0	-	2	5
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.1	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	6	-	-	-	-	-	2	-	-	-	-	-	3	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	46.2	-	-	-	-	-	25.0	-	-	-	-	-	21.4	-	-
Pedestrians	-	-	-	-	9	-	-	-	-	-	7	-	-	-	-	-	6	-	-	-	-	-	11	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	53.8	-	-	-	-	-	75.0	-	-	-	-	-	78.6	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Regional Road 25 & Louis Saint
Lauent Avenue
Site Code:
Start Date: 11/06/2019
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Regional Road 25 & Louis Saint
Laurent Avenue
Site Code:
Start Date: 11/06/2019
Page No: 4

Turning Movement Peak Hour Data (7:30 AM)

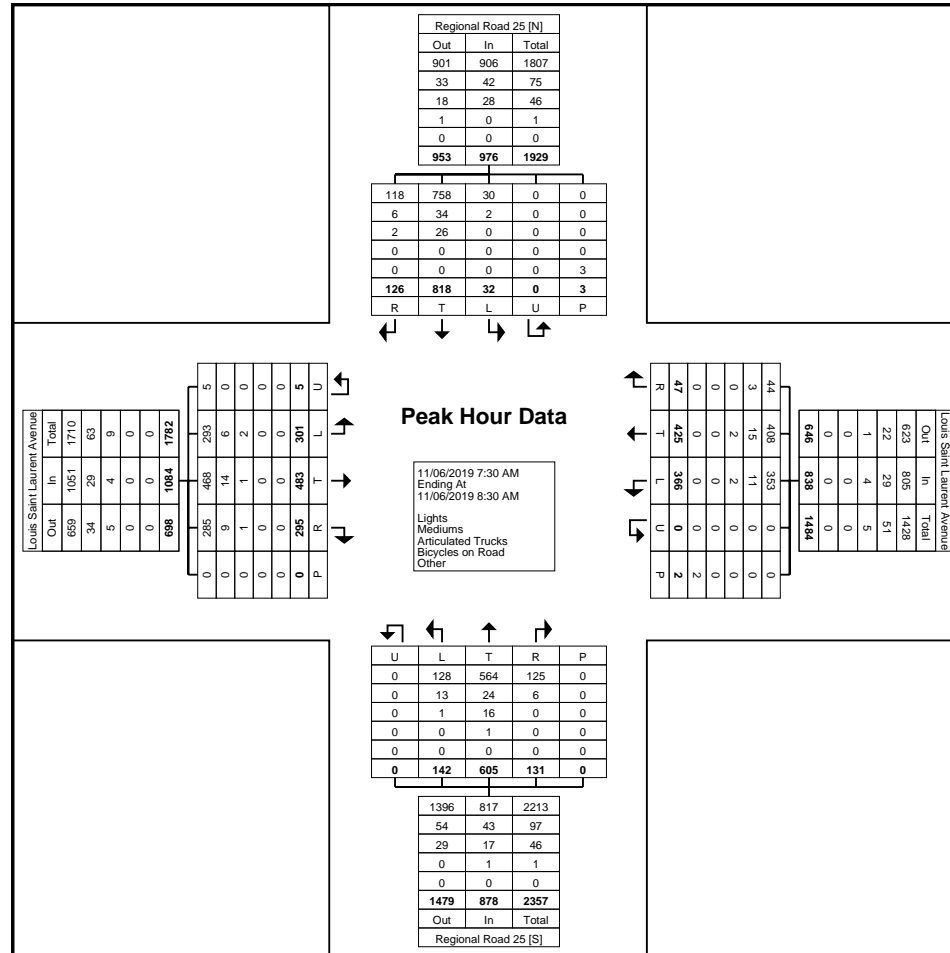
Start Time	Louis Saint Laurent Avenue Eastbound						Louis Saint Laurent Avenue Westbound						Regional Road 25 Northbound						Regional Road 25 Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:30 AM	68	97	64	0	0	229	113	57	16	0	0	186	21	153	31	0	0	205	6	211	27	0	1	244	864
7:45 AM	73	130	85	1	0	289	69	106	14	0	0	189	31	152	30	0	0	213	4	207	34	0	0	245	936
8:00 AM	66	134	75	3	0	278	85	170	12	0	2	267	50	150	41	0	0	241	7	199	31	0	1	237	1023
8:15 AM	94	122	71	1	0	288	99	92	5	0	0	196	40	150	29	0	0	219	15	201	34	0	1	250	953
Total	301	483	295	5	0	1084	366	425	47	0	2	838	142	605	131	0	0	878	32	818	126	0	3	976	3776
Approach %	27.8	44.6	27.2	0.5	-	-	43.7	50.7	5.6	0.0	-	-	16.2	68.9	14.9	0.0	-	-	3.3	83.8	12.9	0.0	-	-	-
Total %	8.0	12.8	7.8	0.1	-	28.7	9.7	11.3	1.2	0.0	-	22.2	3.8	16.0	3.5	0.0	-	23.3	0.8	21.7	3.3	0.0	-	25.8	-
PHF	0.801	0.901	0.868	0.417	-	0.938	0.810	0.625	0.734	0.000	-	0.785	0.710	0.989	0.799	0.000	-	0.911	0.533	0.969	0.926	0.000	-	0.976	0.923
Lights	293	468	285	5	-	1051	353	408	44	0	-	805	128	564	125	0	-	817	30	758	118	0	-	906	3579
% Lights	97.3	96.9	96.6	100.0	-	97.0	96.4	96.0	93.6	-	-	96.1	90.1	93.2	95.4	-	-	93.1	93.8	92.7	93.7	-	-	92.8	94.8
Mediums	6	14	9	0	-	29	11	15	3	0	-	29	13	24	6	0	-	43	2	34	6	0	-	42	143
% Mediums	2.0	2.9	3.1	0.0	-	2.7	3.0	3.5	6.4	-	-	3.5	9.2	4.0	4.6	-	-	4.9	6.3	4.2	4.8	-	-	4.3	3.8
Articulated Trucks	2	1	1	0	-	4	2	2	0	0	-	4	1	16	0	0	-	17	0	26	2	0	-	28	53
% Articulated Trucks	0.7	0.2	0.3	0.0	-	0.4	0.5	0.5	0.0	-	-	0.5	0.7	2.6	0.0	-	-	1.9	0.0	3.2	1.6	-	-	2.9	1.4
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	33.3	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	66.7	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsI.com

Count Name: Regional Road 25 & Louis Saint
Lauent Avenue
Site Code:
Start Date: 11/06/2019
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cdowness@pts.com

Count Name: Regional Road 25 & Louis Saint
Laurent Avenue
Site Code:
Start Date: 11/06/2019
Page No: 6

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Louis Saint Laurent Avenue Eastbound						Louis Saint Laurent Avenue Westbound						Regional Road 25 Northbound						Regional Road 25 Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	28	32	31	0	0	91	36	46	10	0	0	92	35	137	26	0	0	198	11	114	23	0	0	148	529
12:15 PM	34	47	25	0	0	106	30	31	10	0	0	71	34	107	21	0	0	162	8	158	25	0	1	191	530
12:30 PM	36	42	34	2	1	114	35	39	13	0	0	87	25	161	35	0	0	221	9	130	30	0	0	169	591
12:45 PM	36	39	33	2	2	110	26	56	7	0	1	89	25	136	27	0	0	188	7	126	24	0	0	157	544
Total	134	160	123	4	3	421	127	172	40	0	1	339	119	541	109	0	0	769	35	528	102	0	1	665	2194
Approach %	31.8	38.0	29.2	1.0	-	-	37.5	50.7	11.8	0.0	-	-	15.5	70.4	14.2	0.0	-	-	5.3	79.4	15.3	0.0	-	-	-
Total %	6.1	7.3	5.6	0.2	-	19.2	5.8	7.8	1.8	0.0	-	15.5	5.4	24.7	5.0	0.0	-	35.1	1.6	24.1	4.6	0.0	-	30.3	-
PHF	0.931	0.851	0.904	0.500	-	0.923	0.882	0.768	0.769	0.000	-	0.921	0.850	0.840	0.779	0.000	-	0.870	0.795	0.835	0.850	0.000	-	0.870	0.928
Lights	131	156	115	4	-	406	123	168	39	0	-	330	105	472	102	0	-	679	34	467	100	0	-	601	2016
% Lights	97.8	97.5	93.5	100.0	-	96.4	96.9	97.7	97.5	-	-	97.3	88.2	87.2	93.6	-	-	88.3	97.1	88.4	98.0	-	-	90.4	91.9
Mediums	3	4	8	0	-	15	4	3	1	0	-	8	14	51	7	0	-	72	1	35	2	0	-	38	133
% Mediums	2.2	2.5	6.5	0.0	-	3.6	3.1	1.7	2.5	-	-	2.4	11.8	9.4	6.4	-	-	9.4	2.9	6.6	2.0	-	-	5.7	6.1
Articulated Trucks	0	0	0	0	-	0	0	1	0	0	-	1	0	18	0	0	-	18	0	26	0	0	-	26	45
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.6	0.0	-	-	0.3	0.0	3.3	0.0	-	-	2.3	0.0	4.9	0.0	-	-	3.9	2.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



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Count Name: Regional Road 25 & Louis Saint
Laurent Avenue
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Start Date: 11/06/2019
Page No: 8

Turning Movement Peak Hour Data (5:00 PM)

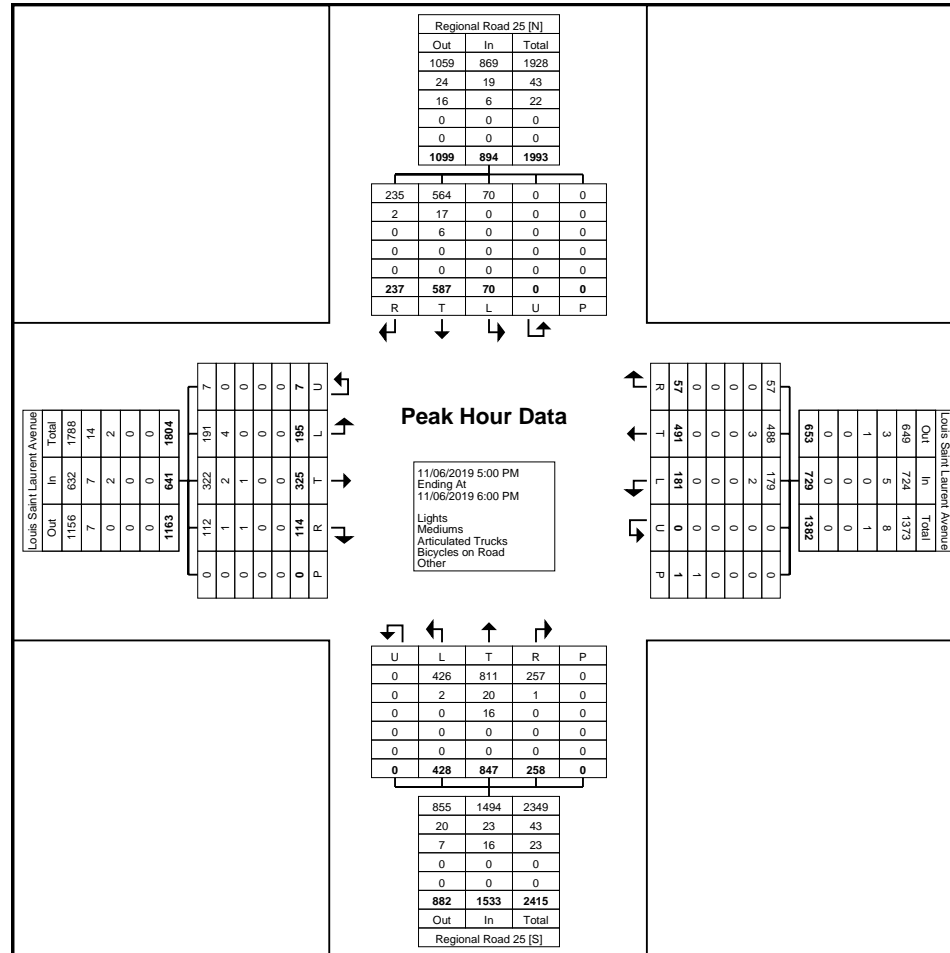
Start Time	Louis Saint Laurent Avenue Eastbound						Louis Saint Laurent Avenue Westbound						Regional Road 25 Northbound						Regional Road 25 Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
5:00 PM	36	85	32	3	0	156	46	120	15	0	0	181	92	231	70	0	0	393	14	168	55	0	0	237	967
5:15 PM	50	68	27	1	0	146	51	129	16	0	1	196	110	196	55	0	0	361	16	149	70	0	0	235	938
5:30 PM	50	80	33	3	0	166	30	118	17	0	0	165	113	209	67	0	0	389	16	143	57	0	0	216	936
5:45 PM	59	92	22	0	0	173	54	124	9	0	0	187	113	211	66	0	0	390	24	127	55	0	0	206	956
Total	195	325	114	7	0	641	181	491	57	0	1	729	428	847	258	0	0	1533	70	587	237	0	0	894	3797
Approach %	30.4	50.7	17.8	1.1	-	-	24.8	67.4	7.8	0.0	-	-	27.9	55.3	16.8	0.0	-	-	7.8	65.7	26.5	0.0	-	-	-
Total %	5.1	8.6	3.0	0.2	-	16.9	4.8	12.9	1.5	0.0	-	19.2	11.3	22.3	6.8	0.0	-	40.4	1.8	15.5	6.2	0.0	-	23.5	-
PHF	0.826	0.883	0.864	0.583	-	0.926	0.838	0.952	0.838	0.000	-	0.930	0.947	0.917	0.921	0.000	-	0.975	0.729	0.874	0.846	0.000	-	0.943	0.982
Lights	191	322	112	7	-	632	179	488	57	0	-	724	426	811	257	0	-	1494	70	564	235	0	-	869	3719
% Lights	97.9	99.1	98.2	100.0	-	98.6	98.9	99.4	100.0	-	-	99.3	99.5	95.7	99.6	-	-	97.5	100.0	96.1	99.2	-	-	97.2	97.9
Mediums	4	2	1	0	-	7	2	3	0	0	-	5	2	20	1	0	-	23	0	17	2	0	-	19	54
% Mediums	2.1	0.6	0.9	0.0	-	1.1	1.1	0.6	0.0	-	-	0.7	0.5	2.4	0.4	-	-	1.5	0.0	2.9	0.8	-	-	2.1	1.4
Articulated Trucks	0	1	1	0	-	2	0	0	0	0	-	0	0	16	0	0	-	16	0	6	0	0	-	6	24
% Articulated Trucks	0.0	0.3	0.9	0.0	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	1.9	0.0	-	-	1.0	0.0	1.0	0.0	-	-	0.7	0.6
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Start Date: 11/06/2019
Page No: 9



Turning Movement Peak Hour Data Plot (5:00 PM)



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Count Name: Regional Road 25 & Louis Saint
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Start Date: 11/06/2019
Page No: 10



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsI.com

Count Name: Regional Road 25/Ontario Street
South & Derry RoadWest
Site Code:
Start Date: 11/06/2019
Page No: 1

Turning Movement Data

Start Time	Derry Road West Eastbound						Derry Road West Westbound						Regional Road 25 Northbound						Ontario Street South Southbound				Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	App. Total	
7:00 AM	56	296	27	0	0	379	48	92	22	0	0	162	13	123	64	0	1	200	21	145	28	194	935
7:15 AM	66	282	53	0	1	401	62	125	17	0	0	204	23	112	52	0	1	187	19	144	15	178	970
7:30 AM	54	277	56	0	0	387	43	108	28	0	2	179	24	151	46	0	2	221	31	140	31	202	989
7:45 AM	71	307	38	0	0	416	44	177	33	0	2	254	25	151	61	0	1	237	17	140	25	182	1089
Hourly Total	247	1162	174	0	1	1583	197	502	100	0	4	799	85	537	223	0	5	845	88	569	99	756	3983
8:00 AM	67	235	61	0	0	363	55	155	42	0	0	252	41	136	58	0	0	235	21	138	25	184	1034
8:15 AM	54	269	53	0	0	376	53	163	50	0	1	266	32	149	77	0	0	258	27	157	28	212	1112
8:30 AM	46	243	44	0	2	333	43	133	37	0	0	213	47	146	65	0	2	258	26	123	30	179	983
8:45 AM	71	286	38	0	8	395	41	184	33	0	1	258	36	121	60	1	3	218	29	80	23	132	1003
Hourly Total	238	1033	196	0	10	1467	192	635	162	0	2	989	156	552	260	1	5	969	103	498	106	707	4132
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	54	130	14	0	0	198	34	117	14	0	0	165	37	86	31	0	0	154	21	91	39	151	668
11:15 AM	49	141	28	1	0	219	41	112	17	0	2	170	30	117	31	0	1	178	25	88	32	145	712
11:30 AM	59	149	35	0	0	243	42	129	22	0	1	193	29	98	33	0	1	160	24	91	25	140	736
11:45 AM	55	155	21	0	0	231	49	132	30	0	0	211	38	117	46	0	1	201	34	110	33	177	820
Hourly Total	217	575	98	1	0	891	166	490	83	0	3	739	134	418	141	0	3	693	104	380	129	613	2936
12:00 PM	57	183	28	0	0	268	33	100	26	1	4	160	29	107	42	0	0	178	42	98	42	182	788
12:15 PM	48	147	36	0	2	231	55	120	28	2	7	205	41	93	41	0	0	175	26	109	46	181	792
12:30 PM	60	147	27	1	2	235	24	129	25	0	3	178	36	117	46	0	0	199	27	106	44	177	789
12:45 PM	57	131	34	0	3	222	48	129	39	1	0	217	32	96	34	0	0	162	31	76	37	144	745
Hourly Total	222	608	125	1	7	956	160	478	118	4	14	760	138	413	163	0	0	714	126	389	169	684	3114
1:00 PM	43	155	34	0	2	232	47	150	24	0	0	221	42	77	37	0	0	156	20	90	34	144	753
1:15 PM	56	137	21	0	1	214	52	130	20	1	0	203	29	98	49	0	0	176	42	105	32	179	772
1:30 PM	42	115	27	0	3	184	48	128	32	0	0	208	35	89	42	0	0	166	27	102	39	168	726
1:45 PM	53	125	26	0	2	204	58	121	28	0	0	207	23	92	41	0	0	156	23	82	32	137	704
Hourly Total	194	532	108	0	8	834	205	529	104	1	0	839	129	356	169	0	0	654	112	379	137	628	2955
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	57	183	21	0	1	261	51	203	40	3	1	297	41	143	54	0	1	238	38	125	43	206	1002
3:15 PM	56	199	28	0	1	283	45	216	47	0	0	308	50	141	71	0	1	262	31	128	50	209	1062
3:30 PM	54	229	36	0	2	319	41	246	41	0	0	328	42	139	57	0	0	238	52	134	56	242	1127
3:45 PM	48	181	35	0	5	264	48	268	39	0	1	355	45	151	68	0	1	264	43	149	49	241	1124
Hourly Total	215	792	120	0	9	1127	185	933	167	3	2	1288	178	574	250	0	3	1002	164	536	198	898	4315
4:00 PM	52	218	22	0	2	292	49	266	39	0	0	354	51	133	64	0	2	248	56	137	51	244	1138
4:15 PM	50	193	25	1	0	269	52	234	25	0	0	311	40	176	57	0	1	273	38	137	54	229	1082
4:30 PM	48	233	31	0	0	312	44	278	30	0	0	352	51	144	52	0	2	247	36	160	68	264	1175

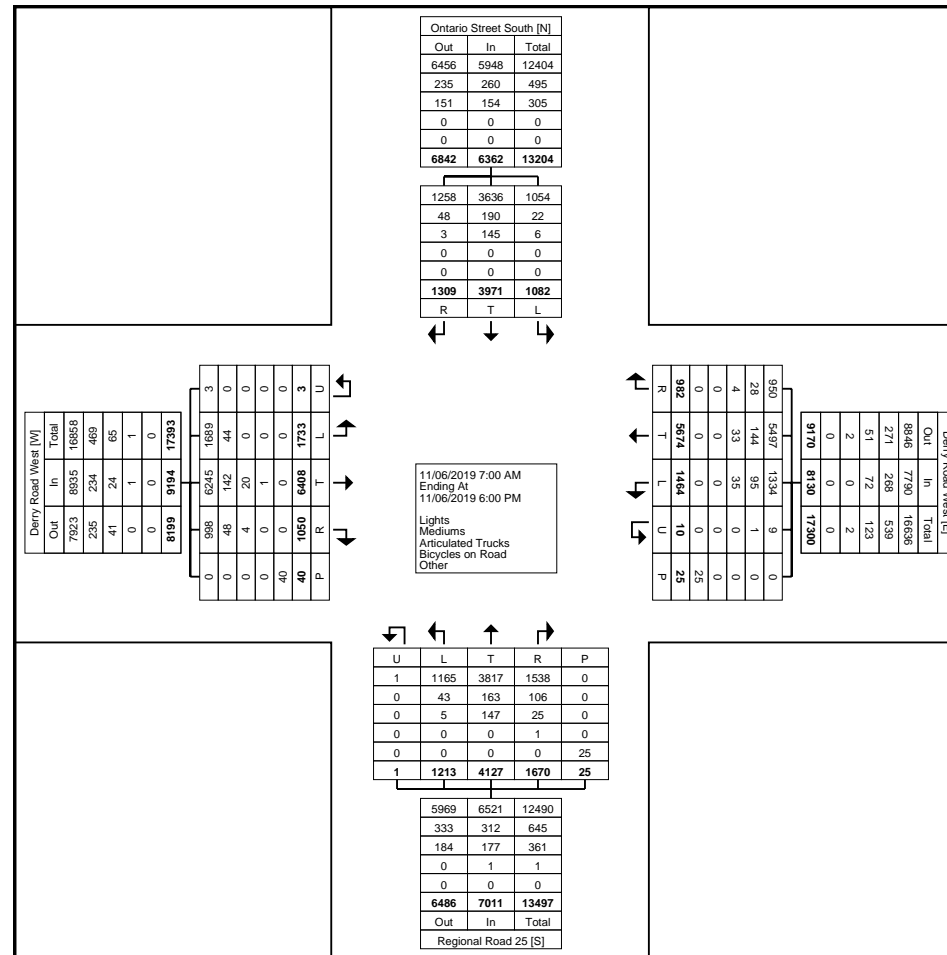
4:45 PM	50	214	32	0	0	296	42	249	35	0	0	326	54	165	66	0	1	285	46	153	58	257	1164
Hourly Total	200	858	110	1	2	1169	187	1027	129	0	0	1343	196	618	239	0	6	1053	176	587	231	994	4559
5:00 PM	49	211	45	0	1	305	40	281	32	1	0	354	52	147	59	0	2	258	48	162	56	266	1183
5:15 PM	50	186	27	0	1	263	39	258	34	0	0	331	52	186	51	0	0	289	50	159	69	278	1161
5:30 PM	48	233	26	0	1	307	51	276	29	1	0	357	41	149	56	0	0	246	54	158	55	267	1177
5:45 PM	53	218	21	0	0	292	42	265	24	0	0	331	52	177	59	0	1	288	57	154	60	271	1182
Hourly Total	200	848	119	0	3	1167	172	1080	119	2	0	1373	197	659	225	0	3	1081	209	633	240	1082	4703
Grand Total	1733	6408	1050	3	40	9194	1464	5674	982	10	25	8130	1213	4127	1670	1	25	7011	1082	3971	1309	6362	30697
Approach %	18.8	69.7	11.4	0.0	-	-	18.0	69.8	12.1	0.1	-	-	17.3	58.9	23.8	0.0	-	-	17.0	62.4	20.6	-	-
Total %	5.6	20.9	3.4	0.0	-	30.0	4.8	18.5	3.2	0.0	-	26.5	4.0	13.4	5.4	0.0	-	22.8	3.5	12.9	4.3	20.7	-
Lights	1689	6245	998	3	-	8935	1334	5497	950	9	-	7790	1165	3817	1538	1	-	6521	1054	3636	1258	5948	29194
% Lights	97.5	97.5	95.0	100.0	-	97.2	91.1	96.9	96.7	90.0	-	95.8	96.0	92.5	92.1	100.0	-	93.0	97.4	91.6	96.1	93.5	95.1
Mediums	44	142	48	0	-	234	95	144	28	1	-	268	43	163	106	0	-	312	22	190	48	260	1074
% Mediums	2.5	2.2	4.6	0.0	-	2.5	6.5	2.5	2.9	10.0	-	3.3	3.5	3.9	6.3	0.0	-	4.5	2.0	4.8	3.7	4.1	3.5
Articulated Trucks	0	20	4	0	-	24	35	33	4	0	-	72	5	147	25	0	-	177	6	145	3	154	427
% Articulated Trucks	0.0	0.3	0.4	0.0	-	0.3	2.4	0.6	0.4	0.0	-	0.9	0.4	3.6	1.5	0.0	-	2.5	0.6	3.7	0.2	2.4	1.4
Bicycles on Road	0	1	0	0	-	1	0	0	0	0	-	0	0	0	1	0	-	1	0	0	0	0	2
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.1	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	5	-	-	-	-	-	1	-	-	-	-	-	4	-	-	-	-	-	-
% Bicycles on Crosswalk	-	-	-	-	12.5	-	-	-	-	-	4.0	-	-	-	-	-	16.0	-	-	-	-	-	-
Pedestrians	-	-	-	-	35	-	-	-	-	-	24	-	-	-	-	-	21	-	-	-	-	-	-
% Pedestrians	-	-	-	-	87.5	-	-	-	-	-	96.0	-	-	-	-	-	84.0	-	-	-	-	-	-



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South & Derry RoadWest
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Turning Movement Data Plot



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Count Name: Regional Road 25/Ontario Street
South & Derry RoadWest
Site Code:
Start Date: 11/06/2019
Page No: 4

Turning Movement Peak Hour Data (7:30 AM)

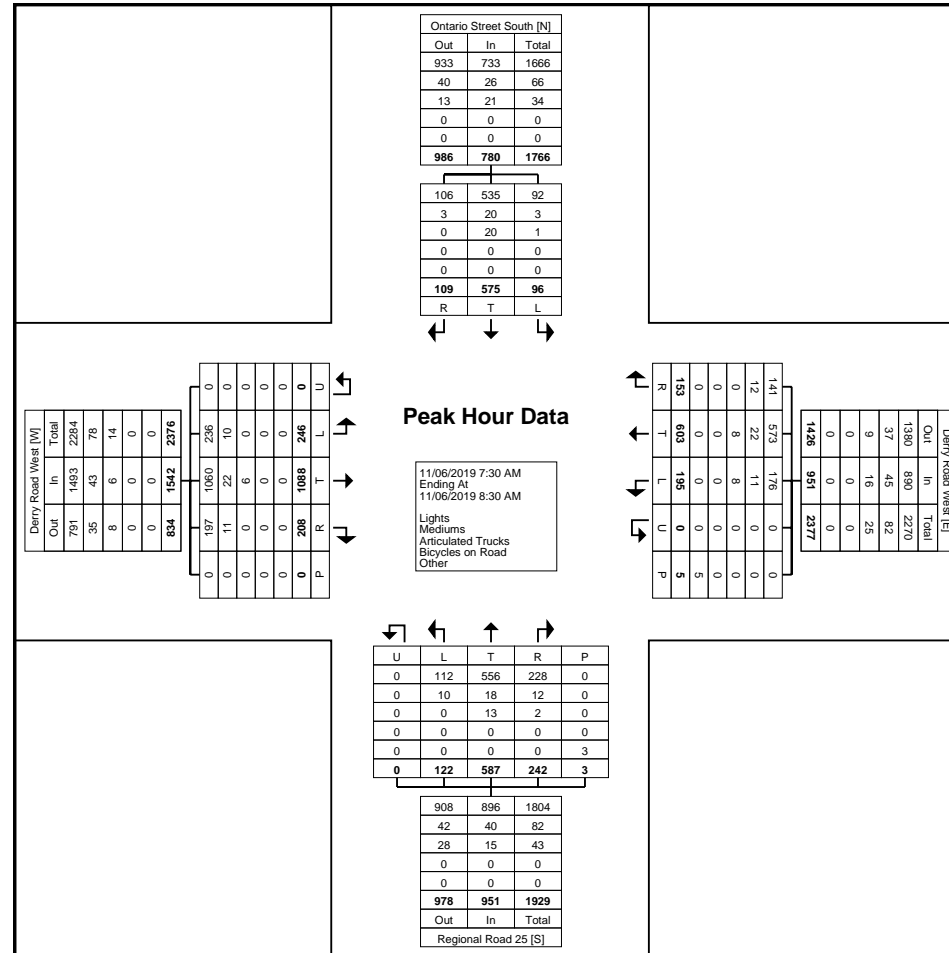
Start Time	Derry Road West Eastbound						Derry Road West Westbound						Regional Road 25 Northbound						Ontario Street South Southbound				Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	App. Total	
7:30 AM	54	277	56	0	0	387	43	108	28	0	2	179	24	151	46	0	2	221	31	140	31	202	989
7:45 AM	71	307	38	0	0	416	44	177	33	0	2	254	25	151	61	0	1	237	17	140	25	182	1089
8:00 AM	67	235	61	0	0	363	55	155	42	0	0	252	41	136	58	0	0	235	21	138	25	184	1034
8:15 AM	54	269	53	0	0	376	53	163	50	0	1	266	32	149	77	0	0	258	27	157	28	212	1112
Total	246	1088	208	0	0	1542	195	603	153	0	5	951	122	587	242	0	3	951	96	575	109	780	4224
Approach %	16.0	70.6	13.5	0.0	-	-	20.5	63.4	16.1	0.0	-	-	12.8	61.7	25.4	0.0	-	-	12.3	73.7	14.0	-	-
Total %	5.8	25.8	4.9	0.0	-	36.5	4.6	14.3	3.6	0.0	-	22.5	2.9	13.9	5.7	0.0	-	22.5	2.3	13.6	2.6	18.5	-
PHF	0.866	0.886	0.852	0.000	-	0.927	0.886	0.852	0.765	0.000	-	0.894	0.744	0.972	0.786	0.000	-	0.922	0.774	0.916	0.879	0.920	0.950
Lights	236	1060	197	0	-	1493	176	573	141	0	-	890	112	556	228	0	-	896	92	535	106	733	4012
% Lights	95.9	97.4	94.7	-	-	96.8	90.3	95.0	92.2	-	-	93.6	91.8	94.7	94.2	-	-	94.2	95.8	93.0	97.2	94.0	95.0
Mediums	10	22	11	0	-	43	11	22	12	0	-	45	10	18	12	0	-	40	3	20	3	26	154
% Mediums	4.1	2.0	5.3	-	-	2.8	5.6	3.6	7.8	-	-	4.7	8.2	3.1	5.0	-	-	4.2	3.1	3.5	2.8	3.3	3.6
Articulated Trucks	0	6	0	0	-	6	8	8	0	0	-	16	0	13	2	0	-	15	1	20	0	21	58
% Articulated Trucks	0.0	0.6	0.0	-	-	0.4	4.1	1.3	0.0	-	-	1.7	0.0	2.2	0.8	-	-	1.6	1.0	3.5	0.0	2.7	1.4
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	3	-	-	-	-	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Regional Road 25/Ontario Street
South & Derry RoadWest
Site Code:
Start Date: 11/06/2019
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Regional Road 25/Ontario Street
South & Derry RoadWest
Site Code:
Start Date: 11/06/2019
Page No: 6

Turning Movement Peak Hour Data (11:45 AM)

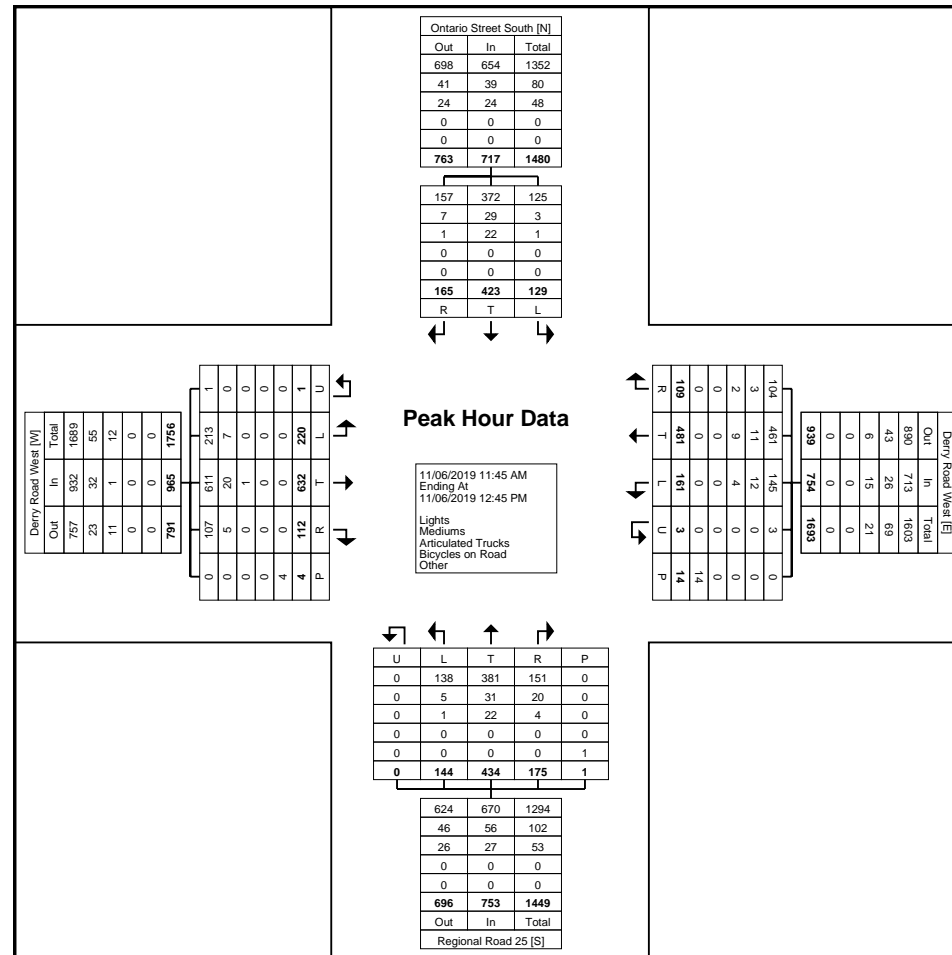
Start Time	Derry Road West Eastbound						Derry Road West Westbound						Regional Road 25 Northbound						Ontario Street South Southbound				Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	App. Total	
11:45 AM	55	155	21	0	0	231	49	132	30	0	0	211	38	117	46	0	1	201	34	110	33	177	820
12:00 PM	57	183	28	0	0	268	33	100	26	1	4	160	29	107	42	0	0	178	42	98	42	182	788
12:15 PM	48	147	36	0	2	231	55	120	28	2	7	205	41	93	41	0	0	175	26	109	46	181	792
12:30 PM	60	147	27	1	2	235	24	129	25	0	3	178	36	117	46	0	0	199	27	106	44	177	789
Total	220	632	112	1	4	965	161	481	109	3	14	754	144	434	175	0	1	753	129	423	165	717	3189
Approach %	22.8	65.5	11.6	0.1	-	-	21.4	63.8	14.5	0.4	-	-	19.1	57.6	23.2	0.0	-	-	18.0	59.0	23.0	-	-
Total %	6.9	19.8	3.5	0.0	-	30.3	5.0	15.1	3.4	0.1	-	23.6	4.5	13.6	5.5	0.0	-	23.6	4.0	13.3	5.2	22.5	-
PHF	0.917	0.863	0.778	0.250	-	0.900	0.732	0.911	0.908	0.375	-	0.893	0.878	0.927	0.951	0.000	-	0.937	0.768	0.961	0.897	0.985	0.972
Lights	213	611	107	1	-	932	145	461	104	3	-	713	138	381	151	0	-	670	125	372	157	654	2969
% Lights	96.8	96.7	95.5	100.0	-	96.6	90.1	95.8	95.4	100.0	-	94.6	95.8	87.8	86.3	-	-	89.0	96.9	87.9	95.2	91.2	93.1
Mediums	7	20	5	0	-	32	12	11	3	0	-	26	5	31	20	0	-	56	3	29	7	39	153
% Mediums	3.2	3.2	4.5	0.0	-	3.3	7.5	2.3	2.8	0.0	-	3.4	3.5	7.1	11.4	-	-	7.4	2.3	6.9	4.2	5.4	4.8
Articulated Trucks	0	1	0	0	-	1	4	9	2	0	-	15	1	22	4	0	-	27	1	22	1	24	67
% Articulated Trucks	0.0	0.2	0.0	0.0	-	0.1	2.5	1.9	1.8	0.0	-	2.0	0.7	5.1	2.3	-	-	3.6	0.8	5.2	0.6	3.3	2.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	3	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-
% Bicycles on Crosswalk	-	-	-	-	75.0	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-	-	-	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	14	-	-	-	-	-	-	1	-	-	-	-	-	-
% Pedestrians	-	-	-	-	25.0	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
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Count Name: Regional Road 25/Ontario Street
South & Derry RoadWest
Site Code:
Start Date: 11/06/2019
Page No: 7



Turning Movement Peak Hour Data Plot (11:45 AM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Regional Road 25/Ontario Street
South & Derry RoadWest
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Page No: 8

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Derry Road West Eastbound						Derry Road West Westbound						Regional Road 25 Northbound						Ontario Street South Southbound				Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	App. Total	
5:00 PM	49	211	45	0	1	305	40	281	32	1	0	354	52	147	59	0	2	258	48	162	56	266	1183
5:15 PM	50	186	27	0	1	263	39	258	34	0	0	331	52	186	51	0	0	289	50	159	69	278	1161
5:30 PM	48	233	26	0	1	307	51	276	29	1	0	357	41	149	56	0	0	246	54	158	55	267	1177
5:45 PM	53	218	21	0	0	292	42	265	24	0	0	331	52	177	59	0	1	288	57	154	60	271	1182
Total	200	848	119	0	3	1167	172	1080	119	2	0	1373	197	659	225	0	3	1081	209	633	240	1082	4703
Approach %	17.1	72.7	10.2	0.0	-	-	12.5	78.7	8.7	0.1	-	-	18.2	61.0	20.8	0.0	-	-	19.3	58.5	22.2	-	-
Total %	4.3	18.0	2.5	0.0	-	24.8	3.7	23.0	2.5	0.0	-	29.2	4.2	14.0	4.8	0.0	-	23.0	4.4	13.5	5.1	23.0	-
PHF	0.943	0.910	0.661	0.000	-	0.950	0.843	0.961	0.875	0.500	-	0.961	0.947	0.886	0.953	0.000	-	0.935	0.917	0.977	0.870	0.973	0.994
Lights	196	836	117	0	-	1149	170	1072	118	2	-	1362	195	626	218	0	-	1039	207	613	234	1054	4604
% Lights	98.0	98.6	98.3	-	-	98.5	98.8	99.3	99.2	100.0	-	99.2	99.0	95.0	96.9	-	-	96.1	99.0	96.8	97.5	97.4	97.9
Mediums	4	11	2	0	-	17	2	7	1	0	-	10	2	15	5	0	-	22	2	16	5	23	72
% Mediums	2.0	1.3	1.7	-	-	1.5	1.2	0.6	0.8	0.0	-	0.7	1.0	2.3	2.2	-	-	2.0	1.0	2.5	2.1	2.1	1.5
Articulated Trucks	0	1	0	0	-	1	0	1	0	0	-	1	0	18	2	0	-	20	0	4	1	5	27
% Articulated Trucks	0.0	0.1	0.0	-	-	0.1	0.0	0.1	0.0	0.0	-	0.1	0.0	2.7	0.9	-	-	1.9	0.0	0.6	0.4	0.5	0.6
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
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Count Name: Regional Road 25/Ontario Street
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Start Date: 11/06/2019
Page No: 10

Appendix C

Existing Traffic Operations Reports



Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Existing AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	94	122	60	88	156	83	38	928	37	54	640	52
Future Volume (vph)	94	122	60	88	156	83	38	928	37	54	640	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99		0.99		1.00		1.00		
Fit		0.951			0.948			0.994			0.989	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1735	0	1770	1708	0	1752	3384	0	1597	3353	0
Fit Permitted	0.478			0.616			0.379			0.268		
Satd. Flow (perm)	869	1735	0	1137	1708	0	699	3384	0	449	3353	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			28			6			13	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	7		10	10		7		7		7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	4%	2%	2%	3%	8%	3%	6%	3%	13%	7%	0%
Adj. Flow (vph)	94	122	60	88	156	83	38	928	37	54	640	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	182	0	88	239	0	38	965	0	54	692	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0	
Total Split (s)	39.0	39.0		39.0	39.0		61.0	61.0		61.0	61.0	
Total Split (%)	39.0%	39.0%		39.0%	39.0%		61.0%	61.0%		61.0%	61.0%	
Maximum Green (s)	32.0	32.0		32.0	32.0		55.0	55.0		55.0	55.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	15.7	15.7		15.7	15.7		55.1	55.1		55.1	55.1	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.66	0.66		0.66	0.66	
v/c Ratio	0.58	0.53		0.41	0.70		0.08	0.43		0.18	0.31	

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Existing AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	45.4	31.5		35.7	39.1		7.0	8.2		8.8	7.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	45.4	31.5		35.7	39.1		7.0	8.2		8.8	7.1	
LOS	D	C		D	D		A	A		A	A	
Approach Delay		36.3			38.2			8.1			7.2	
Approach LOS		D			D			A			A	
Queue Length 50th (m)	14.5	23.7		13.2	33.3		2.0	35.4		3.1	22.5	
Queue Length 95th (m)	30.2	43.3		27.0	57.2		7.0	60.7		10.4	40.0	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	332	679		434	670		458	2225		294	2207	
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	0.28	0.27		0.20	0.36		0.08	0.43		0.18	0.31	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	83.9
Natural Cycle:	40
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	15.3
Intersection Capacity Utilization:	84.6%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	E

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Existing AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	94	122	60	88	156	83	38	928	37	54	640	52
Future Volume (veh/h)	94	122	60	88	156	83	38	928	37	54	640	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1856	1781	1856	1811	1856	1707	1796	1900
Adj Flow Rate, veh/h	94	122	60	88	156	83	38	928	37	54	640	52
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	2	2	3	8	3	6	3	13	7	0
Cap, veh/h	222	287	141	270	281	150	460	2051	82	324	1944	158
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	1116	1160	570	1193	1135	604	745	3372	134	531	3195	259
Grp Volume(v), veh/h	94	0	182	88	0	239	38	473	492	54	341	351
Grp Sat Flow(s),veh/h/ln	1116	0	1730	1193	0	1738	745	1721	1786	531	1706	1748
Q Serve(g_s), s	7.3	0.0	8.0	6.1	0.0	10.8	2.4	13.4	13.4	5.5	8.9	8.9
Cycle Q Clear(g_c), s	18.1	0.0	8.0	14.0	0.0	10.8	11.3	13.4	13.4	19.0	8.9	8.9
Prop In Lane	1.00		0.33	1.00		0.35	1.00		0.08	1.00		0.15
Lane Grp Cap(c), veh/h	222	0	429	270	0	431	460	1047	1086	324	1038	1063
V/C Ratio(X)	0.42	0.00	0.42	0.33	0.00	0.55	0.08	0.45	0.45	0.17	0.33	0.33
Avail Cap(c_a), veh/h	341	0	612	396	0	615	460	1047	1086	324	1038	1063
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.5	0.0	28.6	34.5	0.0	29.6	11.4	9.6	9.6	14.7	8.7	8.7
Incr Delay (d2), s/veh	1.3	0.0	0.7	0.7	0.0	1.1	0.4	1.4	1.4	1.1	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	2.2	1.2	0.0	3.0	0.2	1.2	1.2	0.4	1.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.8	0.0	29.2	35.2	0.0	30.8	11.8	11.0	10.9	15.8	9.5	9.5
LnGrp LOS	D	A	C	D	A	C	B	B	B	B	A	A
Approach Vol, veh/h	276			327			1003			746		
Approach Delay, s/veh	32.5			32.0			11.0			10.0		
Approach LOS	C			C			B			A		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	61.0		29.4		61.0		29.4					
Change Period (Y+Rc), s	6.0		7.0		6.0		7.0					
Max Green Setting (Gmax), s	55.0		32.0		55.0		32.0					
Max Q Clear Time (g_c+I1), s	15.4		20.1		21.0		16.0					
Green Ext Time (p_c), s	9.4		1.3		6.8		1.8					
Intersection Summary												
HCM 6th Ctrl Delay	16.1											
HCM 6th LOS	B											

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Existing AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔	↔	↔
Traffic Volume (vph)	0	4	0	1026	788	12
Future Volume (vph)	0	4	0	1026	788	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt	0.865		0.998			
Fit Protected						
Satd. Flow (prot)	0	1644	0	3406	3402	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	3406	3402	0
Link Speed (k/h)	60		60		50	
Link Distance (m)	63.0		90.2		135.8	
Travel Time (s)	3.8		5.4		9.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	4	0	1026	788	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	0	1026	800	0
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 32.2%						ICU Level of Service A
Analysis Period (min) 15						

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Existing AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕	↕↕	
Traffic Vol, veh/h	0	4	0	1026	788	12
Future Vol, veh/h	0	4	0	1026	788	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	4	0	1026	788	12

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	400	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	605	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	605	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	605	-
HCM Lane V/C Ratio	-	0.007	-
HCM Control Delay (s)	-	11	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Existing AM Peak Hour

	↖	→	↘	↙	←	↗	↖	↗	↘	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖	↖↖	↖	↖	↖↖	↖			
Traffic Volume (vph)	246	1088	208	195	603	153	122	587	242	96	575	109			
Future Volume (vph)	246	1088	208	195	603	153	122	587	242	96	575	109			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0			
Storage Lanes	1		1	1		1	1		1	1		0			
Taper Length (m)	10.0			85.0			100.0			7.5					
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95			
Ped Bike Factor			0.99	1.00					0.98	1.00					
Frt			0.850			0.850			0.850		0.976				
Fit Protected	0.950			0.950			0.950			0.950					
Satd. Flow (prot)	1736	3505	1538	1641	3438	1495	1671	3438	1524	1736	3313	0			
Fit Permitted	0.303			0.101			0.249			0.318					
Satd. Flow (perm)	554	3505	1515	174	3438	1495	438	3438	1499	580	3313	0			
Right Turn on Red			Yes			Yes			Yes			Yes			
Satd. Flow (RTOR)			100			142			242		19				
Link Speed (k/h)		60			60			60			50				
Link Distance (m)		117.7			375.6			511.5			90.2				
Travel Time (s)		7.1			22.5			30.7			6.5				
Confl. Peds. (#/hr)			3	3					5	5					
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Heavy Vehicles (%)	4%	3%	5%	10%	5%	8%	8%	5%	6%	4%	7%	3%			
Adj. Flow (vph)	246	1088	208	195	603	153	122	587	242	96	575	109			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	246	1088	208	195	603	153	122	587	242	96	684	0			
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA				
Protected Phases	7	4		3	8		5	2		1	6				
Permitted Phases	4		4	8		8	2		2	6					
Detector Phase	7	4	4	3	8	8	5	2	2	1	6				
Switch Phase															
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0				
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7				
Total Split (s)	17.0	45.0	45.0	17.0	45.0	45.0	13.0	45.0	45.0	13.0	45.0				
Total Split (%)	14.2%	37.5%	37.5%	14.2%	37.5%	37.5%	10.8%	37.5%	37.5%	10.8%	37.5%				
Maximum Green (s)	13.0	39.0	39.0	13.0	39.0	39.0	9.0	39.0	39.0	9.0	39.0				
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0				
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max				
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0				
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0				
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0				
Act Effct Green (s)	54.0	39.5	39.5	54.0	39.5	39.5	50.3	39.7	39.7	49.7	39.4				
Actuated g/C Ratio	0.45	0.33	0.33	0.45	0.33	0.33	0.42	0.33	0.33	0.41	0.33				
v/c Ratio	0.66	0.94	0.37	0.84	0.53	0.26	0.45	0.52	0.37	0.30	0.62				

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

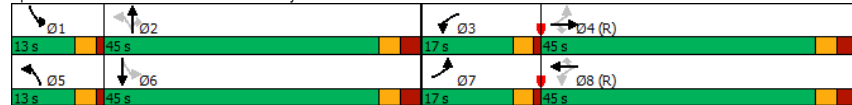
(190237) 550 Ontario St S, RR 25, Milton
Existing AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	28.6	55.8	17.8	57.6	35.0	7.0	25.3	34.6	5.3	22.0	36.1	
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	28.6	55.8	17.8	57.6	35.0	7.0	25.3	34.6	5.3	22.0	36.1	
LOS	C	E	B	E	D	A	C	C	A	C	D	
Approach Delay	46.3			35.1			25.9			34.4		
Approach LOS	D			D			C			C		
Queue Length 50th (m)	35.7	138.3	19.4	31.7	64.1	1.8	17.5	62.1	0.0	13.6	73.3	
Queue Length 95th (m)	54.2	#183.8	40.9	#72.5	83.0	17.1	30.3	80.5	18.3	24.5	94.4	
Internal Link Dist (m)	93.7		351.6		487.5							
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	379	1152	564	238	1130	586	277	1136	657	330	1099	
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	0.94	0.37	0.82	0.53	0.26	0.44	0.52	0.37	0.29	0.62	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 37.0
 Intersection Capacity Utilization 97.0%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Existing AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	246	1088	208	195	603	153	122	587	242	96	575	109
Future Volume (veh/h)	246	1088	208	195	603	153	122	587	242	96	575	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1856	1826	1752	1826	1781	1781	1826	1811	1841	1796	1856
Adj Flow Rate, veh/h	246	1088	208	195	603	153	122	587	242	96	575	109
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	3	5	10	5	8	8	5	6	4	7	3
Cap, veh/h	386	1241	543	240	1171	508	279	1170	515	281	930	176
Arrive On Green	0.11	0.35	0.35	0.09	0.34	0.34	0.06	0.34	0.34	0.05	0.32	0.32
Sat Flow, veh/h	1753	3526	1543	1668	3469	1506	1697	3469	1528	1753	2862	541
Grip Volume(v), veh/h	246	1088	208	195	603	153	122	587	242	96	342	342
Grip Sat Flow(s), veh/h/ln	1753	1763	1543	1668	1735	1506	1697	1735	1528	1753	1706	1696
Q Serve(g_s), s	10.9	34.7	12.1	9.0	16.7	9.0	5.7	16.2	15.0	4.3	20.3	20.4
Cycle Q Clear(g_c), s	10.9	34.7	12.1	9.0	16.7	9.0	5.7	16.2	15.0	4.3	20.3	20.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	386	1241	543	240	1171	508	279	1170	515	281	555	551
V/C Ratio(X)	0.64	0.88	0.38	0.81	0.51	0.30	0.44	0.50	0.47	0.34	0.62	0.62
Avail Cap(c_a), veh/h	388	1241	543	266	1171	508	299	1170	515	323	555	551
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	36.4	29.1	28.4	31.9	29.3	26.3	31.7	31.3	25.8	34.2	34.2
Incr Delay (d2), s/veh	3.4	8.9	2.0	15.9	1.6	1.5	1.1	1.5	3.1	0.7	5.1	5.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	3.2	11.7	3.4	3.3	5.2	2.5	1.6	5.0	4.3	1.4	7.0	7.0
Unsig. Movement Delay, s/veh												
LnGrip Delay(d), s/veh	26.7	45.3	31.2	44.2	33.5	30.8	27.4	33.3	34.4	26.5	39.3	39.4
LnGrip LOS	C	D	C	D	C	C	C	C	C	C	D	D
Approach Vol, veh/h	1542			951			951			780		
Approach Delay, s/veh	40.5			35.3			32.8			37.8		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.1	46.5	15.2	48.2	11.6	45.0	16.9	46.5				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	9.0	39.0	13.0	39.0	9.0	39.0	13.0	39.0				
Max Q Clear Time (g_c+I1), s	6.3	18.2	11.0	36.7	7.7	22.4	12.9	18.7				
Green Ext Time (p_c), s	0.1	5.8	0.1	1.7	0.0	4.6	0.0	5.3				

Intersection Summary

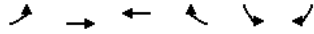
HCM 6th Ctrl Delay 37.1
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Existing AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↔
Traffic Volume (vph)	20	1464	885	27	3	22
Future Volume (vph)	20	1464	885	27	3	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.881	
Flt Protected	0.950				0.994	
Satd. Flow (prot)	1805	3539	3461	0	1600	0
Flt Permitted	0.950				0.994	
Satd. Flow (perm)	1805	3539	3461	0	1600	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	0%	33%	0%
Adj. Flow (vph)	20	1464	885	27	3	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	1464	912	0	25	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Existing AM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↔
Traffic Vol, veh/h	20	1464	885	27	3	22
Future Vol, veh/h	20	1464	885	27	3	22
Conflicting Peds, #/hr	7	0	0	7	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	4	0	33	0
Mvmt Flow	20	1464	885	27	3	22

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	919	0	0
Stage 1	-	-	906
Stage 2	-	-	772
Critical Hdwy	4.1	-	7.46
Critical Hdwy Stg 1	-	-	6.46
Critical Hdwy Stg 2	-	-	6.46
Follow-up Hdwy	2.2	-	3.83
Pot Cap-1 Maneuver	751	-	62
Stage 1	-	-	288
Stage 2	-	-	345
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	747	-	60
Mov Cap-2 Maneuver	-	-	60
Stage 1	-	-	278
Stage 2	-	-	343

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	19.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	747	-	-	-	277
HCM Lane V/C Ratio	0.027	-	-	-	0.09
HCM Control Delay (s)	10	-	-	-	19.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Existing AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	122	1265	37	118	632	85	59	99	195	98	79	67
Future Volume (vph)	122	1265	37	118	632	85	59	99	195	98	79	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		1.00	0.99	0.99		1.00	0.99	
Frt			0.850		0.982			0.901			0.931	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3505	1568	1770	3333	0	1770	1662	0	1703	1657	0
Flt Permitted	0.379			0.086			0.649			0.439		
Satd. Flow (perm)	671	3505	1525	160	3333	0	1201	1662	0	785	1657	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			66		21			91			39	
Link Speed (k/h)		60						60			60	
Link Distance (m)		171.2			370.5			215.4			213.5	
Travel Time (s)		10.3			22.2			12.9			12.8	
Conf. Peds. (#/hr)	5		5	5		5	8		3	3		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	3%	3%	2%	6%	6%	2%	2%	2%	6%	3%	9%
Adj. Flow (vph)	122	1265	37	118	632	85	59	99	195	98	79	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	1265	37	118	717	0	59	294	0	98	146	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	58.0	58.0	58.0	14.0	72.0		44.0	44.0		44.0	44.0	
Total Split (%)	50.0%	50.0%	50.0%	12.1%	62.1%		37.9%	37.9%		37.9%	37.9%	
Maximum Green (s)	52.0	52.0	52.0	10.0	66.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)	53.3	53.3	53.3	68.0	66.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.46	0.46	0.46	0.59	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.40	0.79	0.05	0.55	0.38		0.15	0.49		0.38	0.26	

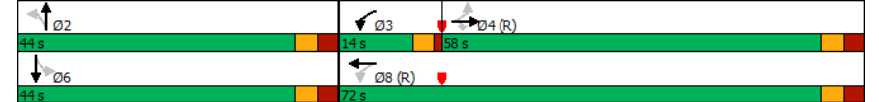
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Existing AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	26.0	31.1	1.4	23.3	14.0		29.0	24.2		35.4	22.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.0	31.1	1.4	23.3	14.0		29.0	24.2		35.4	22.1	
LOS	C	C	A	C	B		C	C		D	C	
Approach Delay		29.9			15.3			25.0			27.5	
Approach LOS		C			B			C			C	
Queue Length 50th (m)	18.9	131.7	0.0	11.8	45.5		10.0	38.0		17.9	18.3	
Queue Length 95th (m)	37.0	164.3	2.4	25.8	58.5		20.6	65.1		34.7	35.1	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	308	1611	736	232	1905		393	605		257	569	
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	0.40	0.79	0.05	0.51	0.38		0.15	0.49		0.38	0.26	

Intersection Summary

Area Type: Other
 Cycle Length: 116
 Actuated Cycle Length: 116
 Offset: 40 (34%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 24.8 Intersection LOS: C
 Intersection Capacity Utilization 104.2% ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Existing AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	122	1265	37	118	632	85	59	99	195	98	79	67
Future Volume (veh/h)	122	1265	37	118	632	85	59	99	195	98	79	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1796	1856	1856	1870	1811	1811	1870	1870	1811	1856	1767	1767
Adj Flow Rate, veh/h	122	1265	37	118	632	85	59	99	195	98	79	67
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	3	2	6	6	2	2	2	6	3	9
Cap, veh/h	383	1711	759	233	1733	233	389	183	361	254	303	257
Arrive On Green	0.49	0.49	0.49	0.05	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	704	3526	1564	1781	3047	409	1236	560	1103	1047	924	784
Grp Volume(v), veh/h	122	1265	37	118	356	361	59	0	294	98	0	146
Grp Sat Flow(s),veh/h/ln	704	1763	1564	1781	1721	1735	1236	0	1662	1047	0	1708
Q Serve(g_s), s	13.2	33.4	1.4	3.7	13.1	13.1	4.3	0.0	16.8	9.8	0.0	7.3
Cycle Q Clear(g_c), s	16.6	33.4	1.4	3.7	13.1	13.1	11.6	0.0	16.8	26.5	0.0	7.3
Prop In Lane	1.00		1.00	1.00	0.24	1.00	0.66	1.00	0.66	1.00	0.46	0.46
Lane Grp Cap(c), veh/h	383	1711	759	233	979	987	389	0	545	254	0	559
V/C Ratio(X)	0.32	0.74	0.05	0.51	0.36	0.37	0.15	0.00	0.54	0.39	0.00	0.26
Avail Cap(c_a), veh/h	383	1711	759	299	979	987	389	0	545	254	0	559
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.8	24.0	15.7	20.0	13.6	13.6	32.9	0.0	31.9	42.7	0.0	28.7
Incr Delay (d2), s/veh	2.2	2.9	0.1	1.7	1.0	1.0	0.8	0.0	3.8	4.4	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	8.5	0.3	0.8	2.6	2.7	1.0	0.0	5.2	2.2	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	26.9	15.9	21.7	14.6	14.6	33.8	0.0	35.7	47.1	0.0	29.8
LnGrp LOS	C	C	B	C	B	B	C	A	D	D	A	C
Approach Vol, veh/h	1424			835			353			244		
Approach Delay, s/veh	26.2			15.6			35.3			36.7		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	2	3	4	6			8					
Phs Duration (G+Y+Rc), s	44.0	9.7	62.3	44.0			72.0					
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0			6.0					
Max Green Setting (Gmax), s	38.0	10.0	52.0	38.0			66.0					
Max Q Clear Time (g_c+I1), s	18.8	5.7	35.4	28.5			15.1					
Green Ext Time (p_c), s	2.3	0.1	10.4	1.0			6.1					
Intersection Summary												
HCM 6th Ctrl Delay	25.2											
HCM 6th LOS	C											

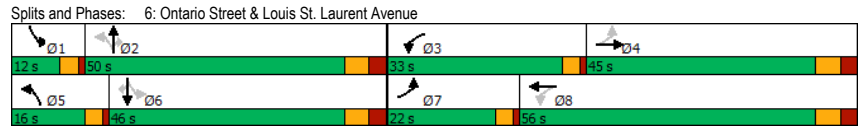
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Existing AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	301	483	295	366	425	47	142	605	131	32	818	126
Future Volume (vph)	301	483	295	366	425	47	142	605	131	32	818	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00				1.00					0.98		1.00
Frt		0.943			0.985				0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3305	0	1736	3407	0	1641	3374	1538	1703	3374	1524
Fit Permitted	0.482			0.110			0.149		0.380			
Satd. Flow (perm)	887	3305	0	201	3407	0	257	3374	1514	680	3374	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		91			9				125			125
Link Speed (k/h)		60			60			60				60
Link Distance (m)		193.1			250.0			253.7				194.1
Travel Time (s)		11.6			15.0			15.2				11.6
Confl. Peds. (#/hr)	3					3			2		2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	4%	4%	6%	10%	7%	5%	6%	7%	6%
Adj. Flow (vph)	301	483	295	366	425	47	142	605	131	32	818	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	301	778	0	366	472	0	142	605	131	32	818	126
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1		6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	22.0	45.0		33.0	56.0		16.0	50.0	50.0	12.0	46.0	46.0
Total Split (%)	15.7%	32.1%		23.6%	40.0%		11.4%	35.7%	35.7%	8.6%	32.9%	32.9%
Maximum Green (s)	18.0	38.0		29.0	49.0		12.0	43.0	43.0	8.0	39.0	39.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	52.1	32.3		64.8	40.9		57.6	48.1	48.1	49.2	39.3	39.3
Actuated g/C Ratio	0.40	0.25		0.50	0.31		0.44	0.37	0.37	0.38	0.30	0.30
v/c Ratio	0.65	0.88		0.92	0.44		0.61	0.49	0.21	0.10	0.80	0.23

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Existing AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	28.1	53.9		64.3	36.0		36.2	36.3	7.4	24.9	50.7	7.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	53.9		64.3	36.0		36.2	36.3	7.4	24.9	50.7	7.5
LOS	C	D		E	D		D	D	A	C	D	A
Approach Delay	46.7			48.3			32.0			44.3		
Approach LOS	D			D			C			D		
Queue Length 50th (m)	48.5	100.0		81.3	53.3		25.2	74.8	1.2	5.3	115.8	0.2
Queue Length 95th (m)	69.4	125.9		#138.1	69.5		42.3	99.0	16.7	12.5	#149.6	16.2
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0			20.0			50.0			50.0		
Base Capacity (vph)	484	1035		444	1296		242	1242	636	326	1017	546
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.75		0.82	0.36		0.59	0.49	0.21	0.10	0.80	0.23

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	130.5
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.92
Intersection Signal Delay:	43.0
Intersection Capacity Utilization:	91.9%
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Existing AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	301	483	295	366	425	47	142	605	131	32	818	126
Future Volume (veh/h)	301	483	295	366	425	47	142	605	131	32	818	126
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1811	1752	1796	1826	1811	1796	1811
Adj Flow Rate, veh/h	301	483	295	366	425	47	142	605	131	32	818	126
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	4	4	6	10	7	5	6	7	6
Cap, veh/h	481	556	338	399	963	106	230	1215	550	255	1059	475
Arrive On Green	0.14	0.26	0.26	0.18	0.30	0.30	0.07	0.36	0.36	0.03	0.31	0.31
Sat Flow, veh/h	1767	2104	1279	1753	3176	349	1668	3413	1545	1725	3413	1532
Grp Volume(v), veh/h	301	404	374	366	233	239	142	605	131	32	818	126
Grp Sat Flow(s), veh/h/ln	1767	1763	1620	1753	1749	1777	1668	1706	1545	1725	1706	1532
Q Serve(g_s), s	15.4	27.5	27.7	19.4	13.5	13.6	7.0	17.4	7.5	1.6	27.3	7.8
Cycle Q Clear(g_c), s	15.4	27.5	27.7	19.4	13.5	13.6	7.0	17.4	7.5	1.6	27.3	7.8
Prop In Lane	1.00		0.79	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	481	466	428	399	530	538	230	1215	550	255	1059	475
V/C Ratio(X)	0.63	0.87	0.87	0.92	0.44	0.44	0.62	0.50	0.24	0.13	0.77	0.27
Avail Cap(c_a), veh/h	488	533	490	492	682	693	268	1215	550	319	1059	475
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	44.1	44.2	31.7	35.2	35.3	29.4	31.7	28.5	28.7	39.3	32.6
Incr Delay (d2), s/veh	2.5	13.0	14.4	19.6	0.6	0.6	3.3	1.5	1.0	0.2	5.5	1.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	4.7	10.6	10.0	7.6	4.3	4.4	2.1	5.3	2.1	0.5	9.1	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.9	57.1	58.6	51.3	35.8	35.8	32.7	33.1	29.5	28.9	44.8	33.9
LnGrp LOS	C	E	E	D	D	D	C	C	C	C	D	C
Approach Vol, veh/h	1079			838			878			976		
Approach Delay, s/veh	50.0			42.6			32.5			42.8		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.4	51.7	26.4	40.2	13.1	46.0	21.5	45.1				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	8.0	43.0	29.0	38.0	12.0	39.0	18.0	49.0				
Max Q Clear Time (g_c+I1), s	3.6	19.4	21.4	29.7	9.0	29.3	17.4	15.6				
Green Ext Time (p_c), s	0.0	5.5	1.0	3.5	0.1	4.6	0.1	3.5				
Intersection Summary												
HCM 6th Ctrl Delay				42.4								
HCM 6th LOS				D								

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Existing PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	83	234	51	101	260	103	76	809	82	149	983	120
Future Volume (vph)	83	234	51	101	260	103	76	809	82	149	983	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00	
Frt		0.973			0.957			0.986			0.984	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1827	0	1787	1800	0	1787	3419	0	1787	3447	0
Fit Permitted	0.270			0.412			0.259			0.222		
Satd. Flow (perm)	507	1827	0	771	1800	0	487	3419	0	416	3447	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			20			14			23	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	3		7	7		3	2		8	8		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	0%	1%	0%	2%	1%	4%	1%	1%	3%	1%
Adj. Flow (vph)	83	234	51	101	260	103	76	809	82	149	983	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	285	0	101	363	0	76	891	0	149	1103	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		4.5	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		9.0	21.0	
Total Split (s)	35.0	35.0		35.0	35.0		50.0	50.0		15.0	65.0	
Total Split (%)	35.0%	35.0%		35.0%	35.0%		50.0%	50.0%		15.0%	65.0%	
Maximum Green (s)	28.0	28.0		28.0	28.0		44.0	44.0		10.5	59.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	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		4.5	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	22.3	22.3		22.3	22.3		46.1	46.1		60.6	59.1	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.49	0.49		0.64	0.63	
v/c Ratio	0.70	0.65		0.56	0.82		0.32	0.53		0.38	0.51	

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Existing PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	63.2	38.4		43.9	48.4		22.0	19.0		10.4	11.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	63.2	38.4		43.9	48.4		22.0	19.0		10.4	11.2	
LOS	E	D		D	D		C	B		B	B	
Approach Delay		44.0			47.4			19.2			11.1	
Approach LOS		D			D			B			B	
Queue Length 50th (m)	14.6	47.4		17.0	62.7		8.7	60.0		10.4	55.8	
Queue Length 95th (m)	#36.3	74.5		34.5	96.1		23.2	89.3		20.9	82.5	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0			35.0			15.0			40.0		
Base Capacity (vph)	150	550		228	548		237	1675		419	2166	
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	0.55	0.52		0.44	0.66		0.32	0.53		0.36	0.51	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 94.5

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 23.1

Intersection LOS: C

Intersection Capacity Utilization 93.7%

ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Existing PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	83	234	51	101	260	103	76	809	82	149	983	120
Future Volume (veh/h)	83	234	51	101	260	103	76	809	82	149	983	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1900	1885	1900	1870	1885	1841	1885	1885	1856	1885
Adj Flow Rate, veh/h	83	234	51	101	260	103	76	809	82	149	983	120
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	0	1	0	2	1	4	1	1	3	1
Cap, veh/h	173	419	91	233	362	143	280	1552	157	376	1864	228
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.48	0.48	0.48	0.06	0.59	0.59
Sat Flow, veh/h	1024	1497	326	1099	1292	512	515	3203	325	1795	3160	386
Grp Volume(v), veh/h	83	0	285	101	0	363	76	442	449	149	548	555
Grp Sat Flow(s),veh/h/ln	1024	0	1824	1099	0	1803	515	1749	1779	1795	1763	1783
Q Serve(g_s), s	7.9	0.0	13.3	8.6	0.0	18.1	10.3	17.4	17.4	3.9	18.5	18.5
Cycle Q Clear(g_c), s	26.1	0.0	13.3	22.0	0.0	18.1	18.3	17.4	17.4	3.9	18.5	18.5
Prop In Lane	1.00		0.18	1.00		0.28	1.00		0.18	1.00		0.22
Lane Grp Cap(c), veh/h	173	0	511	233	0	505	280	847	862	376	1040	1052
V/C Ratio(X)	0.48	0.00	0.56	0.43	0.00	0.72	0.27	0.52	0.52	0.40	0.53	0.53
Avail Cap(c_a), veh/h	173	0	511	233	0	505	280	847	862	456	1040	1052
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	0.0	30.7	40.1	0.0	32.5	20.8	17.8	17.8	12.8	12.2	12.2
Incr Delay (d2), s/veh	2.1	0.0	1.4	1.3	0.0	4.9	2.4	2.3	2.3	0.7	1.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	4.0	1.8	0.0	5.9	0.9	3.9	4.0	0.7	3.3	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	0.0	32.1	41.4	0.0	37.4	23.2	20.1	20.0	13.5	14.1	14.1
LnGrp LOS	D	A	C	D	A	D	C	C	C	B	B	B
Approach Vol, veh/h	368			464			967			1252		
Approach Delay, s/veh	35.3			38.2			20.3			14.0		
Approach LOS	D			D			C			B		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	10.5	54.5	35.0		65.0		35.0					
Change Period (Y+Rc), s	4.5	6.0	7.0		6.0		7.0					
Max Green Setting (Gmax), s	10.5	44.0	28.0		59.0		28.0					
Max Q Clear Time (g_c+I1), s	5.9	20.3	28.1		20.5		24.0					
Green Ext Time (p_c), s	0.2	8.3	0.0		11.5		1.1					
Intersection Summary												
HCM 6th Ctrl Delay	22.3											
HCM 6th LOS	C											

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Existing PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↕	↕	
Traffic Volume (vph)	0	38	0	1011	1083	50
Future Volume (vph)	0	38	0	1011	1083	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt	0.865		0.993			
Fit Protected						
Satd. Flow (prot)	0	1644	0	3471	3485	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	3471	3485	0
Link Speed (k/h)	60		60			
Link Distance (m)	63.0		90.2			
Travel Time (s)	3.8		5.4			
Confl. Peds. (#/hr)	2		2		2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	4%	3%	0%
Adj. Flow (vph)	0	38	0	1011	1083	50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	38	0	1011	1133	0
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Existing PM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑		↑↑	↑↓	
Traffic Vol, veh/h	0	38	0	1011	1083	50
Future Vol, veh/h	0	38	0	1011	1083	50
Conflicting Peds, #/hr	2	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	38	0	1011	1083	50

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	569	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	470	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	469	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	469	-
HCM Lane V/C Ratio	-	0.081	-
HCM Control Delay (s)	-	13.4	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.3	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Existing PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↕	↔	↔	↕↕	↔	↔	↕↕	↔	↔	↕↕	↔
Traffic Volume (vph)	200	848	119	172	1080	119	197	659	225	209	633	240
Future Volume (vph)	200	848	119	172	1080	119	197	659	225	209	633	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor			0.99	1.00			1.00					1.00
Frt			0.850			0.850			0.850			0.959
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3539	1509	1752	3505	1417	1752	3610	1553	1641	3206	0
Fit Permitted	0.099			0.170			0.144		0.264			
Satd. Flow (perm)	188	3539	1487	313	3505	1417	265	3610	1553	456	3206	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			100			225			49
Link Speed (k/h)		60			60			60				50
Link Distance (m)		117.7			375.6			511.5				90.2
Travel Time (s)		7.1			22.5			30.7				6.5
Confl. Peds. (#/hr)			3	3			3					3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	7%	3%	3%	14%	3%	0%	4%	10%	7%	9%
Adj. Flow (vph)	200	848	119	172	1080	119	197	659	225	209	633	240
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	848	119	172	1080	119	197	659	225	209	873	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	15.0	46.0	46.0	15.0	46.0	46.0	14.0	45.0	45.0	14.0	45.0	
Total Split (%)	12.5%	38.3%	38.3%	12.5%	38.3%	38.3%	11.7%	37.5%	37.5%	11.7%	37.5%	
Maximum Green (s)	11.0	40.0	40.0	11.0	40.0	40.0	10.0	39.0	39.0	10.0	39.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	53.6	40.6	40.6	52.4	40.0	40.0	51.0	39.0	39.0	51.0	39.0	
Actuated g/C Ratio	0.45	0.34	0.34	0.44	0.33	0.33	0.42	0.32	0.32	0.42	0.32	
v/c Ratio	0.86	0.71	0.21	0.66	0.92	0.22	0.83	0.56	0.34	0.72	0.81	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

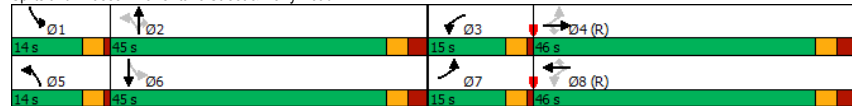
(190237) 550 Ontario St S, RR 25, Milton
Existing PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	59.8	38.7	8.6	31.2	52.5	8.8	50.9	35.7	5.3	36.7	42.1	
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	59.8	38.7	8.6	31.2	52.5	8.8	50.9	35.7	5.3	36.7	42.1	
LOS	E	D	A	C	D	A	D	D	A	D	D	
Approach Delay	39.2			46.0			32.1			41.1		
Approach LOS	D			D			C			D		
Queue Length 50th (m)	31.8	96.5	3.2	24.2	135.2	3.2	29.1	70.7	0.0	31.4	98.9	
Queue Length 95th (m)	#75.0	120.5	16.7	38.9	#177.4	16.8	#65.4	90.2	17.6	#52.9	125.3	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	232	1196	568	270	1168	539	236	1173	656	292	1075	
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	0.86	0.71	0.21	0.64	0.92	0.22	0.83	0.56	0.34	0.72	0.81	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 40.0
 Intersection Capacity Utilization 101.8%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Existing PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	200	848	119	172	1080	119	197	659	225	209	633	240
Future Volume (veh/h)	200	848	119	172	1080	119	197	659	225	209	633	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1870	1796	1856	1856	1693	1856	1900	1841	1752	1796	1767
Adj Flow Rate, veh/h	200	848	119	172	1080	119	197	659	225	209	633	240
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	7	3	3	14	3	0	4	10	7	9
Cap, veh/h	241	1226	524	282	1187	482	261	1173	506	302	786	298
Arrive On Green	0.09	0.34	0.34	0.08	0.34	0.34	0.08	0.32	0.32	0.08	0.32	0.32
Sat Flow, veh/h	1810	3554	1518	1767	3526	1431	1767	3610	1556	1668	2418	916
Grp Volume(v), veh/h	200	848	119	172	1080	119	197	659	225	209	447	426
Grp Sat Flow(s), veh/h/ln	1810	1777	1518	1767	1763	1431	1767	1805	1556	1668	1706	1628
Q Serve(g_s), s	8.6	24.6	6.7	7.5	35.2	7.2	8.9	18.1	13.7	10.0	28.7	28.7
Cycle Q Clear(g_c), s	8.6	24.6	6.7	7.5	35.2	7.2	8.9	18.1	13.7	10.0	28.7	28.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.56
Lane Grp Cap(c), veh/h	241	1226	524	282	1187	482	261	1173	506	302	555	529
V/C Ratio(X)	0.83	0.69	0.23	0.61	0.91	0.25	0.75	0.56	0.45	0.69	0.81	0.81
Avail Cap(c_a), veh/h	247	1226	524	302	1187	482	261	1173	506	302	555	529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	33.8	27.9	25.9	38.1	28.8	28.6	33.4	32.0	26.4	37.0	37.0
Incr Delay (d2), s/veh	20.5	3.2	1.0	3.2	11.8	1.2	11.8	1.9	2.8	6.7	11.8	12.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	3.7	7.9	1.9	2.3	12.5	1.9	3.3	5.9	4.0	3.4	10.6	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	49.3	37.0	28.9	29.1	49.9	30.0	40.4	35.4	34.8	33.1	48.8	49.4
LnGrp LOS	D	D	C	C	D	C	D	D	C	C	D	D
Approach Vol, veh/h	1167			1371			1081			1082		
Approach Delay, s/veh	38.3			45.6			36.2			46.0		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	45.0	13.6	47.4	14.0	45.0	14.6	46.4				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	10.0	39.0	11.0	40.0	10.0	39.0	11.0	40.0				
Max Q Clear Time (g_c+I1), s	12.0	20.1	9.5	26.6	10.9	30.7	10.6	37.2				
Green Ext Time (p_c), s	0.0	6.1	0.1	5.9	0.0	4.0	0.0	2.1				

Intersection Summary

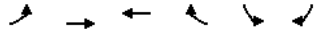
HCM 6th Ctrl Delay 41.7
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Existing PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↔
Traffic Volume (vph)	33	1150	1478	54	13	84
Future Volume (vph)	33	1150	1478	54	13	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.995		0.883	
Flt Protected	0.950				0.993	
Satd. Flow (prot)	1805	3539	3558	0	1666	0
Flt Permitted	0.950				0.993	
Satd. Flow (perm)	1805	3539	3558	0	1666	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%
Adj. Flow (vph)	33	1150	1478	54	13	84
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	1150	1532	0	97	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.2%
ICU Level of Service	B
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Existing PM Peak Hour

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↔
Traffic Vol, veh/h	33	1150	1478	54	13	84
Future Vol, veh/h	33	1150	1478	54	13	84
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	1	0	0	0
Mvmt Flow	33	1150	1478	54	13	84

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1534	0	0
Stage 1	-	-	1507
Stage 2	-	-	641
Critical Hdwy	4.1	-	6.8
Critical Hdwy Stg 1	-	-	5.8
Critical Hdwy Stg 2	-	-	5.8
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	439	-	42
Stage 1	-	-	173
Stage 2	-	-	492
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	438	-	39
Mov Cap-2 Maneuver	-	-	39
Stage 1	-	-	160
Stage 2	-	-	491

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	51.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	438	-	-	-	169
HCM Lane V/C Ratio	0.075	-	-	-	0.574
HCM Control Delay (s)	13.9	-	-	-	51.6
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.2	-	-	-	3

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Existing PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	63	904	114	289	1120	97	135	117	198	92	221	75
Future Volume (vph)	63	904	114	289	1120	97	135	117	198	92	221	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.94	0.99			0.99	0.99		0.99	0.99	
Frt			0.850		0.988			0.906			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1615	1787	3531	0	1805	1677	0	1770	1804	0
Flt Permitted	0.201			0.193			0.437			0.411		
Satd. Flow (perm)	360	3539	1517	360	3531	0	826	1677	0	762	1804	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			71		13				78			16
Link Speed (k/h)		60			60				60			60
Link Distance (m)		171.2			370.5				215.4			213.5
Travel Time (s)		10.3			22.2				12.9			12.8
Conf. Peds. (#/hr)			27	27			9		9	9		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	2%	0%	1%	1%	1%	0%	0%	2%	2%	1%	0%
Adj. Flow (vph)	63	904	114	289	1120	97	135	117	198	92	221	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	904	114	289	1217	0	135	315	0	92	296	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	57.0	57.0	57.0	15.0	72.0		44.0	44.0		44.0	44.0	
Total Split (%)	49.1%	49.1%	49.1%	12.9%	62.1%		37.9%	37.9%		37.9%	37.9%	
Maximum Green (s)	51.0	51.0	51.0	11.0	66.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effect Green (s)	51.0	51.0	51.0	68.0	66.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.44	0.44	0.44	0.59	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.40	0.58	0.16	0.84	0.60		0.50	0.52		0.37	0.49	

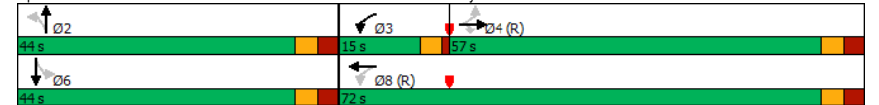
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Existing PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	31.7	26.3	8.9	34.8	17.8		39.1	27.0		35.2	32.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.7	26.3	8.9	34.8	17.8		39.1	27.0		35.2	32.8	
LOS	C	C	A	C	B		D	C		D	C	
Approach Delay		24.8			21.1			30.7				33.4
Approach LOS		C			C			C				C
Queue Length 50th (m)	10.0	83.7	5.8	32.2	94.5		25.8	45.4		16.8	53.3	
Queue Length 95th (m)	24.2	104.7	17.1	#64.2	115.7		47.1	74.3		32.9	81.1	
Internal Link Dist (m)		147.2			346.5			191.4				189.5
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	158	1555	706	346	2014		270	601		249	601	
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	0.40	0.58	0.16	0.84	0.60		0.50	0.52		0.37	0.49	

Intersection Summary

Area Type: Other
 Cycle Length: 116
 Actuated Cycle Length: 116
 Offset: 40 (34%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 24.9 Intersection LOS: C
 Intersection Capacity Utilization 106.5% ICU Level of Service G
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Existing PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	63	904	114	289	1120	97	135	117	198	92	221	75
Future Volume (veh/h)	63	904	114	289	1120	97	135	117	198	92	221	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1870	1900	1885	1885	1885	1900	1900	1870	1870	1885	1900
Adj Flow Rate, veh/h	63	904	114	289	1120	97	135	117	198	92	221	75
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	2	0	1	1	1	0	0	2	2	1	0
Cap, veh/h	217	1562	686	371	1894	164	276	207	350	247	440	149
Arrive On Green	0.44	0.44	0.44	0.09	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	442	3554	1561	1795	3328	288	1096	630	1067	1061	1343	456
Grp Volume(v), veh/h	63	904	114	289	602	615	135	0	315	92	0	296
Grp Sat Flow(s),veh/h/ln	442	1777	1561	1795	1791	1825	1096	0	1697	1061	0	1799
Q Serve(g_s), s	12.5	22.2	5.1	10.0	25.3	25.4	13.1	0.0	17.8	9.1	0.0	15.4
Cycle Q Clear(g_c), s	22.9	22.2	5.1	10.0	25.3	25.4	28.5	0.0	17.8	26.9	0.0	15.4
Prop In Lane	1.00		1.00	1.00	0.16	1.00	0.63	1.00	0.63	1.00	0.00	0.25
Lane Grp Cap(c), veh/h	217	1562	686	371	1019	1038	276	0	556	247	0	589
V/C Ratio(X)	0.29	0.58	0.17	0.78	0.59	0.59	0.49	0.00	0.57	0.37	0.00	0.50
Avail Cap(c_a), veh/h	217	1562	686	371	1019	1038	276	0	556	247	0	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.6	24.4	19.6	19.1	16.2	16.3	42.8	0.0	32.2	43.3	0.0	31.4
Incr Delay (d2), s/veh	3.4	1.6	0.5	10.2	2.5	2.5	6.1	0.0	4.1	4.3	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.1	1.3	3.0	5.5	5.6	3.1	0.0	5.7	2.1	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.9	26.0	20.2	29.3	18.8	18.7	48.9	0.0	36.3	47.5	0.0	34.4
LnGrp LOS	C	C	C	C	B	B	D	A	D	D	A	C
Approach Vol, veh/h	1081			1506			450			388		
Approach Delay, s/veh	25.7			20.8			40.1			37.5		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	2		3		4		6		8			
Phs Duration (G+Y+Rc), s	44.0	15.0	57.0	44.0	72.0	6.0	6.0					
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0	6.0							
Max Green Setting (Gmax), s	38.0	11.0	51.0	38.0	66.0							
Max Q Clear Time (g_c+I1), s	30.5	12.0	24.9	28.9	27.4							
Green Ext Time (p_c), s	1.8	0.0	10.1	1.7	12.8							
Intersection Summary												
HCM 6th Ctrl Delay	26.8											
HCM 6th LOS	C											

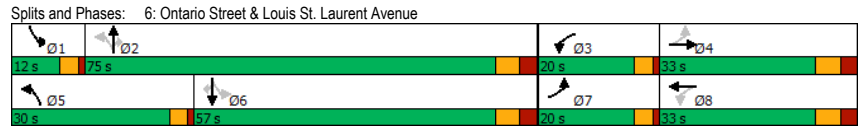
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Existing PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	195	325	114	181	491	57	428	847	258	70	587	237
Future Volume (vph)	195	325	114	181	491	57	428	847	258	70	587	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.99	1.00		
Frt	0.961				0.984				0.850		0.850	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3426	0	1787	3521	0	1787	3471	1615	1805	3471	1599
Fit Permitted	0.177			0.319			0.323			0.334		
Satd. Flow (perm)	330	3426	0	600	3521	0	608	3471	1593	634	3471	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			8				210			222
Link Speed (k/h)		60			60			60				60
Link Distance (m)	193.1				250.0				253.7		194.1	
Travel Time (s)	11.6				15.0				15.2		11.6	
Confl. Peds. (#/hr)							1		1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	2%	1%	1%	0%	1%	4%	0%	0%	4%	1%
Adj. Flow (vph)	195	325	114	181	491	57	428	847	258	70	587	237
Shared Lane Traffic (%)												
Lane Group Flow (vph)	195	439	0	181	548	0	428	847	258	70	587	237
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2			2	6	6
Detector Phase	7	4		3	8		5	2		2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	20.0	33.0		20.0	33.0		30.0	75.0	75.0	12.0	57.0	57.0
Total Split (%)	14.3%	23.6%		14.3%	23.6%		21.4%	53.6%	53.6%	8.6%	40.7%	40.7%
Maximum Green (s)	16.0	26.0		16.0	26.0		26.0	68.0	68.0	8.0	50.0	50.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	42.5	24.7		41.1	24.0		80.6	68.6	68.6	62.0	51.7	51.7
Actuated g/C Ratio	0.32	0.18		0.31	0.18		0.60	0.51	0.51	0.46	0.38	0.38
v/c Ratio	0.74	0.67		0.59	0.86		0.77	0.48	0.28	0.20	0.44	0.32

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Existing PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	51.3	53.6		41.3	68.0		24.8	23.6	5.4	15.1	33.1	6.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	53.6		41.3	68.0		24.8	23.6	5.4	15.1	33.1	6.0
LOS	D	D		D	E		C	C	A	B	C	A
Approach Delay	52.9			61.3			20.9			24.5		
Approach LOS	D			E			C			C		
Queue Length 50th (m)	41.3	58.5		37.9	80.4		63.8	86.1	7.2	8.3	67.2	2.7
Queue Length 95th (m)	#66.2	78.4		58.5	#104.7		88.0	105.6	23.4	15.4	87.7	21.4
Internal Link Dist (m)	169.1			226.0			229.7		170.1			
Turn Bay Length (m)	45.0			20.0			50.0		50.0	50.0	50.0	
Base Capacity (vph)	278	692		333	690		593	1769	915	365	1334	751
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.63		0.54	0.79		0.72	0.48	0.28	0.19	0.44	0.32

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	134.5
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.86
Intersection Signal Delay:	34.9
Intersection Capacity Utilization:	84.9%
ICU Level of Service E	Intersection LOS: C
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Existing PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	195	325	114	181	491	57	428	847	258	70	587	237
Future Volume (veh/h)	195	325	114	181	491	57	428	847	258	70	587	237
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1885	1870	1885	1885	1900	1885	1841	1900	1900	1841	1885
Adj Flow Rate, veh/h	195	325	114	181	491	57	428	847	258	70	587	237
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	1	2	1	1	0	1	4	0	0	4	1
Cap, veh/h	265	475	164	291	566	65	522	1809	832	307	1379	629
Arrive On Green	0.10	0.18	0.18	0.10	0.17	0.17	0.16	0.52	0.52	0.04	0.39	0.39
Sat Flow, veh/h	1781	2614	900	1795	3235	374	1795	3497	1609	1810	3497	1596
Grip Volume(v), veh/h	195	221	218	181	271	277	428	847	258	70	587	237
Grip Sat Flow(s), veh/h/ln	1781	1791	1723	1795	1791	1818	1795	1749	1609	1810	1749	1596
Q Serve(g_s), s	11.6	15.1	15.6	10.7	19.3	19.5	17.8	20.3	12.1	3.0	16.1	13.9
Cycle Q Clear(g_c), s	11.6	15.1	15.6	10.7	19.3	19.5	17.8	20.3	12.1	3.0	16.1	13.9
Prop In Lane	1.00		0.52	1.00		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	265	325	313	291	313	318	522	1809	832	307	1379	629
V/C Ratio(X)	0.74	0.68	0.70	0.62	0.87	0.87	0.82	0.47	0.31	0.23	0.43	0.38
Avail Cap(c_a), veh/h	294	354	341	334	354	360	592	1809	832	353	1379	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	50.2	50.4	39.6	52.7	52.8	19.5	20.2	18.2	22.3	29.0	28.3
Incr Delay (d2), s/veh	8.4	4.6	5.5	2.8	18.0	18.6	8.1	0.9	1.0	0.4	1.0	1.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	4.5	5.8	5.8	3.8	8.4	8.7	5.2	5.2	3.0	0.9	4.9	4.0
Unsig. Movement Delay, s/veh												
LnGrip Delay(d), s/veh	48.5	54.8	55.9	42.5	70.7	71.4	27.6	21.1	19.2	22.7	29.9	30.0
LnGrip LOS	D	D	E	D	E	E	C	C	B	C	C	C
Approach Vol, veh/h	634			729			1533			894		
Approach Delay, s/veh	53.3			63.9			22.6			29.4		
Approach LOS	D			E			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	75.0	16.9	30.9	24.8	58.8	17.8	30.0				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	8.0	68.0	16.0	26.0	26.0	50.0	16.0	26.0				
Max Q Clear Time (g_c+I1), s	5.0	22.3	12.7	17.6	19.8	18.1	13.6	21.5				
Green Ext Time (p_c), s	0.0	10.5	0.2	1.9	1.1	6.5	0.2	1.5				

Intersection Summary	
HCM 6th Ctrl Delay	37.3
HCM 6th LOS	D

Appendix D

Proxy Site Survey Data



TIME	Appleby												Ironstone												
	26-Feb				27-Feb				28-Feb				26-Feb				27-Feb				28-Feb				
	Commercial		Residential		Commercial		Residential		Commercial		Residential		Commercial		Residential		Commercial		Residential		Commercial		Residential		
ENDING	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	
7:15 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	1	
7:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	1	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	1	3
8:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	2	4	
8:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	2	0	0	0	2	0	0	0	4	
8:45 AM	2	0	2	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	3	2	
9:00 AM	1	1	0	1	4	2	1	0	0	0	0	0	0	0	2	2	0	0	4	2	0	0	2	0	
9:15 AM	2	2	0	1	0	0	0	0	4	1	0	0	0	0	0	0	3	0	0	0	1	0	0	0	1
9:30 AM	0	0	0	0	1	1	0	1	3	3	0	0	0	0	0	0	0	0	2	2	1	0	0	0	
9:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	
10:00 AM	0	0	1	0	2	0	0	1	4	4	0	0	0	0	0	3	0	0	0	1	0	0	0	1	
10:15 AM	1	1	1	2	0	0	2	0	2	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	
10:30 AM	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	
10:45 AM	0	0	1	0	0	1	0	0	2	2	0	0	0	0	0	2	0	0	0	0	0	0	3	2	
11:00 AM	0	0	0	1	2	0	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	2	1	
11:15 AM	0	0	1	2	1	0	1	2	2	2	0	0	1	0	0	0	0	0	2	0	0	0	2	3	
11:30 AM	0	0	0	0	0	0	0	0	0	3	1	1	0	0	0	0	0	0	0	2	0	0	0	0	
11:45 AM	2	1	0	2	0	0	0	0	2	0	1	0	1	1	0	0	0	0	0	1	1	2	2	2	
12:00 PM	2	3	4	1	0	0	1	0	0	0	0	1	3	2	2	0	0	0	1	1	0	0	0	0	
12:15 PM	1	0	0	0	2	0	0	0	0	1	1	0	0	0	1	1	0	0	1	1	0	0	0	1	
12:30 PM	2	2	1	1	0	1	0	0	1	1	0	0	1	1	1	3	0	0	1	2	0	0	0	2	
12:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	1	0	0	1	0	0	0	0	2	
1:00 PM	1	2	0	1	4	1	0	0	3	2	0	0	1	1	2	2	0	0	2	3	0	0	2	0	
1:15 PM	3	4	2	4	1	2	0	0	2	4	0	1	0	0	1	0	0	0	1	0	0	0	0	0	
1:30 PM	1	1	3	1	1	0	0	0	0	0	0	2	0	0	0	2	0	0	1	0	0	0	1	3	
1:45 PM	3	0	1	2	2	2	0	0	0	0	0	0	0	0	2	5	1	1	3	2	0	0	0	0	
2:00 PM	0	1	5	4	0	1	0	1	2	2	3	0	2	0	1	0	0	0	0	0	0	0	0	0	
2:15 PM	1	0	1	2	4	1	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	
2:30 PM	0	2	1	0	0	2	0	0	0	0	0	0	0	0	1	2	0	0	3	1	2	2	1	0	
2:45 PM	2	0	0	1	4	2	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	2	1	
3:00 PM	0	0	0	0	2	0	0	0	4	1	0	0	1	1	1	1	0	0	0	1	0	0	1	0	
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	
3:30 PM	3	1	1	2	0	0	0	0	4	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	
3:45 PM	2	0	1	1	3	3	0	0	3	2	0	0	0	0	2	0	0	0	1	0	0	0	1	0	
4:00 PM	0	2	0	1	3	1	0	0	2	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	
4:15 PM	0	0	1	0	1	0	0	0	4	4	0	0	0	0	2	0	0	0	1	0	0	0	2	0	
4:30 PM	2	0	0	1	2	1	0	0	1	3	0	0	0	0	1	0	0	0	1	0	0	0	1	1	
4:45 PM	2	1	2	2	3	2	0	0	1	2	0	0	0	0	0	1	1	0	0	2	0	0	0	0	
5:00 PM	1	1	1	0	4	2	0	0	2	4	0	0	0	0	0	0	0	0	1	1	0	0	0	1	
5:15 PM	0	1	1	0	0	2	0	0	1	0	0	0	0	0	1	0	0	0	1	1	0	0	2	0	
5:30 PM	0	0	0	1	3	2	0	0	1	2	0	0	0	0	1	1	0	1	3	2	0	0	5	5	
5:45 PM	2	0	2	2	0	5	1	2	0	0	0	0	0	0	2	0	0	2	0	0	0	2	0	0	
6:00 PM	2	0	0	2	2	0	0	0	3	2	3	1	0	0	0	1	0	0	0	3	0	0	1	3	
6:15 PM	0	1	1	0	4	8	0	0	2	1	0	2	0	0	2	0	0	0	2	0	0	0	5	4	
6:30 PM	1	0	1	0	1	0	1	0	1	3	0	2	0	0	3	1	0	0	1	2	0	0	0	0	
6:45 PM	0	1	1	0	1	2	0	1	1	0	0	0	0	0	2	2	0	0	2	1	0	0	2	3	
7:00 PM	1	1	2	1	0	2	0	0	1	0	0	0	0	0	2	1	0	0	0	1	0	0	0	0	

Appendix E

2024 Background Traffic Operations Reports



Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Background 2024 AM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↕	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↖		↖	↖		↖	↖		↖	↖			
Traffic Volume (vph)	104	135	66	97	172	92	42	1025	41	60	693	57		
Future Volume (vph)	104	135	66	97	172	92	42	1025	41	60	693	57		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0		
Storage Lanes	1		0	1		0	1		0	1		0		
Taper Length (m)	15.0			25.0			15.0			20.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95		
Ped Bike Factor	0.99	0.99		0.99		0.99		1.00						
Fit		0.951			0.948			0.994			0.989			
Fit Protected	0.950			0.950			0.950			0.950				
Satd. Flow (prot)	1736	1735	0	1770	1708	0	1752	3384	0	1597	3353	0		
Fit Permitted	0.530			0.632			0.350			0.222				
Satd. Flow (perm)	963	1735	0	1167	1708	0	646	3384	0	373	3353	0		
Right Turn on Red			Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)		35			24			5			10			
Link Speed (k/h)		60			60			60			50			
Link Distance (m)		66.2			94.7			135.8			142.5			
Travel Time (s)		4.0			5.7			8.1			10.3			
Conf. Peds. (#/hr)	7		10	10		7		7		7				
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Heavy Vehicles (%)	4%	4%	2%	2%	3%	8%	3%	6%	3%	13%	7%	0%		
Adj. Flow (vph)	104	135	66	97	172	92	42	1025	41	60	693	57		
Shared Lane Traffic (%)														
Lane Group Flow (vph)	104	201	0	97	264	0	42	1066	0	60	750	0		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA			
Protected Phases		4			8			2			6			
Permitted Phases	4			8			2			6				
Detector Phase	4	4		8	8		2	2		6	6			
Switch Phase														
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0			
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0			
Total Split (s)	57.0	57.0		57.0	57.0		43.0	43.0		43.0	43.0			
Total Split (%)	57.0%	57.0%		57.0%	57.0%		43.0%	43.0%		43.0%	43.0%			
Maximum Green (s)	50.0	50.0		50.0	50.0		37.0	37.0		37.0	37.0			
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0			
All-Red Time (s)	3.0	3.0		3.0	3.0		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?														
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0			
Recall Mode	None	None		None	None		Max	Max		Max	Max			
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0			
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0			
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0			
Act Effct Green (s)	14.4	14.4		14.4	14.4		37.1	37.1		37.1	37.1			
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.58	0.58		0.58	0.58			
v/c Ratio	0.49	0.49		0.37	0.66		0.11	0.55		0.28	0.39			

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

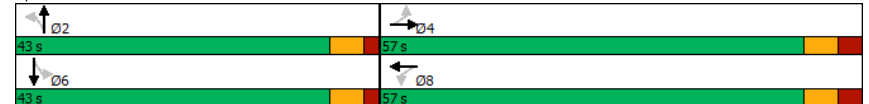
Background 2024 AM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↕	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Control Delay	29.8	21.8		25.3	29.1		8.4	10.4		12.6	8.7			
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0			
Total Delay	29.8	21.8		25.3	29.1		8.4	10.4		12.6	8.7			
LOS	C	C		C	C		A	B		B	A			
Approach Delay		24.5			28.1			10.3			9.0			
Approach LOS		C			C			B			A			
Queue Length 50th (m)	11.4	18.0		10.4	27.4		2.1	38.4		3.4	23.5			
Queue Length 95th (m)	25.0	35.2		22.5	49.2		7.6	66.9		12.9	42.3			
Internal Link Dist (m)		42.2			70.7			111.8			118.5			
Turn Bay Length (m)	15.0				35.0			15.0			40.0			
Base Capacity (vph)	748	1355		906	1332		371	1947		214	1931			
Starvation Cap Reductn	0	0		0	0		0	0		0	0			
Spillback Cap Reductn	0	0		0	0		0	0		0	0			
Storage Cap Reductn	0	0		0	0		0	0		0	0			
Reduced v/c Ratio	0.14	0.15		0.11	0.20		0.11	0.55		0.28	0.39			

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	64.5
Natural Cycle:	45
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.66
Intersection Signal Delay:	14.0
Intersection Capacity Utilization:	88.5%
Intersection LOS:	B
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	104	135	66	97	172	92	42	1025	41	60	693	57
Future Volume (veh/h)	104	135	66	97	172	92	42	1025	41	60	693	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1856	1781	1856	1811	1856	1707	1796	1900
Adj Flow Rate, veh/h	104	135	66	97	172	92	42	1025	41	60	693	57
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	2	2	3	8	3	6	3	13	7	0
Cap, veh/h	281	338	165	334	329	176	380	1770	71	256	1675	138
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	1092	1163	569	1174	1133	606	706	3371	135	483	3191	262
Grp Volume(v), veh/h	104	0	201	97	0	264	42	523	543	60	370	380
Grp Sat Flow(s),veh/h/ln	1092	0	1731	1174	0	1739	706	1721	1786	483	1706	1747
Q Serve(g_s), s	6.2	0.0	6.6	5.1	0.0	8.9	2.7	14.6	14.6	6.8	9.3	9.3
Cycle Q Clear(g_c), s	15.2	0.0	6.6	11.7	0.0	8.9	12.0	14.6	14.6	21.4	9.3	9.3
Prop In Lane	1.00		0.33	1.00		0.35	1.00		0.08	1.00		0.15
Lane Grp Cap(c), veh/h	281	0	503	334	0	505	380	903	938	256	896	917
V/C Ratio(X)	0.37	0.00	0.40	0.29	0.00	0.52	0.11	0.58	0.58	0.23	0.41	0.41
Avail Cap(c_a), veh/h	738	0	1228	825	0	1234	380	903	938	256	896	917
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	20.1	24.7	0.0	20.9	13.8	11.4	11.4	18.7	10.2	10.2
Incr Delay (d2), s/veh	0.8	0.0	0.5	0.5	0.0	0.8	0.6	2.7	2.6	2.1	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.3	0.8	0.0	1.8	0.2	1.2	1.2	0.5	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	0.0	20.6	25.2	0.0	21.8	14.4	14.1	14.0	20.9	11.6	11.5
LnGrp LOS	C	A	C	C	A	C	B	B	B	C	B	B
Approach Vol, veh/h	305			361			1108			810		
Approach Delay, s/veh	23.1			22.7			14.1			12.2		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	43.0			27.5			43.0			27.5		
Change Period (Y+Rc), s	6.0			7.0			6.0			7.0		
Max Green Setting (Gmax), s	37.0			50.0			37.0			50.0		
Max Q Clear Time (g_c+I1), s	16.6			17.2			23.4			13.7		
Green Ext Time (p_c), s	8.6			2.1			5.3			2.6		
Intersection Summary												
HCM 6th Ctrl Delay	15.8											
HCM 6th LOS	B											

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔	↔	
Traffic Volume (vph)	0	0	0	1189	914	0
Future Volume (vph)	0	0	0	1189	914	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Fit						
Fit Protected						
Satd. Flow (prot)	0	1900	0	3406	3406	0
Fit Permitted						
Satd. Flow (perm)	0	1900	0	3406	3406	0
Link Speed (k/h)	60		60		50	
Link Distance (m)	63.0		90.2		135.8	
Travel Time (s)	3.8		5.4		9.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	0	0	1189	914	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1189	914	0
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 36.2%						ICU Level of Service A
Analysis Period (min) 15						

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕	↕↕	
Traffic Vol, veh/h	0	0	0	1189	914	0
Future Vol, veh/h	0	0	0	1189	914	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	0	0	1189	914	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	457	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	556	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	556	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 AM Peak Hour

	↖	→	↘	↙	←	↗	↖	↗	↘	↙	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖	↖↖	↖	↖	↖↖	↖
Traffic Volume (vph)	200	883	169	158	489	124	141	680	281	111	667	126
Future Volume (vph)	200	883	169	158	489	124	141	680	281	111	667	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor			0.99	1.00					0.98	1.00		
Frt			0.850			0.850			0.850		0.976	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3505	1538	1641	3438	1495	1671	3438	1524	1736	3313	0
Fit Permitted	0.358			0.142			0.178		0.314			
Satd. Flow (perm)	654	3505	1515	245	3438	1495	313	3438	1499	573	3313	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			136			281		19	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		117.7			375.6			511.5			90.2	
Travel Time (s)		7.1			22.5			30.7			6.5	
Confl. Peds. (#/hr)			3	3					5	5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	3%	5%	10%	5%	8%	8%	5%	6%	4%	7%	3%
Adj. Flow (vph)	200	883	169	158	489	124	141	680	281	111	667	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	883	169	158	489	124	141	680	281	111	793	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	19.0	43.0	43.0	17.0	41.0	41.0	14.0	51.0	51.0	9.0	46.0	
Total Split (%)	15.8%	35.8%	35.8%	14.2%	34.2%	34.2%	11.7%	42.5%	42.5%	7.5%	38.3%	
Maximum Green (s)	15.0	37.0	37.0	13.0	35.0	35.0	10.0	45.0	45.0	5.0	40.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	53.6	38.6	38.6	50.4	37.0	37.0	55.8	45.0	45.0	47.5	40.5	
Actuated g/C Ratio	0.45	0.32	0.32	0.42	0.31	0.31	0.46	0.38	0.38	0.40	0.34	
v/c Ratio	0.49	0.78	0.29	0.67	0.46	0.22	0.56	0.53	0.38	0.41	0.70	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

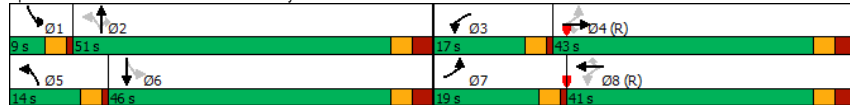
(190237) 550 Ontario St S, RR 25, Milton
Background 2024 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	23.8	43.2	9.5	35.5	35.6	5.3	27.5	31.1	4.5	24.6	37.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	23.8	43.2	9.5	35.5	35.6	5.3	27.5	31.1	4.5	24.6	37.8	
LOS	C	D	A	D	D	A	C	C	A	C	D	
Approach Delay	35.6			30.7			23.8			36.2		
Approach LOS	D			C			C			D		
Queue Length 50th (m)	29.1	105.4	5.7	22.6	51.8	0.0	19.9	68.4	0.0	15.3	87.8	
Queue Length 95th (m)	45.6	132.5	22.8	40.3	69.7	12.1	33.2	87.4	17.8	26.7	111.4	
Internal Link Dist (m)	93.7		351.6		487.5							
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0		70.0			
Base Capacity (vph)	434	1126	579	257	1059	554	259	1289	737	274	1130	
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	0.46	0.78	0.29	0.61	0.46	0.22	0.54	0.53	0.38	0.41	0.70	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	31.6
Intersection Capacity Utilization:	95.7%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	F

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (veh/h)	200	883	169	158	489	124	141	680	281	111	667	126
Future Volume (veh/h)	200	883	169	158	489	124	141	680	281	111	667	126
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1856	1826	1752	1826	1781	1781	1826	1811	1841	1796	1856
Adj Flow Rate, veh/h	200	883	169	158	489	124	141	680	281	111	667	126
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	3	5	10	5	8	8	5	6	4	7	3
Cap, veh/h	393	1186	519	251	1120	486	274	1301	573	261	996	188
Arrive On Green	0.09	0.34	0.34	0.08	0.32	0.32	0.07	0.38	0.38	0.04	0.35	0.35
Sat Flow, veh/h	1753	3526	1543	1668	3469	1505	1697	3469	1529	1753	2863	540
Grp Volume(v), veh/h	200	883	169	158	489	124	141	680	281	111	397	396
Grp Sat Flow(s), veh/h/ln	1753	1763	1543	1668	1735	1505	1697	1735	1529	1753	1706	1696
Q Serve(g_s), s	9.0	26.6	9.8	7.5	13.3	7.3	6.2	18.3	16.9	5.0	23.7	23.8
Cycle Q Clear(g_c), s	9.0	26.6	9.8	7.5	13.3	7.3	6.2	18.3	16.9	5.0	23.7	23.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	393	1186	519	251	1120	486	274	1301	573	261	594	590
V/C Ratio(X)	0.51	0.74	0.33	0.63	0.44	0.26	0.51	0.52	0.49	0.43	0.67	0.67
Avail Cap(c_a), veh/h	447	1186	519	298	1120	486	299	1301	573	261	594	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	35.2	29.7	27.4	32.0	30.0	24.8	29.2	28.7	25.0	33.2	33.3
Incr Delay (d2), s/veh	1.0	4.3	1.7	3.1	1.2	1.3	1.5	1.5	3.0	1.1	5.9	6.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	2.6	8.7	2.8	2.2	4.2	2.1	1.7	5.4	4.7	1.5	8.1	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	25.1	39.5	31.3	30.5	33.3	31.3	26.3	30.7	31.7	26.1	39.1	39.2
LnGrp LOS	C	D	C	C	C	C	C	C	C	C	D	D
Approach Vol, veh/h	1252			771			1102			904		
Approach Delay, s/veh	36.1			32.4			30.4			37.6		
Approach LOS	D			C			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	51.0	13.6	46.4	12.2	47.8	15.3	44.7				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	5.0	45.0	13.0	37.0	10.0	40.0	15.0	35.0				
Max Q Clear Time (g_c+I1), s	7.0	20.3	9.5	28.6	8.2	25.8	11.0	15.3				
Green Ext Time (p_c), s	0.0	7.3	0.2	4.6	0.1	5.1	0.3	4.2				

Intersection Summary

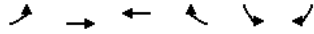
HCM 6th Ctrl Delay	34.1
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↕↕	
Traffic Volume (vph)	0	1188	718	0	0	0
Future Volume (vph)	0	1188	718	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Flt Protected						
Satd. Flow (prot)	1900	3539	3471	0	1429	0
Flt Permitted						
Satd. Flow (perm)	1900	3539	3471	0	1429	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	0%	33%	0%
Adj. Flow (vph)	0	1188	718	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1188	718	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.2%
ICU Level of Service A	
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↕↕	
Traffic Vol, veh/h	0	1188	718	0	0	0
Future Vol, veh/h	0	1188	718	0	0	0
Conflicting Peds, #/hr	7	0	0	7	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	4	0	33	0
Mvmt Flow	0	1188	718	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	725	0	1319
Stage 1	-	-	725
Stage 2	-	-	594
Critical Hdwy	4.1	-	7.46
Critical Hdwy Stg 1	-	-	6.46
Critical Hdwy Stg 2	-	-	6.46
Follow-up Hdwy	2.2	-	3.83
Pot Cap-1 Maneuver	887	-	114
Stage 1	-	-	367
Stage 2	-	-	437
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	882	-	113
Mov Cap-2 Maneuver	-	-	113
Stage 1	-	-	365
Stage 2	-	-	434

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	882	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2024 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	99	1027	30	96	513	69	68	115	226	114	92	78
Future Volume (vph)	99	1027	30	96	513	69	68	115	226	114	92	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		1.00	0.99		0.99	1.00		0.99
Flt			0.850		0.982			0.901			0.931	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3505	1568	1770	3333	0	1770	1662	0	1703	1657	0
Flt Permitted	0.433			0.160			0.613			0.377		
Satd. Flow (perm)	766	3505	1525	298	3333	0	1135	1662	0	675	1657	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			66		21			91			39	
Link Speed (k/h)		60						60				60
Link Distance (m)		171.2			370.5			215.4			213.5	
Travel Time (s)		10.3			22.2			12.9			12.8	
Conf. Peds. (#/hr)	5		5	5		5	8		3	3		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	3%	3%	2%	6%	6%	2%	2%	2%	6%	3%	9%
Adj. Flow (vph)	99	1027	30	96	513	69	68	115	226	114	92	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	1027	30	96	582	0	68	341	0	114	170	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	58.0	58.0	58.0	14.0	72.0		44.0	44.0		44.0	44.0	
Total Split (%)	50.0%	50.0%	50.0%	12.1%	62.1%		37.9%	37.9%		37.9%	37.9%	
Maximum Green (s)	52.0	52.0	52.0	10.0	66.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)	53.8	53.8	53.8	68.0	66.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.46	0.46	0.46	0.59	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.28	0.63	0.04	0.35	0.31		0.18	0.56		0.52	0.30	

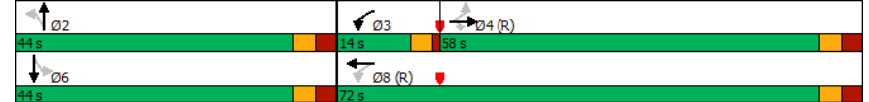
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2024 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	22.3	26.0	0.4	14.0	13.0		29.6	27.3		41.5	23.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.3	26.0	0.4	14.0	13.0		29.6	27.3		41.5	23.8	
LOS	C	C	A	B	B		C	C		D	C	
Approach Delay		25.0			13.2			27.7			30.9	
Approach LOS		C			B			C			C	
Queue Length 50th (m)	14.2	95.5	0.0	9.5	34.7		11.6	48.8		22.0	22.8	
Queue Length 95th (m)	28.4	122.1	0.8	17.2	46.0		23.5	79.7		42.6	41.3	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	355	1626	743	301	1905		371	605		221	569	
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	0.28	0.63	0.04	0.32	0.31		0.18	0.56		0.52	0.30	

Intersection Summary

Area Type: Other
 Cycle Length: 116
 Actuated Cycle Length: 116
 Offset: 40 (34%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 22.9 Intersection LOS: C
 Intersection Capacity Utilization 104.2% ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2024 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	99	1027	30	96	513	69	68	115	226	114	92	78
Future Volume (veh/h)	99	1027	30	96	513	69	68	115	226	114	92	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1796	1856	1856	1870	1811	1811	1870	1870	1870	1811	1856	1767
Adj Flow Rate, veh/h	99	1027	30	96	513	69	68	115	226	114	92	78
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	3	2	6	6	2	2	2	6	3	9
Cap, veh/h	446	1737	771	288	1734	232	368	184	361	217	303	257
Arrive On Green	0.49	0.49	0.49	0.04	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	798	3526	1565	1781	3048	408	1209	561	1102	1004	924	784
Grp Volume(v), veh/h	99	1027	30	96	289	293	68	0	341	114	0	170
Grp Sat Flow(s),veh/h/ln	798	1763	1565	1781	1721	1735	1209	0	1662	1004	0	1708
Q Serve(g_s), s	8.5	24.2	1.2	3.0	10.1	10.2	5.2	0.0	20.1	12.6	0.0	8.6
Cycle Q Clear(g_c), s	9.8	24.2	1.2	3.0	10.1	10.2	13.8	0.0	20.1	32.7	0.0	8.6
Prop In Lane	1.00		1.00	1.00		0.24	1.00		0.66	1.00		0.46
Lane Grp Cap(c), veh/h	446	1737	771	288	979	987	368	0	545	217	0	559
V/C Ratio(X)	0.22	0.59	0.04	0.33	0.29	0.30	0.18	0.00	0.63	0.53	0.00	0.30
Avail Cap(c_a), veh/h	446	1737	771	367	979	987	368	0	545	217	0	559
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.8	21.1	15.2	15.9	12.9	13.0	34.3	0.0	33.0	46.8	0.0	29.1
Incr Delay (d2), s/veh	1.1	1.5	0.1	0.7	0.8	0.8	1.1	0.0	5.4	8.8	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.0	0.3	0.6	2.0	2.1	1.2	0.0	6.4	2.9	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.0	22.5	15.3	16.6	13.7	13.7	35.4	0.0	38.4	55.7	0.0	30.5
LnGrp LOS	B	C	B	B	B	B	D	A	D	E	A	C
Approach Vol, veh/h	1156			678			409			284		
Approach Delay, s/veh	22.1			14.1			37.9			40.6		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	2	3	4	6			8					
Phs Duration (G+Y+Rc), s	44.0	8.8	63.2	44.0			72.0					
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0			6.0					
Max Green Setting (Gmax), s	38.0	10.0	52.0	38.0			66.0					
Max Q Clear Time (g_c+I1), s	22.1	5.0	26.2	34.7			12.2					
Green Ext Time (p_c), s	2.5	0.1	10.6	0.5			4.7					
Intersection Summary												
HCM 6th Ctrl Delay	24.6											
HCM 6th LOS	C											

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2024 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	332	533	326	404	469	52	165	701	152	37	948	146
Future Volume (vph)	332	533	326	404	469	52	165	701	152	37	948	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00				1.00					0.98		1.00
Frt		0.943			0.985					0.850		0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3305	0	1736	3407	0	1641	3374	1538	1703	3374	1524
Fit Permitted	0.377			0.101			0.089			0.306		
Satd. Flow (perm)	694	3305	0	185	3407	0	154	3374	1514	548	3374	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		91			8				114			125
Link Speed (k/h)		60			60				60			60
Link Distance (m)		193.1			250.0				253.7			194.1
Travel Time (s)		11.6			15.0				15.2			11.6
Confl. Peds. (#/hr)	3					3			2		2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	4%	4%	6%	10%	7%	5%	6%	7%	6%
Adj. Flow (vph)	332	533	326	404	469	52	165	701	152	37	948	146
Shared Lane Traffic (%)												
Lane Group Flow (vph)	332	859	0	404	521	0	165	701	152	37	948	146
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2			2	6	6
Detector Phase	7	4		3	8		5	2		2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	29.0	45.0		29.0	45.0		19.0	53.0	53.0	13.0	47.0	47.0
Total Split (%)	20.7%	32.1%		20.7%	32.1%		13.6%	37.9%	37.9%	9.3%	33.6%	33.6%
Maximum Green (s)	25.0	38.0		25.0	38.0		15.0	46.0	46.0	9.0	40.0	40.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	59.4	35.5		65.9	39.7		60.5	48.4	48.4	50.3	40.1	40.1
Actuated g/C Ratio	0.44	0.26		0.48	0.29		0.44	0.36	0.36	0.37	0.29	0.29
v/c Ratio	0.71	0.92		1.08	0.52		0.77	0.58	0.25	0.14	0.95	0.27

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

6: Ontario Street & Louis St. Laurent Avenue

Background 2024 AM Peak Hour

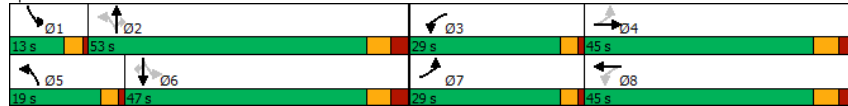


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	31.2	59.9		107.9	42.7		53.7	39.3	11.2	24.0	67.0	10.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	59.9		107.9	42.7		53.7	39.3	11.2	24.0	67.0	10.3
LOS	C	E		F	D		D	D	B	C	E	B
Approach Delay	51.9			71.2			37.4			58.3		
Approach LOS	D			E			D			E		
Queue Length 50th (m)	58.2	115.6		~115.1	65.6		30.6	89.1	7.5	6.1	144.9	4.5
Queue Length 95th (m)	82.5	#152.0		#185.8	87.2		#63.4	113.3	25.0	13.3	#191.8	21.8
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0			20.0			50.0			50.0		
Base Capacity (vph)	519	990		375	999		232	1199	612	286	993	536
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.87		1.08	0.52		0.71	0.58	0.25	0.13	0.95	0.27

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	136.1
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.08
Intersection Signal Delay:	54.3
Intersection Capacity Utilization:	101.2%
Analysis Period (min):	15
ICU Level of Service G	Intersection LOS: D
ICU Level of Service G	ICU Level of Service G
- 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.	

Splits and Phases: 6: Ontario Street & Louis St. Laurent Avenue



HCM 6th Signalized Intersection Summary

(190237) 550 Ontario St S, RR 25, Milton

6: Ontario Street & Louis St. Laurent Avenue

Background 2024 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	332	533	326	404	469	52	165	701	152	37	948	146
Future Volume (veh/h)	332	533	326	404	469	52	165	701	152	37	948	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1811	1752	1796	1826	1811	1796	1811
Adj Flow Rate, veh/h	332	533	326	404	469	52	165	701	152	37	948	146
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	4	4	6	10	7	5	6	7	6
Cap, veh/h	484	574	350	394	971	107	204	1198	542	216	1011	454
Arrive On Green	0.15	0.27	0.27	0.19	0.31	0.31	0.08	0.35	0.35	0.03	0.30	0.30
Sat Flow, veh/h	1767	2100	1283	1753	3175	351	1668	3413	1545	1725	3413	1532
Grp Volume(v), veh/h	332	447	412	404	257	264	165	701	152	37	948	146
Grp Sat Flow(s), veh/h/ln	1767	1763	1620	1753	1749	1776	1668	1706	1545	1725	1706	1532
Q Serve(g_s), s	17.9	33.4	33.5	25.0	16.2	16.3	9.0	22.7	9.6	2.0	36.6	10.0
Cycle Q Clear(g_c), s	17.9	33.4	33.5	25.0	16.2	16.3	9.0	22.7	9.6	2.0	36.6	10.0
Prop In Lane	1.00		0.79	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	484	482	443	394	535	543	204	1198	542	216	1011	454
V/C Ratio(X)	0.69	0.93	0.93	1.03	0.48	0.49	0.81	0.59	0.28	0.17	0.94	0.32
Avail Cap(c_a), veh/h	542	496	456	394	535	543	251	1198	542	283	1011	454
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	47.8	47.8	40.2	38.2	38.2	34.0	35.8	31.5	32.5	46.3	37.0
Incr Delay (d2), s/veh	3.1	23.7	25.4	52.0	0.7	0.7	14.9	2.1	1.3	0.4	16.8	1.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	5.7	14.3	13.4	13.5	5.4	5.5	3.4	7.3	2.8	0.7	14.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.4	71.5	73.3	92.3	38.8	38.9	48.9	37.9	32.8	32.8	63.1	38.9
LnGrp LOS	C	E	E	F	D	D	D	D	C	C	E	D
Approach Vol, veh/h	1191			925			1018			1131		
Approach Delay, s/veh	60.9			62.2			38.9			59.0		
Approach LOS	E			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	54.4	29.0	43.9	15.2	47.0	24.6	48.3				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	9.0	46.0	25.0	38.0	15.0	40.0	25.0	38.0				
Max Q Clear Time (g_c+I1), s	4.0	24.7	27.0	35.5	11.0	38.6	19.9	18.3				
Green Ext Time (p_c), s	0.0	6.3	0.0	1.4	0.2	1.0	0.7	3.5				

Intersection Summary

HCM 6th Ctrl Delay	55.4
HCM 6th LOS	E

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Background 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	258	56	112	287	114	84	893	91	165	1030	132
Future Volume (vph)	92	258	56	112	287	114	84	893	91	165	1030	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00		1.00	1.00		1.00		1.00	
Flt		0.973			0.957			0.986			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1827	0	1787	1800	0	1787	3419	0	1787	3443	0
Flt Permitted	0.298			0.436			0.224			0.173		
Satd. Flow (perm)	560	1827	0	816	1800	0	421	3419	0	325	3443	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			25			12			18	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	3		7	7		3	2		8	8		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	0%	1%	0%	2%	1%	4%	1%	1%	3%	1%
Adj. Flow (vph)	92	258	56	112	287	114	84	893	91	165	1030	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	314	0	112	401	0	84	984	0	165	1162	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2				6	
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		4.5	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		9.0	21.0	
Total Split (s)	50.0	50.0		50.0	50.0		41.0	41.0		9.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		41.0%	41.0%		9.0%	50.0%	
Maximum Green (s)	43.0	43.0		43.0	43.0		35.0	35.0		4.5	44.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	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		4.5	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	21.8	21.8		21.8	21.8		35.2	35.2		45.8	44.3	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.45	0.45		0.58	0.56	
v/c Ratio	0.60	0.61		0.50	0.78		0.45	0.64		0.61	0.60	

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Background 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	41.6	28.9		31.8	35.8		27.7	20.3		21.6	14.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.6	28.9		31.8	35.8		27.7	20.3		21.6	14.0	
LOS	D	C		C	D		C	C		C	B	
Approach Delay		31.8			35.0			20.9			15.0	
Approach LOS		C			C			C			B	
Queue Length 50th (m)	12.5	40.9		14.7	54.5		8.7	59.6		10.9	57.2	
Queue Length 95th (m)	28.4	65.4		30.3	85.3		28.0	99.8		#32.3	101.4	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	306	1005		446	995		187	1528		271	1934	
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	0.30	0.31		0.25	0.40		0.45	0.64		0.61	0.60	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 79.1

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 22.0

Intersection LOS: C

Intersection Capacity Utilization 97.3%

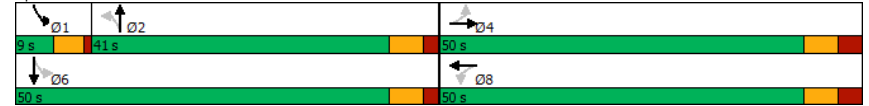
ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	92	258	56	112	287	114	84	893	91	165	1030	132
Future Volume (veh/h)	92	258	56	112	287	114	84	893	91	165	1030	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1900	1885	1900	1870	1885	1841	1885	1885	1856	1885
Adj Flow Rate, veh/h	92	258	56	112	287	114	84	893	91	165	1030	132
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	0	1	0	2	1	4	1	1	3	1
Cap, veh/h	224	498	108	291	429	170	220	1313	134	284	1619	207
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.41	0.41	0.41	0.05	0.52	0.52
Sat Flow, veh/h	989	1499	325	1071	1291	513	487	3201	326	1795	3140	402
Grp Volume(v), veh/h	92	0	314	112	0	401	84	488	496	165	578	584
Grp Sat Flow(s),veh/h/ln	989	0	1824	1071	0	1804	487	1749	1778	1795	1763	1779
Q Serve(g_s), s	7.5	0.0	11.9	8.0	0.0	16.3	12.8	19.5	19.5	4.4	20.2	20.2
Cycle Q Clear(g_c), s	23.8	0.0	11.9	19.9	0.0	16.3	24.1	19.5	19.5	4.4	20.2	20.2
Prop In Lane	1.00		0.18	1.00		0.28	1.00		0.18	1.00		0.23
Lane Grp Cap(c), veh/h	224	0	606	291	0	599	220	717	729	284	909	917
V/C Ratio(X)	0.41	0.00	0.52	0.38	0.00	0.67	0.38	0.68	0.68	0.58	0.64	0.64
Avail Cap(c_a), veh/h	394	0	919	475	0	909	220	717	729	284	909	917
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	0.0	23.0	31.0	0.0	24.5	26.8	20.6	20.6	16.2	14.9	14.9
Incr Delay (d2), s/veh	1.2	0.0	0.7	0.8	0.0	1.3	5.0	5.2	5.1	3.0	3.4	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	2.8	1.4	0.0	3.9	1.2	4.7	4.7	1.0	3.9	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	0.0	23.7	31.8	0.0	25.8	31.8	25.8	25.7	19.2	18.3	18.3
LnGrp LOS	D	A	C	C	A	C	C	C	C	B	B	B
Approach Vol, veh/h	406			513			1068			1327		
Approach Delay, s/veh	26.4			27.1			26.2			18.4		
Approach LOS	C			C			C			B		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.0	41.0	35.4		50.0		35.4					
Change Period (Y+Rc), s	4.5	6.0	7.0		6.0		7.0					
Max Green Setting (Gmax), s	4.5	35.0	43.0		44.0		43.0					
Max Q Clear Time (g_c+I1), s	6.4	26.1	25.8		22.2		21.9					
Green Ext Time (p_c), s	0.0	5.1	2.5		9.9		3.6					

Intersection Summary		
HCM 6th Ctrl Delay	23.2	
HCM 6th LOS	C	

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↕	↕	
Traffic Volume (vph)	0	0	0	1172	1255	0
Future Volume (vph)	0	0	0	1172	1255	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Fit Protected						
Satd. Flow (prot)	0	1900	0	3471	3505	0
Fit Permitted						
Satd. Flow (perm)	0	1900	0	3471	3505	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	63.0			90.2	135.8	
Travel Time (s)	3.8			5.4	9.8	
Confl. Peds. (#/hr)	2		2			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	4%	3%	0%
Adj. Flow (vph)	0	0	0	1172	1255	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1172	1255	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.0%
Analysis Period (min)	15
	ICU Level of Service A

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑		↑↑	↑↑	
Traffic Vol, veh/h	0	0	0	1172	1255	0
Future Vol, veh/h	0	0	0	1172	1255	0
Conflicting Peds, #/hr	2	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	0	0	1172	1255	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	630	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	429	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	428	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑	↑↑	↑	↑	↑↑	↑
Traffic Volume (vph)	162	688	97	140	876	97	228	764	261	242	734	278
Future Volume (vph)	162	688	97	140	876	97	228	764	261	242	734	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor			0.99	1.00			1.00					1.00
Frt			0.850			0.850			0.850			0.959
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3539	1509	1752	3505	1417	1752	3610	1553	1641	3206	0
Fit Permitted	0.127			0.189			0.170			0.231		
Satd. Flow (perm)	241	3539	1487	348	3505	1417	313	3610	1553	399	3206	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			136			239			57
Link Speed (k/h)		60			60			60				50
Link Distance (m)		117.7			375.6			511.5				90.2
Travel Time (s)		7.1			22.5			30.7				6.5
Confl. Peds. (#/hr)			3	3			3					3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	7%	3%	3%	14%	3%	0%	4%	10%	7%	9%
Adj. Flow (vph)	162	688	97	140	876	97	228	764	261	242	734	278
Shared Lane Traffic (%)												
Lane Group Flow (vph)	162	688	97	140	876	97	228	764	261	242	1012	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	11.0	37.6	37.6	11.0	37.6	37.6	14.0	51.4	51.4	20.0	57.4	
Total Split (%)	9.2%	31.3%	31.3%	9.2%	31.3%	31.3%	11.7%	42.8%	42.8%	16.7%	47.8%	
Maximum Green (s)	7.0	31.6	31.6	7.0	31.6	31.6	10.0	45.4	45.4	16.0	51.4	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	40.6	31.6	31.6	40.6	31.6	31.6	59.6	47.6	47.6	66.3	51.4	
Actuated g/C Ratio	0.34	0.26	0.26	0.34	0.26	0.26	0.50	0.40	0.40	0.55	0.43	
v/c Ratio	0.94	0.74	0.20	0.70	0.95	0.21	0.83	0.53	0.34	0.67	0.72	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

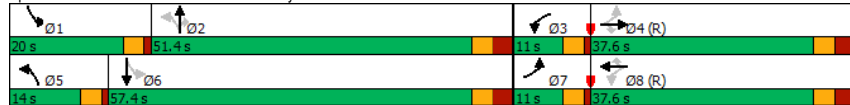
(190237) 550 Ontario St S, RR 25, Milton
Background 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	86.2	46.0	3.0	47.5	63.5	3.0	42.5	29.8	5.6	23.1	30.2	
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	86.2	46.0	3.0	47.5	63.5	3.0	42.5	29.8	5.6	23.1	30.2	
LOS	F	D	A	D	E	A	D	C	A	C	C	
Approach Delay	48.5			56.2			27.1			28.8		
Approach LOS	D			E			C			C		
Queue Length 50th (m)	27.4	82.3	0.0	23.5	112.5	0.0	27.1	76.1	3.3	29.4	101.6	
Queue Length 95th (m)	#66.6	104.8	5.8	#45.5	#154.0	5.8	#67.2	97.9	21.2	45.1	127.5	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	172	931	491	199	922	473	275	1430	759	389	1405	
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	0.94	0.74	0.20	0.70	0.95	0.21	0.83	0.53	0.34	0.62	0.72	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 39.1
 Intersection Capacity Utilization 101.2%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	162	688	97	140	876	97	228	764	261	242	734	278
Future Volume (veh/h)	162	688	97	140	876	97	228	764	261	242	734	278
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1870	1796	1856	1856	1693	1856	1900	1841	1752	1796	1767
Adj Flow Rate, veh/h	162	688	97	140	876	97	228	764	261	242	734	278
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	7	3	3	14	3	0	4	10	7	9
Cap, veh/h	177	936	399	222	928	376	306	1478	637	360	1036	392
Arrive On Green	0.06	0.26	0.26	0.06	0.26	0.26	0.08	0.41	0.41	0.10	0.43	0.43
Sat Flow, veh/h	1810	3554	1517	1767	3526	1429	1767	3610	1557	1668	2419	916
Grp Volume(v), veh/h	162	688	97	140	876	97	228	764	261	242	518	494
Grp Sat Flow(s), veh/h/ln	1810	1777	1517	1767	1763	1429	1767	1805	1557	1668	1706	1629
Q Serve(g_s), s	7.0	21.2	6.0	7.0	29.2	6.4	9.0	19.0	14.3	9.9	29.9	29.9
Cycle Q Clear(g_c), s	7.0	21.2	6.0	7.0	29.2	6.4	9.0	19.0	14.3	9.9	29.9	29.9
Prop In Lane	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.56
Lane Grp Cap(c), veh/h	177	936	399	222	928	376	306	1478	637	360	731	698
V/C Ratio(X)	0.91	0.74	0.24	0.63	0.94	0.26	0.74	0.52	0.41	0.67	0.71	0.71
Avail Cap(c_a), veh/h	177	936	399	222	928	376	306	1478	637	412	731	698
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.0	40.4	34.8	32.4	43.3	34.9	23.1	26.5	25.1	19.5	28.1	28.1
Incr Delay (d2), s/veh	43.9	5.1	1.4	5.6	18.7	1.7	9.5	1.3	1.9	3.6	5.7	6.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	4.6	7.5	1.8	2.5	11.7	1.8	3.0	5.6	3.8	2.7	9.4	9.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	81.0	45.5	36.2	38.0	62.0	36.6	32.6	27.8	27.1	23.1	33.9	34.1
LnGrp LOS	F	D	D	D	E	D	C	C	C	C	C	C
Approach Vol, veh/h	947			1113			1253			1254		
Approach Delay, s/veh	50.6			56.8			28.5			31.9		
Approach LOS	D			E			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.3	55.1	11.0	37.6	14.0	57.4	11.0	37.6				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	16.0	45.4	7.0	31.6	10.0	51.4	7.0	31.6				
Max Q Clear Time (g_c+I1), s	11.9	21.0	9.0	23.2	11.0	31.9	9.0	31.2				
Green Ext Time (p_c), s	0.4	8.0	0.0	3.5	0.0	8.0	0.0	0.3				

Intersection Summary

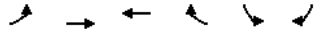
HCM 6th Ctrl Delay 40.9
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↕	↕		↙	
Traffic Volume (vph)	0	933	1199	0	0	0
Future Volume (vph)	0	933	1199	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Flt Protected						
Satd. Flow (prot)	1900	3539	3574	0	1900	0
Flt Permitted						
Satd. Flow (perm)	1900	3539	3574	0	1900	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%
Adj. Flow (vph)	0	933	1199	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	933	1199	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2024 PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↕	↕		↙	
Traffic Vol, veh/h	0	933	1199	0	0	0
Future Vol, veh/h	0	933	1199	0	0	0
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	1	0	0	0
Mvmt Flow	0	933	1199	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1201	0	0
Stage 1	-	-	1201
Stage 2	-	-	467
Critical Hdwy	4.1	-	6.8
Critical Hdwy Stg 1	-	-	5.8
Critical Hdwy Stg 2	-	-	5.8
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	588	-	89
Stage 1	-	-	252
Stage 2	-	-	603
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	587	-	89
Mov Cap-2 Maneuver	-	-	89
Stage 1	-	-	251
Stage 2	-	-	602

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	587	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	51	734	93	235	909	79	157	136	230	107	256	87
Future Volume (vph)	51	734	93	235	909	79	157	136	230	107	256	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.94	0.99			1.00	0.99		1.00	0.99	
Frt			0.850		0.988			0.906			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1615	1787	3531	0	1805	1677	0	1770	1804	0
Flt Permitted	0.290			0.267			0.374			0.344		
Satd. Flow (perm)	520	3539	1517	496	3531	0	707	1677	0	638	1804	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			72		13			78			16	
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		171.2			370.5			215.4			213.5	
Travel Time (s)		10.3			22.2			12.9			12.8	
Conf. Peds. (#/hr)			27	27			9		9	9		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	2%	0%	1%	1%	1%	0%	0%	2%	2%	1%	0%
Adj. Flow (vph)	51	734	93	235	909	79	157	136	230	107	256	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	734	93	235	988	0	157	366	0	107	343	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	57.0	57.0	57.0	15.0	72.0		44.0	44.0		44.0	44.0	
Total Split (%)	49.1%	49.1%	49.1%	12.9%	62.1%		37.9%	37.9%		37.9%	37.9%	
Maximum Green (s)	51.0	51.0	51.0	11.0	66.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)	51.4	51.4	51.4	68.0	66.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.44	0.44	0.44	0.59	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.22	0.47	0.13	0.57	0.49		0.68	0.61		0.51	0.57	

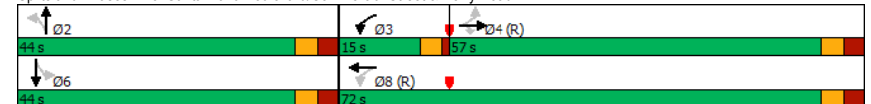
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	23.5	24.0	7.0	17.4	15.7		50.6	30.4		41.9	35.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.5	24.0	7.0	17.4	15.7		50.6	30.4		41.9	35.1	
LOS	C	C	A	B	B		D	C		D	D	
Approach Delay		22.2			16.1			36.5			36.7	
Approach LOS		C			B			D			D	
Queue Length 50th (m)	7.4	63.8	2.8	25.3	69.5		32.3	57.7		20.6	64.3	
Queue Length 95th (m)	17.1	81.3	12.7	38.9	86.5		#64.3	90.9		40.8	95.7	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0		25.0				20.0		
Base Capacity (vph)	230	1567	712	413	2014		231	601		209	601	
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	0.47	0.13	0.57	0.49		0.68	0.61		0.51	0.57	

Intersection Summary

Area Type: Other
 Cycle Length: 116
 Actuated Cycle Length: 116
 Offset: 40 (34%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 24.3
 Intersection Capacity Utilization 100.5%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2024 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	51	734	93	235	909	79	157	136	230	107	256	87
Future Volume (veh/h)	51	734	93	235	909	79	157	136	230	107	256	87
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1870	1900	1885	1885	1885	1900	1900	1870	1870	1885	1900
Adj Flow Rate, veh/h	51	734	93	235	909	79	157	136	230	107	256	87
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	2	0	1	1	1	0	0	2	2	1	0
Cap, veh/h	285	1595	701	419	1893	164	240	207	349	207	440	149
Arrive On Green	0.45	0.45	0.45	0.09	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	548	3554	1562	1795	3327	289	1051	631	1067	1013	1342	456
Grp Volume(v), veh/h	51	734	93	235	489	499	157	0	366	107	0	343
Grp Sat Flow(s),veh/h/ln	548	1777	1562	1795	1791	1825	1051	0	1698	1013	0	1799
Q Serve(g_s), s	7.1	16.6	4.0	7.8	18.8	18.8	16.9	0.0	21.4	11.7	0.0	18.4
Cycle Q Clear(g_c), s	11.9	16.6	4.0	7.8	18.8	18.8	35.3	0.0	21.4	33.2	0.0	18.4
Prop In Lane	1.00		1.00	1.00		0.16	1.00		0.63	1.00		0.25
Lane Grp Cap(c), veh/h	285	1595	701	419	1019	1038	240	0	556	207	0	589
V/C Ratio(X)	0.18	0.46	0.13	0.56	0.48	0.48	0.65	0.00	0.66	0.52	0.00	0.58
Avail Cap(c_a), veh/h	285	1595	701	435	1019	1038	240	0	556	207	0	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.5	22.2	18.7	15.7	14.8	14.8	47.1	0.0	33.4	47.7	0.0	32.4
Incr Delay (d2), s/veh	1.4	1.0	0.4	1.5	1.6	1.6	13.1	0.0	6.0	9.0	0.0	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.4	1.0	1.7	4.0	4.1	4.2	0.0	7.0	2.8	0.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	23.2	19.1	17.2	16.4	16.4	60.2	0.0	39.4	56.6	0.0	36.6
LnGrp LOS	C	C	B	B	B	B	E	A	D	E	A	D
Approach Vol, veh/h	878			1223			523			450		
Approach Delay, s/veh	22.8			16.6			45.7			41.3		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	2	3	4	6			8					
Phs Duration (G+Y+Rc), s	44.0	13.9	58.1	44.0			72.0					
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0			6.0					
Max Green Setting (Gmax), s	38.0	11.0	51.0	38.0			66.0					
Max Q Clear Time (g_c+I1), s	37.3	9.8	18.6	35.2			20.8					
Green Ext Time (p_c), s	0.3	0.1	8.2	0.8			9.6					
Intersection Summary												
HCM 6th Ctrl Delay	26.9											
HCM 6th LOS	C											

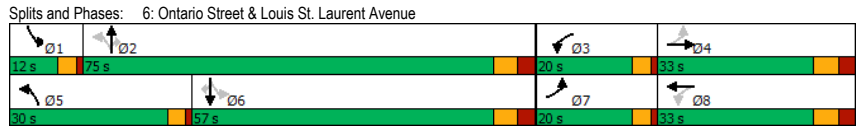
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	215	359	126	200	542	63	496	982	299	81	680	275
Future Volume (vph)	215	359	126	200	542	63	496	982	299	81	680	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							0.99		0.99			1.00
Frt	0.961				0.984				0.850		0.850	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3426	0	1787	3521	0	1787	3471	1615	1805	3471	1599
Fit Permitted	0.152			0.276			0.255			0.273		
Satd. Flow (perm)	283	3426	0	519	3521	0	480	3471	1593	518	3471	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			8				210			223
Link Speed (k/h)		60			60			60				60
Link Distance (m)		193.1			250.0			253.7				194.1
Travel Time (s)		11.6			15.0			15.2				11.6
Confl. Peds. (#/hr)									1		1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	2%	1%	1%	0%	1%	4%	0%	0%	4%	1%
Adj. Flow (vph)	215	359	126	200	542	63	496	982	299	81	680	275
Shared Lane Traffic (%)												
Lane Group Flow (vph)	215	485	0	200	605	0	496	982	299	81	680	275
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1		6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	20.0	33.0		20.0	33.0		30.0	75.0	75.0	12.0	57.0	57.0
Total Split (%)	14.3%	23.6%		14.3%	23.6%		21.4%	53.6%	53.6%	8.6%	40.7%	40.7%
Maximum Green (s)	16.0	26.0		16.0	26.0		26.0	68.0	68.0	8.0	50.0	50.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	44.9	26.3		43.1	25.4		82.7	68.2	68.2	60.5	50.0	50.0
Actuated g/C Ratio	0.32	0.19		0.31	0.18		0.60	0.49	0.49	0.44	0.36	0.36
v/c Ratio	0.83	0.72		0.68	0.93		0.94	0.58	0.34	0.27	0.54	0.38

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	61.8	56.4		46.0	76.5		47.0	26.9	7.5	16.7	37.5	8.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.8	56.4		46.0	76.5		47.0	26.9	7.5	16.7	37.5	8.8
LOS	E	E		D	E		D	C	A	B	D	A
Approach Delay	58.1			68.9			29.2			28.2		
Approach LOS	E			E			C			C		
Queue Length 50th (m)	46.2	66.5		42.5	91.0		80.7	105.8	13.9	9.6	83.1	10.0
Queue Length 95th (m)	#86.5	87.2		64.4	#126.1		#151.8	127.5	33.2	17.2	103.5	32.4
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0		20.0		50.0		50.0		50.0		50.0	
Base Capacity (vph)	263	674		312	666		531	1706	890	302	1251	719
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.72		0.64	0.91		0.93	0.58	0.34	0.27	0.54	0.38

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	138.7
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.94
Intersection Signal Delay:	41.1
Intersection Capacity Utilization:	93.5%
ICU Level of Service:	F
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2024 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	215	359	126	200	542	63	496	982	299	81	680	275
Future Volume (veh/h)	215	359	126	200	542	63	496	982	299	81	680	275
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1885	1870	1885	1885	1900	1885	1841	1900	1900	1841	1885
Adj Flow Rate, veh/h	215	359	126	200	542	63	496	982	299	81	680	275
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	1	2	1	1	0	1	4	0	0	4	1
Cap, veh/h	265	496	171	293	591	69	510	1771	815	263	1259	575
Arrive On Green	0.11	0.19	0.19	0.10	0.18	0.18	0.19	0.51	0.51	0.04	0.36	0.36
Sat Flow, veh/h	1781	2611	903	1795	3234	375	1795	3497	1609	1810	3497	1596
Grp Volume(v), veh/h	215	245	240	200	299	306	496	982	299	81	680	275
Grp Sat Flow(s), veh/h/ln	1781	1791	1723	1795	1791	1818	1795	1749	1609	1810	1749	1596
Q Serve(g_s), s	13.5	17.8	18.3	12.4	22.8	22.9	24.5	26.8	15.6	3.9	21.5	18.5
Cycle Q Clear(g_c), s	13.5	17.8	18.3	12.4	22.8	22.9	24.5	26.8	15.6	3.9	21.5	18.5
Prop In Lane	1.00		0.52	1.00		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	265	340	327	293	327	332	510	1771	815	263	1259	575
V/C Ratio(X)	0.81	0.72	0.74	0.68	0.91	0.92	0.97	0.55	0.37	0.31	0.54	0.48
Avail Cap(c_a), veh/h	271	340	327	312	335	340	510	1771	815	294	1259	575
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.6	52.8	53.0	41.1	55.7	55.7	26.7	23.5	20.8	26.3	35.3	34.4
Incr Delay (d2), s/veh	16.5	7.2	8.4	5.5	28.3	28.9	32.9	1.3	1.3	0.7	1.7	2.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	5.8	7.1	7.1	4.7	10.8	11.1	10.3	7.4	4.1	1.3	7.1	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	58.0	60.0	61.3	46.6	84.0	84.6	59.6	24.8	22.1	26.9	37.0	37.2
LnGrp LOS	E	E	E	D	F	F	E	C	C	C	D	D
Approach Vol, veh/h	700			805			1777			1036		
Approach Delay, s/veh	59.9			74.9			34.1			36.2		
Approach LOS	E			E			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.7	77.3	18.5	33.4	30.0	57.0	19.5	32.4				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	8.0	68.0	16.0	26.0	26.0	50.0	16.0	26.0				
Max Q Clear Time (g_c+I1), s	5.9	28.8	14.4	20.3	26.5	23.5	15.5	24.9				
Green Ext Time (p_c), s	0.0	12.6	0.1	1.6	0.0	7.4	0.0	0.5				

Intersection Summary	
HCM 6th Ctrl Delay	46.4
HCM 6th LOS	D

Appendix F

2029 Background Traffic Operations Reports



Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Background 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	149	73	107	190	101	46	1131	45	66	766	63
Future Volume (vph)	115	149	73	107	190	101	46	1131	45	66	766	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		0.99		0.99		1.00				
Frt		0.951			0.948			0.994			0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1735	0	1770	1708	0	1752	3384	0	1597	3353	0
Flt Permitted	0.439			0.580			0.313			0.189		
Satd. Flow (perm)	798	1735	0	1071	1708	0	577	3384	0	318	3353	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			32			5			11	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	7		10	10		7		7	7			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	4%	2%	2%	3%	8%	3%	6%	3%	13%	7%	0%
Adj. Flow (vph)	115	149	73	107	190	101	46	1131	45	66	766	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	222	0	107	291	0	46	1176	0	66	829	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0	
Total Split (s)	50.0	50.0		50.0	50.0		50.0	50.0		50.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	43.0	43.0		43.0	43.0		44.0	44.0		44.0	44.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	16.4	16.4		16.4	16.4		44.2	44.2		44.2	44.2	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.60	0.60		0.60	0.60	
v/c Ratio	0.65	0.54		0.45	0.72		0.13	0.58		0.35	0.41	

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

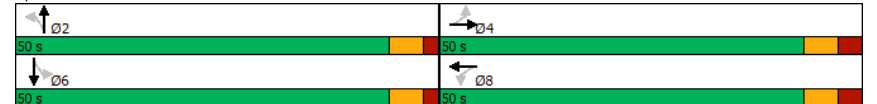
Background 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	43.4	26.4		30.7	33.9		9.0	11.2		15.7	9.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	43.4	26.4		30.7	33.9		9.0	11.2		15.7	9.1	
LOS	D	C		C	C		A	B		B	A	
Approach Delay		32.2			33.0			11.1			9.6	
Approach LOS		C			C			B			A	
Queue Length 50th (m)	15.2	24.3		13.5	34.9		2.6	49.0		4.3	29.5	
Queue Length 95th (m)	32.3	44.2		27.7	60.0		9.1	84.7		17.0	52.5	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	468	1030		628	1015		346	2032		190	2016	
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	0.22		0.17	0.29		0.13	0.58		0.35	0.41	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	73.6
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	16.2
Intersection Capacity Utilization:	92.7%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	F

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	115	149	73	107	190	101	46	1131	45	66	766	63
Future Volume (veh/h)	115	149	73	107	190	101	46	1131	45	66	766	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1856	1781	1856	1811	1856	1707	1796	1900
Adj Flow Rate, veh/h	115	149	73	107	190	101	46	1131	45	66	766	63
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	2	2	3	8	3	6	3	13	7	0
Cap, veh/h	257	347	170	314	340	180	348	1825	73	223	1727	142
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.54	0.54	0.54	0.54	0.54	0.54
Sat Flow, veh/h	1065	1162	569	1152	1136	604	656	3372	134	435	3191	262
Grp Volume(v), veh/h	115	0	222	107	0	291	46	577	599	66	410	419
Grp Sat Flow(s),veh/h/ln	1065	0	1731	1152	0	1740	656	1721	1786	435	1706	1747
Q Serve(g_s), s	8.3	0.0	8.4	6.7	0.0	11.5	3.7	18.8	18.8	10.0	11.8	11.8
Cycle Q Clear(g_c), s	19.7	0.0	8.4	15.1	0.0	11.5	15.5	18.8	18.8	28.9	11.8	11.8
Prop In Lane	1.00		0.33	1.00		0.35	1.00		0.08	1.00		0.15
Lane Grp Cap(c), veh/h	257	0	518	314	0	520	348	931	967	223	923	945
V/C Ratio(X)	0.45	0.00	0.43	0.34	0.00	0.56	0.13	0.62	0.62	0.30	0.44	0.44
Avail Cap(c_a), veh/h	502	0	916	579	0	920	348	931	967	223	923	945
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	0.0	22.9	29.0	0.0	24.0	15.9	12.9	12.9	22.8	11.3	11.3
Incr Delay (d2), s/veh	1.2	0.0	0.6	0.6	0.0	0.9	0.8	3.1	3.0	3.3	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	1.9	1.2	0.0	2.7	0.3	2.3	2.4	0.8	1.7	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	0.0	23.5	29.6	0.0	24.9	16.7	16.0	15.9	26.2	12.8	12.8
LnGrp LOS	C	A	C	C	A	C	B	B	B	C	B	B
Approach Vol, veh/h	337			398			1222			895		
Approach Delay, s/veh	26.9			26.2			15.9			13.8		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	50.0		31.3		50.0		31.3					
Change Period (Y+Rc), s	6.0		7.0		6.0		7.0					
Max Green Setting (Gmax), s	44.0		43.0		44.0		43.0					
Max Q Clear Time (g_c+I1), s	20.8		21.7		30.9		17.1					
Green Ext Time (p_c), s	10.4		2.1		5.8		2.7					

Intersection Summary		
HCM 6th Ctrl Delay	18.0	
HCM 6th LOS	B	

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔↔↔	↔↔	
Traffic Volume (vph)	0	0	0	1379	1059	0
Future Volume (vph)	0	0	0	1379	1059	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Fit						
Fit Protected						
Satd. Flow (prot)	0	1900	0	4893	3406	0
Fit Permitted						
Satd. Flow (perm)	0	1900	0	4893	3406	0
Link Speed (k/h)	60		60		50	
Link Distance (m)	63.0		90.2		135.8	
Travel Time (s)	3.8		5.4		9.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	0	0	1379	1059	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1379	1059	0
Sign Control	Stop		Free		Free	

Intersection Summary		
Area Type:	Other	
Control Type:	Unsignalized	
Intersection Capacity Utilization	32.6%	ICU Level of Service A
Analysis Period (min)	15	

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖↗↘	↖↗↘	↖↗	
Traffic Vol, veh/h	0	0	0	1379	1059	0
Future Vol, veh/h	0	0	0	1379	1059	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	0	0	1379	1059	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	530	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	499	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	499	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖
Traffic Volume (vph)	231	1024	196	183	567	144	164	789	325	129	773	146
Future Volume (vph)	231	1024	196	183	567	144	164	789	325	129	773	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor			0.99	1.00					0.98	1.00		
Frt			0.850			0.850			0.850		0.976	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3505	1538	1641	3438	1495	1671	4940	1524	1736	4760	0
Fit Permitted	0.341			0.140			0.146		0.258			
Satd. Flow (perm)	623	3505	1515	242	3438	1495	257	4940	1499	471	4760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			144			264		31	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		117.7			375.6			511.5			90.2	
Travel Time (s)		7.1			22.5			30.7			6.5	
Confl. Peds. (#/hr)			3	3					5	5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	3%	5%	10%	5%	8%	8%	5%	6%	4%	7%	3%
Adj. Flow (vph)	231	1024	196	183	567	144	164	789	325	129	773	146
Shared Lane Traffic (%)												
Lane Group Flow (vph)	231	1024	196	183	567	144	164	789	325	129	919	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	19.0	53.0	53.0	16.0	50.0	50.0	14.0	40.0	40.0	11.0	37.0	
Total Split (%)	15.8%	44.2%	44.2%	13.3%	41.7%	41.7%	11.7%	33.3%	33.3%	9.2%	30.8%	
Maximum Green (s)	15.0	47.0	47.0	12.0	44.0	44.0	10.0	34.0	34.0	7.0	31.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	62.9	47.8	47.8	59.1	45.9	45.9	45.9	34.0	34.0	40.1	31.1	
Actuated g/C Ratio	0.52	0.40	0.40	0.49	0.38	0.38	0.38	0.28	0.28	0.33	0.26	
v/c Ratio	0.52	0.73	0.30	0.73	0.43	0.22	0.76	0.56	0.53	0.56	0.73	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

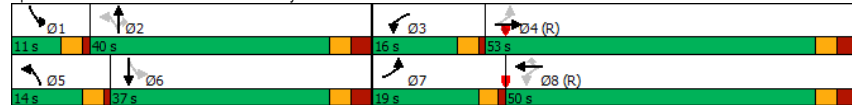
(190237) 550 Ontario St S, RR 25, Milton
Background 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	19.0	34.8	13.3	36.2	29.1	5.0	49.0	38.5	11.2	35.4	43.3	
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	19.0	34.8	13.3	36.2	29.1	5.0	49.0	38.5	11.2	35.4	43.3	
LOS	B	C	B	D	C	A	D	D	B	D	D	
Approach Delay	29.3			26.6			32.9			42.3		
Approach LOS	C			C			C			D		
Queue Length 50th (m)	29.0	113.3	15.3	22.5	54.6	0.0	27.1	61.1	11.3	20.7	74.1	
Queue Length 95th (m)	44.5	139.5	33.4	#51.0	72.5	13.7	#53.0	75.3	38.8	35.2	90.7	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	473	1394	663	260	1313	660	216	1399	613	230	1255	
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	0.49	0.73	0.30	0.70	0.43	0.22	0.76	0.56	0.53	0.56	0.73	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 32.7
 Intersection Capacity Utilization 98.1%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔
Traffic Volume (veh/h)	231	1024	196	183	567	144	164	789	325	129	773	146
Future Volume (veh/h)	231	1024	196	183	567	144	164	789	325	129	773	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1856	1826	1752	1826	1781	1781	1826	1811	1841	1796	1856
Adj Flow Rate, veh/h	231	1024	196	183	567	144	164	789	325	129	773	146
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	3	5	10	5	8	8	5	6	4	7	3
Cap, veh/h	430	1444	632	269	1371	595	251	1412	433	236	1071	200
Arrive On Green	0.10	0.41	0.41	0.08	0.40	0.40	0.08	0.28	0.28	0.06	0.26	0.26
Sat Flow, veh/h	1753	3526	1544	1668	3469	1506	1697	4985	1527	1753	4144	776
Grp Volume(v), veh/h	231	1024	196	183	567	144	164	789	325	129	608	311
Grp Sat Flow(s), veh/h/ln	1753	1763	1544	1668	1735	1506	1697	1662	1527	1753	1635	1651
Q Serve(g_s), s	9.3	29.0	10.3	7.7	14.2	7.7	8.3	16.2	23.3	6.5	20.3	20.6
Cycle Q Clear(g_c), s	9.3	29.0	10.3	7.7	14.2	7.7	8.3	16.2	23.3	6.5	20.3	20.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	430	1444	632	269	1371	595	251	1412	433	236	845	427
V/C Ratio(X)	0.54	0.71	0.31	0.68	0.41	0.24	0.65	0.56	0.75	0.55	0.72	0.73
Avail Cap(c_a), veh/h	480	1444	632	299	1371	595	251	1412	433	236	845	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	29.5	24.0	23.8	26.2	24.3	30.8	36.6	39.2	31.2	40.5	40.7
Incr Delay (d2), s/veh	1.0	3.0	1.3	5.4	0.9	1.0	5.9	1.6	11.4	2.6	5.3	10.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	2.3	8.6	2.7	2.2	4.1	2.0	2.8	5.0	7.7	2.2	6.9	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.1	32.4	25.2	29.2	27.2	25.2	36.7	38.2	50.6	33.8	45.8	51.1
LnGrp LOS	C	C	C	C	C	C	D	D	D	C	D	D
Approach Vol, veh/h	1451			894			1278			1048		
Approach Delay, s/veh	29.5			27.3			41.2			45.9		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	40.0	13.8	55.2	14.0	37.0	15.6	53.4				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	7.0	34.0	12.0	47.0	10.0	31.0	15.0	44.0				
Max Q Clear Time (g_c+I1), s	8.5	25.3	9.7	31.0	10.3	22.6	11.3	16.2				
Green Ext Time (p_c), s	0.0	4.8	0.1	8.2	0.0	4.2	0.3	5.5				

Intersection Summary

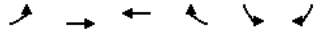
HCM 6th Ctrl Delay 35.9
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↕	↕		↕	
Traffic Volume (vph)	0	1377	833	0	0	0
Future Volume (vph)	0	1377	833	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Flt Protected						
Satd. Flow (prot)	1900	3539	3471	0	1429	0
Flt Permitted						
Satd. Flow (perm)	1900	3539	3471	0	1429	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	0%	33%	0%
Adj. Flow (vph)	0	1377	833	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1377	833	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↕	↕		↕	
Traffic Vol, veh/h	0	1377	833	0	0	0
Future Vol, veh/h	0	1377	833	0	0	0
Conflicting Peds, #/hr	7	0	0	7	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	4	0	33	0
Mvmt Flow	0	1377	833	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	840	0	1529
Stage 1	-	-	840
Stage 2	-	-	689
Critical Hdwy	4.1	-	7.46
Critical Hdwy Stg 1	-	-	6.46
Critical Hdwy Stg 2	-	-	6.46
Follow-up Hdwy	2.2	-	3.83
Pot Cap-1 Maneuver	804	-	80
Stage 1	-	-	315
Stage 2	-	-	385
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	799	-	79
Mov Cap-2 Maneuver	-	-	79
Stage 1	-	-	313
Stage 2	-	-	383

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	799	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2029 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	115	1190	35	111	595	80	79	133	262	132	106	90
Future Volume (vph)	115	1190	35	111	595	80	79	133	262	132	106	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		1.00	0.99		0.99	1.00		0.99
Frt			0.850		0.982			0.901			0.931	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3505	1568	1770	3333	0	1770	1662	0	1703	1657	0
Flt Permitted	0.395			0.108			0.576			0.307		
Satd. Flow (perm)	699	3505	1525	201	3333	0	1066	1662	0	550	1657	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			66		21			91			39	
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		171.2			370.5			215.4			213.5	
Travel Time (s)		10.3			22.2			12.9			12.8	
Conf. Peds. (#/hr)	5		5	5		5	8		3	3		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	3%	3%	2%	6%	6%	2%	2%	2%	6%	3%	9%
Adj. Flow (vph)	115	1190	35	111	595	80	79	133	262	132	106	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	1190	35	111	675	0	79	395	0	132	196	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	58.0	58.0	58.0	14.0	72.0		44.0	44.0		44.0	44.0	
Total Split (%)	50.0%	50.0%	50.0%	12.1%	62.1%		37.9%	37.9%		37.9%	37.9%	
Maximum Green (s)	52.0	52.0	52.0	10.0	66.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)	53.5	53.5	53.5	68.0	66.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.46	0.46	0.46	0.59	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.36	0.74	0.05	0.48	0.35		0.23	0.65		0.73	0.34	

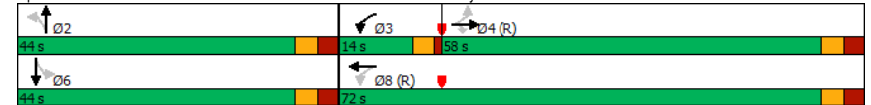
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2029 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	24.7	29.1	1.2	17.7	13.7		30.5	31.2		60.1	25.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.7	29.1	1.2	17.7	13.7		30.5	31.2		60.1	25.4	
LOS	C	C	A	B	B		C	C		E	C	
Approach Delay		28.0			14.2			31.1			39.4	
Approach LOS		C			B			C			D	
Queue Length 50th (m)	17.3	119.4	0.0	11.1	42.1		13.7	62.2		27.8	27.9	
Queue Length 95th (m)	34.2	149.8	1.8	19.5	54.5		26.7	97.9		#61.2	48.5	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0		25.0				20.0		
Base Capacity (vph)	322	1617	739	253	1905		349	605		180	569	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.36	0.74	0.05	0.44	0.35		0.23	0.65		0.73	0.34	

Intersection Summary

Area Type: Other
 Cycle Length: 116
 Actuated Cycle Length: 116
 Offset: 40 (34%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 26.1 Intersection LOS: C
 Intersection Capacity Utilization 104.2% ICU Level of Service G
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2029 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	115	1190	35	111	595	80	79	133	262	132	106	90
Future Volume (veh/h)	115	1190	35	111	595	80	79	133	262	132	106	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1796	1856	1856	1870	1811	1811	1870	1870	1870	1811	1856	1767
Adj Flow Rate, veh/h	115	1190	35	111	595	80	79	133	262	132	106	90
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	3	2	6	6	2	2	2	6	3	9
Cap, veh/h	402	1719	763	249	1734	233	346	183	361	175	303	257
Arrive On Green	0.49	0.49	0.49	0.05	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	732	3526	1564	1781	3047	409	1181	560	1103	956	923	784
Grp Volume(v), veh/h	115	1190	35	111	335	340	79	0	395	132	0	196
Grp Sat Flow(s),veh/h/ln	732	1763	1564	1781	1721	1735	1181	0	1662	956	0	1708
Q Serve(g_s), s	11.6	30.3	1.4	3.5	12.1	12.2	6.3	0.0	24.3	13.7	0.0	10.1
Cycle Q Clear(g_c), s	14.3	30.3	1.4	3.5	12.1	12.2	16.4	0.0	24.3	38.0	0.0	10.1
Prop In Lane	1.00		1.00	1.00	0.24	1.00	0.66	1.00	0.66	1.00	0.46	0.46
Lane Grp Cap(c), veh/h	402	1719	763	249	979	987	346	0	545	175	0	559
V/C Ratio(X)	0.29	0.69	0.05	0.45	0.34	0.34	0.23	0.00	0.73	0.75	0.00	0.35
Avail Cap(c_a), veh/h	402	1719	763	319	979	987	346	0	545	175	0	559
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	23.0	15.6	18.4	13.4	13.4	35.9	0.0	34.4	52.2	0.0	29.6
Incr Delay (d2), s/veh	1.8	2.3	0.1	1.3	1.0	1.0	1.5	0.0	8.2	25.7	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	7.7	0.3	0.8	2.5	2.5	1.5	0.0	8.0	4.3	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	25.3	15.7	19.6	14.3	14.4	37.4	0.0	42.6	77.8	0.0	31.4
LnGrp LOS	C	C	B	B	B	B	D	A	D	E	A	C
Approach Vol, veh/h	1340			786			474			328		
Approach Delay, s/veh	24.7			15.1			41.7			50.1		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	2	3	4	6			8					
Phs Duration (G+Y+Rc), s	44.0	9.4	62.6	44.0			72.0					
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0			6.0					
Max Green Setting (Gmax), s	38.0	10.0	52.0	38.0			66.0					
Max Q Clear Time (g_c+I1), s	26.3	5.5	32.3	40.0			14.2					
Green Ext Time (p_c), s	2.6	0.1	11.0	0.0			5.7					

Intersection Summary		
HCM 6th Ctrl Delay	27.7	
HCM 6th LOS	C	

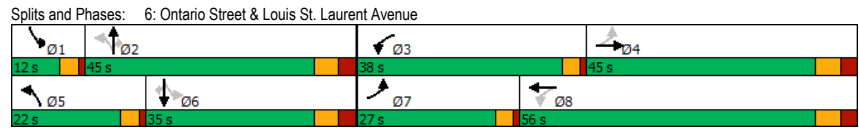
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	367	589	360	446	518	57	191	813	176	43	1099	169
Future Volume (vph)	367	589	360	446	518	57	191	813	176	43	1099	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	1.00				1.00				0.98	1.00		
Frt		0.943			0.985				0.850			0.850
Fit Protected	0.950			0.950			0.950		0.950			0.950
Satd. Flow (prot)	1752	3305	0	1736	3407	0	1641	4848	1538	1703	4848	1524
Fit Permitted	0.436			0.095			0.120		0.303			0.303
Satd. Flow (perm)	802	3305	0	174	3407	0	207	4848	1514	543	4848	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		91			9				151			156
Link Speed (k/h)		60			60			60				60
Link Distance (m)		193.1			250.0			253.7				194.1
Travel Time (s)		11.6			15.0			15.2				11.6
Confl. Peds. (#/hr)	3				3			2		2		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	4%	4%	6%	10%	7%	5%	6%	7%	6%
Adj. Flow (vph)	367	589	360	446	518	57	191	813	176	43	1099	169
Shared Lane Traffic (%)												
Lane Group Flow (vph)	367	949	0	446	575	0	191	813	176	43	1099	169
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1		6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	27.0	45.0		38.0	56.0		22.0	45.0	45.0	12.0	35.0	35.0
Total Split (%)	19.3%	32.1%		27.1%	40.0%		15.7%	32.1%	32.1%	8.6%	25.0%	25.0%
Maximum Green (s)	23.0	38.0		34.0	49.0		18.0	38.0	38.0	8.0	28.0	28.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effect Green (s)	61.0	38.0		77.5	50.5		51.4	39.3	39.3	38.7	28.5	28.5
Actuated g/C Ratio	0.45	0.28		0.57	0.37		0.38	0.29	0.29	0.28	0.21	0.21
v/c Ratio	0.74	0.97		0.95	0.46		0.79	0.59	0.33	0.20	1.09	0.38

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	28.4	65.7		70.2	34.4		55.7	44.8	10.5	31.0	106.0	11.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	65.7		70.2	34.4		55.7	44.8	10.5	31.0	106.0	11.5
LOS	C	E		E	C		E	D	B	C	F	B
Approach Delay		55.3			50.0			41.4			91.4	
Approach LOS		E			D			D			F	
Queue Length 50th (m)	56.4	133.8		109.6	66.2		38.9	76.0	5.4	7.9	~133.9	3.1
Queue Length 95th (m)	79.5	#181.7		#177.6	86.1		#70.9	91.9	25.1	16.7	#166.8	23.7
Internal Link Dist (m)		169.1			226.0			229.7			170.1	
Turn Bay Length (m)	45.0			20.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	535	984		486	1263		266	1389	541	224	1009	440
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.96		0.92	0.46		0.72	0.59	0.33	0.19	1.09	0.38

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 136.9	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 60.6	Intersection LOS: E
Intersection Capacity Utilization 102.7%	ICU Level of Service G
Analysis Period (min) 15	
- 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.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2029 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (veh/h)	367	589	360	446	518	57	191	813	176	43	1099	169
Future Volume (veh/h)	367	589	360	446	518	57	191	813	176	43	1099	169
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1811	1752	1796	1826	1811	1796	1811
Adj Flow Rate, veh/h	367	589	360	446	518	57	191	813	176	43	1099	169
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	4	4	6	10	7	5	6	7	6
Cap, veh/h	534	597	365	472	1140	125	227	1395	439	184	1033	322
Arrive On Green	0.16	0.28	0.28	0.24	0.36	0.36	0.10	0.28	0.28	0.03	0.21	0.21
Sat Flow, veh/h	1767	2099	1283	1753	3177	348	1668	4904	1544	1725	4904	1530
Grp Volume(v), veh/h	367	495	454	446	284	291	191	813	176	43	1099	169
Grp Sat Flow(s), veh/h/ln	1767	1763	1620	1753	1749	1777	1668	1635	1544	1725	1635	1530
Q Serve(g_s), s	19.4	37.3	37.3	29.0	16.6	16.7	11.6	19.0	12.3	2.6	28.1	13.1
Cycle Q Clear(g_c), s	19.4	37.3	37.3	29.0	16.6	16.7	11.6	19.0	12.3	2.6	28.1	13.1
Prop In Lane	1.00		0.79	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	534	501	461	472	628	638	227	1395	439	184	1033	322
V/C Ratio(X)	0.69	0.99	0.99	0.95	0.45	0.46	0.84	0.58	0.40	0.23	1.06	0.52
Avail Cap(c_a), veh/h	552	501	461	503	641	652	279	1395	439	236	1033	322
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	47.5	47.5	40.2	32.8	32.8	37.3	41.0	38.6	39.9	52.7	46.8
Incr Delay (d2), s/veh	3.4	36.5	38.3	26.2	0.5	0.5	17.3	1.8	2.7	0.6	46.7	6.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	6.0	17.4	16.2	9.7	5.2	5.4	4.6	6.1	3.9	0.9	13.5	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.6	84.1	85.8	66.4	33.3	33.3	54.6	42.8	41.3	40.5	99.4	52.8
LnGrp LOS	C	F	F	E	C	C	D	D	D	D	F	D
Approach Vol, veh/h		1316			1021			1180			1311	
Approach Delay, s/veh		69.5			47.8			44.5			91.5	
Approach LOS		E			D			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	45.0	35.6	45.0	17.8	35.1	25.7	54.9				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	8.0	38.0	34.0	38.0	18.0	28.0	23.0	49.0				
Max Q Clear Time (g_c+I1), s	4.6	21.0	31.0	39.3	13.6	30.1	21.4	18.7				
Green Ext Time (p_c), s	0.0	6.7	0.6	0.0	0.3	0.0	0.3	4.4				

Intersection Summary	
HCM 6th Ctrl Delay	64.8
HCM 6th LOS	E

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Background 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	101	285	62	123	317	126	93	986	100	182	1137	146
Future Volume (vph)	101	285	62	123	317	126	93	986	100	182	1137	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00		1.00		1.00		1.00		1.00
Fit		0.973			0.957			0.986			0.983	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1827	0	1787	1800	0	1787	3419	0	1787	3443	0
Fit Permitted	0.260			0.399			0.176			0.125		
Satd. Flow (perm)	488	1827	0	747	1800	0	331	3419	0	235	3443	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			25			12			18	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	3		7	7		3	2		8	8		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	0%	1%	0%	2%	1%	4%	1%	1%	3%	1%
Adj. Flow (vph)	101	285	62	123	317	126	93	986	100	182	1137	146
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	347	0	123	443	0	93	1086	0	182	1283	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		4.5	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		9.0	21.0	
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		10.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		40.0%	40.0%		10.0%	50.0%	
Maximum Green (s)	43.0	43.0		43.0	43.0		34.0	34.0		5.5	44.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	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		4.5	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	24.1	24.1		24.1	24.1		34.2	34.2		45.8	44.3	
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.42	0.42		0.56	0.54	
v/c Ratio	0.70	0.63		0.56	0.81		0.67	0.75		0.77	0.68	

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Background 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	51.3	28.8		34.0	36.7		50.0	25.3		35.8	16.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	51.3	28.8		34.0	36.7		50.0	25.3		35.8	16.9	
LOS	D	C		C	D		D	C		D	B	
Approach Delay		33.9			36.1			27.3			19.3	
Approach LOS		C			D			C			B	
Queue Length 50th (m)	14.4	46.4		16.7	62.5		11.7	75.1		13.2	72.5	
Queue Length 95th (m)	33.5	72.3		33.8	95.6		#44.0	#127.2		#48.5	127.6	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	259	976		396	967		138	1442		237	1879	
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	0.39	0.36		0.31	0.46		0.67	0.75		0.77	0.68	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 81.5

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 26.2

Intersection LOS: C

Intersection Capacity Utilization 103.1%

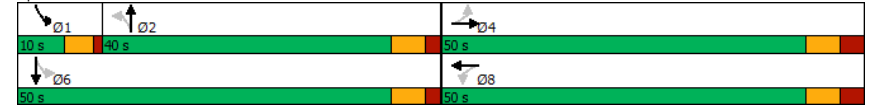
ICU Level of Service G

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	101	285	62	123	317	126	93	986	100	182	1137	146
Future Volume (veh/h)	101	285	62	123	317	126	93	986	100	182	1137	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1900	1885	1900	1870	1885	1841	1885	1885	1856	1885
Adj Flow Rate, veh/h	101	285	62	123	317	126	93	986	100	182	1137	146
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	0	1	0	2	1	4	1	1	3	1
Cap, veh/h	226	540	117	299	465	185	170	1222	124	247	1551	199
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.38	0.38	0.38	0.06	0.49	0.49
Sat Flow, veh/h	953	1498	326	1040	1291	513	434	3202	325	1795	3140	402
Grp Volume(v), veh/h	101	0	347	123	0	443	93	538	548	182	637	646
Grp Sat Flow(s),veh/h/ln	953	0	1824	1040	0	1804	434	1749	1778	1795	1763	1779
Q Serve(g_s), s	9.0	0.0	13.4	9.4	0.0	18.6	18.3	24.5	24.5	5.4	25.5	25.7
Cycle Q Clear(g_c), s	27.5	0.0	13.4	22.8	0.0	18.6	34.0	24.5	24.5	5.4	25.5	25.7
Prop In Lane	1.00		0.18	1.00		0.28	1.00		0.18	1.00		0.23
Lane Grp Cap(c), veh/h	226	0	657	299	0	650	170	667	679	247	871	879
V/C Ratio(X)	0.45	0.00	0.53	0.41	0.00	0.68	0.55	0.81	0.81	0.74	0.73	0.73
Avail Cap(c_a), veh/h	342	0	880	426	0	871	170	667	679	247	871	879
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	0.0	22.5	31.5	0.0	24.2	35.8	24.6	24.6	20.0	17.9	17.9
Incr Delay (d2), s/veh	1.4	0.0	0.7	0.9	0.0	1.4	12.1	10.1	10.0	10.9	5.4	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	3.2	1.6	0.0	4.5	1.9	7.1	7.2	1.8	5.9	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	0.0	23.2	32.4	0.0	25.5	47.8	34.7	34.6	30.8	23.3	23.3
LnGrp LOS	D	A	C	C	A	C	D	C	C	C	C	C
Approach Vol, veh/h	448			566			1179			1465		
Approach Delay, s/veh	26.3			27.0			35.7			24.2		
Approach LOS	C			C			D			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	10.0	40.0	39.1		50.0		39.1					
Change Period (Y+Rc), s	4.5	6.0	7.0		6.0		7.0					
Max Green Setting (Gmax), s	5.5	34.0	43.0		44.0		43.0					
Max Q Clear Time (g_c+I1), s	7.4	36.0	29.5		27.7		24.8					
Green Ext Time (p_c), s	0.0	0.0	2.6		9.3		3.9					

Intersection Summary		
HCM 6th Ctrl Delay	28.6	
HCM 6th LOS	C	

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↕↕↕	↕↕	
Traffic Volume (vph)	0	0	0	1359	1455	0
Future Volume (vph)	0	0	0	1359	1455	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Ped Bike Factor						
Fit Protected						
Satd. Flow (prot)	0	1900	0	4988	3505	0
Fit Permitted						
Satd. Flow (perm)	0	1900	0	4988	3505	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	63.0			90.2	135.8	
Travel Time (s)	3.8			5.4	9.8	
Confl. Peds. (#/hr)	2		2			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	4%	3%	0%
Adj. Flow (vph)	0	0	0	1359	1455	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1359	1455	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	43.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↗↗↗	↗↗	↗	
Traffic Vol, veh/h	0	0	0	1359	1455	0
Future Vol, veh/h	0	0	0	1359	1455	0
Conflicting Peds, #/hr	2	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	0	0	1359	1455	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	730	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	369	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	368	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 PM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖↖↖	↖↖↖	↖	↖↖↖	↖↖↖	↖↖↖	
Traffic Volume (vph)	188	798	112	162	1016	112	265	886	302	281	851	323	
Future Volume (vph)	188	798	112	162	1016	112	265	886	302	281	851	323	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0	
Storage Lanes	1		1	1		1	1		1	1		0	
Taper Length (m)	10.0			85.0			100.0			7.5			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	0.91	
Ped Bike Factor			0.99	1.00			1.00				1.00		
Frt			0.850			0.850			0.850		0.959		
Fit Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	1805	3539	1509	1752	3505	1417	1752	5187	1553	1641	4606	0	
Fit Permitted	0.101			0.187			0.130			0.182			
Satd. Flow (perm)	192	3539	1487	345	3505	1417	240	5187	1553	314	4606	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			100			100			223		85		
Link Speed (k/h)		60			60			60			50		
Link Distance (m)		117.7			375.6			511.5			90.2		
Travel Time (s)		7.1			22.5			30.7			6.5		
Confl. Peds. (#/hr)			3	3			3					3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	0%	2%	7%	3%	3%	14%	3%	0%	4%	10%	7%	9%	
Adj. Flow (vph)	188	798	112	162	1016	112	265	886	302	281	851	323	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	188	798	112	162	1016	112	265	886	302	281	1174	0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4		4	8		8	2		2	6			
Detector Phase	7	4	4	3	8	8	5	2	2	1	6		
Switch Phase													
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0		
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7		
Total Split (s)	13.0	45.4	45.4	13.0	45.4	45.4	16.0	41.6	41.6	20.0	45.6		
Total Split (%)	10.8%	37.8%	37.8%	10.8%	37.8%	37.8%	13.3%	34.7%	34.7%	16.7%	38.0%		
Maximum Green (s)	9.0	39.4	39.4	9.0	39.4	39.4	12.0	35.6	35.6	16.0	39.6		
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max		
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0		
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0		
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0		
Act Effect Green (s)	50.5	39.5	39.5	50.3	39.4	39.4	49.9	35.9	35.9	57.3	39.6		
Actuated g/C Ratio	0.42	0.33	0.33	0.42	0.33	0.33	0.42	0.30	0.30	0.48	0.33		
v/c Ratio	0.94	0.68	0.20	0.65	0.88	0.21	1.06	0.57	0.49	0.87	0.74		

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

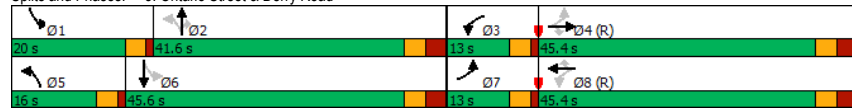
(190237) 550 Ontario St S, RR 25, Milton
Background 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	75.8	38.5	7.9	33.8	48.5	8.0	102.0	37.3	12.4	48.4	36.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	75.8	38.5	7.9	33.8	48.5	8.0	102.0	37.3	12.4	48.4	36.5	
LOS	E	D	A	C	D	A	F	D	B	D	D	
Approach Delay	41.8			43.2			44.0			38.8		
Approach LOS	D			D			D			D		
Queue Length 50th (m)	29.1	89.9	2.0	23.6	124.9	2.0	~52.2	68.2	14.5	42.5	88.0	
Queue Length 95th (m)	#76.0	112.9	15.1	38.5	#162.2	15.2	#107.8	82.9	41.1	#87.7	106.1	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	201	1165	557	250	1150	532	251	1552	621	327	1576	
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	0.94	0.68	0.20	0.65	0.88	0.21	1.06	0.57	0.49	0.86	0.74	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.06
Intersection Signal Delay:	41.9
Intersection Capacity Utilization:	104.5%
Analysis Period (min):	15
~	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.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔
Traffic Volume (veh/h)	188	798	112	162	1016	112	265	886	302	281	851	323
Future Volume (veh/h)	188	798	112	162	1016	112	265	886	302	281	851	323
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1870	1796	1856	1856	1693	1856	1900	1841	1752	1796	1767
Adj Flow Rate, veh/h	188	798	112	162	1016	112	265	886	302	281	851	323
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	7	3	3	14	3	0	4	10	7	9
Cap, veh/h	224	1167	498	274	1158	470	290	1556	467	346	1155	436
Arrive On Green	0.08	0.33	0.33	0.08	0.33	0.33	0.10	0.30	0.30	0.13	0.33	0.33
Sat Flow, veh/h	1810	3554	1518	1767	3526	1430	1767	5187	1555	1668	3501	1322
Grp Volume(v), veh/h	188	798	112	162	1016	112	265	886	302	281	794	380
Grp Sat Flow(s), veh/h/ln	1810	1777	1518	1767	1763	1430	1767	1729	1555	1668	1635	1554
Q Serve(g_s), s	8.3	23.3	6.4	7.2	32.6	6.8	12.0	17.3	20.2	13.5	25.8	26.0
Cycle Q Clear(g_c), s	8.3	23.3	6.4	7.2	32.6	6.8	12.0	17.3	20.2	13.5	25.8	26.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.85
Lane Grp Cap(c), veh/h	224	1167	498	274	1158	470	290	1556	467	346	1079	513
V/C Ratio(X)	0.84	0.68	0.22	0.59	0.88	0.24	0.91	0.57	0.65	0.81	0.74	0.74
Avail Cap(c_a), veh/h	224	1167	498	274	1158	470	290	1556	467	351	1079	513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	34.9	29.2	26.6	38.0	29.4	30.6	35.4	36.5	26.0	35.6	35.6
Incr Delay (d2), s/veh	23.5	3.3	1.0	3.4	9.5	1.2	31.1	1.5	6.8	13.4	4.5	9.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	3.8	7.6	1.8	2.3	11.4	1.8	6.0	5.5	6.4	4.9	8.2	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	53.2	38.2	30.3	30.0	47.5	30.6	61.7	37.0	43.3	39.4	40.1	44.9
LnGrp LOS	D	D	C	C	D	C	E	D	D	D	D	D
Approach Vol, veh/h	1098			1290			1453			1455		
Approach Delay, s/veh	39.9			43.9			42.8			41.2		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.6	42.0	13.0	45.4	16.0	45.6	13.0	45.4				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	16.0	35.6	9.0	39.4	12.0	39.6	9.0	39.4				
Max Q Clear Time (g_c+I1), s	15.5	22.2	9.2	25.3	14.0	28.0	10.3	34.6				
Green Ext Time (p_c), s	0.1	6.8	0.0	5.7	0.0	6.7	0.0	3.1				

Intersection Summary

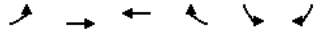
HCM 6th Ctrl Delay	42.0
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↔	↕
Traffic Volume (vph)	0	1082	1390	0	0	0
Future Volume (vph)	0	1082	1390	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Flt Protected						
Satd. Flow (prot)	1900	3539	3574	0	1900	0
Flt Permitted						
Satd. Flow (perm)	1900	3539	3574	0	1900	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%
Adj. Flow (vph)	0	1082	1390	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1082	1390	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.8%
ICU Level of Service A	
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2029 PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↔	↕
Traffic Vol, veh/h	0	1082	1390	0	0	0
Future Vol, veh/h	0	1082	1390	0	0	0
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	1	0	0	0
Mvmt Flow	0	1082	1390	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1392	0	0
Stage 1	-	-	1392
Stage 2	-	-	541
Critical Hdwy	4.1	-	6.8
Critical Hdwy Stg 1	-	-	5.8
Critical Hdwy Stg 2	-	-	5.8
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	498	-	59
Stage 1	-	-	199
Stage 2	-	-	553
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	497	-	59
Mov Cap-2 Maneuver	-	-	59
Stage 1	-	-	199
Stage 2	-	-	552

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	497	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	59	850	107	272	1054	91	181	157	266	124	297	101
Future Volume (vph)	59	850	107	272	1054	91	181	157	266	124	297	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.94	0.99			1.00	0.99		1.00	0.99	
Frt		0.850		0.988			0.906			0.962		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1615	1787	3531	0	1805	1677	0	1770	1804	0
Flt Permitted	0.226			0.167			0.354			0.327		
Satd. Flow (perm)	405	3539	1517	311	3531	0	670	1677	0	607	1804	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			66		11				85			17
Link Speed (k/h)		60							60			60
Link Distance (m)		171.2			370.5				215.4			213.5
Travel Time (s)		10.3			22.2				12.9			12.8
Confl. Peds. (#/hr)			27	27			9		9	9		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	2%	0%	1%	1%	1%	0%	0%	2%	2%	1%	0%
Adj. Flow (vph)	59	850	107	272	1054	91	181	157	266	124	297	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	850	107	272	1145	0	181	423	0	124	398	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	46.0	46.0	46.0	20.0	66.0		50.0	50.0		50.0	50.0	
Total Split (%)	39.7%	39.7%	39.7%	17.2%	56.9%		43.1%	43.1%		43.1%	43.1%	
Maximum Green (s)	40.0	40.0	40.0	16.0	60.0		44.0	44.0		44.0	44.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0	31.0	31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effect Green (s)	41.5	41.5	41.5	62.0	60.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio	0.36	0.36	0.36	0.53	0.52		0.38	0.38		0.38	0.38	
v/c Ratio	0.41	0.67	0.18	0.78	0.63		0.71	0.61		0.54	0.57	

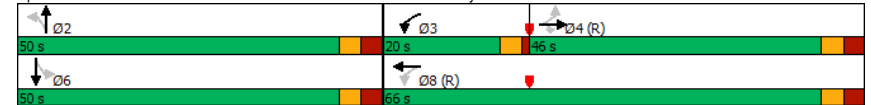
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	39.6	35.0	12.4	33.1	21.7		48.3	27.4		38.7	31.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.6	35.0	12.4	33.1	21.7		48.3	27.4		38.7	31.2	
LOS	D	D	B	C	C		D	C		D	C	
Approach Delay		32.9			23.9			33.7			33.0	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	10.7	91.2	6.5	34.2	98.2		36.4	64.8		22.9	71.5	
Queue Length 95th (m)	25.3	115.0	19.6	#66.0	120.7		#73.2	99.9		44.7	104.3	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	144	1266	585	369	1831		254	688		230	694	
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	0.41	0.67	0.18	0.74	0.63		0.71	0.61		0.54	0.57	

Intersection Summary

Area Type: Other
 Cycle Length: 116
 Actuated Cycle Length: 116
 Offset: 40 (34%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 29.4 Intersection LOS: C
 Intersection Capacity Utilization 106.2% ICU Level of Service G
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2029 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	59	850	107	272	1054	91	181	157	266	124	297	101
Future Volume (veh/h)	59	850	107	272	1054	91	181	157	266	124	297	101
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.96	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1870	1900	1885	1885	1885	1900	1900	1870	1870	1885	1900
Adj Flow Rate, veh/h	59	850	107	272	1054	91	181	157	266	124	297	101
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	2	0	1	1	1	0	0	2	2	1	0
Cap, veh/h	201	1325	579	363	1721	149	265	239	405	229	509	173
Arrive On Green	0.37	0.37	0.37	0.11	0.52	0.52	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	473	3554	1552	1795	3328	287	1000	630	1068	963	1343	457
Grp Volume(v), veh/h	59	850	107	272	567	578	181	0	423	124	0	398
Grp Sat Flow(s),veh/h/ln	473	1777	1552	1795	1791	1824	1000	0	1699	963	0	1799
Q Serve(g_s), s	11.7	22.9	5.4	10.4	25.9	26.0	20.4	0.0	23.9	14.2	0.0	20.5
Cycle Q Clear(g_c), s	20.9	22.9	5.4	10.4	25.9	26.0	40.9	0.0	23.9	38.1	0.0	20.5
Prop In Lane	1.00		1.00	1.00		0.16	1.00		0.63	1.00		0.25
Lane Grp Cap(c), veh/h	201	1325	579	363	926	944	265	0	644	229	0	682
V/C Ratio(X)	0.29	0.64	0.18	0.75	0.61	0.61	0.68	0.00	0.66	0.54	0.00	0.58
Avail Cap(c_a), veh/h	201	1325	579	413	926	944	265	0	644	229	0	682
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.1	30.0	24.5	22.0	19.8	19.8	45.0	0.0	29.8	45.5	0.0	28.7
Incr Delay (d2), s/veh	3.7	2.4	0.7	6.5	3.0	3.0	13.4	0.0	5.2	8.9	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	6.9	1.4	3.1	6.5	6.6	4.7	0.0	7.3	3.1	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	32.4	25.2	28.6	22.8	22.8	58.3	0.0	34.9	54.4	0.0	32.3
LnGrp LOS	D	C	C	C	C	C	E	A	C	D	A	C
Approach Vol, veh/h	1016			1417			604			522		
Approach Delay, s/veh	31.9			23.9			41.9			37.6		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	2		3		4		6		8			
Phs Duration (G+Y+Rc), s	50.0		16.7		49.3		50.0		66.0			
Change Period (Y+Rc), s	6.0		4.0		6.0		6.0		6.0			
Max Green Setting (Gmax), s	44.0		16.0		40.0		44.0		60.0			
Max Q Clear Time (g_c+1), s	42.9		12.4		24.9		40.1		28.0			
Green Ext Time (p_c), s	0.5		0.4		7.0		1.3		11.0			
Intersection Summary												
HCM 6th Ctrl Delay	31.2											
HCM 6th LOS	C											

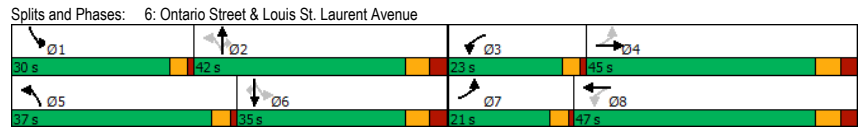
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	238	396	139	221	599	69	575	1138	347	94	789	319
Future Volume (vph)	238	396	139	221	599	69	575	1138	347	94	789	319
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor							0.99		0.99			1.00
Frt	0.961				0.985				0.850		0.850	
Fit Protected	0.950				0.950				0.950		0.950	
Satd. Flow (prot)	1770		3426		0		1787		4988		1615	
Fit Permitted	0.165				0.280				0.170		0.238	
Satd. Flow (perm)	307		3426		0		527		3524		0	
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)			34				9				207	
Link Speed (k/h)			60				60				60	
Link Distance (m)	193.1				250.0				253.7		194.1	
Travel Time (s)	11.6				15.0				15.2		11.6	
Confl. Peds. (#/hr)							1		1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	2%	1%	1%	0%	1%	4%	0%	0%	4%	1%
Adj. Flow (vph)	238	396	139	221	599	69	575	1138	347	94	789	319
Shared Lane Traffic (%)												
Lane Group Flow (vph)	238	535	0	221	668	0	575	1138	347	94	789	319
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			2	6	
Detector Phase	7	4		3	8		5	2		2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0		20.0	5.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0		32.0	9.0	32.0
Total Split (s)	21.0	45.0		23.0	47.0		37.0	42.0		42.0	30.0	35.0
Total Split (%)	15.0%	32.1%		16.4%	33.6%		26.4%	30.0%		30.0%	21.4%	25.0%
Maximum Green (s)	17.0	38.0		19.0	40.0		33.0	35.0		35.0	26.0	28.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0		3.0	1.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0		7.0	4.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max		Max	None	Max
Walk Time (s)		7.0			7.0			7.0		7.0		7.0
Flash Dont Walk (s)		18.0			18.0			16.0		16.0		16.0
Pedestrian Calls (#/hr)		0			0			0		0		0
Act Effct Green (s)	48.2	29.4		47.9	29.2		68.2	52.2		52.2	40.1	28.1
Actuated g/C Ratio	0.38	0.23		0.37	0.23		0.53	0.41		0.41	0.31	0.22
v/c Ratio	0.81	0.66		0.63	0.83		1.05	0.56		0.45	0.40	0.72

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	49.5	46.3		34.1	55.8		84.5	31.9	13.8	25.3	51.8	15.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.5	46.3		34.1	55.8		84.5	31.9	13.8	25.3	51.8	15.2
LOS	D	D		C	E		F	C	B	C	D	B
Approach Delay	47.3			50.4			43.5			40.0		
Approach LOS	D			D			D			D		
Queue Length 50th (m)	42.8	64.4		39.3	89.3		~144.1	85.0	24.7	12.2	72.5	13.6
Queue Length 95th (m)	#80.0	86.1		58.6	111.8		#241.2	116.9	60.3	24.6	95.8	47.2
Internal Link Dist (m)	169.1		226.0		229.7		170.1		50.0		50.0	
Turn Bay Length (m)	45.0		20.0		50.0		50.0		50.0		50.0	
Base Capacity (vph)	311	1042		395	1108		548	2030	771	476	1092	550
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.51		0.56	0.60		1.05	0.56	0.45	0.20	0.72	0.58

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	128.3
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.05
Intersection Signal Delay:	44.5
Intersection Capacity Utilization:	98.8%
Analysis Period (min):	15
~ 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.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2029 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	238	396	139	221	599	69	575	1138	347	94	789	319
Future Volume (veh/h)	238	396	139	221	599	69	575	1138	347	94	789	319
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1885	1870	1885	1885	1900	1885	1841	1900	1900	1841	1885
Adj Flow Rate, veh/h	238	396	139	221	599	69	575	1138	347	94	789	319
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	1	2	1	1	0	1	4	0	0	4	1
Cap, veh/h	306	606	210	339	730	84	564	2143	686	237	1112	353
Arrive On Green	0.12	0.23	0.23	0.11	0.23	0.23	0.26	0.43	0.43	0.06	0.22	0.22
Sat Flow, veh/h	1781	2609	905	1795	3237	372	1795	5025	1609	1810	5025	1595
Grp Volume(v), veh/h	238	270	265	221	331	337	575	1138	347	94	789	319
Grp Sat Flow(s), veh/h/ln	1781	1791	1722	1795	1791	1818	1795	1675	1609	1810	1675	1595
Q Serve(g_s), s	12.8	17.3	17.6	11.8	22.2	22.3	33.0	21.2	20.0	5.0	18.4	24.6
Cycle Q Clear(g_c), s	12.8	17.3	17.6	11.8	22.2	22.3	33.0	21.2	20.0	5.0	18.4	24.6
Prop In Lane	1.00		0.53	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	306	416	400	339	404	410	564	2143	686	237	1112	353
V/C Ratio(X)	0.78	0.65	0.66	0.65	0.82	0.82	1.02	0.53	0.51	0.40	0.71	0.90
Avail Cap(c_a), veh/h	334	538	517	408	566	575	564	2143	686	508	1112	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.1	43.9	44.1	33.2	46.5	46.6	32.8	26.9	26.5	34.9	45.5	48.0
Incr Delay (d2), s/veh	10.3	1.8	2.0	2.7	6.5	6.6	42.8	0.9	2.7	1.1	3.8	28.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	4.8	6.0	6.0	3.9	8.3	8.4	16.1	5.8	5.6	1.7	6.2	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	44.4	45.7	46.1	35.9	53.1	53.2	75.6	27.9	29.2	36.0	49.4	76.7
LnGrp LOS	D	D	D	D	D	D	F	C	C	D	D	E
Approach Vol, veh/h	773			889			2060			1202		
Approach Delay, s/veh	45.4			48.8			41.4			55.6		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	61.0	18.2	36.4	37.0	35.0	19.0	35.5				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	26.0	35.0	19.0	38.0	33.0	28.0	17.0	40.0				
Max Q Clear Time (g_c+I1), s	7.0	23.2	13.8	19.6	35.0	26.6	14.8	24.3				
Green Ext Time (p_c), s	0.3	7.6	0.4	3.6	0.0	0.9	0.2	4.2				

Intersection Summary	
HCM 6th Ctrl Delay	46.8
HCM 6th LOS	D

Appendix G

2031 Background Traffic Operations Reports



Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Background 2031 AM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↕	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗			
Traffic Volume (vph)	119	155	76	112	198	105	48	1177	47	68	796	66		
Future Volume (vph)	119	155	76	112	198	105	48	1177	47	68	796	66		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0		
Storage Lanes	1		0	1		0	1		0	1		0		
Taper Length (m)	15.0			25.0			15.0			20.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95		
Ped Bike Factor	1.00	0.99		0.99		0.99		1.00		1.00				
Fit		0.951			0.948			0.994			0.989			
Fit Protected	0.950			0.950			0.950			0.950				
Satd. Flow (prot)	1736	1735	0	1770	1708	0	1752	3384	0	1597	3354	0		
Fit Permitted	0.422			0.564			0.298			0.173				
Satd. Flow (perm)	767	1735	0	1042	1708	0	550	3384	0	291	3354	0		
Right Turn on Red			Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)		31			28			5			11			
Link Speed (k/h)		60			60			60			50			
Link Distance (m)		66.2			94.7			135.8			142.5			
Travel Time (s)		4.0			5.7			8.1			10.3			
Conf. Peds. (#/hr)	7		10	10		7		7	7					
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Heavy Vehicles (%)	4%	4%	2%	2%	3%	8%	3%	6%	3%	13%	7%	0%		
Adj. Flow (vph)	119	155	76	112	198	105	48	1177	47	68	796	66		
Shared Lane Traffic (%)														
Lane Group Flow (vph)	119	231	0	112	303	0	48	1224	0	68	862	0		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA			
Protected Phases		4			8			2			6			
Permitted Phases	4			8			2			6				
Detector Phase	4	4		8	8		2	2		6	6			
Switch Phase														
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0			
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0			
Total Split (s)	50.0	50.0		50.0	50.0		50.0	50.0		50.0	50.0			
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%			
Maximum Green (s)	43.0	43.0		43.0	43.0		44.0	44.0		44.0	44.0			
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0			
All-Red Time (s)	3.0	3.0		3.0	3.0		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?														
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0			
Recall Mode	None	None		None	None		Max	Max		Max	Max			
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0			
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0			
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0			
Act Effect Green (s)	17.2	17.2		17.2	17.2		44.2	44.2		44.2	44.2			
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.59	0.59		0.59	0.59			
v/c Ratio	0.67	0.54		0.47	0.73		0.15	0.61		0.40	0.43			

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

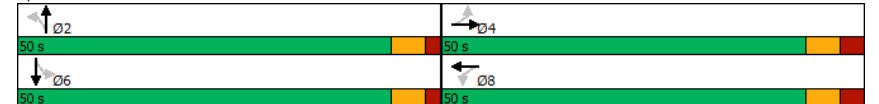
Background 2031 AM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↕	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Control Delay	45.1	26.4		31.0	34.6		9.7	12.0		18.6	9.7			
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0			
Total Delay	45.1	26.4		31.0	34.6		9.7	12.0		18.6	9.7			
LOS	D	C		C	C		A	B		B	A			
Approach Delay		32.7			33.6			11.9			10.3			
Approach LOS		C			C			B			B			
Queue Length 50th (m)	16.0	25.7		14.2	37.4		2.8	53.7		4.8	32.2			
Queue Length 95th (m)	33.7	46.0		29.0	63.2		9.9	93.0		19.5	57.0			
Internal Link Dist (m)		42.2			70.7			111.8			118.5			
Turn Bay Length (m)	15.0			35.0			15.0			40.0				
Base Capacity (vph)	445	1019		604	1002		326	2011		172	1996			
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	0.27	0.23		0.19	0.30		0.15	0.61		0.40	0.43			

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	74.4
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	16.9
Intersection Capacity Utilization:	94.6%
Intersection LOS:	B
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	119	155	76	112	198	105	48	1177	47	68	796	66
Future Volume (veh/h)	119	155	76	112	198	105	48	1177	47	68	796	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1856	1781	1856	1811	1856	1707	1796	1900
Adj Flow Rate, veh/h	119	155	76	112	198	105	48	1177	47	68	796	66
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	2	2	3	8	3	6	3	13	7	0
Cap, veh/h	257	356	175	316	349	185	330	1805	72	206	1707	141
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.54	0.54	0.54	0.54	0.54	0.54
Sat Flow, veh/h	1054	1162	570	1143	1137	603	636	3372	135	416	3189	264
Grp Volume(v), veh/h	119	0	231	112	0	303	48	600	624	68	426	436
Grp Sat Flow(s),veh/h/ln	1054	0	1732	1143	0	1740	636	1721	1786	416	1706	1747
Q Serve(g_s), s	8.8	0.0	8.8	7.1	0.0	12.0	4.2	20.5	20.5	11.5	12.7	12.7
Cycle Q Clear(g_c), s	20.8	0.0	8.8	15.9	0.0	12.0	16.9	20.5	20.5	32.0	12.7	12.7
Prop In Lane	1.00		0.33	1.00		0.35	1.00		0.08	1.00		0.15
Lane Grp Cap(c), veh/h	257	0	531	316	0	534	330	921	956	206	913	935
V/C Ratio(X)	0.46	0.00	0.44	0.35	0.00	0.57	0.15	0.65	0.65	0.33	0.47	0.47
Avail Cap(c_a), veh/h	485	0	906	563	0	910	330	921	956	206	913	935
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	0.0	22.8	29.2	0.0	23.9	17.1	13.6	13.6	25.1	11.8	11.8
Incr Delay (d2), s/veh	1.3	0.0	0.6	0.7	0.0	1.0	0.9	3.6	3.5	4.2	1.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	2.0	1.3	0.0	2.8	0.4	2.8	2.8	0.9	2.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	0.0	23.4	29.8	0.0	24.9	18.0	17.2	17.1	29.3	13.5	13.5
LnGrp LOS	C	A	C	C	A	C	B	B	B	C	B	B
Approach Vol, veh/h	350			415			1272			930		
Approach Delay, s/veh	27.0			26.2			17.2			14.7		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	50.0		32.2		50.0		32.2					
Change Period (Y+Rc), s	6.0		7.0		6.0		7.0					
Max Green Setting (Gmax), s	44.0		43.0		44.0		43.0					
Max Q Clear Time (g_c+1), s	22.5		22.8		34.0		17.9					
Green Ext Time (p_c), s	10.5		2.2		5.1		2.8					
Intersection Summary												
HCM 6th Ctrl Delay	18.8											
HCM 6th LOS	B											

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔↔↔	↔↔	
Traffic Volume (vph)	0	0	0	1463	1123	0
Future Volume (vph)	0	0	0	1463	1123	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Fit						
Fit Protected						
Satd. Flow (prot)	0	1900	0	4893	3406	0
Fit Permitted						
Satd. Flow (perm)	0	1900	0	4893	3406	0
Link Speed (k/h)	60		60		50	
Link Distance (m)	63.0		90.2		135.8	
Travel Time (s)	3.8		5.4		9.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	0	0	1463	1123	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1463	1123	0
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	34.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕	↕↕↕	↕↕↕	↕↕	
Traffic Vol, veh/h	0	0	0	1463	1123	0
Future Vol, veh/h	0	0	0	1463	1123	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	0	0	1463	1123	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	562	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	475	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	475	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

	↕	↔	↕	↔	↕	↔	↕	↔	↕	↔	↕	↔
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕↕↕	↕	↕	↕↕↕	↕	↕	↕↕↕	↕	↕	↕↕	↕
Traffic Volume (vph)	351	1551	297	278	860	218	174	837	345	137	820	155
Future Volume (vph)	351	1551	297	278	860	218	174	837	345	137	820	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor			0.99	1.00					0.98	1.00		
Frt			0.850			0.850			0.850		0.976	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	5036	1538	1641	4940	1495	1671	4940	1524	1736	4760	0
Fit Permitted	0.226			0.093			0.125		0.231			
Satd. Flow (perm)	413	5036	1515	161	4940	1495	220	4940	1499	421	4760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			135			194			324		30	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		117.7			375.6			511.5			90.2	
Travel Time (s)		7.1			22.5			30.7			6.5	
Confl. Peds. (#/hr)			3	3					5	5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	3%	5%	10%	5%	8%	8%	5%	6%	4%	7%	3%
Adj. Flow (vph)	351	1551	297	278	860	218	174	837	345	137	820	155
Shared Lane Traffic (%)												
Lane Group Flow (vph)	351	1551	297	278	860	218	174	837	345	137	975	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	32.0	51.0	51.0	22.0	41.0	41.0	13.0	38.0	38.0	9.0	34.0	
Total Split (%)	26.7%	42.5%	42.5%	18.3%	34.2%	34.2%	10.8%	31.7%	31.7%	7.5%	28.3%	
Maximum Green (s)	28.0	45.0	45.0	18.0	35.0	35.0	9.0	32.0	32.0	5.0	28.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	66.2	45.5	45.5	62.3	42.8	42.8	43.0	32.0	32.0	35.0	28.0	
Actuated g/C Ratio	0.55	0.38	0.38	0.52	0.36	0.36	0.36	0.27	0.27	0.29	0.23	
v/c Ratio	0.78	0.81	0.45	0.93	0.49	0.33	0.93	0.64	0.54	0.77	0.86	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

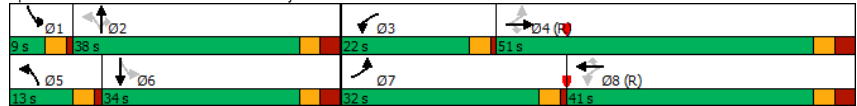
(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	16.2	31.9	14.7	70.3	32.2	7.6	81.4	41.4	8.4	60.4	51.6	
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	16.2	31.9	14.7	70.3	32.2	7.6	81.4	41.4	8.4	60.4	51.6	
LOS	B	C	B	E	C	A	F	D	A	E	D	
Approach Delay	27.1			36.0			38.2			52.7		
Approach LOS	C			D			D			D		
Queue Length 50th (m)	32.9	134.8	45.9	52.2	60.3	3.9	30.7	67.2	3.9	23.5	83.0	
Queue Length 95th (m)	m50.2	157.3	m67.5	#109.8	81.8	23.9	#71.8	82.4	29.9	#50.7	100.8	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0		45.0	70.0		70.0			
Base Capacity (vph)	546	1909	658	305	1762	658	187	1317	637	177	1133	
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	0.64	0.81	0.45	0.91	0.49	0.33	0.93	0.64	0.54	0.77	0.86	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 36.3
 Intersection Capacity Utilization 103.8%
 Analysis Period (min) 15
 # 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.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖
Traffic Volume (veh/h)	351	1551	297	278	860	218	174	837	345	137	820	155
Future Volume (veh/h)	351	1551	297	278	860	218	174	837	345	137	820	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1856	1826	1752	1826	1781	1781	1826	1811	1841	1796	1856
Adj Flow Rate, veh/h	351	1551	297	278	860	218	174	837	345	137	820	155
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	3	5	10	5	8	8	5	6	4	7	3
Cap, veh/h	444	2008	612	305	1891	571	211	1329	407	188	966	181
Arrive On Green	0.15	0.40	0.40	0.13	0.38	0.38	0.08	0.27	0.27	0.04	0.23	0.23
Sat Flow, veh/h	1753	5066	1544	1668	4985	1506	1697	4985	1526	1753	4142	777
Grp Volume(v), veh/h	351	1551	297	278	860	218	174	837	345	137	646	329
Grp Sat Flow(s), veh/h/ln	1753	1689	1544	1668	1662	1506	1697	1662	1526	1753	1635	1650
Q Serve(g_s), s	14.3	32.0	17.3	13.1	15.5	12.6	9.0	17.8	25.7	5.0	22.7	22.9
Cycle Q Clear(g_c), s	14.3	32.0	17.3	13.1	15.5	12.6	9.0	17.8	25.7	5.0	22.7	22.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	444	2008	612	305	1891	571	211	1329	407	188	763	385
V/C Ratio(X)	0.79	0.77	0.49	0.91	0.45	0.38	0.83	0.63	0.85	0.73	0.85	0.85
Avail Cap(c_a), veh/h	598	2008	612	341	1891	571	211	1329	407	188	763	385
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.1	31.5	27.1	29.1	27.9	27.0	34.4	38.8	41.7	40.9	44.0	44.0
Incr Delay (d2), s/veh	5.1	3.0	2.7	26.2	0.8	1.9	22.9	2.3	19.2	13.2	11.2	20.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	3.8	9.1	4.7	5.4	4.3	3.4	4.0	5.6	9.2	3.1	8.3	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	25.2	34.5	29.8	55.2	28.7	28.9	57.3	41.0	60.9	54.0	55.2	64.9
LnGrp LOS	C	C	C	E	C	C	E	D	E	D	E	E
Approach Vol, veh/h	2199			1356			1356			1112		
Approach Delay, s/veh	32.3			34.2			48.2			57.9		
Approach LOS	C			C			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	38.0	19.4	53.6	13.0	34.0	21.5	51.5				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	5.0	32.0	18.0	45.0	9.0	28.0	28.0	35.0				
Max Q Clear Time (g_c+I1), s	7.0	27.7	15.1	34.0	11.0	24.9	16.3	17.5				
Green Ext Time (p_c), s	0.0	2.8	0.3	8.6	0.0	1.9	1.2	7.4				

Intersection Summary

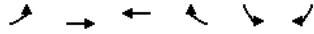
HCM 6th Ctrl Delay 41.0
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕ ↑↑↑	↑↑↑	↑↑↑		↕	
Traffic Volume (vph)	0	2087	1262	0	0	0
Future Volume (vph)	0	2087	1262	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor						
Flt Protected						
Satd. Flow (prot)	1900	5085	4988	0	1429	0
Flt Permitted						
Satd. Flow (perm)	1900	5085	4988	0	1429	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	0%	33%	0%
Adj. Flow (vph)	0	2087	1262	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2087	1262	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	43.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕ ↑↑↑	↑↑↑	↑↑↑		↕	
Traffic Vol, veh/h	0	2087	1262	0	0	0
Future Vol, veh/h	0	2087	1262	0	0	0
Conflicting Peds, #/hr	7	0	0	7	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	4	0	33	0
Mvmt Flow	0	2087	1262	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1269	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	5.3	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	3.1	-	-
Pot Cap-1 Maneuver	295	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	293	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	293	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	174	1804	53	168	901	121	84	141	278	140	113	96
Future Volume (vph)	174	1804	53	168	901	121	84	141	278	140	113	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00	1.00		0.99	0.99		1.00	0.99	
Fit			0.850		0.982			0.900			0.931	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	5036	1568	1770	4790	0	1770	1660	0	1703	1657	0
Fit Permitted	0.268			0.067			0.556			0.281		
Satd. Flow (perm)	475	5036	1524	125	4790	0	1029	1660	0	503	1657	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)			64		33			89			38	
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		171.2			370.5			215.4			213.5	
Travel Time (s)		10.3			22.2			12.9			12.8	
Conf. Peds. (#/hr)	5		5	5		5	8		3	3		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	3%	3%	2%	6%	6%	2%	2%	2%	6%	3%	9%
Adj. Flow (vph)	174	1804	53	168	901	121	84	141	278	140	113	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	1804	53	168	1022	0	84	419	0	140	209	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	61.8	61.8	61.8	12.2	74.0		46.0	46.0		46.0	46.0	
Total Split (%)	51.5%	51.5%	51.5%	10.2%	61.7%		38.3%	38.3%		38.3%	38.3%	
Maximum Green (s)	55.8	55.8	55.8	8.2	68.0		40.0	40.0		40.0	40.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effect Green (s)	55.8	55.8	55.8	70.0	68.0		40.0	40.0		40.0	40.0	
Actuated g/C Ratio	0.46	0.46	0.46	0.58	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.79	0.77	0.07	0.91	0.37		0.24	0.68		0.84	0.36	

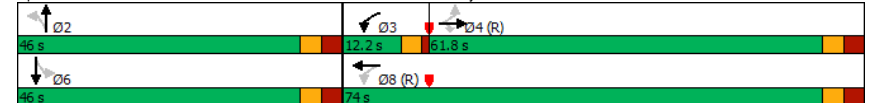
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	54.5	29.6	3.5	60.5	9.2		31.5	33.5		76.4	26.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	54.5	29.6	3.5	60.5	9.2		31.5	33.5		76.4	26.7	
LOS	D	C	A	E	A		C	C		E	C	
Approach Delay		31.0			16.4			33.2			46.6	
Approach LOS		C			B			C			D	
Queue Length 50th (m)	35.6	133.2	0.0	21.4	62.1		15.1	71.0		31.9	31.6	
Queue Length 95th (m)	#79.2	153.0	5.7	m#54.4	m15.9		28.9	109.3		#71.3	53.2	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	220	2341	742	185	2728		343	612		167	577	
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	0.79	0.77	0.07	0.91	0.37		0.24	0.68		0.84	0.36	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 28.4 Intersection LOS: C
 Intersection Capacity Utilization 104.2% ICU Level of Service G
 Analysis Period (min) 15
 # 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.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (veh/h)	174	1804	53	168	901	121	84	141	278	140	113	96
Future Volume (veh/h)	174	1804	53	168	901	121	84	141	278	140	113	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1796	1856	1856	1870	1811	1811	1870	1870	1870	1811	1856	1767
Adj Flow Rate, veh/h	174	1804	53	168	901	121	84	141	278	140	113	96
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	3	2	6	6	2	2	2	6	3	9
Cap, veh/h	301	2380	735	217	2498	334	341	186	368	162	308	261
Arrive On Green	0.47	0.47	0.47	0.06	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	529	5066	1564	1781	4408	590	1168	559	1103	936	923	784
Grp Volume(v), veh/h	174	1804	53	168	673	349	84	0	419	140	0	209
Grp Sat Flow(s),veh/h/ln	529	1689	1564	1781	1648	1702	1168	0	1662	936	0	1708
Q Serve(g_s), s	32.0	35.2	2.2	5.6	13.3	13.4	7.1	0.0	27.0	13.0	0.0	11.2
Cycle Q Clear(g_c), s	33.8	35.2	2.2	5.6	13.3	13.4	18.2	0.0	27.0	40.0	0.0	11.2
Prop In Lane	1.00		1.00	1.00		0.35	1.00		0.66	1.00		0.46
Lane Grp Cap(c), veh/h	301	2380	735	217	1868	964	341	0	554	162	0	569
V/C Ratio(X)	0.58	0.76	0.07	0.77	0.36	0.36	0.25	0.00	0.76	0.87	0.00	0.37
Avail Cap(c_a), veh/h	301	2380	735	225	1868	964	341	0	554	162	0	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.6	26.2	17.5	24.9	14.2	14.2	37.3	0.0	35.7	55.3	0.0	30.4
Incr Delay (d2), s/veh	7.9	2.3	0.2	14.9	0.5	1.1	1.7	0.0	9.3	42.3	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	9.0	0.5	2.1	2.6	2.8	1.7	0.0	9.0	5.4	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	28.5	17.7	39.8	14.7	15.2	39.0	0.0	44.9	97.5	0.0	32.2
LnGrp LOS	C	C	B	D	B	B	D	A	D	F	A	C
Approach Vol, veh/h	2031			1190			503			349		
Approach Delay, s/veh	28.7			18.4			44.0			58.4		
Approach LOS	C			B			D			E		
Timer - Assigned Phs	2	3	4	6			8					
Phs Duration (G+Y+Rc), s	46.0	11.6	62.4	46.0			74.0					
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0			6.0					
Max Green Setting (Gmax), s	40.0	8.2	55.8	40.0			68.0					
Max Q Clear Time (g_c+I1), s	29.0	7.6	37.2	42.0			15.4					
Green Ext Time (p_c), s	2.7	0.0	15.1	0.0			10.3					
Intersection Summary												
HCM 6th Ctrl Delay	30.1											
HCM 6th LOS	C											

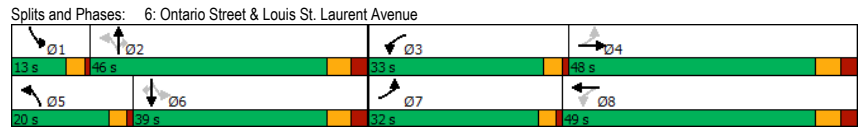
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	382	613	374	464	539	60	202	863	187	46	1166	180
Future Volume (vph)	382	613	374	464	539	60	202	863	187	46	1166	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	1.00				1.00				0.98	1.00		
Frt		0.943			0.985				0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3305	0	1736	3407	0	1641	4848	1538	1703	4848	1524
Fit Permitted	0.359			0.090			0.109			0.271		
Satd. Flow (perm)	661	3305	0	164	3407	0	188	4848	1514	485	4848	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		94			9				153			125
Link Speed (k/h)		60			60			60				60
Link Distance (m)		193.1			250.0			253.7				194.1
Travel Time (s)		11.6			15.0			15.2				11.6
Confl. Peds. (#/hr)	3				3			2		2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	4%	4%	6%	10%	7%	5%	6%	7%	6%
Adj. Flow (vph)	382	613	374	464	539	60	202	863	187	46	1166	180
Shared Lane Traffic (%)												
Lane Group Flow (vph)	382	987	0	464	599	0	202	863	187	46	1166	180
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1		6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	32.0	48.0		33.0	49.0		20.0	46.0	46.0	13.0	39.0	39.0
Total Split (%)	22.9%	34.3%		23.6%	35.0%		14.3%	32.9%	32.9%	9.3%	27.9%	27.9%
Maximum Green (s)	28.0	41.0		29.0	42.0		16.0	39.0	39.0	9.0	32.0	32.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	65.8	40.3		75.4	46.7		54.5	41.9	41.9	42.6	32.0	32.0
Actuated g/C Ratio	0.47	0.29		0.54	0.34		0.39	0.30	0.30	0.31	0.23	0.23
v/c Ratio	0.78	0.96		1.11	0.52		0.86	0.59	0.33	0.21	1.04	0.40

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	30.8	64.2		117.3	39.3		65.9	44.0	11.1	29.7	90.2	18.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	64.2		117.3	39.3		65.9	44.0	11.1	29.7	90.2	18.1
LOS	C	E		F	D		E	D	B	C	F	B
Approach Delay	54.9			73.3			42.6			78.8		
Approach LOS	D			E			D			E		
Queue Length 50th (m)	61.8	137.6		~137.8	72.7		41.9	80.1	7.3	8.3	~135.5	12.9
Queue Length 95th (m)	86.5	#182.6		#211.1	97.4		#86.4	97.1	27.8	17.3	#166.5	35.8
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0			20.0			50.0			50.0		
Base Capacity (vph)	559	1042		417	1152		241	1463	564	232	1118	447
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.95		1.11	0.52		0.84	0.59	0.33	0.20	1.04	0.40

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	138.8
Natural Cycle:	100
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.11
Intersection Signal Delay:	62.3
Intersection Capacity Utilization:	106.7%
Analysis Period (min):	15
ICU Level of Service G	Intersection LOS: E
ICU Level of Service G	ICU Level of Service G
- 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.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	382	613	374	464	539	60	202	863	187	46	1166	180
Future Volume (veh/h)	382	613	374	464	539	60	202	863	187	46	1166	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1811	1752	1796	1826	1811	1796	1811
Adj Flow Rate, veh/h	382	613	374	464	539	60	202	863	187	46	1166	180
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	4	4	6	10	7	5	6	7	6
Cap, veh/h	513	622	379	422	1069	119	227	1500	472	186	1133	354
Arrive On Green	0.17	0.30	0.30	0.21	0.34	0.34	0.10	0.31	0.31	0.03	0.23	0.23
Sat Flow, veh/h	1767	2101	1282	1753	3173	352	1668	4904	1544	1725	4904	1531
Grip Volume(v), veh/h	382	514	473	464	296	303	202	863	187	46	1166	180
Grip Sat Flow(s), veh/h/ln	1767	1763	1620	1753	1749	1776	1668	1635	1544	1725	1635	1531
Q Serve(g_s), s	20.5	40.2	40.2	29.0	18.7	18.9	12.4	20.5	13.2	2.8	32.0	14.2
Cycle Q Clear(g_c), s	20.5	40.2	40.2	29.0	18.7	18.9	12.4	20.5	13.2	2.8	32.0	14.2
Prop In Lane	1.00		0.79	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	513	522	480	422	589	599	227	1500	472	186	1133	354
V/C Ratio(X)	0.75	0.99	0.99	1.10	0.50	0.51	0.89	0.58	0.40	0.25	1.03	0.51
Avail Cap(c_a), veh/h	572	522	480	422	589	599	245	1500	472	246	1133	354
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	48.5	48.5	44.1	36.6	36.7	37.4	40.5	38.0	39.3	53.3	46.4
Incr Delay (d2), s/veh	4.7	35.6	37.2	73.1	0.7	0.7	29.4	1.6	2.5	0.7	34.5	5.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	6.5	18.6	17.3	15.3	6.1	6.3	5.6	6.5	4.2	1.0	13.9	4.8
Unsig. Movement Delay, s/veh												
LnGrip Delay(d), s/veh	31.3	84.0	85.7	117.3	37.3	37.4	66.8	42.1	40.4	40.0	87.7	51.6
LnGrip LOS	C	F	F	F	D	D	E	D	D	D	F	D
Approach Vol, veh/h	1369			1063			1252			1392		
Approach Delay, s/veh	69.9			72.2			45.9			81.5		
Approach LOS	E			E			D			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	49.4	33.0	48.0	18.5	39.0	27.3	53.7				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	9.0	39.0	29.0	41.0	16.0	32.0	28.0	42.0				
Max Q Clear Time (g_c+I1), s	4.8	22.5	31.0	42.2	14.4	34.0	22.5	20.9				
Green Ext Time (p_c), s	0.0	7.0	0.0	0.0	0.1	0.0	0.8	4.2				

Intersection Summary	
HCM 6th Ctrl Delay	67.6
HCM 6th LOS	E

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	105	297	65	128	330	131	96	1026	104	189	1183	152
Future Volume (vph)	105	297	65	128	330	131	96	1026	104	189	1183	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00		1.00		1.00		1.00		1.00
Frt		0.973			0.957			0.986			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1827	0	1787	1800	0	1787	3419	0	1787	3443	0
Flt Permitted	0.248			0.386			0.149			0.113		
Satd. Flow (perm)	466	1827	0	723	1800	0	280	3419	0	213	3443	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			25			12			18	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	3		7	7		3	2		8	8		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	0%	1%	0%	2%	1%	4%	1%	1%	3%	1%
Adj. Flow (vph)	105	297	65	128	330	131	96	1026	104	189	1183	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	362	0	128	461	0	96	1130	0	189	1335	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		4.5	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		9.0	21.0	
Total Split (s)	50.0	50.0		50.0	50.0		41.0	41.0		9.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		41.0%	41.0%		9.0%	50.0%	
Maximum Green (s)	43.0	43.0		43.0	43.0		35.0	35.0		4.5	44.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	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		4.5	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	25.4	25.4		25.4	25.4		35.3	35.3		45.8	44.3	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.43	0.43		0.55	0.54	
v/c Ratio	0.74	0.64		0.58	0.81		0.81	0.77		0.93	0.72	

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

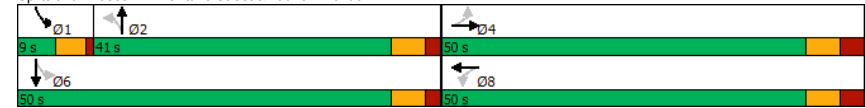
(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	55.5	28.7		34.8	36.7		73.2	26.1		65.8	18.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.5	28.7		34.8	36.7		73.2	26.1		65.8	18.6	
LOS	E	C		C	D		E	C		E	B	
Approach Delay		34.7			36.3			29.8			24.4	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	15.4	49.0		17.6	65.9		13.3	79.6		14.2	79.8	
Queue Length 95th (m)	#38.6	75.6		35.6	100.3		#49.5	#143.3		#59.1	140.5	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	243	963		378	953		119	1463		204	1852	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.43	0.38		0.34	0.48		0.81	0.77		0.93	0.72	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 82.8
 Natural Cycle: 65
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 29.3
 Intersection Capacity Utilization 105.5%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	105	297	65	128	330	131	96	1026	104	189	1183	152
Future Volume (veh/h)	105	297	65	128	330	131	96	1026	104	189	1183	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1900	1885	1900	1870	1885	1841	1885	1885	1856	1885
Adj Flow Rate, veh/h	105	297	65	128	330	131	96	1026	104	189	1183	152
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	0	1	0	2	1	4	1	1	3	1
Cap, veh/h	226	557	122	301	480	191	150	1235	125	217	1522	195
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.39	0.39	0.39	0.05	0.48	0.48
Sat Flow, veh/h	937	1497	328	1026	1292	513	413	3203	324	1795	3140	402
Grp Volume(v), veh/h	105	0	362	128	0	461	96	560	570	189	662	673
Grp Sat Flow(s),veh/h/ln	937	0	1824	1026	0	1804	413	1749	1778	1795	1763	1779
Q Serve(g_s), s	9.7	0.0	14.1	10.1	0.0	19.6	15.6	26.3	26.3	4.5	28.1	28.4
Cycle Q Clear(g_c), s	29.2	0.0	14.1	24.3	0.0	19.6	35.0	26.3	26.3	4.5	28.1	28.4
Prop In Lane	1.00		0.18	1.00		0.28	1.00		0.18	1.00		0.23
Lane Grp Cap(c), veh/h	226	0	678	301	0	671	150	674	686	217	855	863
V/C Ratio(X)	0.46	0.00	0.53	0.42	0.00	0.69	0.64	0.83	0.83	0.87	0.78	0.78
Avail Cap(c_a), veh/h	321	0	864	406	0	855	150	674	686	217	855	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	0.0	22.3	31.8	0.0	24.0	39.6	25.2	25.2	25.8	19.3	19.4
Incr Delay (d2), s/veh	1.5	0.0	0.7	1.0	0.0	1.6	19.0	11.4	11.2	30.0	6.8	6.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	3.4	1.7	0.0	4.8	2.3	7.8	7.9	3.0	7.0	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.9	0.0	23.0	32.8	0.0	25.7	58.6	36.6	36.4	55.8	26.1	26.3
LnGrp LOS	D	A	C	C	A	C	E	D	D	E	C	C
Approach Vol, veh/h	467			589			1226			1524		
Approach Delay, s/veh	26.3			27.2			38.2			29.8		
Approach LOS	C			C			D			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.0	41.0	40.7		50.0		40.7					
Change Period (Y+Rc), s	4.5	6.0	7.0		6.0		7.0					
Max Green Setting (Gmax), s	4.5	35.0	43.0		44.0		43.0					
Max Q Clear Time (g_c+I1), s	6.5	37.0	31.2		30.4		26.3					
Green Ext Time (p_c), s	0.0	0.0	2.5		8.5		3.9					

Intersection Summary		
HCM 6th Ctrl Delay	31.7	
HCM 6th LOS	C	

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔↔↔	↔↔	
Traffic Volume (vph)	0	0	0	1441	1544	0
Future Volume (vph)	0	0	0	1441	1544	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Ped Bike Factor						
Fit Protected						
Satd. Flow (prot)	0	1900	0	4988	3505	0
Fit Permitted						
Satd. Flow (perm)	0	1900	0	4988	3505	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	63.0			90.2	135.8	
Travel Time (s)	3.8			5.4	9.8	
Confl. Peds. (#/hr)	2		2			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	4%	3%	0%
Adj. Flow (vph)	0	0	0	1441	1544	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1441	1544	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.0%
Analysis Period (min)	15
	ICU Level of Service A

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖	↖	↗	
Traffic Vol, veh/h	0	0	0	1441	1544	0
Future Vol, veh/h	0	0	0	1441	1544	0
Conflicting Peds, #/hr	2	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	0	0	1441	1544	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	774	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	346	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	345	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

	↖	→	↗	↖	↖	↗	↖	↖	↗	↖	↖	↗	↖	↖	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖			
Traffic Volume (vph)	285	1209	170	245	1540	170	281	940	321	298	903	342			
Future Volume (vph)	285	1209	170	245	1540	170	281	940	321	298	903	342			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0			
Storage Lanes	1		1	1		1	1		1	1		0			
Taper Length (m)	10.0			85.0			100.0			7.5					
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91			
Ped Bike Factor			0.99	1.00			1.00					1.00			
Frt			0.850			0.850			0.850			0.959			
Fit Protected	0.950			0.950			0.950			0.950					
Satd. Flow (prot)	1805	5085	1509	1752	5036	1417	1752	5187	1553	1641	4607	0			
Fit Permitted	0.102			0.103			0.129			0.133					
Satd. Flow (perm)	194	5085	1487	190	5036	1417	238	5187	1553	230	4607	0			
Right Turn on Red			Yes			Yes			Yes			Yes			
Satd. Flow (RTOR)			136			136			247			82			
Link Speed (k/h)		60			60			60				50			
Link Distance (m)		117.7			375.6			511.5				90.2			
Travel Time (s)		7.1			22.5			30.7				6.5			
Confl. Peds. (#/hr)			3	3			3					3			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Heavy Vehicles (%)	0%	2%	7%	3%	3%	14%	3%	0%	4%	10%	7%	9%			
Adj. Flow (vph)	285	1209	170	245	1540	170	281	940	321	298	903	342			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	285	1209	170	245	1540	170	281	940	321	298	1245	0			
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA				
Protected Phases	7	4		3	8		5	2		1	6				
Permitted Phases	4		4	8		8	2		2	6					
Detector Phase	7	4	4	3	8	8	5	2	2	1	6				
Switch Phase															
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0				
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7				
Total Split (s)	17.0	45.0	45.0	18.0	46.0	46.0	14.0	37.0	37.0	20.0	43.0				
Total Split (%)	14.2%	37.5%	37.5%	15.0%	38.3%	38.3%	11.7%	30.8%	30.8%	16.7%	35.8%				
Maximum Green (s)	13.0	39.0	39.0	14.0	40.0	40.0	10.0	31.0	31.0	16.0	37.0				
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0				
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max				
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0				
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0				
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0				
Act Effct Green (s)	54.1	39.1	39.1	55.9	40.0	40.0	43.0	31.0	31.0	53.0	37.0				
Actuated g/C Ratio	0.45	0.33	0.33	0.47	0.33	0.33	0.36	0.26	0.26	0.44	0.31				
v/c Ratio	1.09	0.73	0.30	0.91	0.92	0.30	1.33	0.70	0.55	1.03	0.84				

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

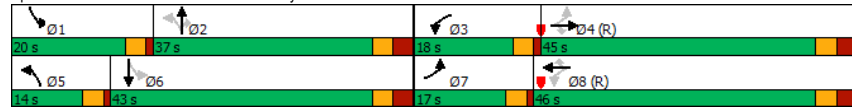
(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	95.6	36.4	16.9	66.2	48.2	9.2	205.1	43.6	13.5	91.7	42.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	95.6	36.4	16.9	66.2	48.2	9.2	205.1	43.6	13.5	91.7	42.5	
LOS	F	D	B	E	D	A	F	D	B	F	D	
Approach Delay	44.6			47.1			66.8			52.0		
Approach LOS	D			D			E			D		
Queue Length 50th (m)	~62.8	102.6	20.0	42.7	133.6	5.7	~73.6	77.5	14.3	~60.2	99.4	
Queue Length 95th (m)	m#112.6	m120.0	m36.5	#92.0	#159.0	22.3	#130.2	93.6	43.3	#118.4	119.0	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	261	1656	576	270	1678	563	211	1339	584	289	1477	
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	1.09	0.73	0.30	0.91	0.92	0.30	1.33	0.70	0.55	1.03	0.84	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.33
 Intersection Signal Delay: 52.1 Intersection LOS: D
 Intersection Capacity Utilization 111.1% ICU Level of Service H
 Analysis Period (min) 15
 ~ 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.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	285	1209	170	245	1540	170	281	940	321	298	903	342
Future Volume (veh/h)	285	1209	170	245	1540	170	281	940	321	298	903	342
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1870	1796	1856	1856	1693	1856	1900	1841	1752	1796	1767
Adj Flow Rate, veh/h	285	1209	170	245	1540	170	281	940	321	298	903	342
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	7	3	3	14	3	0	4	10	7	9
Cap, veh/h	268	1706	507	300	1689	477	237	1340	402	321	1079	408
Arrive On Green	0.11	0.33	0.33	0.11	0.33	0.33	0.08	0.26	0.26	0.13	0.31	0.31
Sat Flow, veh/h	1810	5106	1518	1767	5066	1430	1767	5187	1554	1668	3501	1322
Grp Volume(v), veh/h	285	1209	170	245	1540	170	281	940	321	298	843	402
Grp Sat Flow(s), veh/h/ln	1810	1702	1518	1767	1689	1430	1767	1729	1554	1668	1635	1554
Q Serve(g_s), s	13.0	24.8	10.1	10.8	34.9	10.8	10.0	19.7	23.2	15.4	28.8	29.0
Cycle Q Clear(g_c), s	13.0	24.8	10.1	10.8	34.9	10.8	10.0	19.7	23.2	15.4	28.8	29.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.85
Lane Grp Cap(c), veh/h	268	1706	507	300	1689	477	237	1340	402	321	1008	479
V/C Ratio(X)	1.06	0.71	0.34	0.82	0.91	0.36	1.19	0.70	0.80	0.93	0.84	0.84
Avail Cap(c_a), veh/h	268	1706	507	316	1689	477	237	1340	402	321	1008	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	34.9	30.0	26.9	38.3	30.3	37.1	40.3	41.6	29.4	38.7	38.7
Incr Delay (d2), s/veh	72.4	2.5	1.8	14.7	9.0	2.1	118.0	3.1	15.3	32.1	8.2	16.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	8.5	7.6	2.8	4.1	11.4	2.9	11.4	6.5	8.2	7.1	9.7	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	106.0	37.4	31.7	41.6	47.3	32.3	155.1	43.4	56.9	61.5	46.9	54.7
LnGrp LOS	F	D	C	D	D	C	F	D	E	E	D	D
Approach Vol, veh/h	1664			1955			1542			1543		
Approach Delay, s/veh	48.6			45.3			66.6			51.8		
Approach LOS	D			D			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.0	37.0	16.9	46.1	14.0	43.0	17.0	46.0				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	16.0	31.0	14.0	39.0	10.0	37.0	13.0	40.0				
Max Q Clear Time (g_c+I1), s	17.4	25.2	12.8	26.8	12.0	31.0	15.0	36.9				
Green Ext Time (p_c), s	0.0	3.9	0.1	7.6	0.0	4.2	0.0	2.6				

Intersection Summary

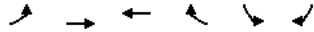
HCM 6th Ctrl Delay 52.5
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕	↕↕↕	↕↕↕		↕	
Traffic Volume (vph)	0	1640	2107	0	0	0
Future Volume (vph)	0	1640	2107	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor						
Flt Protected						
Satd. Flow (prot)	1900	5085	5136	0	1900	0
Flt Permitted						
Satd. Flow (perm)	1900	5085	5136	0	1900	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%
Adj. Flow (vph)	0	1640	2107	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1640	2107	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕	↕↕↕	↕↕↕		↕	
Traffic Vol, veh/h	0	1640	2107	0	0	0
Future Vol, veh/h	0	1640	2107	0	0	0
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	1	0	0	0
Mvmt Flow	0	1640	2107	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2109	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	5.3	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	3.1	-	-
Pot Cap-1 Maneuver	113	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	113	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	113	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	1289	163	412	1597	138	192	167	282	131	315	107
Future Volume (vph)	90	1289	163	412	1597	138	192	167	282	131	315	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.94	1.00			1.00	0.99		1.00	0.99	
Frt			0.850		0.988			0.906			0.962	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	5085	1615	1787	5074	0	1805	1677	0	1770	1804	0
Fit Permitted	0.125			0.114			0.256			0.222		
Satd. Flow (perm)	224	5085	1515	213	5074	0	485	1677	0	412	1804	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94		20			74			15	
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		171.2			370.5			215.4			213.5	
Travel Time (s)		10.3			22.2			12.9			12.8	
Conf. Peds. (#/hr)			27	27			9		9	9		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	2%	0%	1%	1%	1%	0%	0%	2%	2%	1%	0%
Adj. Flow (vph)	90	1289	163	412	1597	138	192	167	282	131	315	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	1289	163	412	1735	0	192	449	0	131	422	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	55.0	55.0	55.0	21.0	76.0		44.0	44.0		44.0	44.0	
Total Split (%)	45.8%	45.8%	45.8%	17.5%	63.3%		36.7%	36.7%		36.7%	36.7%	
Maximum Green (s)	49.0	49.0	49.0	17.0	70.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0	31.0	31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effect Green (s)	49.0	49.0	49.0	72.0	70.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.41	0.41	0.41	0.60	0.58		0.32	0.32		0.32	0.32	
v/c Ratio	0.99	0.62	0.24	1.18	0.58		1.25	0.77		1.01	0.73	

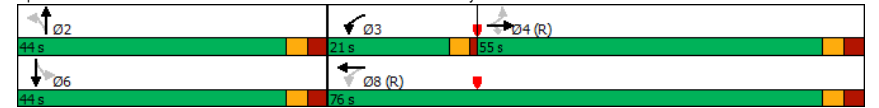
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	130.3	29.8	11.1	123.7	7.2		193.1	41.1		123.6	43.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	130.3	29.8	11.1	123.7	7.2		193.1	41.1		123.6	43.5	
LOS	F	C	B	F	A		F	D		F	D	
Approach Delay		33.7			29.6			86.6			62.5	
Approach LOS		C			C			F			E	
Queue Length 50th (m)	21.7	91.4	10.5	-92.1	27.0		-59.4	85.2		-32.7	89.5	
Queue Length 95th (m)	#57.9	107.4	25.5	#106.5	m29.4		#107.4	127.6		#75.2	128.4	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	91	2076	674	350	2968		153	581		130	581	
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	0.99	0.62	0.24	1.18	0.58		1.25	0.77		1.01	0.73	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.25
Intersection Signal Delay:	42.1
Intersection LOS:	D
Intersection Capacity Utilization:	111.0%
ICU Level of Service:	H
Analysis Period (min):	15
~	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.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	90	1289	163	412	1597	138	192	167	282	131	315	107
Future Volume (veh/h)	90	1289	163	412	1597	138	192	167	282	131	315	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1870	1900	1885	1885	1885	1900	1900	1870	1870	1885	1900
Adj Flow Rate, veh/h	90	1289	163	412	1597	138	192	167	282	131	315	107
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	2	0	1	1	1	0	0	2	2	1	0
Cap, veh/h	161	2085	636	391	2808	242	165	200	338	127	425	144
Arrive On Green	0.41	0.41	0.41	0.14	0.58	0.58	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	269	5106	1557	1795	4814	416	978	631	1066	940	1342	456
Grp Volume(v), veh/h	90	1289	163	412	1138	597	192	0	449	131	0	422
Grp Sat Flow(s),veh/h/ln	269	1702	1557	1795	1716	1799	978	0	1697	940	0	1798
Q Serve(g_s), s	37.6	24.0	8.3	17.0	24.8	24.9	12.9	0.0	29.5	8.5	0.0	25.1
Cycle Q Clear(g_c), s	41.5	24.0	8.3	17.0	24.8	24.9	38.0	0.0	29.5	38.0	0.0	25.1
Prop In Lane	1.00		1.00	1.00		0.23	1.00		0.63	1.00		0.25
Lane Grp Cap(c), veh/h	161	2085	636	391	2001	1049	165	0	537	127	0	570
V/C Ratio(X)	0.56	0.62	0.26	1.05	0.57	0.57	1.16	0.00	0.84	1.03	0.00	0.74
Avail Cap(c_a), veh/h	161	2085	636	391	2001	1049	165	0	537	127	0	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.1	28.1	23.5	27.9	15.6	15.6	55.9	0.0	38.1	57.8	0.0	36.6
Incr Delay (d2), s/veh	13.2	1.4	1.0	60.1	1.2	2.2	121.3	0.0	14.3	89.5	0.0	8.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	6.7	2.2	9.4	4.8	5.3	9.6	0.0	10.8	6.3	0.0	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.3	29.5	24.4	88.0	16.8	17.8	177.2	0.0	52.3	147.2	0.0	45.0
LnGrp LOS	D	C	C	F	B	B	F	A	D	F	A	D
Approach Vol, veh/h	1542			2147			641			553		
Approach Delay, s/veh	30.0			30.7			89.8			69.2		
Approach LOS	C			C			F			E		
Timer - Assigned Phs	2		3		4		6		8			
Phs Duration (G+Y+Rc), s	44.0	21.0	55.0		44.0		76.0					
Change Period (Y+Rc), s	6.0	4.0	6.0		6.0		6.0					
Max Green Setting (Gmax), s	38.0	17.0	49.0		38.0		70.0					
Max Q Clear Time (g_c+I1), s	40.0	19.0	43.5		40.0		26.9					
Green Ext Time (p_c), s	0.0	0.0	4.6		0.0		21.9					
Intersection Summary												
HCM 6th Ctrl Delay	42.6											
HCM 6th LOS	D											

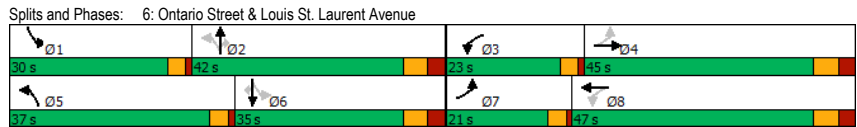
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	247	412	145	230	623	72	610	1208	368	100	837	338
Future Volume (vph)	247	412	145	230	623	72	610	1208	368	100	837	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0		100.0				90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor									0.99	1.00		
Frt	0.961				0.984				0.850		0.850	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3426	0	1787	3521	0	1787	4988	1615	1805	4988	1599
Fit Permitted	0.155			0.269			0.143			0.221		
Satd. Flow (perm)	289	3426	0	506	3521	0	269	4988	1593	420	4988	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35			9				207			257
Link Speed (k/h)		60			60			60				60
Link Distance (m)	193.1				250.0				253.7		194.1	
Travel Time (s)	11.6				15.0				15.2		11.6	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	2%	1%	1%	0%	1%	4%	0%	0%	4%	1%
Adj. Flow (vph)	247	412	145	230	623	72	610	1208	368	100	837	338
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	557	0	230	695	0	610	1208	368	100	837	338
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			2	6	
Detector Phase	7	4		3	8		5	2		2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	21.0	45.0		23.0	47.0		37.0	42.0	42.0	30.0	35.0	35.0
Total Split (%)	15.0%	32.1%		16.4%	33.6%		26.4%	30.0%	30.0%	21.4%	25.0%	25.0%
Maximum Green (s)	17.0	38.0		19.0	40.0		33.0	35.0	35.0	26.0	28.0	28.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	50.0	30.8		49.7	30.7		68.2	51.8	51.8	40.5	28.1	28.1
Actuated g/C Ratio	0.38	0.24		0.38	0.24		0.52	0.40	0.40	0.31	0.22	0.22
v/c Ratio	0.84	0.66		0.66	0.83		1.16	0.61	0.49	0.43	0.78	0.62

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	54.1	46.3		34.7	55.9		124.2	34.1	15.8	26.9	54.7	17.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	46.3		34.7	55.9		124.2	34.1	15.8	26.9	54.7	17.9
LOS	D	D		C	E		F	C	B	C	D	B
Approach Delay	48.7			50.6			56.1			42.7		
Approach LOS	D			D			E			D		
Queue Length 50th (m)	44.7	68.0		41.1	93.8		~177.7	95.4	30.6	13.5	79.6	18.5
Queue Length 95th (m)	#88.9	89.8		60.9	116.9		#275.8	128.9	69.0	26.6	103.5	55.6
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0		20.0		50.0		50.0		50.0			
Base Capacity (vph)	306	1028		391	1091		527	1985	758	462	1076	546
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.54		0.59	0.64		1.16	0.61	0.49	0.22	0.78	0.62

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	130.1
Natural Cycle:	100
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.16
Intersection Signal Delay:	50.7
Intersection Capacity Utilization:	102.0%
Analysis Period (min):	15
ICU Level of Service G	Intersection LOS: D
ICU Level of Service G	ICU Level of Service G
- 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.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	247	412	145	230	623	72	610	1208	368	100	837	338
Future Volume (veh/h)	247	412	145	230	623	72	610	1208	368	100	837	338
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1885	1870	1885	1885	1900	1885	1841	1900	1900	1841	1885
Adj Flow Rate, veh/h	247	412	145	230	623	72	610	1208	368	100	837	338
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	1	2	1	1	0	1	4	0	0	4	1
Cap, veh/h	308	622	217	342	751	87	548	2094	671	234	1096	348
Arrive On Green	0.12	0.24	0.24	0.11	0.23	0.23	0.26	0.42	0.42	0.06	0.22	0.22
Sat Flow, veh/h	1781	2606	907	1795	3236	373	1795	5025	1609	1810	5025	1595
Grp Volume(v), veh/h	247	282	275	230	344	351	610	1208	368	100	837	338
Grp Sat Flow(s), veh/h/ln	1781	1791	1722	1795	1791	1818	1795	1675	1609	1810	1675	1595
Q Serve(g_s), s	13.4	18.2	18.6	12.3	23.5	23.5	33.0	23.7	22.2	5.4	20.1	27.0
Cycle Q Clear(g_c), s	13.4	18.2	18.6	12.3	23.5	23.5	33.0	23.7	22.2	5.4	20.1	27.0
Prop In Lane	1.00		0.53	1.00		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	308	428	411	342	416	422	548	2094	671	234	1096	348
V/C Ratio(X)	0.80	0.66	0.67	0.67	0.83	0.83	1.11	0.58	0.55	0.43	0.76	0.97
Avail Cap(c_a), veh/h	329	530	510	403	558	567	548	2094	671	495	1096	348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	44.1	44.3	33.1	46.8	46.9	34.6	28.7	28.3	35.5	47.1	49.8
Incr Delay (d2), s/veh	12.6	2.1	2.4	3.5	7.6	7.6	73.6	1.2	3.2	1.2	5.1	41.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	5.2	6.4	6.3	4.2	8.9	9.0	20.9	6.7	6.4	1.9	7.0	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	46.8	46.3	46.7	36.5	54.4	54.5	108.3	29.9	31.5	36.8	52.1	91.2
LnGrp LOS	D	D	D	D	D	D	F	C	C	D	D	F
Approach Vol, veh/h	804			925			2186			1275		
Approach Delay, s/veh	46.6			50.0			52.0			61.3		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.5	60.5	18.7	37.6	37.0	35.0	19.5	36.8				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	26.0	35.0	19.0	38.0	33.0	28.0	17.0	40.0				
Max Q Clear Time (g_c+I1), s	7.4	25.7	14.3	20.6	35.0	29.0	15.4	25.5				
Green Ext Time (p_c), s	0.3	6.7	0.4	3.7	0.0	0.0	0.2	4.3				

Intersection Summary	
HCM 6th Ctrl Delay	53.1
HCM 6th LOS	D

Appendix H

2031 Background Development Growth Traffic Operations Reports



Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Background 2031 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖		↖	↖		↖	↖	
Traffic Volume (vph)	95	122	60	88	156	84	38	1573	37	61	924	59
Future Volume (vph)	95	122	60	88	156	84	38	1573	37	61	924	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99	0.99		1.00		1.00			
Fit		0.951			0.947			0.997			0.991	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1735	0	1770	1706	0	1752	3395	0	1597	3357	0
Fit Permitted	0.537			0.643			0.256			0.091		
Satd. Flow (perm)	976	1735	0	1187	1706	0	472	3395	0	153	3357	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)	31			7			3			8		
Link Speed (k/h)	60			60			60			50		
Link Distance (m)	66.2			94.7			135.8			142.5		
Travel Time (s)	4.0			5.7			8.1			10.3		
Conf. Peds. (#/hr)	7		10	10		7		7		7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	4%	2%	2%	3%	8%	3%	6%	3%	13%	7%	0%
Adj. Flow (vph)	95	122	60	88	156	84	38	1573	37	61	924	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	182	0	88	240	0	38	1610	0	61	983	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0	
Total Split (s)	50.0	50.0		50.0	50.0		50.0	50.0		50.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	43.0	43.0		43.0	43.0		44.0	44.0		44.0	44.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	15.0	15.0		15.0	15.0		44.1	44.1		44.1	44.1	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.61	0.61		0.61	0.61	
v/c Ratio	0.47	0.47		0.36	0.67		0.13	0.78		0.66	0.48	

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Background 2031 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	32.8	24.6		28.3	34.9		8.6	14.6		50.4	9.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	32.8	24.6		28.3	34.9		8.6	14.6		50.4	9.2	
LOS	C	C		C	C		A	B		D	A	
Approach Delay		27.4			33.1			14.5			11.6	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	11.9	18.8		10.8	30.6		2.0	78.3		4.9	35.3	
Queue Length 95th (m)	25.7	36.4		23.1	52.8		7.5	133.4		#29.6	60.6	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	583	1049		708	1022		288	2076		93	2055	
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	0.17		0.12	0.23		0.13	0.78		0.66	0.48	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 72.2

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 16.5

Intersection LOS: B

Intersection Capacity Utilization 91.0%

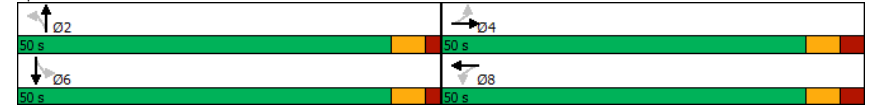
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	95	122	60	88	156	84	38	1573	37	61	924	59
Future Volume (veh/h)	95	122	60	88	156	84	38	1573	37	61	924	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1856	1781	1856	1811	1856	1707	1796	1900
Adj Flow Rate, veh/h	95	122	60	88	156	84	38	1573	37	61	924	59
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	2	2	3	8	3	6	3	13	7	0
Cap, veh/h	256	306	150	304	298	160	318	1953	46	151	1850	118
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	1115	1160	570	1193	1130	608	568	3436	81	287	3256	208
Grp Volume(v), veh/h	95	0	182	88	0	240	38	786	824	61	484	499
Grp Sat Flow(s),veh/h/ln	1115	0	1730	1193	0	1738	568	1721	1796	287	1706	1757
Q Serve(g_s), s	6.2	0.0	6.7	5.1	0.0	9.1	3.3	28.1	28.3	15.7	13.2	13.2
Cycle Q Clear(g_c), s	15.3	0.0	6.7	11.8	0.0	9.1	16.6	28.1	28.3	44.0	13.2	13.2
Prop In Lane	1.00		0.33	1.00		0.35	1.00		0.04	1.00		0.12
Lane Grp Cap(c), veh/h	256	0	456	304	0	458	318	978	1021	151	970	999
V/C Ratio(X)	0.37	0.00	0.40	0.29	0.00	0.52	0.12	0.80	0.81	0.40	0.50	0.50
Avail Cap(c_a), veh/h	581	0	961	652	0	965	318	978	1021	151	970	999
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.9	0.0	23.4	28.3	0.0	24.3	15.1	13.3	13.3	31.2	10.1	10.1
Incr Delay (d2), s/veh	0.9	0.0	0.6	0.5	0.0	0.9	0.8	7.0	6.8	7.8	1.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	1.5	0.9	0.0	2.1	0.2	2.9	3.0	1.0	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	0.0	24.0	28.8	0.0	25.3	15.8	20.3	20.2	39.1	11.9	11.9
LnGrp LOS	C	A	C	C	A	C	B	C	C	D	B	B
Approach Vol, veh/h	277			328			1648			1044		
Approach Delay, s/veh	26.7			26.2			20.1			13.5		
Approach LOS	C			C			C			B		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	50.0		27.4		50.0		27.4					
Change Period (Y+Rc), s	6.0		7.0		6.0		7.0					
Max Green Setting (Gmax), s	44.0		43.0		44.0		43.0					
Max Q Clear Time (g_c+I1), s	30.3		17.3		46.0		13.8					
Green Ext Time (p_c), s	10.1		1.8		0.0		2.2					

Intersection Summary		
HCM 6th Ctrl Delay	19.2	
HCM 6th LOS	B	

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔↔↔	↔↔	
Traffic Volume (vph)	0	0	0	1671	1084	0
Future Volume (vph)	0	0	0	1671	1084	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Fit						
Fit Protected						
Satd. Flow (prot)	0	1900	0	4893	3406	0
Fit Permitted						
Satd. Flow (perm)	0	1900	0	4893	3406	0
Link Speed (k/h)	60		60		50	
Link Distance (m)	63.0		90.2		135.8	
Travel Time (s)	3.8		5.4		9.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	0	0	1671	1084	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1671	1084	0
Sign Control	Stop		Free		Free	

Intersection Summary		
Area Type:	Other	
Control Type:	Unsignalized	
Intersection Capacity Utilization 35.6%	ICU Level of Service A	
Analysis Period (min)	15	

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕	↕↕↕	↕↕↕	↕↕	
Traffic Vol, veh/h	0	0	0	1671	1084	0
Future Vol, veh/h	0	0	0	1671	1084	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	0	0	1671	1084	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	542	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	490	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	490	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

	↕	↔	↕	↔	↕	↔	↕	↔	↕	↔	↕	↔
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕↕↕	↕	↕	↕↕↕	↕	↕	↕↕↕	↕	↕	↕↕↕	↕
Traffic Volume (vph)	246	1195	208	207	599	157	149	1228	247	112	851	109
Future Volume (vph)	246	1195	208	207	599	157	149	1228	247	112	851	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor			0.99	1.00					0.98	1.00		
Frt			0.850			0.850			0.850		0.983	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	5036	1538	1641	4940	1495	1671	4940	1524	1736	4786	0
Fit Permitted	0.380			0.149			0.125			0.143		
Satd. Flow (perm)	694	5036	1515	257	4940	1495	220	4940	1499	261	4786	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			123			157			219		18	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		117.7			375.6			511.5			90.2	
Travel Time (s)		7.1			22.5			30.7			6.5	
Confl. Peds. (#/hr)			3	3					5	5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	3%	5%	10%	5%	8%	8%	5%	6%	4%	7%	3%
Adj. Flow (vph)	246	1195	208	207	599	157	149	1228	247	112	851	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	246	1195	208	207	599	157	149	1228	247	112	960	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	32.0	51.0	51.0	22.0	41.0	41.0	13.0	38.0	38.0	9.0	34.0	
Total Split (%)	26.7%	42.5%	42.5%	18.3%	34.2%	34.2%	10.8%	31.7%	31.7%	7.5%	28.3%	
Maximum Green (s)	28.0	45.0	45.0	18.0	35.0	35.0	9.0	32.0	32.0	5.0	28.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	65.4	49.3	49.3	64.6	49.0	49.0	43.0	32.0	32.0	35.0	28.0	
Actuated g/C Ratio	0.54	0.41	0.41	0.54	0.41	0.41	0.36	0.27	0.27	0.29	0.23	
v/c Ratio	0.49	0.58	0.30	0.70	0.30	0.22	0.80	0.93	0.44	0.82	0.85	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

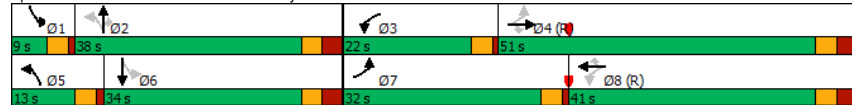
(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	9.0	24.6	13.1	29.1	24.9	4.6	58.3	56.4	9.3	71.9	51.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.0	24.6	13.1	29.1	24.9	4.6	58.3	56.4	9.3	71.9	51.5	
LOS	A	C	B	C	C	A	E	E	A	E	D	
Approach Delay	20.8			22.5			49.4			53.6		
Approach LOS	C			C			D			D		
Queue Length 50th (m)	24.5	95.0	28.0	23.7	36.0	0.0	25.8	109.1	5.2	18.9	82.3	
Queue Length 95th (m)	36.5	116.9	49.7	46.8	49.1	14.1	#55.6	#138.1	27.4	#43.0	100.0	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	642	2070	695	352	2016	703	187	1317	560	137	1130	
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	0.38	0.58	0.30	0.59	0.30	0.22	0.80	0.93	0.44	0.82	0.85	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 36.5
 Intersection Capacity Utilization 98.5%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	246	1195	208	207	599	157	149	1228	247	112	851	109
Future Volume (veh/h)	246	1195	208	207	599	157	149	1228	247	112	851	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1856	1826	1752	1826	1781	1781	1826	1811	1841	1796	1856
Adj Flow Rate, veh/h	246	1195	208	207	599	157	149	1228	247	112	851	109
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	3	5	10	5	8	8	5	6	4	7	3
Cap, veh/h	478	2206	673	303	2110	638	214	1329	407	143	1027	131
Arrive On Green	0.10	0.44	0.44	0.09	0.42	0.42	0.08	0.27	0.27	0.04	0.23	0.23
Sat Flow, veh/h	1753	5066	1544	1668	4985	1506	1697	4985	1526	1753	4400	561
Grp Volume(v), veh/h	246	1195	208	207	599	157	149	1228	247	112	631	329
Grp Sat Flow(s), veh/h/ln	1753	1689	1544	1668	1662	1506	1697	1662	1526	1753	1635	1691
Q Serve(g_s), s	9.3	20.9	10.5	8.3	9.5	8.1	7.8	28.8	17.0	5.0	22.0	22.2
Cycle Q Clear(g_c), s	9.3	20.9	10.5	8.3	9.5	8.1	7.8	28.8	17.0	5.0	22.0	22.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	478	2206	673	303	2110	638	214	1329	407	143	763	395
V/C Ratio(X)	0.51	0.54	0.31	0.68	0.28	0.25	0.70	0.92	0.61	0.79	0.83	0.83
Avail Cap(c_a), veh/h	709	2206	673	404	2110	638	214	1329	407	143	763	395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.3	25.0	22.1	20.0	22.7	22.3	33.2	42.8	38.5	40.0	43.7	43.8
Incr Delay (d2), s/veh	0.9	1.0	1.2	2.9	0.3	0.9	9.4	12.1	6.6	24.5	10.0	18.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	2.2	5.5	2.7	2.0	2.5	2.0	2.8	10.1	5.4	2.9	7.9	9.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	17.2	26.0	23.3	22.9	23.0	23.2	42.6	54.9	45.1	64.5	53.7	62.1
LnGrp LOS	B	C	C	C	C	C	D	D	D	E	D	E
Approach Vol, veh/h	1649			963			1624			1072		
Approach Delay, s/veh	24.3			23.0			52.3			57.4		
Approach LOS	C			C			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	38.0	14.7	58.3	13.0	34.0	16.2	56.8				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	5.0	32.0	18.0	45.0	9.0	28.0	28.0	35.0				
Max Q Clear Time (g_c+I1), s	7.0	30.8	10.3	22.9	9.8	24.2	11.3	11.5				
Green Ext Time (p_c), s	0.0	1.0	0.5	11.3	0.0	2.3	0.9	5.6				

Intersection Summary

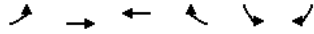
HCM 6th Ctrl Delay 39.3
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑↑↑	↑↑↑		↔	
Traffic Volume (vph)	0	1574	935	0	0	0
Future Volume (vph)	0	1574	935	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor						
Flt Protected						
Satd. Flow (prot)	1900	5085	4988	0	1429	0
Flt Permitted						
Satd. Flow (perm)	1900	5085	4988	0	1429	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	0%	33%	0%
Adj. Flow (vph)	0	1574	935	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1574	935	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑↑↑	↑↑↑		↔	
Traffic Vol, veh/h	0	1574	935	0	0	0
Future Vol, veh/h	0	1574	935	0	0	0
Conflicting Peds, #/hr	7	0	0	7	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	4	0	33	0
Mvmt Flow	0	1574	935	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	942	0	1572
Stage 1	-	-	942
Stage 2	-	-	630
Critical Hdwy	5.3	-	6.36
Critical Hdwy Stg 1	-	-	7.26
Critical Hdwy Stg 2	-	-	6.66
Follow-up Hdwy	3.1	-	4.13
Pot Cap-1 Maneuver	424	-	117
Stage 1	-	-	213
Stage 2	-	-	382
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	421	-	116
Mov Cap-2 Maneuver	-	-	116
Stage 1	-	-	212
Stage 2	-	-	380

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	421	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	123	1355	37	118	660	85	59	99	195	98	79	67
Future Volume (vph)	123	1355	37	118	660	85	59	99	195	98	79	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		1.00	0.99	0.99		1.00	0.99	
Fit			0.850		0.983		0.901			0.931		
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	5036	1568	1770	4795	0	1770	1661	0	1703	1657	0
Fit Permitted	0.357			0.119			0.646			0.441		
Satd. Flow (perm)	632	5036	1524	221	4795	0	1195	1661	0	789	1657	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)			64		31		89		38		38	
Link Speed (k/h)		60					60		60			
Link Distance (m)		171.2			370.5		215.4		213.5			
Travel Time (s)		10.3			22.2		12.9		12.8			
Conf. Peds. (#/hr)	5		5	5		5	8		3	3		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	3%	3%	2%	6%	6%	2%	2%	2%	6%	3%	9%
Adj. Flow (vph)	123	1355	37	118	660	85	59	99	195	98	79	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	1355	37	118	745	0	59	294	0	98	146	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8		2			6		6
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	61.8	61.8	61.8	12.2	74.0		46.0	46.0		46.0	46.0	
Total Split (%)	51.5%	51.5%	51.5%	10.2%	61.7%		38.3%	38.3%		38.3%	38.3%	
Maximum Green (s)	55.8	55.8	55.8	8.2	68.0		40.0	40.0		40.0	40.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)	56.1	56.1	56.1	70.0	68.0		40.0	40.0		40.0	40.0	
Actuated g/C Ratio	0.47	0.47	0.47	0.58	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.42	0.58	0.05	0.51	0.27		0.15	0.48		0.37	0.25	

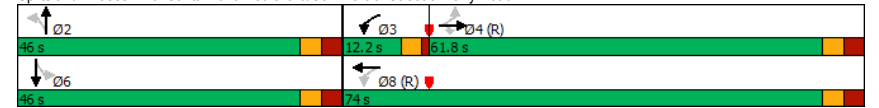
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	26.8	24.5	1.6	16.7	11.6		29.4	24.6		35.6	22.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.8	24.5	1.6	16.7	11.6		29.4	24.6		35.6	22.7	
LOS	C	C	A	B	B		C	C		D	C	
Approach Delay		24.1			12.3			25.4			27.9	
Approach LOS		C			B			C			C	
Queue Length 50th (m)	19.8	87.8	0.0	16.7	41.1		10.2	39.5		18.4	19.0	
Queue Length 95th (m)	38.1	103.0	2.5	m27.0	m52.3		20.9	66.6		35.1	36.1	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	295	2355	746	234	2730		398	613		263	577	
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	0.42	0.58	0.05	0.50	0.27		0.15	0.48		0.37	0.25	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 21.2 Intersection LOS: C
 Intersection Capacity Utilization 104.2% ICU Level of Service G
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	123	1355	37	118	660	85	59	99	195	98	79	67
Future Volume (veh/h)	123	1355	37	118	660	85	59	99	195	98	79	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1796	1856	1856	1870	1811	1811	1870	1870	1811	1856	1767	1767
Adj Flow Rate, veh/h	123	1355	37	118	660	85	59	99	195	98	79	67
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	3	2	6	6	2	2	2	6	3	9
Cap, veh/h	393	2457	759	261	2514	320	395	187	368	259	308	261
Arrive On Green	0.49	0.49	0.49	0.05	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	686	5066	1564	1781	4437	566	1236	560	1103	1048	924	784
Grp Volume(v), veh/h	123	1355	37	118	489	256	59	0	294	98	0	146
Grp Sat Flow(s),veh/h/ln	686	1689	1564	1781	1648	1706	1236	0	1662	1048	0	1708
Q Serve(g_s), s	13.5	22.6	1.5	3.8	9.0	9.2	4.4	0.0	17.2	10.0	0.0	7.5
Cycle Q Clear(g_c), s	13.5	22.6	1.5	3.8	9.0	9.2	11.9	0.0	17.2	27.2	0.0	7.5
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.66	1.00		0.46
Lane Grp Cap(c), veh/h	393	2457	759	261	1868	967	395	0	554	259	0	569
V/C Ratio(X)	0.31	0.55	0.05	0.45	0.26	0.27	0.15	0.00	0.53	0.38	0.00	0.26
Avail Cap(c_a), veh/h	393	2457	759	297	1868	967	395	0	554	259	0	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	21.7	16.3	16.6	13.2	13.3	33.5	0.0	32.4	43.4	0.0	29.2
Incr Delay (d2), s/veh	2.1	0.9	0.1	1.2	0.3	0.7	0.8	0.0	3.6	4.2	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	5.5	0.3	0.9	1.8	1.9	1.1	0.0	5.4	2.3	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	22.6	16.4	17.8	13.6	13.9	34.3	0.0	36.0	47.6	0.0	30.2
LnGrp LOS	C	C	B	B	B	B	C	A	D	D	A	C
Approach Vol, veh/h	1515			863			353			244		
Approach Delay, s/veh	22.4			14.3			35.7			37.2		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	2		3		4		6		8			
Phs Duration (G+Y+Rc), s	46.0		9.8		64.2		46.0		74.0			
Change Period (Y+Rc), s	6.0		4.0		6.0		6.0		6.0			
Max Green Setting (Gmax), s	40.0		8.2		55.8		40.0		68.0			
Max Q Clear Time (g_c+I1), s	19.2		5.8		24.6		29.2		11.2			
Green Ext Time (p_c), s	2.4		0.1		16.0		1.1		6.8			
Intersection Summary												
HCM 6th Ctrl Delay	22.8											
HCM 6th LOS	C											

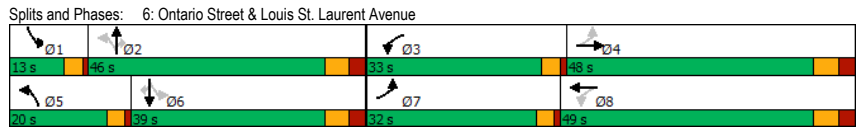
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	408	697	335	413	713	311	238	907	230	140	956	172
Future Volume (vph)	408	697	335	413	713	311	238	907	230	140	956	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor					0.99				0.98			1.00
Frt		0.951			0.954				0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3333	0	1736	3275	0	1641	4848	1538	1703	4848	1524
Fit Permitted	0.098			0.095			0.111			0.218		
Satd. Flow (perm)	181	3333	0	174	3275	0	192	4848	1514	390	4848	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			50				179			125
Link Speed (k/h)		60			60				60			60
Link Distance (m)		193.1			250.0				253.7			194.1
Travel Time (s)		11.6			15.0				15.2			11.6
Confl. Peds. (#/hr)	3					3			2		2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	4%	4%	6%	10%	7%	5%	6%	7%	6%
Adj. Flow (vph)	408	697	335	413	713	311	238	907	230	140	956	172
Shared Lane Traffic (%)												
Lane Group Flow (vph)	408	1032	0	413	1024	0	238	907	230	140	956	172
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	32.0	48.0		33.0	49.0		20.0	46.0	46.0	13.0	39.0	39.0
Total Split (%)	22.9%	34.3%		23.6%	35.0%		14.3%	32.9%	32.9%	9.3%	27.9%	27.9%
Maximum Green (s)	28.0	41.0		29.0	42.0		16.0	39.0	39.0	9.0	32.0	32.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	72.0	41.0		74.0	42.0		55.0	39.0	39.0	44.0	32.0	32.0
Actuated g/C Ratio	0.51	0.29		0.53	0.30		0.39	0.28	0.28	0.31	0.23	0.23
v/c Ratio	1.00	1.01		1.00	1.01		0.99	0.67	0.42	0.68	0.86	0.39

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	86.9	77.8		84.5	76.0		92.2	47.8	12.8	47.8	61.0	16.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.9	77.8		84.5	76.0		92.2	47.8	12.8	47.8	61.0	16.8
LOS	F	E		F	E		F	D	B	D	E	B
Approach Delay		80.4			78.4			49.6			53.5	
Approach LOS		F			E			D			D	
Queue Length 50th (m)	~102.5	~156.2		103.7	~153.6		53.5	86.2	11.2	26.8	98.8	11.0
Queue Length 95th (m)	#173.4	#204.2		#175.4	#202.8		#110.8	102.6	35.1	#45.9	117.2	32.8
Internal Link Dist (m)		169.1			226.0			229.7			170.1	
Turn Bay Length (m)	45.0			20.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	407	1017		415	1017		241	1350	550	206	1108	444
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.00	1.01		1.00	1.01		0.99	0.67	0.42	0.68	0.86	0.39

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Natural Cycle: 110	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 66.0	Intersection LOS: E
Intersection Capacity Utilization 102.9%	ICU Level of Service G
Analysis Period (min) 15	
- 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.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	408	697	335	413	713	311	238	907	230	140	956	172
Future Volume (veh/h)	408	697	335	413	713	311	238	907	230	140	956	172
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1811	1752	1796	1826	1811	1796	1811
Adj Flow Rate, veh/h	408	697	335	413	713	311	238	907	230	140	956	172
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	4	4	6	10	7	5	6	7	6
Cap, veh/h	405	675	325	415	710	310	262	1366	430	217	1121	350
Arrive On Green	0.20	0.29	0.29	0.21	0.30	0.30	0.11	0.28	0.28	0.06	0.23	0.23
Sat Flow, veh/h	1767	2307	1108	1753	2367	1032	1668	4904	1544	1725	4904	1531
Grp Volume(v), veh/h	408	533	499	413	527	497	238	907	230	140	956	172
Grp Sat Flow(s), veh/h/ln	1767	1763	1652	1753	1749	1651	1668	1635	1544	1725	1635	1531
Q Serve(g_s), s	28.0	41.0	41.0	28.8	42.0	42.0	15.0	22.9	17.7	8.7	26.2	13.7
Cycle Q Clear(g_c), s	28.0	41.0	41.0	28.8	42.0	42.0	15.0	22.9	17.7	8.7	26.2	13.7
Prop In Lane	1.00		0.67	1.00		0.63	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	405	516	484	415	525	495	262	1366	430	217	1121	350
V/C Ratio(X)	1.01	1.03	1.03	1.00	1.00	1.00	0.91	0.66	0.53	0.64	0.85	0.49
Avail Cap(c_a), veh/h	405	516	484	415	525	495	262	1366	430	217	1121	350
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	49.5	49.5	44.9	49.0	49.0	37.6	44.7	42.8	39.4	51.7	46.9
Incr Delay (d2), s/veh	46.7	48.0	49.4	43.1	40.2	41.5	32.9	2.6	4.7	6.4	8.3	4.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	11.9	20.7	19.6	11.7	19.8	18.9	6.9	7.5	5.8	3.3	9.3	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	91.9	97.5	98.9	88.1	89.2	90.5	70.5	47.3	47.5	45.7	60.0	51.8
LnGrp LOS	F	F	F	F	F	F	E	D	D	D	E	D
Approach Vol, veh/h		1440			1437			1375			1268	
Approach Delay, s/veh		96.4			89.3			51.3			57.3	
Approach LOS		F			F			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	46.0	33.0	48.0	20.0	39.0	32.0	49.0				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	9.0	29.0	29.0	41.0	16.0	32.0	28.0	42.0				
Max Q Clear Time (g_c+I1), s	10.7	24.9	30.8	43.0	17.0	28.2	30.0	44.0				
Green Ext Time (p_c), s	0.0	6.9	0.0	0.0	0.0	2.5	0.0	0.0				

Intersection Summary	
HCM 6th Ctrl Delay	74.4
HCM 6th LOS	E

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	89	234	51	101	260	110	76	1311	82	152	1655	123
Future Volume (vph)	89	234	51	101	260	110	76	1311	82	152	1655	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		0.99	1.00			1.00			1.00	
Frt		0.973			0.955			0.991			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1827	0	1787	1796	0	1787	3438	0	1787	3469	0
Flt Permitted	0.330			0.475			0.114			0.101		
Satd. Flow (perm)	620	1827	0	889	1796	0	214	3438	0	190	3469	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			27			7			10	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	3		7	7		3	2		8	8		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	0%	1%	0%	2%	1%	4%	1%	1%	3%	1%
Adj. Flow (vph)	89	234	51	101	260	110	76	1311	82	152	1655	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	285	0	101	370	0	76	1393	0	152	1778	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		4.5	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		9.0	21.0	
Total Split (s)	50.0	50.0		50.0	50.0		41.0	41.0		9.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		41.0%	41.0%		9.0%	50.0%	
Maximum Green (s)	43.0	43.0		43.0	43.0		35.0	35.0		4.5	44.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	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		4.5	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	20.0	20.0		20.0	20.0		35.2	35.2		45.7	44.2	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.46	0.46		0.59	0.57	
v/c Ratio	0.56	0.60		0.44	0.76		0.78	0.89		0.74	0.89	

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	38.4	29.7		29.8	35.1		74.7	29.3		34.5	23.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	38.4	29.7		29.8	35.1		74.7	29.3		34.5	23.5	
LOS	D	C		C	D		E	C		C	C	
Approach Delay		31.8			34.0			31.7			24.3	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	11.8	37.4		12.9	48.6		9.4	97.6		9.3	113.6	
Queue Length 95th (m)	26.5	60.5		26.8	77.5		#39.8	#176.2		#36.7	#215.5	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	346	1023		496	1015		97	1567		205	1988	
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	0.26	0.28		0.20	0.36		0.78	0.89		0.74	0.89	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 77.3

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 28.6

Intersection LOS: C

Intersection Capacity Utilization 112.8%

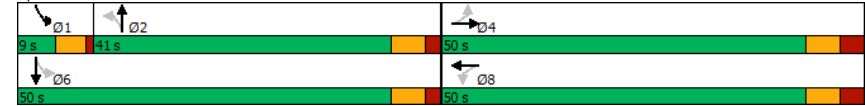
ICU Level of Service H

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↖	↗	↖	↗
Traffic Volume (veh/h)	89	234	51	101	260	110	76	1311	82	152	1655	123
Future Volume (veh/h)	89	234	51	101	260	110	76	1311	82	152	1655	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1900	1885	1900	1870	1885	1841	1885	1885	1856	1885
Adj Flow Rate, veh/h	89	234	51	101	260	110	76	1311	82	152	1655	123
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	0	1	0	2	1	4	1	1	3	1
Cap, veh/h	225	469	102	292	396	168	102	1408	88	202	1763	130
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.42	0.42	0.42	0.05	0.53	0.53
Sat Flow, veh/h	1017	1497	326	1099	1264	535	270	3341	209	1795	3327	245
Grp Volume(v), veh/h	89	0	285	101	0	370	76	685	708	152	870	908
Grp Sat Flow(s),veh/h/ln	1017	0	1824	1099	0	1799	270	1749	1801	1795	1763	1809
Q Serve(g_s), s	6.9	0.0	10.6	6.8	0.0	14.8	4.7	30.9	31.1	3.8	38.0	39.3
Cycle Q Clear(g_c), s	21.6	0.0	10.6	17.4	0.0	14.8	35.0	30.9	31.1	3.8	38.0	39.3
Prop In Lane	1.00		0.18	1.00		0.30	1.00		0.12	1.00		0.14
Lane Grp Cap(c), veh/h	225	0	572	292	0	564	102	737	759	202	934	959
V/C Ratio(X)	0.40	0.00	0.50	0.35	0.00	0.66	0.75	0.93	0.93	0.75	0.93	0.95
Avail Cap(c_a), veh/h	433	0	945	516	0	932	102	737	759	202	934	959
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	0.0	23.2	30.3	0.0	24.6	41.1	22.8	22.9	19.4	18.1	18.4
Incr Delay (d2), s/veh	1.1	0.0	0.7	0.7	0.0	1.3	38.8	19.8	19.9	14.5	16.9	18.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	2.5	1.2	0.0	3.6	2.2	9.4	9.7	1.4	9.4	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.1	0.0	23.9	31.0	0.0	25.9	79.9	42.6	42.8	33.9	35.0	37.2
LnGrp LOS	D	A	C	C	A	C	E	D	D	C	C	D
Approach Vol, veh/h	374			471			1469			1930		
Approach Delay, s/veh	26.5			27.0			44.6			36.0		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	9.0	41.0	33.0		50.0		33.0					
Change Period (Y+Rc), s	4.5	6.0	7.0		6.0		7.0					
Max Green Setting (Gmax), s	4.5	35.0	43.0		44.0		43.0					
Max Q Clear Time (g_c+I1), s	5.8	37.0	23.6		41.3		19.4					
Green Ext Time (p_c), s	0.0	0.0	2.4		2.4		3.4					
Intersection Summary												
HCM 6th Ctrl Delay	37.1											
HCM 6th LOS	D											

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↖		↖↖↖	↖↖	
Traffic Volume (vph)	0	0	0	1513	1805	0
Future Volume (vph)	0	0	0	1513	1805	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Ped Bike Factor						
Fit Protected						
Satd. Flow (prot)	0	1900	0	4988	3505	0
Fit Permitted						
Satd. Flow (perm)	0	1900	0	4988	3505	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	63.0			90.2	135.8	
Travel Time (s)	3.8			5.4	9.8	
Confl. Peds. (#/hr)	2		2			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	4%	3%	0%
Adj. Flow (vph)	0	0	0	1513	1805	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1513	1805	0
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	53.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖	↖	↗	
Traffic Vol, veh/h	0	0	0	1513	1805	0
Future Vol, veh/h	0	0	0	1513	1805	0
Conflicting Peds, #/hr	2	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	- None	- None	- None	- None	- None	- None
Storage Length	- 0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	0	0	1513	1805	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 905	- 0	- 0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	- 6.9	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	- 3.3	-	-
Pot Cap-1 Maneuver	0 283	0	-
Stage 1	0	- 0	-
Stage 2	0	- 0	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	- 283	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	- 0	-	-
HCM Lane LOS	- A	-	-
HCM 95th %tile Q(veh)	-	-	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

	↖	→	↗	↖	↖	↗	↖	↖	↗	↖	↖	↗	↖	↖	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖			
Traffic Volume (vph)	200	914	119	179	1121	121	218	1159	228	239	1287	240			
Future Volume (vph)	200	914	119	179	1121	121	218	1159	228	239	1287	240			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0			
Storage Lanes	1		1	1		1	1		1	1		0			
Taper Length (m)	10.0			85.0			100.0			7.5					
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91			
Ped Bike Factor			0.99	1.00			1.00					1.00			
Frt			0.850			0.850			0.850			0.976			
Fit Protected	0.950			0.950			0.950			0.950					
Satd. Flow (prot)	1805	5085	1509	1752	5036	1417	1752	5187	1553	1641	4707	0			
Fit Permitted	0.139			0.212			0.127			0.112					
Satd. Flow (perm)	264	5085	1487	391	5036	1417	234	5187	1553	193	4707	0			
Right Turn on Red			Yes			Yes			Yes			Yes			
Satd. Flow (RTOR)			136			136			212			33			
Link Speed (k/h)		60			60			60				50			
Link Distance (m)		117.7			375.6			511.5				90.2			
Travel Time (s)		7.1			22.5			30.7				6.5			
Confl. Peds. (#/hr)			3	3			3					3			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Heavy Vehicles (%)	0%	2%	7%	3%	3%	14%	3%	0%	4%	10%	7%	9%			
Adj. Flow (vph)	200	914	119	179	1121	121	218	1159	228	239	1287	240			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	200	914	119	179	1121	121	218	1159	228	239	1527	0			
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA				
Protected Phases	7	4		3	8		5	2		1	6				
Permitted Phases	4		4	8		8	2		2	6					
Detector Phase	7	4	4	3	8	8	5	2	2	1	6				
Switch Phase															
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0				
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7				
Total Split (s)	17.0	45.0	45.0	18.0	46.0	46.0	14.0	37.0	37.0	20.0	43.0				
Total Split (%)	14.2%	37.5%	37.5%	15.0%	38.3%	38.3%	11.7%	30.8%	30.8%	16.7%	35.8%				
Maximum Green (s)	13.0	39.0	39.0	14.0	40.0	40.0	10.0	31.0	31.0	16.0	37.0				
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0				
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max				
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0				
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0				
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0				
Act Effct Green (s)	55.0	41.0	41.0	55.0	41.0	41.0	43.6	31.6	31.6	52.8	37.0				
Actuated g/C Ratio	0.46	0.34	0.34	0.46	0.34	0.34	0.36	0.26	0.26	0.44	0.31				
v/c Ratio	0.73	0.53	0.20	0.57	0.65	0.21	1.03	0.85	0.40	0.88	1.04				

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

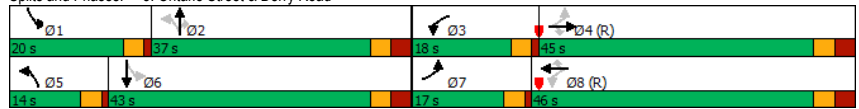
(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	32.0	33.3	15.4	25.0	35.8	4.5	100.8	49.2	8.3	61.4	73.2	
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	32.0	33.3	15.4	25.0	35.8	4.5	100.8	49.2	8.3	61.4	73.2	
LOS	C	C	B	C	D	A	F	D	A	E	E	
Approach Delay	31.4			31.8			50.4			71.6		
Approach LOS	C			C			D			E		
Queue Length 50th (m)	36.0	72.2	10.2	24.4	86.9	0.0	~40.8	100.9	3.0	42.4	~147.1	
Queue Length 95th (m)	#55.5	87.8	26.0	39.0	103.4	10.7	#92.5	119.5	23.6	#88.3	#178.7	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0		45.0	70.0		70.0			
Base Capacity (vph)	289	1739	598	344	1721	574	211	1364	564	278	1474	
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	0.69	0.53	0.20	0.52	0.65	0.21	1.03	0.85	0.40	0.86	1.04	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 48.3
 Intersection Capacity Utilization 102.8%
 Analysis Period (min) 15
 ~ 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.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	200	914	119	179	1121	121	218	1159	228	239	1287	240
Future Volume (veh/h)	200	914	119	179	1121	121	218	1159	228	239	1287	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1870	1796	1856	1856	1693	1856	1900	1841	1752	1796	1767
Adj Flow Rate, veh/h	200	914	119	179	1121	121	218	1159	228	239	1287	240
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	7	3	3	14	3	4	10	7	9	9
Cap, veh/h	296	1836	546	324	1794	507	207	1423	427	280	1280	239
Arrive On Green	0.09	0.36	0.36	0.08	0.35	0.35	0.08	0.27	0.27	0.12	0.31	0.31
Sat Flow, veh/h	1810	5106	1518	1767	5066	1431	1767	5187	1555	1668	4150	774
Grp Volume(v), veh/h	200	914	119	179	1121	121	218	1159	228	239	1014	513
Grp Sat Flow(s),veh/h/ln	1810	1702	1518	1767	1689	1431	1767	1729	1555	1668	1635	1654
Q Serve(g_s), s	8.3	16.8	6.5	7.6	22.0	7.2	10.0	25.1	15.0	11.9	37.0	37.0
Cycle Q Clear(g_c), s	8.3	16.8	6.5	7.6	22.0	7.2	10.0	25.1	15.0	11.9	37.0	37.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	296	1836	546	324	1794	507	207	1423	427	280	1008	510
V/C Ratio(X)	0.68	0.50	0.22	0.55	0.62	0.24	1.05	0.81	0.53	0.85	1.01	1.01
Avail Cap(c_a), veh/h	334	1836	546	385	1794	507	207	1423	427	306	1008	510
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.6	30.0	26.7	22.8	32.1	27.3	33.1	40.7	37.0	29.2	41.5	41.5
Incr Delay (d2), s/veh	4.6	1.0	0.9	1.5	1.7	1.1	76.8	5.2	4.7	19.2	29.8	41.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.9	1.8	2.2	6.5	1.9	7.4	8.4	4.7	4.8	15.2	17.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	30.9	27.6	24.3	33.8	28.5	109.9	45.9	41.8	48.4	71.3	82.8
LnGrp LOS	C	C	C	C	C	C	F	D	D	D	F	F
Approach Vol, veh/h	1233			1421			1605			1766		
Approach Delay, s/veh	30.3			32.1			54.0			71.5		
Approach LOS	C			C			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.1	38.9	13.8	49.2	14.0	43.0	14.5	48.5				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	16.0	31.0	14.0	39.0	10.0	37.0	13.0	40.0				
Max Q Clear Time (g_c+I1), s	13.9	27.1	9.6	18.8	12.0	39.0	10.3	24.0				
Green Ext Time (p_c), s	0.2	3.0	0.2	7.9	0.0	0.0	0.2	8.4				

Intersection Summary

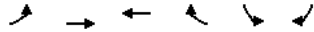
HCM 6th Ctrl Delay 49.1
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗↗↗	↗↗↗		↘	
Traffic Volume (vph)	0	1229	1594	0	0	0
Future Volume (vph)	0	1229	1594	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor						
Flt Protected						
Satd. Flow (prot)	1900	5085	5136	0	1900	0
Flt Permitted						
Satd. Flow (perm)	1900	5085	5136	0	1900	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%
Adj. Flow (vph)	0	1229	1594	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1229	1594	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Background 2031 PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗↗↗	↗↗↗		↘	
Traffic Vol, veh/h	0	1229	1594	0	0	0
Future Vol, veh/h	0	1229	1594	0	0	0
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	1	0	0	0
Mvmt Flow	0	1229	1594	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1596	0	2088
Stage 1	-	-	1596
Stage 2	-	-	492
Critical Hdwy	5.3	-	5.7
Critical Hdwy Stg 1	-	-	6.6
Critical Hdwy Stg 2	-	-	6
Follow-up Hdwy	3.1	-	3.8
Pot Cap-1 Maneuver	204	-	86
Stage 1	-	-	105
Stage 2	-	-	535
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	204	-	86
Mov Cap-2 Maneuver	-	-	86
Stage 1	-	-	105
Stage 2	-	-	534

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	204	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	65	950	114	289	1152	97	135	117	198	92	221	77
Future Volume (vph)	65	950	114	289	1152	97	135	117	198	92	221	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.94	0.99			0.99	0.99		0.99	0.99	
Fit			0.850		0.988			0.906			0.961	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	5085	1615	1787	5074	0	1805	1677	0	1770	1802	0
Fit Permitted	0.211			0.214			0.422			0.399		
Satd. Flow (perm)	378	5085	1515	399	5074	0	797	1677	0	739	1802	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89		19				74			15
Link Speed (k/h)		60			60				60			60
Link Distance (m)		171.2			370.5				215.4			213.5
Travel Time (s)		10.3			22.2				12.9			12.8
Conf. Peds. (#/hr)			27	27			9		9	9		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	2%	0%	1%	1%	1%	0%	0%	2%	2%	1%	0%
Adj. Flow (vph)	65	950	114	289	1152	97	135	117	198	92	221	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	950	114	289	1249	0	135	315	0	92	298	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	55.0	55.0	55.0	21.0	76.0		44.0	44.0		44.0	44.0	
Total Split (%)	45.8%	45.8%	45.8%	17.5%	63.3%		36.7%	36.7%		36.7%	36.7%	
Maximum Green (s)	49.0	49.0	49.0	17.0	70.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effect Green (s)	51.7	51.7	51.7	72.0	70.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.43	0.43	0.43	0.60	0.58		0.32	0.32		0.32	0.32	
v/c Ratio	0.40	0.43	0.16	0.71	0.42		0.54	0.54		0.39	0.51	

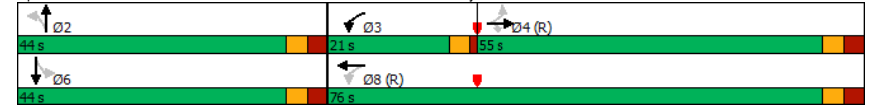
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	34.1	25.1	7.5	18.1	6.8		43.1	29.5		38.2	35.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.1	25.1	7.5	18.1	6.8		43.1	29.5		38.2	35.4	
LOS	C	C	A	B	A		D	C		D	D	
Approach Delay			23.8				8.9			33.6		36.1
Approach LOS			C				A			C		D
Queue Length 50th (m)	11.0	59.5	3.6	12.0	19.4		27.5	48.9		17.8	57.0	
Queue Length 95th (m)	26.7	74.6	15.5	m19.0	m21.1		50.0	79.0		34.5	85.9	
Internal Link Dist (m)			147.2				346.5			191.4		189.5
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	162	2189	703	436	2967		252	581		234	580	
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	0.40	0.43	0.16	0.66	0.42		0.54	0.54		0.39	0.51	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 19.9 Intersection LOS: B
 Intersection Capacity Utilization 101.8% ICU Level of Service G
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Background 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔		↔	↔		↔	↔	↔	↔
Traffic Volume (veh/h)	65	950	114	289	1152	97	135	117	198	92	221	77
Future Volume (veh/h)	65	950	114	289	1152	97	135	117	198	92	221	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1870	1900	1885	1885	1885	1900	1900	1870	1870	1885	1900
Adj Flow Rate, veh/h	65	950	114	289	1152	97	135	117	198	92	221	77
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	2	0	1	1	1	0	0	2	2	1	0
Cap, veh/h	251	2276	696	417	2815	237	258	200	338	231	422	147
Arrive On Green	0.45	0.45	0.45	0.10	0.58	0.58	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	429	5106	1561	1795	4826	406	1094	630	1067	1061	1333	464
Grp Volume(v), veh/h	65	950	114	289	819	430	135	0	315	92	0	298
Grp Sat Flow(s),veh/h/ln	429	1702	1561	1795	1716	1801	1094	0	1697	1061	0	1797
Q Serve(g_s), s	11.9	15.2	5.2	10.0	15.7	15.7	13.8	0.0	18.7	9.6	0.0	16.3
Cycle Q Clear(g_c), s	11.9	15.2	5.2	10.0	15.7	15.7	30.1	0.0	18.7	28.2	0.0	16.3
Prop In Lane	1.00		1.00	1.00	0.23	1.00			0.63	1.00		0.26
Lane Grp Cap(c), veh/h	251	2276	696	417	2001	1050	258	0	537	231	0	569
V/C Ratio(X)	0.26	0.42	0.16	0.69	0.41	0.41	0.52	0.00	0.59	0.40	0.00	0.52
Avail Cap(c_a), veh/h	251	2276	696	484	2001	1050	258	0	537	231	0	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00		1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.7	22.7	19.9	16.1	13.7	13.7	45.9	0.0	34.4	46.3	0.0	33.6
Incr Delay (d2), s/veh	2.5	0.6	0.5	3.5	0.6	1.2	7.4	0.0	4.6	5.1	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	4.0	1.3	2.4	3.0	3.3	3.4	0.0	6.2	2.3	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	23.2	20.4	19.6	14.3	14.9	53.3	0.0	39.0	51.3	0.0	37.0
LnGrp LOS	C	C	C	B	B	D	D	A	D	D	A	D
Approach Vol, veh/h	1129			1538			450			390		
Approach Delay, s/veh	23.0			15.5			43.3			40.4		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	2		3		4		6		8			
Phs Duration (G+Y+Rc), s	44.0	16.5	59.5		44.0		76.0					
Change Period (Y+Rc), s	6.0	4.0	6.0		6.0		6.0					
Max Green Setting (Gmax), s	38.0	17.0	49.0		38.0		70.0					
Max Q Clear Time (g_c+I1), s	32.1	12.0	17.2		30.2		17.7					
Green Ext Time (p_c), s	1.5	0.5	11.4		1.5		14.0					
Intersection Summary												
HCM 6th Ctrl Delay	24.2											
HCM 6th LOS	C											

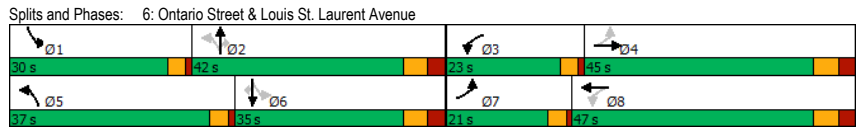
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔		↔	↔		↔	↔	↔	↔
Traffic Volume (vph)	261	663	190	268	758	274	490	1088	312	398	881	314
Future Volume (vph)	261	663	190	268	758	274	490	1088	312	398	881	314
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor									0.99	1.00		
Frt	0.967				0.960				0.850		0.850	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3449	0	1787	3440	0	1787	4988	1615	1805	4988	1599
Fit Permitted	0.103			0.100			0.125			0.143		
Satd. Flow (perm)	192	3449	0	188	3440	0	235	4988	1593	272	4988	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			37				194			227
Link Speed (k/h)		60			60			60				60
Link Distance (m)		193.1			250.0			253.7				194.1
Travel Time (s)		11.6			15.0			15.2				11.6
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	2%	1%	1%	0%	1%	4%	0%	0%	4%	1%
Adj. Flow (vph)	261	663	190	268	758	274	490	1088	312	398	881	314
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	853	0	268	1032	0	490	1088	312	398	881	314
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1		6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	21.0	45.0		23.0	47.0		37.0	42.0	42.0	30.0	35.0	35.0
Total Split (%)	15.0%	32.1%		16.4%	33.6%		26.4%	30.0%	30.0%	21.4%	25.0%	25.0%
Maximum Green (s)	17.0	38.0		19.0	40.0		33.0	35.0	35.0	26.0	28.0	28.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	58.7	38.7		61.3	40.0		68.0	35.0	35.0	57.0	28.0	28.0
Actuated g/C Ratio	0.42	0.28		0.44	0.29		0.49	0.25	0.25	0.41	0.20	0.20
v/c Ratio	0.96	0.88		0.92	1.02		1.02	0.87	0.57	1.01	0.88	0.63

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	83.6	58.4		72.7	81.3		86.7	59.1	21.4	88.2	65.8	20.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.6	58.4		72.7	81.3		86.7	59.1	21.4	88.2	65.8	20.6
LOS	F	E		E	F		F	E	C	F	E	C
Approach Delay	64.3			79.5			60.1			62.5		
Approach LOS	E			E			E			E		
Queue Length 50th (m)	59.1	123.1		59.5	~163.6		~133.0	112.1	29.1	~99.6	92.3	21.8
Queue Length 95th (m)	#116.5	#159.2		#112.5	#208.1		#205.4	131.2	61.5	#169.9	#114.5	56.1
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0		20.0		50.0		50.0		50.0			
Base Capacity (vph)	272	972		300	1009		479	1247	543	395	997	501
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.88		0.89	1.02		1.02	0.87	0.57	1.01	0.88	0.63

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Natural Cycle:	120
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.02
Intersection Signal Delay:	65.8
Intersection Capacity Utilization:	106.7%
Analysis Period (min):	15
ICU Level of Service G	Intersection LOS: E
- 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.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Background 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	261	663	190	268	758	274	490	1088	312	398	881	314
Future Volume (veh/h)	261	663	190	268	758	274	490	1088	312	398	881	314
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1885	1870	1885	1885	1900	1885	1841	1900	1900	1841	1885
Adj Flow Rate, veh/h	261	663	190	268	758	274	490	1088	312	398	881	314
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	1	2	1	1	0	1	4	0	0	4	1
Cap, veh/h	268	788	226	306	736	266	489	1256	402	404	1005	319
Arrive On Green	0.12	0.29	0.29	0.12	0.29	0.29	0.24	0.25	0.25	0.19	0.20	0.20
Sat Flow, veh/h	1781	2748	787	1795	2577	931	1795	5025	1608	1810	5025	1595
Grp Volume(v), veh/h	261	432	421	268	527	505	490	1088	312	398	881	314
Grp Sat Flow(s), veh/h/ln	1781	1791	1744	1795	1791	1718	1795	1675	1608	1810	1675	1595
Q Serve(g_s), s	16.4	31.7	31.8	14.6	40.0	40.0	33.0	29.0	25.3	25.4	23.8	27.4
Cycle Q Clear(g_c), s	16.4	31.7	31.8	14.6	40.0	40.0	33.0	29.0	25.3	25.4	23.8	27.4
Prop In Lane	1.00		0.45	1.00		0.54	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	268	514	500	306	512	491	489	1256	402	404	1005	319
V/C Ratio(X)	0.97	0.84	0.84	0.87	1.03	1.03	1.00	0.87	0.78	0.98	0.88	0.98
Avail Cap(c_a), veh/h	268	514	500	334	512	491	489	1256	402	404	1005	319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.3	46.9	46.9	34.1	50.0	50.0	40.9	50.3	48.9	39.7	54.3	55.8
Incr Delay (d2), s/veh	47.9	11.9	12.3	20.7	47.5	48.4	41.3	8.2	13.7	40.6	10.7	46.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	8.0	12.6	12.3	6.3	20.5	19.7	16.3	10.4	9.5	12.9	9.0	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	91.1	58.9	59.3	54.8	97.5	98.4	82.2	58.4	62.5	80.3	65.0	102.3
LnGrp LOS	F	E	E	D	F	F	F	E	E	F	E	F
Approach Vol, veh/h	1114			1300			1890			1593		
Approach Delay, s/veh	66.6			89.1			65.3			76.2		
Approach LOS	E			F			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.0	42.0	20.9	47.1	37.0	35.0	21.0	47.0				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	26.0	35.0	19.0	38.0	33.0	28.0	17.0	40.0				
Max Q Clear Time (g_c+I1), s	27.4	31.0	16.6	33.8	35.0	29.4	18.4	42.0				
Green Ext Time (p_c), s	0.0	3.0	0.3	2.2	0.0	0.0	0.0	0.0				

Intersection Summary	
HCM 6th Ctrl Delay	73.7
HCM 6th LOS	E

Appendix I

2024 Future Total Traffic Operations Reports



Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Total 2024 AM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↗	↘	↙	↖	↗	↘	↙	↖	↗	↘	↙	
Traffic Volume (vph)	104	135	66	97	172	92	42	1040	41	60	697	57	
Future Volume (vph)	104	135	66	97	172	92	42	1040	41	60	697	57	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0	
Storage Lanes	1		0	1		0	1		0	1		0	
Taper Length (m)	15.0			25.0			15.0			20.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	
Ped Bike Factor	0.99	0.99		0.99		0.99		1.00		1.00			
Fit		0.951			0.948			0.994			0.989		
Fit Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	1736	1735	0	1770	1708	0	1752	3384	0	1597	3353	0	
Fit Permitted	0.485			0.624			0.349			0.222			
Satd. Flow (perm)	881	1735	0	1152	1708	0	644	3384	0	373	3353	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)	31				34			5			11		
Link Speed (k/h)	60				60			60			50		
Link Distance (m)	66.2				94.7			135.8			142.5		
Travel Time (s)	4.0				5.7			8.1			10.3		
Conf. Peds. (#/hr)	7		10	10		7		7		7			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	4%	4%	2%	2%	3%	8%	3%	6%	3%	13%	7%	0%	
Adj. Flow (vph)	104	135	66	97	172	92	42	1040	41	60	697	57	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	104	201	0	97	264	0	42	1081	0	60	754	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		4			8			2			6		
Permitted Phases	4			8			2			6			
Detector Phase	4	4		8	8		2	2		6	6		
Switch Phase													
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0		
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0		
Total Split (s)	50.0	50.0		50.0	50.0		50.0	50.0		50.0	50.0		
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		
Maximum Green (s)	43.0	43.0		43.0	43.0		44.0	44.0		44.0	44.0		
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
All-Red Time (s)	3.0	3.0		3.0	3.0		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?													
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Recall Mode	None	None		None	None		Max	Max		Max	Max		
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0		
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0		
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0		
Act Effct Green (s)	15.1	15.1		15.1	15.1		44.1	44.1		44.1	44.1		
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.61	0.61		0.61	0.61		
v/c Ratio	0.57	0.52		0.40	0.69		0.11	0.52		0.26	0.37		

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

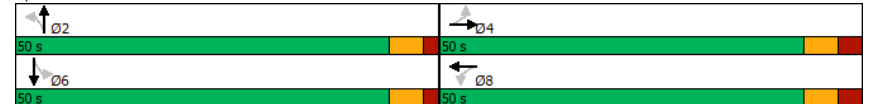
Total 2024 AM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Control Delay	38.0	26.0		29.6	32.5		8.0	9.8		11.7	8.2		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	38.0	26.0		29.6	32.5		8.0	9.8		11.7	8.2		
LOS	D	C		C	C		A	A		B	A		
Approach Delay		30.1			31.7			9.7			8.4		
Approach LOS		C			C			A			A		
Queue Length 50th (m)	13.4	21.4		12.0	30.3		2.2	40.4		3.5	24.4		
Queue Length 95th (m)	28.6	40.2		25.2	53.9		7.8	70.2		12.8	43.8		
Internal Link Dist (m)		42.2			70.7			111.8			118.5		
Turn Bay Length (m)	15.0				35.0			15.0			40.0		
Base Capacity (vph)	525	1047		687	1032		393	2067		227	2050		
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	0.20	0.19		0.14	0.26		0.11	0.52		0.26	0.37		

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	72.3
Natural Cycle:	45
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	14.8
Intersection Capacity Utilization:	88.9%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	E

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	104	135	66	97	172	92	42	1040	41	60	697	57
Future Volume (veh/h)	104	135	66	97	172	92	42	1040	41	60	697	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1856	1781	1856	1811	1856	1707	1796	1900
Adj Flow Rate, veh/h	104	135	66	97	172	92	42	1040	41	60	697	57
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	2	2	3	8	3	6	3	13	7	0
Cap, veh/h	256	326	159	309	317	170	394	1875	74	261	1774	145
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.56	0.56	0.56	0.56	0.56	0.56
Sat Flow, veh/h	1091	1163	568	1173	1133	606	703	3374	133	476	3193	261
Grp Volume(v), veh/h	104	0	201	97	0	264	42	530	551	60	372	382
Grp Sat Flow(s),veh/h/ln	1091	0	1731	1173	0	1739	703	1721	1786	476	1706	1747
Q Serve(g_s), s	7.1	0.0	7.5	5.8	0.0	10.2	2.9	15.7	15.7	7.3	9.8	9.8
Cycle Q Clear(g_c), s	17.3	0.0	7.5	13.3	0.0	10.2	12.7	15.7	15.7	23.0	9.8	9.8
Prop In Lane	1.00		0.33	1.00		0.35	1.00		0.07	1.00		0.15
Lane Grp Cap(c), veh/h	256	0	485	309	0	487	394	956	992	261	948	971
V/C Ratio(X)	0.41	0.00	0.41	0.31	0.00	0.54	0.11	0.55	0.55	0.23	0.39	0.39
Avail Cap(c_a), veh/h	543	0	940	617	0	944	394	956	992	261	948	971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.5	0.0	23.2	28.6	0.0	24.2	13.6	11.3	11.3	18.7	10.0	10.0
Incr Delay (d2), s/veh	1.0	0.0	0.6	0.6	0.0	0.9	0.5	2.3	2.2	2.0	1.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.7	1.0	0.0	2.4	0.2	1.5	1.5	0.6	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.6	0.0	23.8	29.2	0.0	25.1	14.2	13.6	13.5	20.7	11.2	11.2
LnGrp LOS	C	A	C	C	A	C	B	B	B	C	B	B
Approach Vol, veh/h	305			361			1123			814		
Approach Delay, s/veh	26.8			26.2			13.6			11.9		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	50.0		29.2		50.0		29.2					
Change Period (Y+Rc), s	6.0		7.0		6.0		7.0					
Max Green Setting (Gmax), s	44.0		43.0		44.0		43.0					
Max Q Clear Time (g_c+I1), s	17.7		19.3		25.0		15.3					
Green Ext Time (p_c), s	9.8		1.9		6.4		2.5					

Intersection Summary		
HCM 6th Ctrl Delay	16.4	
HCM 6th LOS	B	

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔	↔	
Traffic Volume (vph)	0	66	0	1204	914	4
Future Volume (vph)	0	66	0	1204	914	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt	0.865		0.999			
Fit Protected						
Satd. Flow (prot)	0	1644	0	3406	3403	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	3406	3403	0
Link Speed (k/h)	60		60		50	
Link Distance (m)	63.0		90.2		135.8	
Travel Time (s)	3.8		5.4		9.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	66	0	1204	914	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	66	0	1204	918	0
Sign Control	Stop		Free		Free	

Intersection Summary		
Area Type:	Other	
Control Type:	Unsignalized	
Intersection Capacity Utilization	36.6%	ICU Level of Service A
Analysis Period (min)	15	

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑		↑↑	↑↑	
Traffic Vol, veh/h	0	66	0	1204	914	4
Future Vol, veh/h	0	66	0	1204	914	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	66	0	1204	914	4

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	459	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	554	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	554	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	554	-
HCM Lane V/C Ratio	-	0.119	-
HCM Control Delay (s)	-	12.4	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.4	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↔	↕	↕	↔	↕	↕	↔	↕	↕
Traffic Volume (vph)	215	927	187	158	514	124	151	680	281	155	685	130
Future Volume (vph)	215	927	187	158	514	124	151	680	281	155	685	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	10.0			85.0			100.0					7.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor			0.99	1.00					0.98	1.00		
Frt			0.850			0.850			0.850			0.976
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3505	1538	1641	3438	1495	1671	3438	1524	1736	3313	0
Fit Permitted	0.302			0.119			0.183			0.293		
Satd. Flow (perm)	552	3505	1515	205	3438	1495	322	3438	1499	534	3313	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			136			281			20
Link Speed (k/h)		60			60			60				50
Link Distance (m)		117.7			375.6			511.5				90.2
Travel Time (s)		7.1			22.5			30.7				6.5
Confl. Peds. (#/hr)			3	3					5	5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	3%	5%	10%	5%	8%	8%	5%	6%	4%	7%	3%
Adj. Flow (vph)	215	927	187	158	514	124	151	680	281	155	685	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	215	927	187	158	514	124	151	680	281	155	815	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	21.0	43.0	43.0	15.0	37.0	37.0	15.0	50.0	50.0	12.0	47.0	
Total Split (%)	17.5%	35.8%	35.8%	12.5%	30.8%	30.8%	12.5%	41.7%	41.7%	10.0%	39.2%	
Maximum Green (s)	17.0	37.0	37.0	11.0	31.0	31.0	11.0	44.0	44.0	8.0	41.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	52.9	37.4	37.4	46.3	33.7	33.7	56.2	44.0	44.0	51.8	41.8	
Actuated g/C Ratio	0.44	0.31	0.31	0.39	0.28	0.28	0.47	0.37	0.37	0.43	0.35	
v/c Ratio	0.56	0.85	0.35	0.77	0.53	0.24	0.57	0.54	0.39	0.50	0.70	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

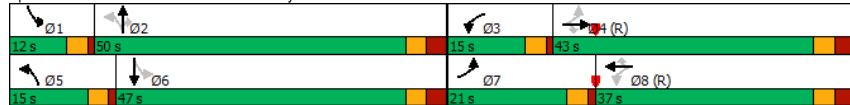
(190237) 550 Ontario St S, RR 25, Milton
Total 2024 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	26.9	47.5	16.8	50.7	39.5	5.9	26.5	32.0	4.6	24.3	36.9	
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	26.9	47.5	16.8	50.7	39.5	5.9	26.5	32.0	4.6	24.3	36.9	
LOS	C	D	B	D	D	A	C	C	A	C	D	
Approach Delay	39.9			36.5			24.3			34.9		
Approach LOS	D			D			C			C		
Queue Length 50th (m)	32.8	113.5	15.8	23.3	57.1	0.0	20.7	69.4	0.0	21.2	89.8	
Queue Length 95th (m)	50.7	#140.9	35.9	#57.8	77.2	12.7	34.2	88.7	18.1	34.7	113.6	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	416	1091	540	211	965	517	276	1260	727	310	1166	
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	0.52	0.85	0.35	0.75	0.53	0.24	0.55	0.54	0.39	0.50	0.70	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 34.0
 Intersection Capacity Utilization 98.2%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	215	927	187	158	514	124	151	680	281	155	685	130
Future Volume (veh/h)	215	927	187	158	514	124	151	680	281	155	685	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1856	1826	1752	1826	1781	1781	1826	1811	1841	1796	1856
Adj Flow Rate, veh/h	215	927	187	158	514	124	151	680	281	155	685	130
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	3	5	10	5	8	8	5	6	4	7	3
Cap, veh/h	376	1122	491	232	1031	447	285	1272	560	299	1032	196
Arrive On Green	0.10	0.32	0.32	0.08	0.30	0.30	0.07	0.37	0.37	0.07	0.36	0.36
Sat Flow, veh/h	1753	3526	1543	1668	3469	1505	1697	3469	1529	1753	2860	542
Grp Volume(v), veh/h	215	927	187	158	514	124	151	680	281	155	408	407
Grp Sat Flow(s), veh/h/ln	1753	1763	1543	1668	1735	1505	1697	1735	1529	1753	1706	1696
Q Serve(g_s), s	10.0	29.2	11.3	7.8	14.7	7.6	6.6	18.5	17.1	6.7	24.1	24.2
Cycle Q Clear(g_c), s	10.0	29.2	11.3	7.8	14.7	7.6	6.6	18.5	17.1	6.7	24.1	24.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	376	1122	491	232	1031	447	285	1272	560	299	616	612
V/C Ratio(X)	0.57	0.83	0.38	0.68	0.50	0.28	0.53	0.53	0.50	0.52	0.66	0.66
Avail Cap(c_a), veh/h	444	1122	491	248	1031	447	317	1272	560	299	616	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	37.8	21.7	29.9	34.8	32.3	24.3	29.9	29.5	23.4	32.2	32.2
Incr Delay (d2), s/veh	1.4	7.0	3.2	6.8	1.7	1.5	1.5	1.6	3.2	1.6	5.6	5.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	2.9	10.0	3.3	2.5	4.7	2.2	1.8	5.6	4.8	2.0	8.1	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	27.0	44.8	34.0	36.6	36.5	33.8	25.9	31.5	32.7	25.0	37.8	37.9
LnGrp LOS	C	D	C	D	D	C	C	C	C	C	D	D
Approach Vol, veh/h	1329			796			1112			970		
Approach Delay, s/veh	40.4			36.1			31.1			35.8		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	50.0	13.8	44.2	12.7	49.3	16.3	41.7				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	8.0	44.0	11.0	37.0	11.0	41.0	17.0	31.0				
Max Q Clear Time (g_c+I1), s	8.7	20.5	9.8	31.2	8.6	26.2	12.0	16.7				
Green Ext Time (p_c), s	0.0	7.1	0.1	3.6	0.1	5.3	0.4	3.8				

Intersection Summary

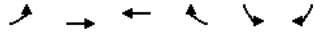
HCM 6th Ctrl Delay 36.1
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↔
Traffic Volume (vph)	2	1188	722	35	77	4
Future Volume (vph)	2	1188	722	35	77	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.993		0.993	
Flt Protected	0.950				0.955	
Satd. Flow (prot)	1805	3539	3453	0	1372	0
Flt Permitted	0.950				0.955	
Satd. Flow (perm)	1805	3539	3453	0	1372	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	0%	33%	0%
Adj. Flow (vph)	2	1188	722	35	77	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	1188	757	0	81	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 AM Peak Hour

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↔
Traffic Vol, veh/h	2	1188	722	35	77	4
Future Vol, veh/h	2	1188	722	35	77	4
Conflicting Peds, #/hr	7	0	0	7	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	4	0	33	0
Mvmt Flow	2	1188	722	35	77	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	764	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	858	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	853	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	94.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	853	-	-	-	112
HCM Lane V/C Ratio	0.002	-	-	-	0.723
HCM Control Delay (s)	9.2	-	-	-	94.6
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	3.9

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2024 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	99	1029	30	96	520	69	68	115	226	114	92	78
Future Volume (vph)	99	1029	30	96	520	69	68	115	226	114	92	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00	1.00		0.99	0.99		1.00	0.99	
Frt			0.850		0.982			0.901			0.931	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3505	1568	1770	3334	0	1770	1662	0	1703	1657	0
Flt Permitted	0.430			0.159			0.613			0.377		
Satd. Flow (perm)	761	3505	1525	296	3334	0	1135	1662	0	675	1657	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			66		21			91			39	
Link Speed (k/h)		60						60			60	
Link Distance (m)		171.2			370.5			215.4			213.5	
Travel Time (s)		10.3			22.2			12.9			12.8	
Conf. Peds. (#/hr)	5		5	5		5	8		3	3		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	3%	3%	2%	6%	6%	2%	2%	2%	6%	3%	9%
Adj. Flow (vph)	99	1029	30	96	520	69	68	115	226	114	92	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	1029	30	96	589	0	68	341	0	114	170	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	58.0	58.0	58.0	14.0	72.0		44.0	44.0		44.0	44.0	
Total Split (%)	50.0%	50.0%	50.0%	12.1%	62.1%		37.9%	37.9%		37.9%	37.9%	
Maximum Green (s)	52.0	52.0	52.0	10.0	66.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)	53.8	53.8	53.8	68.0	66.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.46	0.46	0.46	0.59	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.28	0.63	0.04	0.35	0.31		0.18	0.56		0.52	0.30	

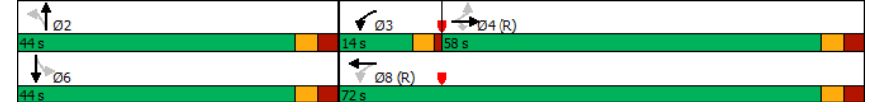
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2024 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	22.4	26.0	0.4	14.1	13.1		29.6	27.3		41.5	23.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.4	26.0	0.4	14.1	13.1		29.6	27.3		41.5	23.8	
LOS	C	C	A	B	B		C	C		D	C	
Approach Delay		25.0			13.2			27.7			30.9	
Approach LOS		C			B			C			C	
Queue Length 50th (m)	14.2	95.7	0.0	9.5	35.3		11.6	48.8		22.0	22.8	
Queue Length 95th (m)	28.5	122.3	0.8	17.2	46.5		23.5	79.7		42.6	41.3	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0		25.0				20.0		
Base Capacity (vph)	353	1626	743	300	1905		371	605		221	569	
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	0.28	0.63	0.04	0.32	0.31		0.18	0.56		0.52	0.30	

Intersection Summary

Area Type: Other
 Cycle Length: 116
 Actuated Cycle Length: 116
 Offset: 40 (34%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 22.9 Intersection LOS: C
 Intersection Capacity Utilization 104.2% ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2024 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	99	1029	30	96	520	69	68	115	226	114	92	78
Future Volume (veh/h)	99	1029	30	96	520	69	68	115	226	114	92	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1796	1856	1856	1870	1811	1811	1870	1870	1811	1856	1767	
Adj Flow Rate, veh/h	99	1029	30	96	520	69	68	115	226	114	92	78
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	3	2	6	6	2	2	2	6	3	9
Cap, veh/h	443	1737	771	288	1737	230	368	184	361	217	303	257
Arrive On Green	0.49	0.49	0.49	0.04	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	793	3526	1565	1781	3053	404	1209	561	1102	1004	924	784
Grp Volume(v), veh/h	99	1029	30	96	292	297	68	0	341	114	0	170
Grp Sat Flow(s),veh/h/ln	793	1763	1565	1781	1721	1736	1209	0	1662	1004	0	1708
Q Serve(g_s), s	8.6	24.3	1.2	3.0	10.2	10.3	5.2	0.0	20.1	12.6	0.0	8.6
Cycle Q Clear(g_c), s	10.1	24.3	1.2	3.0	10.2	10.3	13.8	0.0	20.1	32.7	0.0	8.6
Prop In Lane	1.00		1.00	1.00		0.23	1.00		0.66	1.00		0.46
Lane Grp Cap(c), veh/h	443	1737	771	288	979	988	368	0	545	217	0	559
V/C Ratio(X)	0.22	0.59	0.04	0.33	0.30	0.30	0.18	0.00	0.63	0.53	0.00	0.30
Avail Cap(c_a), veh/h	443	1737	771	367	979	988	368	0	545	217	0	559
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.9	21.1	15.2	15.9	13.0	13.0	34.3	0.0	33.0	46.8	0.0	29.1
Incr Delay (d2), s/veh	1.2	1.5	0.1	0.7	0.8	0.8	1.1	0.0	5.4	8.8	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.0	0.3	0.6	2.1	2.1	1.2	0.0	6.4	2.9	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	22.6	15.3	16.6	13.8	13.8	35.4	0.0	38.4	55.7	0.0	30.5
LnGrp LOS	B	C	B	B	B	B	D	A	D	E	A	C
Approach Vol, veh/h	1158			685			409			284		
Approach Delay, s/veh	22.1			14.2			37.9			40.6		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	2	3	4	6			8					
Phs Duration (G+Y+Rc), s	44.0	8.8	63.2	44.0			72.0					
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0			6.0					
Max Green Setting (Gmax), s	38.0	10.0	52.0	38.0			66.0					
Max Q Clear Time (g_c+I1), s	22.1	5.0	26.3	34.7			12.3					
Green Ext Time (p_c), s	2.5	0.1	10.7	0.5			4.8					
Intersection Summary												
HCM 6th Ctrl Delay	24.6											
HCM 6th LOS	C											

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2024 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	332	533	326	404	469	52	165	711	152	37	985	146
Future Volume (vph)	332	533	326	404	469	52	165	711	152	37	985	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0		100.0			90.0			
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00				1.00				0.98	1.00		
Frt		0.943			0.985				0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3305	0	1736	3407	0	1641	3374	1538	1703	3374	1524
Fit Permitted	0.379			0.102			0.087			0.302		
Satd. Flow (perm)	698	3305	0	186	3407	0	150	3374	1514	541	3374	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		90			8				114			125
Link Speed (k/h)		60			60			60				60
Link Distance (m)		193.1			250.0			253.7				194.1
Travel Time (s)		11.6			15.0			15.2				11.6
Confl. Peds. (#/hr)	3					3			2		2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	4%	4%	6%	10%	7%	5%	6%	7%	6%
Adj. Flow (vph)	332	533	326	404	469	52	165	711	152	37	985	146
Shared Lane Traffic (%)												
Lane Group Flow (vph)	332	859	0	404	521	0	165	711	152	37	985	146
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1		6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	28.0	44.0		29.0	45.0		19.0	54.0	54.0	13.0	48.0	48.0
Total Split (%)	20.0%	31.4%		20.7%	32.1%		13.6%	38.6%	38.6%	9.3%	34.3%	34.3%
Maximum Green (s)	24.0	37.0		25.0	38.0		15.0	47.0	47.0	9.0	41.0	41.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effect Green (s)	59.0	35.3		66.0	39.8		61.5	49.4	49.4	51.2	41.0	41.0
Actuated g/C Ratio	0.43	0.26		0.48	0.29		0.45	0.36	0.36	0.37	0.30	0.30
v/c Ratio	0.72	0.93		1.09	0.52		0.77	0.58	0.25	0.14	0.97	0.27

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2024 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	32.3	62.0		110.0	43.1		54.4	38.9	10.9	23.5	70.3	10.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	62.0		110.0	43.1		54.4	38.9	10.9	23.5	70.3	10.1
LOS	C	E		F	D		D	D	B	C	E	B
Approach Delay		53.7			72.3			37.3			61.3	
Approach LOS		D			E			D			E	
Queue Length 50th (m)	59.2	117.0		~115.9	66.5		30.7	89.7	7.4	6.0	151.4	4.4
Queue Length 95th (m)	83.9	#155.8		#185.6	87.2		#63.6	113.8	24.7	13.1	#199.8	21.5
Internal Link Dist (m)		169.1			226.0			229.7			170.1	
Turn Bay Length (m)	45.0			20.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	502	959		372	994		231	1216	619	286	1011	544
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.90		1.09	0.52		0.71	0.58	0.25	0.13	0.97	0.27

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 136.9

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 55.8

Intersection Capacity Utilization 102.3%

Analysis Period (min) 15

Intersection LOS: E

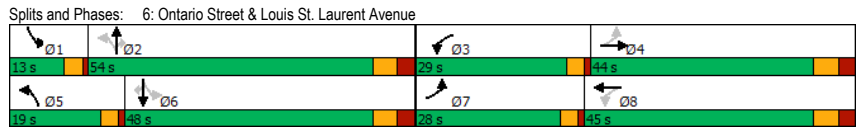
ICU Level of Service G

- 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.



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2024 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	332	533	326	404	469	52	165	711	152	37	985	146
Future Volume (veh/h)	332	533	326	404	469	52	165	711	152	37	985	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No				No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1811	1752	1796	1826	1811	1796	1811
Adj Flow Rate, veh/h	332	533	326	404	469	52	165	711	152	37	985	146
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	4	4	6	10	7	5	6	7	6
Cap, veh/h	479	565	345	389	956	106	199	1217	551	217	1032	463
Arrive On Green	0.15	0.27	0.27	0.18	0.30	0.30	0.08	0.36	0.36	0.03	0.30	0.30
Sat Flow, veh/h	1767	2100	1282	1753	3175	351	1668	3413	1545	1725	3413	1532
Grp Volume(v), veh/h	332	447	412	404	257	264	165	711	152	37	985	146
Grp Sat Flow(s), veh/h/ln	1767	1763	1620	1753	1749	1776	1668	1706	1545	1725	1706	1532
Q Serve(g_s), s	18.1	33.7	33.8	25.0	16.4	16.5	8.9	23.0	9.5	2.0	38.4	10.0
Cycle Q Clear(g_c), s	18.1	33.7	33.8	25.0	16.4	16.5	8.9	23.0	9.5	2.0	38.4	10.0
Prop In Lane	1.00		0.79	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	479	474	436	389	526	535	199	1217	551	217	1032	463
V/C Ratio(X)	0.69	0.94	0.94	1.04	0.49	0.49	0.83	0.58	0.28	0.17	0.95	0.32
Avail Cap(c_a), veh/h	522	481	442	389	526	535	247	1217	551	284	1032	463
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	48.5	48.6	41.0	38.9	38.9	33.9	35.5	31.1	32.1	46.4	36.5
Incr Delay (d2), s/veh	3.5	27.1	29.0	56.1	0.7	0.7	17.3	2.1	1.2	0.4	19.0	1.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	5.8	14.9	14.0	13.9	5.5	5.6	3.5	7.4	2.8	0.6	15.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.4	75.6	77.6	97.0	39.6	39.6	51.2	37.5	32.4	32.4	65.5	38.3
LnGrp LOS	C	E	E	F	D	D	D	D	C	C	E	D
Approach Vol, veh/h		1191			925			1028				1168
Approach Delay, s/veh		64.2			64.7			39.0				61.0
Approach LOS		E			E			D				E
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	55.4	29.0	43.5	15.1	48.0	24.7	47.8				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	9.0	47.0	25.0	37.0	15.0	41.0	24.0	38.0				
Max Q Clear Time (g_c+I1), s	4.0	25.0	27.0	35.8	10.9	40.4	20.1	18.5				
Green Ext Time (p_c), s	0.0	6.5	0.0	0.7	0.2	0.4	0.5	3.5				

Intersection Summary

HCM 6th Ctrl Delay 57.4

HCM 6th LOS E

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Total 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	258	56	112	287	114	84	904	91	165	1047	132
Future Volume (vph)	92	258	56	112	287	114	84	904	91	165	1047	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Flt		0.973			0.957			0.986			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1827	0	1787	1800	0	1787	3419	0	1787	3443	0
Flt Permitted	0.298			0.436			0.240			0.141		
Satd. Flow (perm)	560	1827	0	816	1800	0	451	3419	0	265	3443	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			25			11			17	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	3		7	7		3	2		8	8		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	0%	1%	0%	2%	1%	4%	1%	1%	3%	1%
Adj. Flow (vph)	92	258	56	112	287	114	84	904	91	165	1047	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	314	0	112	401	0	84	995	0	165	1179	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		4.5	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		9.0	21.0	
Total Split (s)	50.0	50.0		50.0	50.0		35.0	35.0		15.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		35.0%	35.0%		15.0%	50.0%	
Maximum Green (s)	43.0	43.0		43.0	43.0		29.0	29.0		10.5	44.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	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		4.5	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	21.8	21.8		21.8	21.8		31.1	31.1		45.8	44.3	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.39	0.39		0.58	0.56	
v/c Ratio	0.60	0.61		0.50	0.78		0.47	0.74		0.52	0.61	

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Total 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	41.6	28.9		31.8	35.8		33.2	26.3		15.3	14.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.6	28.9		31.8	35.8		33.2	26.3		15.3	14.2	
LOS	D	C		C	D		C	C		B	B	
Approach Delay		31.8			35.0			26.8			14.3	
Approach LOS		C			C			C			B	
Queue Length 50th (m)	12.5	40.9		14.7	54.5		9.6	67.5		10.9	58.5	
Queue Length 95th (m)	28.4	65.4		30.3	85.3		#33.3	#124.7		26.8	103.6	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	306	1005		446	995		177	1349		356	1934	
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	0.30	0.31		0.25	0.40		0.47	0.74		0.46	0.61	
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	79.1											
Natural Cycle:	60											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.78											
Intersection Signal Delay:	23.6						Intersection LOS: C					
Intersection Capacity Utilization:	97.8%											
ICU Level of Service:	F											
Analysis Period (min):	15											
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												
Splits and Phases: 1: Ontario Street & Laurier Avenue												

HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	92	258	56	112	287	114	84	904	91	165	1047	132
Future Volume (veh/h)	92	258	56	112	287	114	84	904	91	165	1047	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1900	1885	1900	1870	1885	1841	1885	1885	1856	1885
Adj Flow Rate, veh/h	92	258	56	112	287	114	84	904	91	165	1047	132
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	0	1	0	2	1	4	1	1	3	1
Cap, veh/h	224	498	108	291	429	170	215	1238	125	304	1622	204
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.39	0.39	0.39	0.08	0.52	0.52
Sat Flow, veh/h	989	1499	325	1071	1291	513	479	3205	323	1795	3147	396
Grp Volume(v), veh/h	92	0	314	112	0	401	84	493	502	165	586	593
Grp Sat Flow(s),veh/h/ln	989	0	1824	1071	0	1804	479	1749	1779	1795	1763	1781
Q Serve(g_s), s	7.5	0.0	11.9	8.0	0.0	16.3	13.2	20.6	20.6	4.4	20.6	20.6
Cycle Q Clear(g_c), s	23.8	0.0	11.9	19.9	0.0	16.3	22.8	20.6	20.6	4.4	20.6	20.6
Prop In Lane	1.00		0.18	1.00		0.28	1.00		0.18	1.00		0.22
Lane Grp Cap(c), veh/h	224	0	606	291	0	599	215	676	687	304	909	918
V/C Ratio(X)	0.41	0.00	0.52	0.38	0.00	0.67	0.39	0.73	0.73	0.54	0.64	0.65
Avail Cap(c_a), veh/h	394	0	919	475	0	909	215	676	687	388	909	918
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	0.0	23.0	31.0	0.0	24.5	27.3	22.4	22.4	16.6	15.0	15.0
Incr Delay (d2), s/veh	1.2	0.0	0.7	0.8	0.0	1.3	5.2	6.8	6.7	1.5	3.5	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	2.8	1.4	0.0	3.9	1.2	5.3	5.4	0.9	4.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	0.0	23.7	31.8	0.0	25.8	32.6	29.2	29.1	18.1	18.5	18.5
LnGrp LOS	D	A	C	C	A	C	C	C	C	B	B	B
Approach Vol, veh/h	406			513			1079			1344		
Approach Delay, s/veh	26.4			27.1			29.4			18.5		
Approach LOS	C			C			C			B		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	11.0	39.0	35.4		50.0		35.4					
Change Period (Y+Rc), s	4.5	6.0	7.0		6.0		7.0					
Max Green Setting (Gmax), s	10.5	29.0	43.0		44.0		43.0					
Max Q Clear Time (g_c+I1), s	6.4	24.8	25.8		22.6		21.9					
Green Ext Time (p_c), s	0.2	2.8	2.5		9.9		3.6					
Intersection Summary												
HCM 6th Ctrl Delay	24.3											
HCM 6th LOS	C											

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↕	↕	
Traffic Volume (vph)	0	51	0	1183	1255	17
Future Volume (vph)	0	51	0	1183	1255	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt	0.865		0.998			
Fit Protected						
Satd. Flow (prot)	0	1644	0	3471	3499	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	3471	3499	0
Link Speed (k/h)	60		60			
Link Distance (m)	63.0		90.2			
Travel Time (s)	3.8		5.4			
Confl. Peds. (#/hr)	2		2		2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	4%	3%	0%
Adj. Flow (vph)	0	51	0	1183	1255	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	51	0	1183	1272	0
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	45.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑		↑↑	↑↑	
Traffic Vol, veh/h	0	51	0	1183	1255	17
Future Vol, veh/h	0	51	0	1183	1255	17
Conflicting Peds, #/hr	2	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	51	0	1183	1255	17

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	638	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	424	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	423	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	423	-	-
HCM Lane V/C Ratio	-	0.121	-	-
HCM Control Delay (s)	-	14.7	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-


Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑		↑↑	↑		↑↑	↑
Traffic Volume (vph)	173	722	111	140	979	97	271	764	261	276	748	281
Future Volume (vph)	173	722	111	140	979	97	271	764	261	276	748	281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor			0.99	1.00			1.00					1.00
Frt			0.850			0.850			0.850			0.959
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3539	1509	1752	3505	1417	1752	3610	1553	1641	3206	0
Fit Permitted	0.108			0.218			0.145			0.215		
Satd. Flow (perm)	205	3539	1487	402	3505	1417	267	3610	1553	371	3206	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			100			178			54
Link Speed (k/h)		60			60			60				50
Link Distance (m)		117.7			375.6			511.5				90.2
Travel Time (s)		7.1			22.5			30.7				6.5
Confl. Peds. (#/hr)			3	3			3					3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	7%	3%	3%	14%	3%	0%	4%	10%	7%	9%
Adj. Flow (vph)	173	722	111	140	979	97	271	764	261	276	748	281
Shared Lane Traffic (%)												
Lane Group Flow (vph)	173	722	111	140	979	97	271	764	261	276	1029	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	10.0	43.0	43.0	9.0	42.0	42.0	14.0	50.0	50.0	18.0	54.0	
Total Split (%)	8.3%	35.8%	35.8%	7.5%	35.0%	35.0%	11.7%	41.7%	41.7%	15.0%	45.0%	
Maximum Green (s)	6.0	37.0	37.0	5.0	36.0	36.0	10.0	44.0	44.0	14.0	48.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	45.0	37.0	37.0	43.0	36.0	36.0	56.3	44.3	44.3	63.7	48.0	
Actuated g/C Ratio	0.38	0.31	0.31	0.36	0.30	0.30	0.47	0.37	0.37	0.53	0.40	
v/c Ratio	1.11	0.66	0.21	0.70	0.93	0.20	1.09	0.57	0.38	0.81	0.78	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 PM Peak Hour

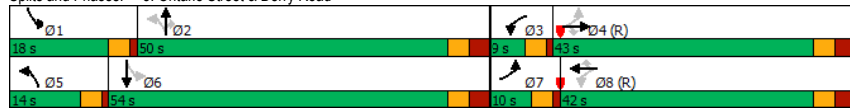


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	133.3	39.6	8.4	46.7	56.7	6.6	106.9	32.5	10.8	35.8	34.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	133.3	39.6	8.4	46.7	56.7	6.6	106.9	32.5	10.8	35.8	34.8	
LOS	F	D	A	D	E	A	F	C	B	D	C	
Approach Delay	52.3			51.5			43.7			35.0		
Approach LOS	D			D			D			D		
Queue Length 50th (m)	~31.0	81.6	1.9	22.3	123.9	0.0	~48.6	79.4	13.6	36.9	110.3	
Queue Length 95th (m)	#78.4	103.6	15.5	#43.4	#165.3	12.2	#104.3	99.8	35.2	#67.1	138.1	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	156	1091	527	200	1051	495	249	1332	685	346	1314	
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	1.11	0.66	0.21	0.70	0.93	0.20	1.09	0.57	0.38	0.80	0.78	

Intersection Summary


Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 45.1
 Intersection Capacity Utilization 103.6%
 Analysis Period (min) 15
 ~ 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.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↗	↔	↕	↗	↔	↕	↗	↔	↕	↗
Traffic Volume (veh/h)	173	722	111	140	979	97	271	764	261	276	748	281
Future Volume (veh/h)	173	722	111	140	979	97	271	764	261	276	748	281
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1870	1796	1856	1856	1693	1856	1900	1841	1752	1796	1767
Adj Flow Rate, veh/h	173	722	111	140	979	97	271	764	261	276	748	281
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	7	3	3	14	3	0	4	10	7	9
Cap, veh/h	167	1096	468	220	1058	429	279	1326	572	355	970	364
Arrive On Green	0.05	0.31	0.31	0.04	0.30	0.30	0.08	0.37	0.37	0.12	0.40	0.40
Sat Flow, veh/h	1810	3554	1518	1767	3526	1430	1767	3610	1556	1668	2425	911
Grp Volume(v), veh/h	173	722	111	140	979	97	271	764	261	276	526	503
Grp Sat Flow(s),veh/h/ln	1810	1777	1518	1767	1763	1430	1767	1805	1556	1668	1706	1630
Q Serve(g_s), s	6.0	21.2	6.5	5.0	32.3	6.1	10.0	20.4	15.3	11.9	32.1	32.1
Cycle Q Clear(g_c), s	6.0	21.2	6.5	5.0	32.3	6.1	10.0	20.4	15.3	11.9	32.1	32.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.56
Lane Grp Cap(c), veh/h	167	1096	468	220	1058	429	279	1326	572	355	683	652
V/C Ratio(X)	1.04	0.66	0.24	0.64	0.93	0.23	0.97	0.58	0.46	0.78	0.77	0.77
Avail Cap(c_a), veh/h	167	1096	468	220	1058	429	279	1326	572	355	683	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	36.0	31.0	35.2	40.7	31.5	31.2	30.5	28.9	22.5	31.2	31.2
Incr Delay (d2), s/veh	79.6	3.1	1.2	6.0	14.7	1.2	45.6	1.8	2.6	10.3	8.2	8.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	7.0	1.9	2.4	12.1	1.7	6.6	6.4	4.3	3.9	10.7	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	118.3	39.1	32.2	41.2	55.4	32.8	76.8	32.3	31.5	32.8	39.5	39.8
LnGrp LOS	F	D	C	D	E	C	E	C	C	C	D	D
Approach Vol, veh/h	1006			1216			1296			1305		
Approach Delay, s/veh	52.0			52.0			41.4			38.2		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.9	50.1	9.0	43.0	14.0	54.0	10.0	42.0				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	14.0	44.0	5.0	37.0	10.0	48.0	6.0	36.0				
Max Q Clear Time (g_c+I1), s	13.9	22.4	7.0	23.2	12.0	34.1	8.0	34.3				
Green Ext Time (p_c), s	0.0	7.6	0.0	5.1	0.0	6.7	0.0	1.2				

Intersection Summary

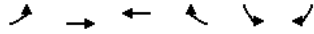
HCM 6th Ctrl Delay 45.4
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗		↘	
Traffic Volume (vph)	9	933	1202	146	60	3
Future Volume (vph)	9	933	1202	146	60	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.984		0.994	
Flt Protected	0.950				0.955	
Satd. Flow (prot)	1805	3539	3521	0	1804	0
Flt Permitted	0.950				0.955	
Satd. Flow (perm)	1805	3539	3521	0	1804	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%
Adj. Flow (vph)	9	933	1202	146	60	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	933	1348	0	63	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2024 PM Peak Hour

Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗		↘	
Traffic Vol, veh/h	9	933	1202	146	60	3
Future Vol, veh/h	9	933	1202	146	60	3
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	1	0	0	0
Mvmt Flow	9	933	1202	146	60	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1350	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	516	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	515	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	144.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	515	-	-	-	78
HCM Lane V/C Ratio	0.017	-	-	-	0.808
HCM Control Delay (s)	12.1	-	-	-	144.4
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	4

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	51	743	93	235	915	79	157	136	230	107	256	87
Future Volume (vph)	51	743	93	235	915	79	157	136	230	107	256	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.94	0.99			1.00	0.99		1.00	0.99	
Frt			0.850		0.988			0.906			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1615	1787	3531	0	1805	1677	0	1770	1804	0
Flt Permitted	0.288			0.263			0.374			0.344		
Satd. Flow (perm)	516	3539	1517	489	3531	0	707	1677	0	638	1804	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			71		13				78			16
Link Speed (k/h)		60			60				60			60
Link Distance (m)		171.2			370.5				215.4			213.5
Travel Time (s)		10.3			22.2				12.9			12.8
Conf. Peds. (#/hr)			27	27			9		9	9		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	2%	0%	1%	1%	1%	0%	0%	2%	2%	1%	0%
Adj. Flow (vph)	51	743	93	235	915	79	157	136	230	107	256	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	743	93	235	994	0	157	366	0	107	343	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	57.0	57.0	57.0	15.0	72.0		44.0	44.0		44.0	44.0	
Total Split (%)	49.1%	49.1%	49.1%	12.9%	62.1%		37.9%	37.9%		37.9%	37.9%	
Maximum Green (s)	51.0	51.0	51.0	11.0	66.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)	51.4	51.4	51.4	68.0	66.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.44	0.44	0.44	0.59	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.22	0.47	0.13	0.58	0.49		0.68	0.61		0.51	0.57	

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	23.6	24.1	7.1	17.6	15.8		50.6	30.4		41.9	35.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.6	24.1	7.1	17.6	15.8		50.6	30.4		41.9	35.1	
LOS	C	C	A	B	B		D	C		D	D	
Approach Delay			22.3				16.1			36.5		36.7
Approach LOS			C				B			D		D
Queue Length 50th (m)	7.4	64.8	2.9	25.3	70.2		32.3	57.7		20.6	64.3	
Queue Length 95th (m)	17.1	82.5	12.9	38.9	87.2		#64.3	90.9		40.8	95.7	
Internal Link Dist (m)			147.2				346.5			191.4		189.5
Turn Bay Length (m)	25.0			35.0	25.0			25.0			20.0	
Base Capacity (vph)	228	1567	711	409	2014		231	601		209	601	
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	0.47	0.13	0.57	0.49		0.68	0.61		0.51	0.57	
Intersection Summary												
Area Type: Other												
Cycle Length: 116												
Actuated Cycle Length: 116												
Offset: 40 (34%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.68												
Intersection Signal Delay: 24.4 Intersection LOS: C												
Intersection Capacity Utilization 100.7% ICU Level of Service G												
Analysis Period (min) 15												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												
Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road												

HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2024 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	51	743	93	235	915	79	157	136	230	107	256	87
Future Volume (veh/h)	51	743	93	235	915	79	157	136	230	107	256	87
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1870	1900	1885	1885	1885	1900	1900	1870	1870	1885	1900
Adj Flow Rate, veh/h	51	743	93	235	915	79	157	136	230	107	256	87
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	2	0	1	1	1	0	0	2	2	1	0
Cap, veh/h	283	1595	701	416	1894	164	240	207	349	207	440	149
Arrive On Green	0.45	0.45	0.45	0.09	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	545	3554	1562	1795	3329	287	1051	631	1067	1013	1342	456
Grp Volume(v), veh/h	51	743	93	235	492	502	157	0	366	107	0	343
Grp Sat Flow(s),veh/h/ln	545	1777	1562	1795	1791	1825	1051	0	1698	1013	0	1799
Q Serve(g_s), s	7.1	16.9	4.0	7.8	19.0	19.0	16.9	0.0	21.4	11.7	0.0	18.4
Cycle Q Clear(g_c), s	12.1	16.9	4.0	7.8	19.0	19.0	35.3	0.0	21.4	33.2	0.0	18.4
Prop In Lane	1.00		1.00	1.00		0.16	1.00		0.63	1.00		0.25
Lane Grp Cap(c), veh/h	283	1595	701	416	1019	1038	240	0	556	207	0	589
V/C Ratio(X)	0.18	0.47	0.13	0.57	0.48	0.48	0.65	0.00	0.66	0.52	0.00	0.58
Avail Cap(c_a), veh/h	283	1595	701	432	1019	1038	240	0	556	207	0	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.6	22.3	18.7	15.8	14.9	14.9	47.1	0.0	33.4	47.7	0.0	32.4
Incr Delay (d2), s/veh	1.4	1.0	0.4	1.6	1.6	1.6	13.1	0.0	6.0	9.0	0.0	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.5	1.0	1.8	4.0	4.1	4.2	0.0	7.0	2.8	0.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	23.3	19.1	17.4	16.5	16.5	60.2	0.0	39.4	56.6	0.0	36.6
LnGrp LOS	C	C	B	B	B	B	E	A	D	E	A	D
Approach Vol, veh/h	887			1229			523			450		
Approach Delay, s/veh	22.9			16.7			45.7			41.3		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	2	3	4	6			8					
Phs Duration (G+Y+Rc), s	44.0	13.9	58.1	44.0			72.0					
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0			6.0					
Max Green Setting (Gmax), s	38.0	11.0	51.0	38.0			66.0					
Max Q Clear Time (g_c+I1), s	37.3	9.8	18.9	35.2			21.0					
Green Ext Time (p_c), s	0.3	0.1	8.2	0.8			9.7					
Intersection Summary												
HCM 6th Ctrl Delay	26.9											
HCM 6th LOS	C											

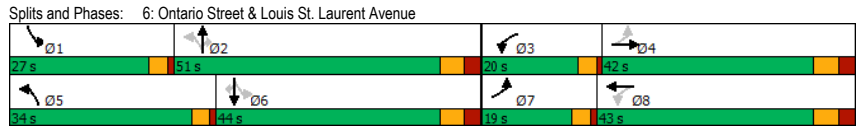
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	215	359	126	200	542	63	496	1025	299	81	709	275
Future Volume (vph)	215	359	126	200	542	63	496	1025	299	81	709	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							0.99					
Frt		0.961			0.984			0.850				0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3426	0	1787	3521	0	1787	3471	1615	1805	3471	1599
Fit Permitted	0.188			0.298			0.182			0.263		
Satd. Flow (perm)	350	3426	0	561	3521	0	342	3471	1593	500	3471	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			9				151			187
Link Speed (k/h)		60			60			60				60
Link Distance (m)		193.1			250.0			253.7				194.1
Travel Time (s)		11.6			15.0			15.2				11.6
Confl. Peds. (#/hr)									1		1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	2%	1%	1%	0%	1%	4%	0%	0%	4%	1%
Adj. Flow (vph)	215	359	126	200	542	63	496	1025	299	81	709	275
Shared Lane Traffic (%)												
Lane Group Flow (vph)	215	485	0	200	605	0	496	1025	299	81	709	275
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2			2	6	6
Detector Phase	7	4		3	8		5	2		2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	19.0	42.0		20.0	43.0		34.0	51.0	51.0	27.0	44.0	44.0
Total Split (%)	13.6%	30.0%		14.3%	30.7%		24.3%	36.4%	36.4%	19.3%	31.4%	31.4%
Maximum Green (s)	15.0	35.0		16.0	36.0		30.0	44.0	44.0	23.0	37.0	37.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effect Green (s)	44.6	27.2		44.6	27.3		74.2	58.8	58.8	48.4	37.1	37.1
Actuated g/C Ratio	0.34	0.21		0.34	0.21		0.57	0.45	0.45	0.37	0.28	0.28
v/c Ratio	0.78	0.66		0.61	0.82		0.94	0.66	0.37	0.30	0.72	0.47

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2024 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	50.1	48.7		37.4	58.3		56.1	31.9	13.9	20.0	48.0	16.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	48.7		37.4	58.3		56.1	31.9	13.9	20.0	48.0	16.1
LOS	D	D		D	E		E	C	B	C	D	B
Approach Delay	49.1			53.1			35.6			37.6		
Approach LOS	D			D			D			D		
Queue Length 50th (m)	41.4	60.5		38.0	82.4		99.0	112.7	24.4	9.7	91.9	18.3
Queue Length 95th (m)	#67.6	79.6		57.6	104.0		#189.8	160.1	54.9	20.2	124.9	48.5
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0		20.0		50.0		50.0		50.0		50.0	
Base Capacity (vph)	284	943		348	977		526	1560	799	471	983	587
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.51		0.57	0.62		0.94	0.66	0.37	0.17	0.72	0.47

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	130.8
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.94
Intersection Signal Delay:	41.4
Intersection Capacity Utilization:	94.3%
ICU Level of Service:	F
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2024 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	215	359	126	200	542	63	496	1025	299	81	709	275
Future Volume (veh/h)	215	359	126	200	542	63	496	1025	299	81	709	275
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1885	1870	1885	1885	1900	1885	1841	1900	1900	1841	1885
Adj Flow Rate, veh/h	215	359	126	200	542	63	496	1025	299	81	709	275
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	1	2	1	1	0	1	4	0	0	4	1
Cap, veh/h	288	549	190	318	660	76	521	1636	753	243	1013	462
Arrive On Green	0.11	0.21	0.21	0.10	0.20	0.20	0.22	0.47	0.47	0.05	0.29	0.29
Sat Flow, veh/h	1781	2611	903	1795	3234	375	1795	3497	1609	1810	3497	1596
Grp Volume(v), veh/h	215	245	240	200	299	306	496	1025	299	81	709	275
Grp Sat Flow(s), veh/h/ln	1781	1791	1723	1795	1791	1818	1795	1749	1609	1810	1749	1596
Q Serve(g_s), s	12.0	16.0	16.4	11.1	20.4	20.6	26.1	28.2	15.5	4.0	23.1	18.9
Cycle Q Clear(g_c), s	12.0	16.0	16.4	11.1	20.4	20.6	26.1	28.2	15.5	4.0	23.1	18.9
Prop In Lane	1.00		0.52	1.00		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	288	377	362	318	365	371	521	1636	753	243	1013	462
V/C Ratio(X)	0.75	0.65	0.66	0.63	0.82	0.82	0.95	0.63	0.40	0.33	0.70	0.60
Avail Cap(c_a), veh/h	301	490	472	357	505	512	541	1636	753	486	1013	462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	46.1	46.3	35.7	48.6	48.7	30.2	25.6	22.2	29.7	40.5	39.0
Incr Delay (d2), s/veh	9.4	1.9	2.2	2.9	7.5	7.6	26.6	1.8	1.6	0.8	4.0	5.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	4.6	5.7	5.7	3.8	7.8	8.0	9.4	7.9	4.1	1.3	8.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	45.8	48.0	48.5	38.6	56.1	56.3	56.8	27.4	23.8	30.5	44.5	44.5
LnGrp LOS	D	D	D	D	E	E	E	C	C	C	D	D
Approach Vol, veh/h	700			805			1820			1065		
Approach Delay, s/veh	47.5			51.8			34.8			43.4		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	66.8	17.3	33.9	32.6	44.0	18.1	33.1				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	23.0	44.0	16.0	35.0	30.0	37.0	15.0	36.0				
Max Q Clear Time (g_c+I1), s	6.0	30.2	13.1	18.4	28.1	25.1	14.0	22.6				
Green Ext Time (p_c), s	0.2	7.9	0.2	3.1	0.5	5.3	0.1	3.5				

Intersection Summary	
HCM 6th Ctrl Delay	42.1
HCM 6th LOS	D

Appendix J

2029 Future Total Traffic Operations Reports



Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔		↔	↔		↔	↔		↔
Traffic Volume (vph)	115	149	73	107	190	101	46	1146	45	66	770	63
Future Volume (vph)	115	149	73	107	190	101	46	1146	45	66	770	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99		0.99		1.00				
Flt	0.951				0.948		0.994				0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1735	0	1770	1708	0	1752	3384	0	1597	3353	0
Flt Permitted	0.452			0.591			0.311			0.183		
Satd. Flow (perm)	822	1735	0	1092	1708	0	574	3384	0	308	3353	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	32			26			5			10		
Link Speed (k/h)	60			60			60			50		
Link Distance (m)	66.2			94.7			135.8			142.5		
Travel Time (s)	4.0			5.7			8.1			10.3		
Conf. Peds. (#/hr)	7		10	10		7		7	7		7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	4%	2%	2%	3%	8%	3%	6%	3%	13%	7%	0%
Adj. Flow (vph)	115	149	73	107	190	101	46	1146	45	66	770	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	222	0	107	291	0	46	1191	0	66	833	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	4				8		2				6	
Permitted Phases	4				8		2				6	
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0	
Total Split (s)	52.0	52.0		52.0	52.0		48.0	48.0		48.0	48.0	
Total Split (%)	52.0%	52.0%		52.0%	52.0%		48.0%	48.0%		48.0%	48.0%	
Maximum Green (s)	45.0	45.0		45.0	45.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	16.3	16.3		16.3	16.3		42.2	42.2		42.2	42.2	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.59	0.59		0.59	0.59	
v/c Ratio	0.61	0.53		0.43	0.71		0.14	0.60		0.36	0.42	

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

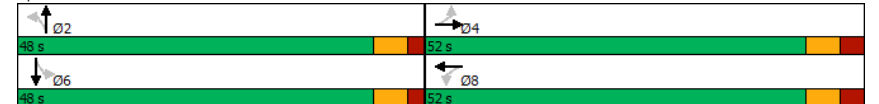
(190237) 550 Ontario St S, RR 25, Milton
Total 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	39.5	25.1		29.0	33.1		9.3	11.6		16.8	9.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.5	25.1		29.0	33.1		9.3	11.6		16.8	9.4	
LOS	D	C		C	C		A	B		B	A	
Approach Delay	30.0			32.0			11.5			9.9		
Approach LOS	C			C			B			A		
Queue Length 50th (m)	14.6	23.3		12.9	34.4		2.6	49.6		4.4	29.6	
Queue Length 95th (m)	31.1	42.7		26.7	58.9		9.1	85.9		17.5	52.6	
Internal Link Dist (m)	42.2				70.7		111.8				118.5	
Turn Bay Length (m)	15.0				35.0		15.0				40.0	
Base Capacity (vph)	519	1108		690	1088		338	1997		181	1981	
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	0.22	0.20		0.16	0.27		0.14	0.60		0.36	0.42	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	71.5
Natural Cycle:	55
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	16.0
Intersection Capacity Utilization:	93.1%
Intersection LOS:	B
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	115	149	73	107	190	101	46	1146	45	66	770	63
Future Volume (veh/h)	115	149	73	107	190	101	46	1146	45	66	770	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1856	1781	1856	1811	1856	1707	1796	1900
Adj Flow Rate, veh/h	115	149	73	107	190	101	46	1146	45	66	770	63
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	2	2	3	8	3	6	3	13	7	0
Cap, veh/h	264	351	172	321	343	182	343	1798	71	217	1702	139
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	1065	1162	569	1152	1136	604	653	3374	132	429	3193	261
Grp Volume(v), veh/h	115	0	222	107	0	291	46	584	607	66	411	422
Grp Sat Flow(s), veh/h/ln	1065	0	1731	1152	0	1740	653	1721	1786	429	1706	1747
Q Serve(g_s), s	8.0	0.0	8.1	6.5	0.0	11.0	3.7	18.9	18.9	10.1	11.7	11.7
Cycle Q Clear(g_c), s	19.0	0.0	8.1	14.5	0.0	11.0	15.4	18.9	18.9	29.1	11.7	11.7
Prop In Lane	1.00		0.33	1.00		0.35	1.00		0.07	1.00		0.15
Lane Grp Cap(c), veh/h	264	0	523	321	0	525	343	917	952	217	910	931
V/C Ratio(X)	0.44	0.00	0.42	0.33	0.00	0.55	0.13	0.64	0.64	0.30	0.45	0.45
Avail Cap(c_a), veh/h	550	0	989	631	0	993	343	917	952	217	910	931
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	0.0	22.0	27.8	0.0	23.0	16.1	13.0	13.0	23.3	11.3	11.3
Incr Delay (d2), s/veh	1.1	0.0	0.5	0.6	0.0	0.9	0.8	3.4	3.3	3.6	1.6	1.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.3	0.0	1.8	1.1	0.0	2.5	0.3	2.3	2.3	0.8	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.2	0.0	22.6	28.4	0.0	24.0	16.9	16.4	16.3	26.9	12.9	12.9
LnGrp LOS	C	A	C	C	A	C	B	B	B	C	B	B
Approach Vol, veh/h	337			398			1237			899		
Approach Delay, s/veh	25.8			25.2			16.3			14.0		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	48.0			30.8			48.0			30.8		
Change Period (Y+Rc), s	6.0			7.0			6.0			7.0		
Max Green Setting (Gmax), s	42.0			45.0			42.0			45.0		
Max Q Clear Time (g_c+I1), s	20.9			21.0			31.1			16.5		
Green Ext Time (p_c), s	10.0			2.2			5.2			2.8		

Intersection Summary		
HCM 6th Ctrl Delay	17.9	
HCM 6th LOS	B	

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔↔↔	↔↔	
Traffic Volume (vph)	0	66	0	1394	1059	4
Future Volume (vph)	0	66	0	1394	1059	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Frt	0.865		0.999			
Fit Protected						
Satd. Flow (prot)	0	1644	0	4893	3403	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	4893	3403	0
Link Speed (k/h)	60		60		50	
Link Distance (m)	63.0		90.2		135.8	
Travel Time (s)	3.8		5.4		9.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	66	0	1394	1059	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	66	0	1394	1063	0
Sign Control	Stop		Free		Free	

Intersection Summary		
Area Type:	Other	
Control Type:	Unsignalized	
Intersection Capacity Utilization	40.2%	ICU Level of Service A
Analysis Period (min)	15	

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑	↑↑↑	↑↑	↑	
Traffic Vol, veh/h	0	66	0	1394	1059	4
Future Vol, veh/h	0	66	0	1394	1059	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	- None	- None	- None	- None	- None	- None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	66	0	1394	1059	4

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	532	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	497	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	497	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	497	-
HCM Lane V/C Ratio	-	0.133	-
HCM Control Delay (s)	-	13.4	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.5	-

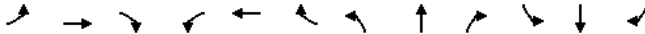
Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑	↑↑↑	↑	↑	↑↑	↑
Traffic Volume (vph)	246	1068	214	183	592	144	174	789	325	173	791	150
Future Volume (vph)	246	1068	214	183	592	144	174	789	325	173	791	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor			0.99	1.00					0.98	1.00		
Frt			0.850			0.850			0.850		0.976	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3505	1538	1641	3438	1495	1671	4940	1524	1736	4760	0
Fit Permitted	0.314			0.105			0.139			0.258		
Satd. Flow (perm)	574	3505	1515	181	3438	1495	245	4940	1499	471	4760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			136			304		31	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		117.7			375.6			511.5			90.2	
Travel Time (s)		7.1			22.5			30.7			6.5	
Confl. Peds. (#/hr)			3	3					5	5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	3%	5%	10%	5%	8%	8%	5%	6%	4%	7%	3%
Adj. Flow (vph)	246	1068	214	183	592	144	174	789	325	173	791	150
Shared Lane Traffic (%)												
Lane Group Flow (vph)	246	1068	214	183	592	144	174	789	325	173	941	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	24.0	49.0	49.0	19.0	44.0	44.0	15.0	40.0	40.0	12.0	37.0	
Total Split (%)	20.0%	40.8%	40.8%	15.8%	36.7%	36.7%	12.5%	33.3%	33.3%	10.0%	30.8%	
Maximum Green (s)	20.0	43.0	43.0	15.0	38.0	38.0	11.0	34.0	34.0	8.0	31.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	61.7	45.0	45.0	58.1	43.1	43.1	46.8	34.0	34.0	41.2	31.2	
Actuated g/C Ratio	0.51	0.38	0.38	0.48	0.36	0.36	0.39	0.28	0.28	0.34	0.26	
v/c Ratio	0.56	0.81	0.34	0.75	0.48	0.23	0.78	0.56	0.51	0.70	0.75	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 AM Peak Hour

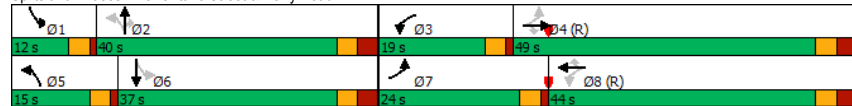


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	20.6	40.1	16.0	43.2	32.0	6.6	49.3	38.5	7.9	42.9	43.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.6	40.1	16.0	43.2	32.0	6.6	49.3	38.5	7.9	42.9	43.7	
LOS	C	D	B	D	C	A	D	D	A	D	D	
Approach Delay	33.6			30.2			32.3			43.6		
Approach LOS	C			C			C			D		
Queue Length 50th (m)	31.9	126.3	19.3	25.2	59.1	1.3	28.5	61.1	3.8	28.2	76.4	
Queue Length 95th (m)	48.4	156.6	40.2	#57.3	82.2	16.4	#58.4	75.3	27.9	#50.6	93.1	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	499	1315	631	273	1235	624	226	1399	642	246	1261	
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	0.49	0.81	0.34	0.67	0.48	0.23	0.77	0.56	0.51	0.70	0.75	

Intersection Summary


Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 34.9
 Intersection Capacity Utilization 100.6%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔
Traffic Volume (veh/h)	246	1068	214	183	592	144	174	789	325	173	791	150
Future Volume (veh/h)	246	1068	214	183	592	144	174	789	325	173	791	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1856	1826	1752	1826	1781	1781	1826	1811	1841	1796	1856
Adj Flow Rate, veh/h	246	1068	214	183	592	144	174	789	325	173	791	150
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	3	5	10	5	8	8	5	6	4	7	3
Cap, veh/h	422	1404	615	257	1311	569	260	1412	433	251	1077	203
Arrive On Green	0.11	0.40	0.40	0.09	0.38	0.38	0.09	0.28	0.28	0.07	0.26	0.26
Sat Flow, veh/h	1753	3526	1544	1668	3469	1506	1697	4985	1527	1753	4141	779
Grp Volume(v), veh/h	246	1068	214	183	592	144	174	789	325	173	623	318
Grp Sat Flow(s), veh/h/ln	1753	1763	1544	1668	1735	1506	1697	1662	1527	1753	1635	1651
Q Serve(g_s), s	10.0	31.4	11.6	7.9	15.4	7.9	8.8	16.2	23.3	8.0	20.9	21.2
Cycle Q Clear(g_c), s	10.0	31.4	11.6	7.9	15.4	7.9	8.8	16.2	23.3	8.0	20.9	21.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	422	1404	615	257	1311	569	260	1412	433	251	850	429
V/C Ratio(X)	0.58	0.76	0.35	0.71	0.45	0.25	0.67	0.56	0.75	0.69	0.73	0.74
Avail Cap(c_a), veh/h	530	1404	615	324	1311	569	263	1412	433	251	850	429
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	31.2	25.2	25.5	28.0	25.7	30.6	36.6	39.2	32.8	40.6	40.7
Incr Delay (d2), s/veh	1.3	3.9	1.6	5.3	1.1	1.1	6.3	1.6	11.4	7.8	5.6	11.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	2.6	9.5	3.1	2.3	4.5	2.1	2.9	5.0	7.7	3.3	7.1	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	21.2	35.1	26.8	30.8	29.1	26.7	36.9	38.2	50.6	40.5	46.2	51.6
LnGrp LOS	C	D	C	C	C	C	D	D	D	D	D	D
Approach Vol, veh/h	1528			919			1288			1114		
Approach Delay, s/veh	31.7			29.1			41.1			46.8		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	40.0	14.2	53.8	14.8	37.2	16.7	51.3				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	8.0	34.0	15.0	43.0	11.0	31.0	20.0	38.0				
Max Q Clear Time (g_c+I1), s	10.0	25.3	9.9	33.4	10.8	23.2	12.0	17.4				
Green Ext Time (p_c), s	0.0	4.8	0.3	6.0	0.0	4.1	0.6	5.2				

Intersection Summary

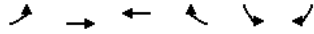
HCM 6th Ctrl Delay 37.2
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↔
Traffic Volume (vph)	2	1377	837	35	77	4
Future Volume (vph)	2	1377	837	35	77	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.994		0.993	
Flt Protected	0.950				0.955	
Satd. Flow (prot)	1805	3539	3456	0	1372	0
Flt Permitted	0.950				0.955	
Satd. Flow (perm)	1805	3539	3456	0	1372	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	0%	33%	0%
Adj. Flow (vph)	2	1377	837	35	77	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	1377	872	0	81	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 AM Peak Hour

Intersection						
Int Delay, s/veh	7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↔
Traffic Vol, veh/h	2	1377	837	35	77	4
Future Vol, veh/h	2	1377	837	35	77	4
Conflicting Peds, #/hr	7	0	0	7	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	4	0	33	0
Mvmt Flow	2	1377	837	35	77	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	879	0	0
Stage 1	-	-	862
Stage 2	-	-	693
Critical Hdwy	4.1	-	7.46
Critical Hdwy Stg 1	-	-	6.46
Critical Hdwy Stg 2	-	-	6.46
Follow-up Hdwy	2.2	-	3.83
Pot Cap-1 Maneuver	777	-	77
Stage 1	-	-	306
Stage 2	-	-	383
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	772	-	76
Mov Cap-2 Maneuver	-	-	76
Stage 1	-	-	303
Stage 2	-	-	381

Approach	EB	WB	SB
HCM Control Delay, s	0	0	201.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	772	-	-	-	79
HCM Lane V/C Ratio	0.003	-	-	-	1.025
HCM Control Delay (s)	9.7	-	-	-	201.4
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	5.6

Notes

--: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	1192	35	111	602	80	79	133	262	132	106	90
Future Volume (vph)	115	1192	35	111	602	80	79	133	262	132	106	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		1.00	0.99		0.99	1.00		0.99
Frt			0.850		0.982			0.901				0.931
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3505	1568	1770	3334	0	1770	1662	0	1703	1657	0
Flt Permitted	0.392			0.107			0.576			0.307		
Satd. Flow (perm)	694	3505	1525	199	3334	0	1066	1662	0	550	1657	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			66		21			91		39		
Link Speed (k/h)		60						60		60		
Link Distance (m)		171.2			370.5			215.4		213.5		
Travel Time (s)		10.3			22.2			12.9		12.8		
Conf. Peds. (#/hr)	5		5	5		5	8		3	3		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	3%	3%	2%	6%	6%	2%	2%	2%	6%	3%	9%
Adj. Flow (vph)	115	1192	35	111	602	80	79	133	262	132	106	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	1192	35	111	682	0	79	395	0	132	196	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	58.0	58.0	58.0	14.0	72.0		44.0	44.0		44.0	44.0	
Total Split (%)	50.0%	50.0%	50.0%	12.1%	62.1%		37.9%	37.9%		37.9%	37.9%	
Maximum Green (s)	52.0	52.0	52.0	10.0	66.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)	53.5	53.5	53.5	68.0	66.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.46	0.46	0.46	0.59	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.36	0.74	0.05	0.48	0.36		0.23	0.65		0.73	0.34	

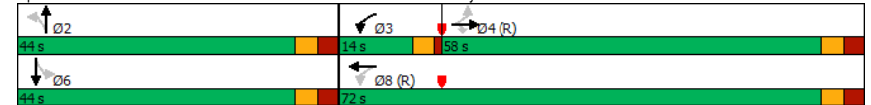
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	24.8	29.2	1.2	17.7	13.7		30.5	31.2		60.1	25.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.8	29.2	1.2	17.7	13.7		30.5	31.2		60.1	25.4	
LOS	C	C	A	B	B		C	C		E	C	
Approach Delay		28.1			14.3			31.1				39.4
Approach LOS		C			B			C				D
Queue Length 50th (m)	17.4	119.8	0.0	11.1	42.5		13.7	62.2		27.8	27.9	
Queue Length 95th (m)	34.2	150.2	1.8	19.5	55.1		26.7	97.9		#61.2	48.5	
Internal Link Dist (m)		147.2			346.5			191.4				189.5
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	320	1617	739	252	1905		349	605		180	569	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.36	0.74	0.05	0.44	0.36		0.23	0.65		0.73	0.34	

Intersection Summary

Area Type: Other
 Cycle Length: 116
 Actuated Cycle Length: 116
 Offset: 40 (34%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 26.1 Intersection LOS: C
 Intersection Capacity Utilization 104.2% ICU Level of Service G
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2029 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	115	1192	35	111	602	80	79	133	262	132	106	90
Future Volume (veh/h)	115	1192	35	111	602	80	79	133	262	132	106	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1796	1856	1856	1870	1811	1811	1870	1870	1870	1811	1856	1767
Adj Flow Rate, veh/h	115	1192	35	111	602	80	79	133	262	132	106	90
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	3	2	6	6	2	2	2	6	3	9
Cap, veh/h	399	1719	763	248	1736	230	346	183	361	175	303	257
Arrive On Green	0.49	0.49	0.49	0.05	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	727	3526	1564	1781	3052	405	1181	560	1103	956	923	784
Grp Volume(v), veh/h	115	1192	35	111	339	343	79	0	395	132	0	196
Grp Sat Flow(s),veh/h/ln	727	1763	1564	1781	1721	1736	1181	0	1662	956	0	1708
Q Serve(g_s), s	11.7	30.4	1.4	3.5	12.3	12.3	6.3	0.0	24.3	13.7	0.0	10.1
Cycle Q Clear(g_c), s	14.6	30.4	1.4	3.5	12.3	12.3	16.4	0.0	24.3	38.0	0.0	10.1
Prop In Lane	1.00		1.00	1.00		0.23	1.00		0.66	1.00		0.46
Lane Grp Cap(c), veh/h	399	1719	763	248	979	988	346	0	545	175	0	559
V/C Ratio(X)	0.29	0.69	0.05	0.45	0.35	0.35	0.23	0.00	0.73	0.75	0.00	0.35
Avail Cap(c_a), veh/h	399	1719	763	318	979	988	346	0	545	175	0	559
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.9	23.0	15.6	18.4	13.4	13.4	35.9	0.0	34.4	52.2	0.0	29.6
Incr Delay (d2), s/veh	1.8	2.3	0.1	1.3	1.0	1.0	1.5	0.0	8.2	25.7	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	7.7	0.3	0.8	2.5	2.5	1.5	0.0	8.0	4.3	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.7	25.3	15.7	19.7	14.4	14.4	37.4	0.0	42.6	77.8	0.0	31.4
LnGrp LOS	C	C	B	B	B	B	D	A	D	E	A	C
Approach Vol, veh/h	1342			793			474			328		
Approach Delay, s/veh	24.8			15.1			41.7			50.1		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	2	3	4	6			8					
Phs Duration (G+Y+Rc), s	44.0	9.4	62.6	44.0			72.0					
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0			6.0					
Max Green Setting (Gmax), s	38.0	10.0	52.0	38.0			66.0					
Max Q Clear Time (g_c+I1), s	26.3	5.5	32.4	40.0			14.3					
Green Ext Time (p_c), s	2.6	0.1	11.0	0.0			5.8					
Intersection Summary												
HCM 6th Ctrl Delay	27.7											
HCM 6th LOS	C											

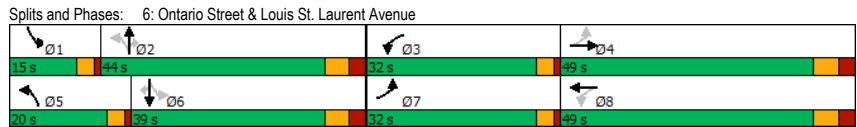
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	367	589	360	446	518	57	191	823	176	43	1136	169
Future Volume (vph)	367	589	360	446	518	57	191	823	176	43	1136	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0		100.0			90.0			
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	1.00				1.00				0.98	1.00		
Frt		0.943			0.985				0.850			0.850
Fit Protected	0.950			0.950			0.950		0.950			
Satd. Flow (prot)	1752	3305	0	1736	3407	0	1641	4848	1538	1703	4848	1524
Fit Permitted	0.377			0.092			0.108		0.291			
Satd. Flow (perm)	694	3305	0	168	3407	0	187	4848	1514	521	4848	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95			9				148			125
Link Speed (k/h)		60			60			60				60
Link Distance (m)		193.1			250.0			253.7				194.1
Travel Time (s)		11.6			15.0			15.2				11.6
Confl. Peds. (#/hr)	3					3			2		2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	4%	4%	6%	10%	7%	5%	6%	7%	6%
Adj. Flow (vph)	367	589	360	446	518	57	191	823	176	43	1136	169
Shared Lane Traffic (%)												
Lane Group Flow (vph)	367	949	0	446	575	0	191	823	176	43	1136	169
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1		6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	32.0	49.0		32.0	49.0		20.0	44.0	44.0	15.0	39.0	39.0
Total Split (%)	22.9%	35.0%		22.9%	35.0%		14.3%	31.4%	31.4%	10.7%	27.9%	27.9%
Maximum Green (s)	28.0	42.0		28.0	42.0		16.0	37.0	37.0	11.0	32.0	32.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	64.2	39.4		73.5	45.7		54.1	41.5	41.5	42.7	32.0	32.0
Actuated g/C Ratio	0.47	0.29		0.54	0.33		0.40	0.30	0.30	0.31	0.23	0.23
v/c Ratio	0.74	0.93		1.08	0.50		0.82	0.56	0.31	0.19	1.00	0.37

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2029 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	28.6	58.0		107.5	38.5		59.7	42.9	10.6	29.0	78.6	16.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.6	58.0		107.5	38.5		59.7	42.9	10.6	29.0	78.6	16.2
LOS	C	E		F	D		E	D	B	C	E	B
Approach Delay	49.8			68.6			40.8			69.2		
Approach LOS	D			E			D			E		
Queue Length 50th (m)	58.8	128.0		~129.0	68.5		38.4	75.6	5.9	7.8	~128.9	10.3
Queue Length 95th (m)	82.3	#166.2		#201.9	93.2		#78.0	93.0	25.9	16.3	#159.6	31.6
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0			20.0			50.0			50.0		
Base Capacity (vph)	575	1083		412	1146		244	1471	562	271	1137	452
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.88		1.08	0.50		0.78	0.56	0.31	0.16	1.00	0.37

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	136.6
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.08
Intersection Signal Delay:	56.9
Intersection Capacity Utilization:	103.4%
Analysis Period (min):	15
ICU Level of Service G	Intersection LOS: E
- 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.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2029 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	367	589	360	446	518	57	191	823	176	43	1136	169
Future Volume (veh/h)	367	589	360	446	518	57	191	823	176	43	1136	169
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1811	1752	1796	1826	1811	1796	1811
Adj Flow Rate, veh/h	367	589	360	446	518	57	191	823	176	43	1136	169
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	4	4	6	10	7	5	6	7	6
Cap, veh/h	517	630	385	428	1088	119	221	1494	471	193	1149	359
Arrive On Green	0.16	0.30	0.30	0.20	0.34	0.34	0.10	0.30	0.30	0.03	0.23	0.23
Sat Flow, veh/h	1767	2100	1283	1753	3177	348	1668	4904	1544	1725	4904	1531
Grp Volume(v), veh/h	367	495	454	446	284	291	191	823	176	43	1136	169
Grp Sat Flow(s), veh/h/ln	1767	1763	1620	1753	1749	1777	1668	1635	1544	1725	1635	1531
Q Serve(g_s), s	19.3	37.3	37.3	28.0	17.4	17.6	11.5	19.2	12.2	2.6	31.5	13.0
Cycle Q Clear(g_c), s	19.3	37.3	37.3	28.0	17.4	17.6	11.5	19.2	12.2	2.6	31.5	13.0
Prop In Lane	1.00		0.79	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	517	529	486	428	599	608	221	1494	471	193	1149	359
V/C Ratio(X)	0.71	0.94	0.94	1.04	0.47	0.48	0.86	0.55	0.37	0.22	0.99	0.47
Avail Cap(c_a), veh/h	592	542	498	428	599	608	249	1494	471	281	1149	359
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	46.5	46.5	41.5	35.3	35.3	36.9	39.7	37.3	38.3	52.1	45.0
Incr Delay (d2), s/veh	3.3	23.6	25.0	55.2	0.6	0.6	23.8	1.5	2.3	0.6	24.1	4.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	5.9	15.8	14.7	15.3	5.6	5.8	4.9	6.1	3.8	0.9	12.6	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.2	70.1	71.5	96.7	35.9	35.9	60.7	41.1	39.5	38.9	76.2	49.4
LnGrp LOS	C	E	E	F	D	D	E	D	D	D	E	D
Approach Vol, veh/h	1316			1021			1190			1348		
Approach Delay, s/veh	59.2			62.5			44.0			71.7		
Approach LOS	E			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	48.6	32.0	48.0	17.7	39.0	26.2	53.8				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	11.0	37.0	28.0	42.0	16.0	32.0	28.0	42.0				
Max Q Clear Time (g_c+I1), s	4.6	21.2	30.0	39.3	13.5	33.5	21.3	19.6				
Green Ext Time (p_c), s	0.0	6.5	0.0	1.7	0.2	0.0	0.9	4.1				

Intersection Summary	
HCM 6th Ctrl Delay	59.6
HCM 6th LOS	E

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	101	285	62	123	317	126	93	997	100	182	1154	146
Future Volume (vph)	101	285	62	123	317	126	93	997	100	182	1154	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00		1.00	1.00	1.00		1.00		1.00
Fit		0.973			0.957			0.986			0.983	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1827	0	1787	1800	0	1787	3419	0	1787	3443	0
Fit Permitted	0.196			0.343			0.190			0.135		
Satd. Flow (perm)	368	1827	0	643	1800	0	357	3419	0	254	3443	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			20			13			24	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	3		7	7		3	2		8	8		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	0%	1%	0%	2%	1%	4%	1%	1%	3%	1%
Adj. Flow (vph)	101	285	62	123	317	126	93	997	100	182	1154	146
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	347	0	123	443	0	93	1097	0	182	1300	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		4.5	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		9.0	21.0	
Total Split (s)	35.0	35.0		35.0	35.0		50.0	50.0		15.0	65.0	
Total Split (%)	35.0%	35.0%		35.0%	35.0%		50.0%	50.0%		15.0%	65.0%	
Maximum Green (s)	28.0	28.0		28.0	28.0		44.0	44.0		10.5	59.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	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		4.5	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	26.9	26.9		26.9	26.9		45.2	45.2		60.5	59.0	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.46	0.46		0.61	0.60	
v/c Ratio	1.01	0.69		0.70	0.88		0.57	0.70		0.61	0.63	

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	133.0	39.2		55.8	53.1		37.9	24.6		18.9	14.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	133.0	39.2		55.8	53.1		37.9	24.6		18.9	14.5	
LOS	F	D		E	D		D	C		B	B	
Approach Delay		60.3			53.7			25.6			15.1	
Approach LOS		E			D			C			B	
Queue Length 50th (m)	20.4	60.7		22.3	82.0		13.8	92.1		15.1	83.7	
Queue Length 95th (m)	#54.9	92.6		#50.8	#136.9		#38.6	118.5		29.1	105.5	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0			35.0			15.0			40.0		
Base Capacity (vph)	104	525		182	524		163	1569		318	2064	
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	0.66		0.68	0.85		0.57	0.70		0.57	0.63	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 98.9

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 29.9

Intersection LOS: C

Intersection Capacity Utilization 103.5%

ICU Level of Service G

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	101	285	62	123	317	126	93	997	100	182	1154	146
Future Volume (veh/h)	101	285	62	123	317	126	93	997	100	182	1154	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1900	1885	1900	1870	1885	1841	1885	1885	1856	1885
Adj Flow Rate, veh/h	101	285	62	123	317	126	93	997	100	182	1154	146
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	0	1	0	2	1	4	1	1	3	1
Cap, veh/h	115	419	91	187	361	144	222	1520	152	322	1856	234
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.47	0.47	0.47	0.07	0.59	0.59
Sat Flow, veh/h	953	1498	326	1039	1290	513	427	3207	322	1795	3147	397
Grp Volume(v), veh/h	101	0	347	123	0	443	93	544	553	182	645	655
Grp Sat Flow(s),veh/h/ln	953	0	1824	1039	0	1803	427	1749	1780	1795	1763	1781
Q Serve(g_s), s	4.5	0.0	16.9	11.1	0.0	23.5	18.1	23.7	23.7	4.9	23.7	23.8
Cycle Q Clear(g_c), s	28.0	0.0	16.9	28.0	0.0	23.5	30.3	23.7	23.7	4.9	23.7	23.8
Prop In Lane	1.00		0.18	1.00		0.28	1.00		0.18	1.00		0.22
Lane Grp Cap(c), veh/h	115	0	511	187	0	505	222	829	844	322	1040	1051
V/C Ratio(X)	0.88	0.00	0.68	0.66	0.00	0.88	0.42	0.66	0.66	0.57	0.62	0.62
Avail Cap(c_a), veh/h	115	0	511	187	0	505	222	829	844	383	1040	1051
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.0	0.0	32.0	44.8	0.0	34.4	26.9	20.1	20.1	15.6	13.3	13.3
Incr Delay (d2), s/veh	47.7	0.0	3.6	8.1	0.0	16.0	5.7	4.0	4.0	1.6	2.8	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	5.4	2.7	0.0	8.9	1.5	5.7	5.7	1.0	4.3	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.8	0.0	35.6	52.9	0.0	50.3	32.6	24.1	24.0	17.2	16.0	16.1
LnGrp LOS	F	A	D	D	A	D	C	C	C	B	B	B
Approach Vol, veh/h	448			566			1190			1482		
Approach Delay, s/veh	49.4			50.9			24.7			16.2		
Approach LOS	D			D			C			B		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	11.6	53.4	35.0		65.0		35.0					
Change Period (Y+Rc), s	4.5	6.0	7.0		6.0		7.0					
Max Green Setting (Gmax), s	10.5	44.0	28.0		59.0		28.0					
Max Q Clear Time (g_c+I1), s	6.9	32.3	30.0		25.8		30.0					
Green Ext Time (p_c), s	0.2	7.0	0.0		14.0		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	28.3											
HCM 6th LOS	C											

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	51	0	1370	1455	17
Future Volume (vph)	0	51	0	1370	1455	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Ped Bike Factor						
Frt	0.865		0.998			
Fit Protected						
Satd. Flow (prot)	0	1644	0	4988	3499	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	4988	3499	0
Link Speed (k/h)	60		60	50		
Link Distance (m)	63.0		90.2	135.8		
Travel Time (s)	3.8		5.4	9.8		
Confl. Peds. (#/hr)	2		2			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	4%	3%	0%
Adj. Flow (vph)	0	51	0	1370	1455	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	51	0	1370	1472	0
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	50.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑	↑↑↑	↑↑	↑	
Traffic Vol, veh/h	0	51	0	1370	1455	17
Future Vol, veh/h	0	51	0	1370	1455	17
Conflicting Peds, #/hr	2	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	51	0	1370	1455	17

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	738	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	365	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	364	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	364	-
HCM Lane V/C Ratio	-	0.14	-
HCM Control Delay (s)	-	16.5	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.5	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	199	832	126	162	1119	112	308	886	302	315	865	326
Future Volume (vph)	199	832	126	162	1119	112	308	886	302	315	865	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor			0.99	1.00			1.00				1.00	
Frt			0.850			0.850			0.850		0.959	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3539	1509	1752	3505	1417	1752	5187	1553	1641	4607	0
Fit Permitted	0.093			0.246			0.125			0.164		
Satd. Flow (perm)	177	3539	1487	453	3505	1417	230	5187	1553	283	4607	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			136			159		80	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		117.7			375.6			511.5			90.2	
Travel Time (s)		7.1			22.5			30.7			6.5	
Confl. Peds. (#/hr)			3	3			3					3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	7%	3%	3%	14%	3%	0%	4%	10%	7%	9%
Adj. Flow (vph)	199	832	126	162	1119	112	308	886	302	315	865	326
Shared Lane Traffic (%)												
Lane Group Flow (vph)	199	832	126	162	1119	112	308	886	302	315	1191	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	17.0	52.0	52.0	9.0	44.0	44.0	18.0	38.0	38.0	21.0	41.0	
Total Split (%)	14.2%	43.3%	43.3%	7.5%	36.7%	36.7%	15.0%	31.7%	31.7%	17.5%	34.2%	
Maximum Green (s)	13.0	46.0	46.0	5.0	38.0	38.0	14.0	32.0	32.0	17.0	35.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	57.0	46.0	46.0	45.8	38.8	38.8	48.0	32.0	32.0	54.0	35.0	
Actuated g/C Ratio	0.48	0.38	0.38	0.38	0.32	0.32	0.40	0.27	0.27	0.45	0.29	
v/c Ratio	0.80	0.61	0.20	0.71	0.99	0.20	1.14	0.64	0.57	0.99	0.85	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

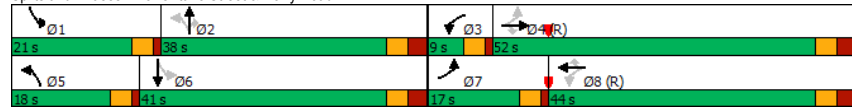
(190237) 550 Ontario St S, RR 25, Milton
Total 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	49.1	32.2	8.0	42.4	64.8	3.7	130.6	41.4	22.2	75.5	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	49.1	32.2	8.0	42.4	64.8	3.7	130.6	41.4	22.2	75.5	44.2	
LOS	D	C	A	D	E	A	F	D	C	E	D	
Approach Delay	32.5			57.3			55.9			50.8		
Approach LOS	C			E			E			D		
Queue Length 50th (m)	30.8	86.5	4.0	22.6	~148.0	0.0	~72.3	71.3	29.8	55.2	95.8	
Queue Length 95th (m)	#67.0	108.2	16.9	#43.8	#196.2	8.8	#130.5	86.7	60.2	#116.0	115.2	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	260	1356	631	227	1133	550	269	1383	530	319	1400	
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	0.77	0.61	0.20	0.71	0.99	0.20	1.14	0.64	0.57	0.99	0.85	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 50.0
 Intersection LOS: D
 Intersection Capacity Utilization 109.0%
 ICU Level of Service H
 Analysis Period (min) 15
 ~ 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.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	199	832	126	162	1119	112	308	886	302	315	865	326
Future Volume (veh/h)	199	832	126	162	1119	112	308	886	302	315	865	326
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1870	1796	1856	1856	1693	1856	1900	1841	1752	1796	1767
Adj Flow Rate, veh/h	199	832	126	162	1119	112	308	886	302	315	865	326
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	7	3	3	14	3	0	4	10	7	9
Cap, veh/h	231	1362	582	247	1191	483	293	1383	415	347	1023	384
Arrive On Green	0.09	0.38	0.38	0.04	0.34	0.34	0.12	0.27	0.27	0.14	0.29	0.29
Sat Flow, veh/h	1810	3554	1519	1767	3526	1431	1767	5187	1555	1668	3507	1316
Grp Volume(v), veh/h	199	832	126	162	1119	112	308	886	302	315	806	385
Grp Sat Flow(s), veh/h/ln	1810	1777	1519	1767	1763	1431	1767	1729	1555	1668	1635	1555
Q Serve(g_s), s	8.3	22.6	6.7	5.0	36.9	6.7	14.0	18.1	21.2	16.3	27.8	28.0
Cycle Q Clear(g_c), s	8.3	22.6	6.7	5.0	36.9	6.7	14.0	18.1	21.2	16.3	27.8	28.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.85
Lane Grp Cap(c), veh/h	231	1362	582	247	1191	483	293	1383	415	347	954	453
V/C Ratio(X)	0.86	0.61	0.22	0.66	0.94	0.23	1.05	0.64	0.73	0.91	0.85	0.85
Avail Cap(c_a), veh/h	270	1362	582	247	1191	483	293	1383	415	347	954	453
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.4	29.8	24.9	32.8	38.5	28.5	32.3	38.9	40.0	28.6	40.0	40.0
Incr Delay (d2), s/veh	21.0	2.0	0.9	6.2	15.1	1.1	66.1	2.3	10.7	26.4	9.1	17.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	3.6	6.9	1.8	2.6	13.5	1.8	9.6	5.9	7.2	7.0	9.6	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	49.5	31.8	25.7	39.0	53.6	29.7	98.4	41.2	50.8	55.0	49.1	57.8
LnGrp LOS	D	C	C	D	D	C	F	D	D	D	D	E
Approach Vol, veh/h	1157			1393			1496			1506		
Approach Delay, s/veh	34.2			50.0			54.9			52.5		
Approach LOS	C			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	38.0	9.0	52.0	18.0	41.0	14.5	46.5				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	17.0	32.0	5.0	46.0	14.0	35.0	13.0	38.0				
Max Q Clear Time (g_c+I1), s	18.3	23.2	7.0	24.6	16.0	30.0	10.3	38.9				
Green Ext Time (p_c), s	0.0	5.1	0.0	7.5	0.0	3.5	0.2	0.0				

Intersection Summary

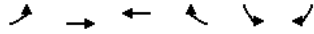
HCM 6th Ctrl Delay 48.7
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↕↕	
Traffic Volume (vph)	9	1082	1393	146	60	3
Future Volume (vph)	9	1082	1393	146	60	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.986		0.994	
Flt Protected	0.950				0.955	
Satd. Flow (prot)	1805	3539	3528	0	1804	0
Flt Permitted	0.950				0.955	
Satd. Flow (perm)	1805	3539	3528	0	1804	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%
Adj. Flow (vph)	9	1082	1393	146	60	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	1082	1539	0	63	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	53.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2029 PM Peak Hour

Intersection						
Int Delay, s/veh	7.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↕↕	
Traffic Vol, veh/h	9	1082	1393	146	60	3
Future Vol, veh/h	9	1082	1393	146	60	3
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	1	0	0	0
Mvmt Flow	9	1082	1393	146	60	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1541	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	437	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	436	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	\$ 321.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	436	-	-	-	52
HCM Lane V/C Ratio	0.021	-	-	-	1.212
HCM Control Delay (s)	13.4	-	-	-	\$ 321.9
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	5.6

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	59	859	107	272	1060	91	181	157	266	124	297	101
Future Volume (vph)	59	859	107	272	1060	91	181	157	266	124	297	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.94	0.99			1.00	0.99		1.00	0.99	
Frt		0.850		0.988			0.906			0.962		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1615	1787	3531	0	1805	1677	0	1770	1804	0
Flt Permitted	0.223			0.163			0.354			0.327		
Satd. Flow (perm)	400	3539	1517	304	3531	0	670	1677	0	607	1804	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			66		11				85			17
Link Speed (k/h)		60							60			60
Link Distance (m)		171.2			370.5				215.4			213.5
Travel Time (s)		10.3			22.2				12.9			12.8
Conf. Peds. (#/hr)			27	27			9		9	9		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	2%	0%	1%	1%	1%	0%	0%	2%	2%	1%	0%
Adj. Flow (vph)	59	859	107	272	1060	91	181	157	266	124	297	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	859	107	272	1151	0	181	423	0	124	398	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	46.0	46.0	46.0	20.0	66.0		50.0	50.0		50.0	50.0	
Total Split (%)	39.7%	39.7%	39.7%	17.2%	56.9%		43.1%	43.1%		43.1%	43.1%	
Maximum Green (s)	40.0	40.0	40.0	16.0	60.0		44.0	44.0		44.0	44.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0	31.0	31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effect Green (s)	41.5	41.5	41.5	62.0	60.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio	0.36	0.36	0.36	0.53	0.52		0.38	0.38		0.38	0.38	
v/c Ratio	0.42	0.68	0.18	0.78	0.63		0.71	0.61		0.54	0.57	

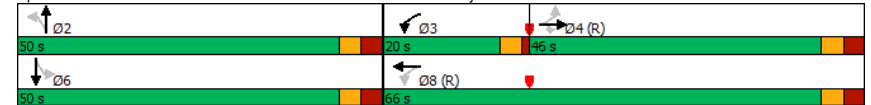
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	40.0	35.2	12.4	33.9	21.7		48.3	27.4		38.7	31.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.0	35.2	12.4	33.9	21.7		48.3	27.4		38.7	31.2	
LOS	D	D	B	C	C		D	C		D	C	
Approach Delay		33.1			24.1			33.7			33.0	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	10.7	92.4	6.5	34.2	98.8		36.4	64.8		22.9	71.5	
Queue Length 95th (m)	25.4	116.5	19.6	#67.4	121.5		#73.2	99.9		44.7	104.3	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	142	1266	585	367	1831		254	688		230	694	
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	0.42	0.68	0.18	0.74	0.63		0.71	0.61		0.54	0.57	

Intersection Summary

Area Type: Other
 Cycle Length: 116
 Actuated Cycle Length: 116
 Offset: 40 (34%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 29.6 Intersection LOS: C
 Intersection Capacity Utilization 106.4% ICU Level of Service G
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2029 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	59	859	107	272	1060	91	181	157	266	124	297	101
Future Volume (veh/h)	59	859	107	272	1060	91	181	157	266	124	297	101
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.96	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1870	1900	1885	1885	1885	1900	1900	1870	1870	1885	1900
Adj Flow Rate, veh/h	59	859	107	272	1060	91	181	157	266	124	297	101
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	2	0	1	1	1	0	0	2	2	1	0
Cap, veh/h	199	1325	579	360	1722	148	265	239	405	229	509	173
Arrive On Green	0.37	0.37	0.37	0.11	0.52	0.52	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	470	3554	1552	1795	3330	286	1000	630	1068	963	1343	457
Grp Volume(v), veh/h	59	859	107	272	570	581	181	0	423	124	0	398
Grp Sat Flow(s),veh/h/ln	470	1777	1552	1795	1791	1825	1000	0	1699	963	0	1799
Q Serve(g_s), s	11.8	23.2	5.4	10.4	26.1	26.2	20.4	0.0	23.9	14.2	0.0	20.5
Cycle Q Clear(g_c), s	21.2	23.2	5.4	10.4	26.1	26.2	40.9	0.0	23.9	38.1	0.0	20.5
Prop In Lane	1.00		1.00	1.00	0.16	1.00	0.63	1.00	0.63	1.00	0.25	0.25
Lane Grp Cap(c), veh/h	199	1325	579	360	926	944	265	0	644	229	0	682
V/C Ratio(X)	0.30	0.65	0.18	0.76	0.62	0.62	0.68	0.00	0.66	0.54	0.00	0.58
Avail Cap(c_a), veh/h	199	1325	579	411	926	944	265	0	644	229	0	682
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.3	30.1	24.5	22.2	19.8	19.8	45.0	0.0	29.8	45.5	0.0	28.7
Incr Delay (d2), s/veh	3.8	2.5	0.7	6.8	3.1	3.0	13.4	0.0	5.2	8.9	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	7.0	1.4	3.1	6.6	6.7	4.7	0.0	7.3	3.1	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	32.5	25.2	29.0	22.9	22.8	58.3	0.0	34.9	54.4	0.0	32.3
LnGrp LOS	D	C	C	C	C	C	E	A	C	D	A	C
Approach Vol, veh/h	1025			1423			604			522		
Approach Delay, s/veh	32.0			24.0			41.9			37.6		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	2		3		4		6		8			
Phs Duration (G+Y+Rc), s	50.0		16.7		49.3		50.0		66.0			
Change Period (Y+Rc), s	6.0		4.0		6.0		6.0		6.0			
Max Green Setting (Gmax), s	44.0		16.0		40.0		44.0		60.0			
Max Q Clear Time (g_c+1), s	42.9		12.4		25.2		40.1		28.2			
Green Ext Time (p_c), s	0.5		0.4		7.0		1.3		11.0			
Intersection Summary												
HCM 6th Ctrl Delay	31.3											
HCM 6th LOS	C											

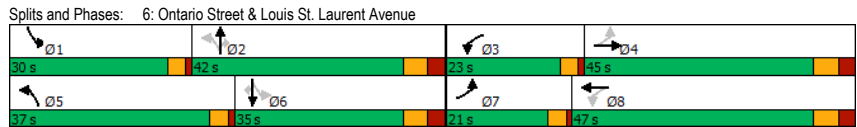
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	238	396	139	221	599	69	575	1181	347	94	818	319
Future Volume (vph)	238	396	139	221	599	69	575	1181	347	94	818	319
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor									0.99	1.00		
Frt	0.961				0.985				0.850		0.850	
Fit Protected	0.950				0.950				0.950		0.950	
Satd. Flow (prot)	1770		3426		0		1787		4988		1615	
Fit Permitted	0.165				0.280				0.156		0.227	
Satd. Flow (perm)	307		3426		0		527		3524		0	
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)			34				9				199	
Link Speed (k/h)			60				60				60	
Link Distance (m)	193.1				250.0				253.7		194.1	
Travel Time (s)	11.6				15.0				15.2		11.6	
Confl. Peds. (#/hr)							1		1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	2%	1%	1%	0%	1%	4%	0%	0%	4%	1%
Adj. Flow (vph)	238	396	139	221	599	69	575	1181	347	94	818	319
Shared Lane Traffic (%)												
Lane Group Flow (vph)	238	535	0	221	668	0	575	1181	347	94	818	319
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			2	6	
Detector Phase	7	4		3	8		5	2		2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0		20.0	5.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0		32.0	9.0	32.0
Total Split (s)	21.0	45.0		23.0	47.0		37.0	42.0		42.0	30.0	35.0
Total Split (%)	15.0%	32.1%		16.4%	33.6%		26.4%	30.0%		30.0%	21.4%	25.0%
Maximum Green (s)	17.0	38.0		19.0	40.0		33.0	35.0		35.0	26.0	28.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0		3.0	1.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0		7.0	4.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max		Max	None	Max
Walk Time (s)		7.0			7.0			7.0		7.0		7.0
Flash Dont Walk (s)		18.0			18.0			16.0		16.0		16.0
Pedestrian Calls (#/hr)		0			0			0		0		0
Act Effct Green (s)	48.2	29.4		47.9	29.2		68.2	52.2		52.2	40.1	28.1
Actuated g/C Ratio	0.38	0.23		0.37	0.23		0.53	0.41		0.41	0.31	0.22
v/c Ratio	0.81	0.66		0.63	0.83		1.06	0.58		0.45	0.41	0.75

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2029 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	49.5	46.3		34.1	55.8		89.9	32.3	14.5	25.6	52.7	16.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.5	46.3		34.1	55.8		89.9	32.3	14.5	25.6	52.7	16.5
LOS	D	D		C	E		F	C	B	C	D	B
Approach Delay	47.3			50.4			45.1			41.2		
Approach LOS	D			D			D			D		
Queue Length 50th (m)	42.8	64.4		39.3	89.3		~148.3	89.3	26.4	12.2	75.7	15.7
Queue Length 95th (m)	#80.0	86.1		58.6	111.8		#245.4	122.4	62.5	24.6	99.6	50.2
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0			20.0			50.0			50.0		
Base Capacity (vph)	311	1042		395	1108		541	2030	766	471	1092	543
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.51		0.56	0.60		1.06	0.58	0.45	0.20	0.75	0.59

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	128.3
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.06
Intersection Signal Delay:	45.4
Intersection Capacity Utilization:	98.8%
Analysis Period (min):	15
~ 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.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2029 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	238	396	139	221	599	69	575	1181	347	94	818	319
Future Volume (veh/h)	238	396	139	221	599	69	575	1181	347	94	818	319
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1885	1870	1885	1885	1900	1885	1841	1900	1900	1841	1885
Adj Flow Rate, veh/h	238	396	139	221	599	69	575	1181	347	94	818	319
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	1	2	1	1	0	1	4	0	0	4	1
Cap, veh/h	306	606	210	339	730	84	560	2143	686	234	1112	353
Arrive On Green	0.12	0.23	0.23	0.11	0.23	0.23	0.26	0.43	0.43	0.06	0.22	0.22
Sat Flow, veh/h	1781	2609	905	1795	3237	372	1795	5025	1609	1810	5025	1595
Grp Volume(v), veh/h	238	270	265	221	331	337	575	1181	347	94	818	319
Grp Sat Flow(s), veh/h/ln	1781	1791	1722	1795	1791	1818	1795	1675	1609	1810	1675	1595
Q Serve(g_s), s	12.8	17.3	17.6	11.8	22.2	22.3	33.0	22.3	20.0	5.0	19.2	24.6
Cycle Q Clear(g_c), s	12.8	17.3	17.6	11.8	22.2	22.3	33.0	22.3	20.0	5.0	19.2	24.6
Prop In Lane	1.00		0.53	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	306	416	400	339	404	410	560	2143	686	234	1112	353
V/C Ratio(X)	0.78	0.65	0.66	0.65	0.82	0.82	1.03	0.55	0.51	0.40	0.74	0.90
Avail Cap(c_a), veh/h	334	538	517	408	566	575	560	2143	686	505	1112	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.1	43.9	44.1	33.2	46.5	46.6	33.4	27.2	26.5	34.9	45.8	48.0
Incr Delay (d2), s/veh	10.3	1.8	2.0	2.7	6.5	6.6	45.1	1.0	2.7	1.1	4.3	28.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	4.8	6.0	6.0	3.9	8.3	8.4	16.5	6.1	5.6	1.7	6.6	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	44.4	45.7	46.1	35.9	53.1	53.2	78.5	28.2	29.2	36.0	50.2	76.7
LnGrp LOS	D	D	D	D	D	D	F	C	C	D	D	E
Approach Vol, veh/h	773			889			2103			1231		
Approach Delay, s/veh	45.4			48.8			42.1			56.0		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	61.0	18.2	36.4	37.0	35.0	19.0	35.5				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	26.0	35.0	19.0	38.0	33.0	28.0	17.0	40.0				
Max Q Clear Time (g_c+I1), s	7.0	24.3	13.8	19.6	35.0	26.6	14.8	24.3				
Green Ext Time (p_c), s	0.3	7.3	0.4	3.6	0.0	1.0	0.2	4.2				

Intersection Summary	
HCM 6th Ctrl Delay	47.2
HCM 6th LOS	D

Appendix K

2031 Future Total Traffic Operations Reports



Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	155	76	112	198	105	48	1192	47	68	800	66
Future Volume (vph)	119	155	76	112	198	105	48	1192	47	68	800	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		0.99		0.99		1.00				
Flt		0.951			0.948			0.994			0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1735	0	1770	1708	0	1752	3384	0	1597	3353	0
Flt Permitted	0.434			0.574			0.295			0.167		
Satd. Flow (perm)	789	1735	0	1060	1708	0	544	3384	0	281	3353	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			22			5			11	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	7		10	10		7		7	7			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	4%	2%	2%	3%	8%	3%	6%	3%	13%	7%	0%
Adj. Flow (vph)	119	155	76	112	198	105	48	1192	47	68	800	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	231	0	112	303	0	48	1239	0	68	866	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0	
Total Split (s)	52.0	52.0		52.0	52.0		48.0	48.0		48.0	48.0	
Total Split (%)	52.0%	52.0%		52.0%	52.0%		48.0%	48.0%		48.0%	48.0%	
Maximum Green (s)	45.0	45.0		45.0	45.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	17.1	17.1		17.1	17.1		42.2	42.2		42.2	42.2	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.58	0.58		0.58	0.58	
v/c Ratio	0.64	0.53		0.45	0.72		0.15	0.63		0.41	0.44	

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

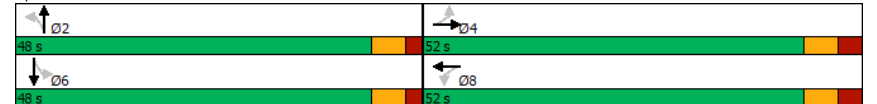
Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	41.1	25.0		29.3	33.8		9.9	12.4		20.1	9.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.1	25.0		29.3	33.8		9.9	12.4		20.1	9.9	
LOS	D	C		C	C		A	B		C	A	
Approach Delay		30.5			32.6			12.3			10.7	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	15.3	24.5		13.6	36.9		2.8	54.6		4.8	32.2	
Queue Length 95th (m)	32.4	44.5		27.9	62.1		9.9	94.1		20.2	56.9	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	493	1096		662	1076		317	1976		164	1961	
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	0.21		0.17	0.28		0.15	0.63		0.41	0.44	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	72.3
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	16.8
Intersection Capacity Utilization:	95.0%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	F

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	119	155	76	112	198	105	48	1192	47	68	800	66
Future Volume (veh/h)	119	155	76	112	198	105	48	1192	47	68	800	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1856	1781	1856	1811	1856	1707	1796	1900
Adj Flow Rate, veh/h	119	155	76	112	198	105	48	1192	47	68	800	66
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	2	2	3	8	3	6	3	13	7	0
Cap, veh/h	264	360	177	323	352	187	324	1778	70	200	1681	139
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	1054	1162	570	1143	1137	603	633	3374	133	410	3190	263
Grp Volume(v), veh/h	119	0	231	112	0	303	48	608	631	68	428	438
Grp Sat Flow(s), veh/h/ln	1054	0	1732	1143	0	1740	633	1721	1786	410	1706	1747
Q Serve(g_s), s	8.5	0.0	8.5	6.9	0.0	11.6	4.1	20.6	20.6	11.6	12.6	12.6
Cycle Q Clear(g_c), s	20.1	0.0	8.5	15.4	0.0	11.6	16.7	20.6	20.6	32.2	12.6	12.6
Prop In Lane	1.00		0.33	1.00		0.35	1.00		0.07	1.00		0.15
Lane Grp Cap(c), veh/h	264	0	537	323	0	539	324	907	941	200	899	921
V/C Ratio(X)	0.45	0.00	0.43	0.35	0.00	0.56	0.15	0.67	0.67	0.34	0.48	0.48
Avail Cap(c_a), veh/h	532	0	978	614	0	983	324	907	941	200	899	921
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.4	0.0	21.9	28.0	0.0	23.0	17.2	13.8	13.8	25.6	11.9	11.9
Incr Delay (d2), s/veh	1.2	0.0	0.5	0.6	0.0	0.9	1.0	3.9	3.8	4.5	1.8	1.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%), veh/ln	2.5	0.0	3.3	2.1	0.0	4.6	0.7	4.9	5.0	1.7	3.4	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.6	0.0	22.4	28.7	0.0	23.9	18.1	17.7	17.6	30.1	13.7	13.7
LnGrp LOS	C	A	C	C	A	C	B	B	B	C	B	B
Approach Vol, veh/h	350			415			1287			934		
Approach Delay, s/veh	25.9			25.2			17.7			14.9		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	48.0		31.7		48.0		31.7					
Change Period (Y+Rc), s	6.0		7.0		6.0		7.0					
Max Green Setting (Gmax), s	42.0		45.0		42.0		45.0					
Max Q Clear Time (g_c+I1), s	22.6		22.1		34.2		17.4					
Green Ext Time (p_c), s	10.0		2.3		4.2		2.9					
Intersection Summary												
HCM 6th Ctrl Delay	18.8											
HCM 6th LOS	B											

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔↔↔	↔↔	↔
Traffic Volume (vph)	0	66	0	1478	1123	4
Future Volume (vph)	0	66	0	1478	1123	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Frt	0.865		0.999			
Fit Protected						
Satd. Flow (prot)	0	1644	0	4893	3403	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	4893	3403	0
Link Speed (k/h)	60		60		50	
Link Distance (m)	63.0		90.2		135.8	
Travel Time (s)	3.8		5.4		9.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	66	0	1478	1123	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	66	0	1478	1127	0
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 41.9%	ICU Level of Service A					
Analysis Period (min) 15						

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑	↑↑↑	↑↑	↑↓	
Traffic Vol, veh/h	0	66	0	1478	1123	4
Future Vol, veh/h	0	66	0	1478	1123	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	66	0	1478	1123	4

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	564	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	474	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	474	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	474	-
HCM Lane V/C Ratio	-	0.139	-
HCM Control Delay (s)	-	13.8	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.5	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑
Traffic Volume (vph)	366	1595	315	278	885	218	184	837	345	181	838	159
Future Volume (vph)	366	1595	315	278	885	218	184	837	345	181	838	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor			0.99	1.00					0.98	1.00		
Frt			0.850			0.850			0.850		0.976	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	5036	1538	1641	4940	1495	1671	4940	1524	1736	4760	0
Fit Permitted	0.211			0.105			0.130			0.215		
Satd. Flow (perm)	385	5036	1515	181	4940	1495	229	4940	1499	392	4760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			123			193			345		32	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		117.7			375.6			511.5			90.2	
Travel Time (s)		7.1			22.5			30.7			6.5	
Confl. Peds. (#/hr)			3	3					5	5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	3%	5%	10%	5%	8%	8%	5%	6%	4%	7%	3%
Adj. Flow (vph)	366	1595	315	278	885	218	184	837	345	181	838	159
Shared Lane Traffic (%)												
Lane Group Flow (vph)	366	1595	315	278	885	218	184	837	345	181	997	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	25.1	41.0	41.0	27.0	42.9	42.9	14.0	39.0	39.0	13.0	38.0	
Total Split (%)	20.9%	34.2%	34.2%	22.5%	35.8%	35.8%	11.7%	32.5%	32.5%	10.8%	31.7%	
Maximum Green (s)	21.1	35.0	35.0	23.0	36.9	36.9	10.0	33.0	33.0	9.0	32.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	60.1	38.4	38.4	59.9	38.2	38.2	45.0	33.0	33.0	43.0	32.0	
Actuated g/C Ratio	0.50	0.32	0.32	0.50	0.32	0.32	0.38	0.28	0.28	0.36	0.27	
v/c Ratio	0.88	0.99	0.55	0.84	0.56	0.36	0.89	0.62	0.52	0.75	0.77	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

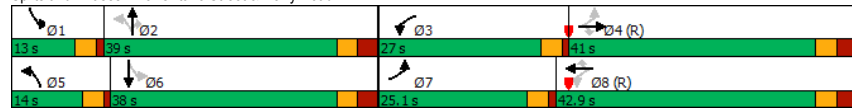
(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	30.6	54.0	21.9	52.5	35.9	8.0	67.9	40.3	6.6	46.3	44.0	
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	30.6	54.0	21.9	52.5	35.9	8.0	67.9	40.3	6.6	46.3	44.0	
LOS	C	D	C	D	D	A	E	D	A	D	D	
Approach Delay	45.8			34.8			35.5			44.4		
Approach LOS	D			C			D			D		
Queue Length 50th (m)	52.3	~157.4	53.3	50.1	67.6	4.4	30.4	66.4	0.0	29.6	81.2	
Queue Length 95th (m)	m#99.8	#197.3	m76.5	#86.8	82.5	23.5	#71.5	81.4	23.6	#48.6	98.5	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0		45.0	70.0		70.0			
Base Capacity (vph)	431	1609	568	374	1574	607	206	1358	662	241	1292	
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	0.85	0.99	0.55	0.74	0.56	0.36	0.89	0.62	0.52	0.75	0.77	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.99
 Intersection Signal Delay: 40.8
 Intersection Capacity Utilization 106.3%
 Analysis Period (min) 15
 ~ 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.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	366	1595	315	278	885	218	184	837	345	181	838	159
Future Volume (veh/h)	366	1595	315	278	885	218	184	837	345	181	838	159
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1856	1826	1752	1826	1781	1781	1826	1811	1841	1796	1856
Adj Flow Rate, veh/h	366	1595	315	278	885	218	184	837	345	181	838	159
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	3	5	10	5	8	8	5	6	4	7	3
Cap, veh/h	426	1719	524	308	1628	492	244	1371	420	251	1104	208
Arrive On Green	0.16	0.34	0.34	0.14	0.33	0.33	0.08	0.28	0.28	0.08	0.27	0.27
Sat Flow, veh/h	1753	5066	1543	1668	4985	1506	1697	4985	1526	1753	4139	780
Grp Volume(v), veh/h	366	1595	315	278	885	218	184	837	345	181	661	336
Grp Sat Flow(s), veh/h/ln	1753	1689	1543	1668	1662	1506	1697	1662	1526	1753	1635	1651
Q Serve(g_s), s	16.4	36.4	20.3	14.7	17.4	13.7	9.5	17.6	25.4	9.0	22.3	22.5
Cycle Q Clear(g_c), s	16.4	36.4	20.3	14.7	17.4	13.7	9.5	17.6	25.4	9.0	22.3	22.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	426	1719	524	308	1628	492	244	1371	420	251	872	440
V/C Ratio(X)	0.86	0.93	0.60	0.90	0.54	0.44	0.75	0.61	0.82	0.72	0.76	0.76
Avail Cap(c_a), veh/h	459	1719	524	388	1628	492	244	1371	420	251	872	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	38.2	32.9	32.9	33.1	31.8	31.6	37.9	40.7	31.1	40.4	40.5
Incr Delay (d2), s/veh	14.3	10.2	5.0	20.5	1.3	2.9	12.5	2.0	16.4	9.6	6.1	11.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%), veh/ln	9.6	17.7	10.1	9.6	8.9	7.1	6.3	9.3	13.7	6.3	12.1	13.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	38.3	48.5	38.0	53.4	34.4	34.7	44.1	39.9	57.2	40.6	46.6	52.4
LnGrp LOS	D	D	D	D	C	C	D	D	E	D	D	D
Approach Vol, veh/h	2276			1381			1366			1178		
Approach Delay, s/veh	45.4			38.3			44.9			47.3		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	39.0	21.3	46.7	14.0	38.0	22.8	45.2				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	9.0	33.0	23.0	35.0	10.0	32.0	21.1	36.9				
Max Q Clear Time (g_c+I1), s	11.0	27.4	16.7	38.4	11.5	24.5	18.4	19.4				
Green Ext Time (p_c), s	0.0	3.5	0.6	0.0	0.0	4.2	0.5	7.5				

Intersection Summary

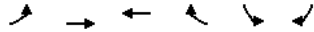
HCM 6th Ctrl Delay 44.0
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕ ↑↑↑	↑↑↑	↑↑↑		↕	
Traffic Volume (vph)	2	2087	1266	35	77	4
Future Volume (vph)	2	2087	1266	35	77	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.993	
Flt Protected	0.950				0.955	
Satd. Flow (prot)	1805	5085	4973	0	1372	0
Flt Permitted	0.950				0.955	
Satd. Flow (perm)	1805	5085	4973	0	1372	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	0%	33%	0%
Adj. Flow (vph)	2	2087	1266	35	77	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	2087	1301	0	81	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Intersection						
Int Delay, s/veh	9.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕ ↑↑↑	↑↑↑	↑↑↑		↕	
Traffic Vol, veh/h	2	2087	1266	35	77	4
Future Vol, veh/h	2	2087	1266	35	77	4
Conflicting Peds, #/hr	7	0	0	7	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	4	0	33	0
Mvmt Flow	2	2087	1266	35	77	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1308	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	5.3	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	3.1	-	-
Pot Cap-1 Maneuver	282	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	280	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	\$ 410.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	280	-	-	-	55
HCM Lane V/C Ratio	0.007	-	-	-	1.473
HCM Control Delay (s)	17.9	-	-	-	\$ 410.7
HCM Lane LOS	C	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	7.4

Notes

--: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	174	1806	53	168	908	121	84	141	278	140	113	96
Future Volume (vph)	174	1806	53	168	908	121	84	141	278	140	113	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		1.00	0.99		0.99	1.00		0.99
Frt			0.850		0.982			0.900			0.931	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	5036	1568	1770	4790	0	1770	1660	0	1703	1657	0
Flt Permitted	0.266			0.067			0.556			0.281		
Satd. Flow (perm)	471	5036	1524	125	4790	0	1029	1660	0	503	1657	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)			64		33			89			38	
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		171.2			370.5			215.4			213.5	
Travel Time (s)		10.3			22.2			12.9			12.8	
Conf. Peds. (#/hr)	5		5	5		5	8		3	3		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	3%	3%	2%	6%	6%	2%	2%	2%	6%	3%	9%
Adj. Flow (vph)	174	1806	53	168	908	121	84	141	278	140	113	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	1806	53	168	1029	0	84	419	0	140	209	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	61.8	61.8	61.8	12.2	74.0		46.0	46.0		46.0	46.0	
Total Split (%)	51.5%	51.5%	51.5%	10.2%	61.7%		38.3%	38.3%		38.3%	38.3%	
Maximum Green (s)	55.8	55.8	55.8	8.2	68.0		40.0	40.0		40.0	40.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effect Green (s)	55.8	55.8	55.8	70.0	68.0		40.0	40.0		40.0	40.0	
Actuated g/C Ratio	0.46	0.46	0.46	0.58	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.79	0.77	0.07	0.91	0.38		0.24	0.68		0.84	0.36	

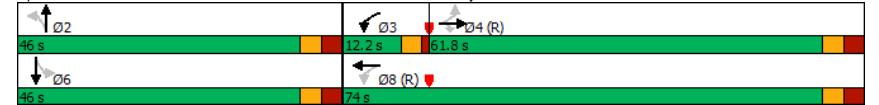
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	55.1	29.6	3.5	60.3	7.7		31.5	33.5		76.4	26.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.1	29.6	3.5	60.3	7.7		31.5	33.5		76.4	26.7	
LOS	E	C	A	E	A		C	C		E	C	
Approach Delay		31.1			15.1			33.2			46.6	
Approach LOS		C			B			C			D	
Queue Length 50th (m)	35.7	133.4	0.0	11.7	44.9		15.1	71.0		31.9	31.6	
Queue Length 95th (m)	#79.7	153.4	5.7	m#56.4	m47.9		28.9	109.3		#71.3	53.2	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	219	2341	742	185	2728		343	612		167	577	
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	0.79	0.77	0.07	0.91	0.38		0.24	0.68		0.84	0.36	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 28.0 Intersection LOS: C
 Intersection Capacity Utilization 104.2% ICU Level of Service G
 Analysis Period (min) 15
 # 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.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	174	1806	53	168	908	121	84	141	278	140	113	96
Future Volume (veh/h)	174	1806	53	168	908	121	84	141	278	140	113	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1796	1856	1856	1870	1811	1811	1870	1870	1870	1811	1856	1767
Adj Flow Rate, veh/h	174	1806	53	168	908	121	84	141	278	140	113	96
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	3	2	6	6	2	2	2	6	3	9
Cap, veh/h	299	2380	735	217	2501	332	341	186	368	162	308	261
Arrive On Green	0.47	0.47	0.47	0.06	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	526	5066	1564	1781	4413	586	1168	559	1103	936	923	784
Grp Volume(v), veh/h	174	1806	53	168	677	352	84	0	419	140	0	209
Grp Sat Flow(s),veh/h/ln	526	1689	1564	1781	1648	1703	1168	0	1662	936	0	1708
Q Serve(g_s), s	32.4	35.3	2.2	5.6	13.4	13.5	7.1	0.0	27.0	13.0	0.0	11.2
Cycle Q Clear(g_c), s	34.3	35.3	2.2	5.6	13.4	13.5	18.2	0.0	27.0	40.0	0.0	11.2
Prop In Lane	1.00		1.00	1.00	0.34	1.00	0.66	1.00	0.66	1.00	0.00	0.46
Lane Grp Cap(c), veh/h	299	2380	735	217	1868	965	341	0	554	162	0	569
V/C Ratio(X)	0.58	0.76	0.07	0.78	0.36	0.36	0.25	0.00	0.76	0.87	0.00	0.37
Avail Cap(c_a), veh/h	299	2380	735	225	1868	965	341	0	554	162	0	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	26.2	17.5	24.9	14.2	14.2	37.3	0.0	35.7	55.3	0.0	30.4
Incr Delay (d2), s/veh	8.1	2.3	0.2	15.0	0.5	1.1	1.7	0.0	9.3	42.3	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.7	13.9	1.0	3.7	4.7	5.2	3.0	0.0	14.0	9.2	0.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.8	28.5	17.7	39.9	14.7	15.3	39.0	0.0	44.9	97.5	0.0	32.2
LnGrp LOS	C	C	B	D	B	B	D	A	D	F	A	C
Approach Vol, veh/h	2033			1197			503			349		
Approach Delay, s/veh	28.8			18.4			44.0			58.4		
Approach LOS	C			B			D			E		
Timer - Assigned Phs	2	3	4	6			8					
Phs Duration (G+Y+Rc), s	46.0	11.6	62.4	46.0			74.0					
Change Period (Y+Rc), s	6.0	4.0	6.0	6.0			6.0					
Max Green Setting (Gmax), s	40.0	8.2	55.8	40.0			68.0					
Max Q Clear Time (g_c+I1), s	29.0	7.6	37.3	42.0			15.5					
Green Ext Time (p_c), s	2.7	0.0	15.0	0.0			10.4					
Intersection Summary												
HCM 6th Ctrl Delay	30.2											
HCM 6th LOS	C											

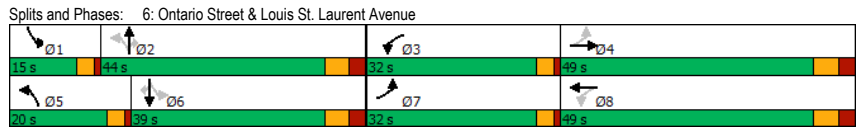
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	382	613	374	464	539	60	202	873	187	46	1203	180
Future Volume (vph)	382	613	374	464	539	60	202	873	187	46	1203	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	1.00				1.00				0.98	1.00		
Frt		0.943			0.985				0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3305	0	1736	3407	0	1641	4848	1538	1703	4848	1524
Fit Permitted	0.350			0.089			0.108		0.263			
Satd. Flow (perm)	645	3305	0	163	3407	0	187	4848	1514	471	4848	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95			9				148			125
Link Speed (k/h)		60			60			60				60
Link Distance (m)		193.1			250.0			253.7				194.1
Travel Time (s)		11.6			15.0			15.2				11.6
Confl. Peds. (#/hr)	3				3			2		2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	4%	4%	6%	10%	7%	5%	6%	7%	6%
Adj. Flow (vph)	382	613	374	464	539	60	202	873	187	46	1203	180
Shared Lane Traffic (%)												
Lane Group Flow (vph)	382	987	0	464	599	0	202	873	187	46	1203	180
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1		6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	32.0	49.0		32.0	49.0		20.0	44.0	44.0	15.0	39.0	39.0
Total Split (%)	22.9%	35.0%		22.9%	35.0%		14.3%	31.4%	31.4%	10.7%	27.9%	27.9%
Maximum Green (s)	28.0	42.0		28.0	42.0		16.0	37.0	37.0	11.0	32.0	32.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	66.3	40.7		74.5	46.2		54.5	41.7	41.7	42.8	32.0	32.0
Actuated g/C Ratio	0.48	0.29		0.54	0.33		0.39	0.30	0.30	0.31	0.23	0.23
v/c Ratio	0.78	0.95		1.14	0.52		0.86	0.60	0.33	0.21	1.07	0.40

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	30.8	61.1		127.8	39.4		65.5	44.2	12.0	29.6	98.2	18.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	61.1		127.8	39.4		65.5	44.2	12.0	29.6	98.2	18.1
LOS	C	E		F	D		E	D	B	C	F	B
Approach Delay	52.7			78.0			42.8			85.9		
Approach LOS	D			E			D			F		
Queue Length 50th (m)	61.8	136.0		~141.1	72.7		42.0	81.3	8.4	8.3	~143.7	12.9
Queue Length 95th (m)	86.5	#178.7		#215.2	97.4		#86.5	99.4	29.7	17.3	#174.7	35.8
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0		20.0		50.0		50.0		50.0		50.0	
Base Capacity (vph)	558	1071		406	1144		241	1462	560	254	1122	448
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.92		1.14	0.52		0.84	0.60	0.33	0.18	1.07	0.40

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 138.3	
Natural Cycle: 100	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.14	
Intersection Signal Delay: 64.8	Intersection LOS: E
Intersection Capacity Utilization 107.4%	ICU Level of Service G
Analysis Period (min) 15	
- 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.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	382	613	374	464	539	60	202	873	187	46	1203	180
Future Volume (veh/h)	382	613	374	464	539	60	202	873	187	46	1203	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1811	1752	1796	1826	1811	1796	1811
Adj Flow Rate, veh/h	382	613	374	464	539	60	202	873	187	46	1203	180
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	4	4	6	10	7	5	6	7	6
Cap, veh/h	511	636	388	415	1073	119	227	1500	473	184	1134	354
Arrive On Green	0.17	0.30	0.30	0.20	0.34	0.34	0.10	0.31	0.31	0.03	0.23	0.23
Sat Flow, veh/h	1767	2101	1282	1753	3173	352	1668	4904	1544	1725	4904	1531
Grip Volume(v), veh/h	382	514	473	464	296	303	202	873	187	46	1203	180
Grip Sat Flow(s), veh/h/ln	1767	1763	1620	1753	1749	1776	1668	1635	1544	1725	1635	1531
Q Serve(g_s), s	20.2	39.8	39.8	28.0	18.7	18.8	12.4	20.8	13.2	2.8	32.0	14.2
Cycle Q Clear(g_c), s	20.2	39.8	39.8	28.0	18.7	18.8	12.4	20.8	13.2	2.8	32.0	14.2
Prop In Lane	1.00		0.79	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	511	534	491	415	591	601	227	1500	473	184	1134	354
V/C Ratio(X)	0.75	0.96	0.96	1.12	0.50	0.50	0.89	0.58	0.40	0.25	1.06	0.51
Avail Cap(c_a), veh/h	574	535	492	415	591	601	245	1500	473	269	1134	354
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	47.5	47.5	43.4	36.5	36.5	37.4	40.6	37.9	39.3	53.2	46.4
Incr Delay (d2), s/veh	4.7	29.7	31.3	79.9	0.7	0.7	29.4	1.7	2.5	0.7	44.6	5.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%), veh/ln	10.5	24.5	23.1	26.6	10.2	10.3	9.5	10.8	7.5	1.7	22.0	8.4
Unsig. Movement Delay, s/veh												
LnGrip Delay(d), s/veh	30.9	77.2	78.8	123.3	37.2	37.2	66.8	42.2	40.4	40.0	97.8	51.5
LnGrip LOS	C	E	E	F	D	D	E	D	D	D	F	D
Approach Vol, veh/h	1369			1063			1262			1429		
Approach Delay, s/veh	64.8			74.8			45.9			90.1		
Approach LOS	E			E			D			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	49.4	32.0	48.9	18.5	39.0	27.1	53.8				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	11.0	37.0	28.0	42.0	16.0	32.0	28.0	42.0				
Max Q Clear Time (g_c+I1), s	4.8	22.8	30.0	41.8	14.4	34.0	22.2	20.8				
Green Ext Time (p_c), s	0.0	6.5	0.0	0.2	0.1	0.0	0.9	4.2				

Intersection Summary	
HCM 6th Ctrl Delay	69.3
HCM 6th LOS	E

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	105	297	65	128	330	131	96	1037	104	189	1200	152
Future Volume (vph)	105	297	65	128	330	131	96	1037	104	189	1200	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00		1.00		1.00		1.00		1.00
Frt		0.973			0.957			0.986			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1827	0	1787	1800	0	1787	3419	0	1787	3443	0
Flt Permitted	0.248			0.386			0.152			0.106		
Satd. Flow (perm)	466	1827	0	723	1800	0	286	3419	0	199	3443	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)		14			25			11			17	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	3		7	7		3	2		8	8		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	0%	1%	0%	2%	1%	4%	1%	1%	3%	1%
Adj. Flow (vph)	105	297	65	128	330	131	96	1037	104	189	1200	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	362	0	128	461	0	96	1141	0	189	1352	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		4.5	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		9.0	21.0	
Total Split (s)	50.0	50.0		50.0	50.0		39.0	39.0		11.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		39.0%	39.0%		11.0%	50.0%	
Maximum Green (s)	43.0	43.0		43.0	43.0		33.0	33.0		6.5	44.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	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		4.5	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	25.4	25.4		25.4	25.4		33.3	33.3		45.8	44.3	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.40	0.40		0.55	0.54	
v/c Ratio	0.74	0.64		0.58	0.81		0.84	0.83		0.80	0.73	

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	55.5	28.7		34.8	36.7		80.7	29.9		41.4	18.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.5	28.7		34.8	36.7		80.7	29.9		41.4	18.9	
LOS	E	C		C	D		F	C		D	B	
Approach Delay		34.7			36.3			33.9			21.6	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	15.4	49.0		17.6	65.9		13.8	84.8		14.2	81.7	
Queue Length 95th (m)	#38.6	75.6		35.6	100.3		#50.3	#153.9		#60.6	143.7	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0			35.0			15.0			40.0		
Base Capacity (vph)	243	963		378	953		114	1379		235	1851	
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	0.43	0.38		0.34	0.48		0.84	0.83		0.80	0.73	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 82.8

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 29.4

Intersection LOS: C

Intersection Capacity Utilization 106.0%

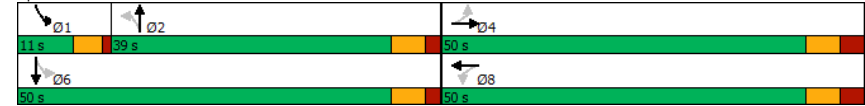
ICU Level of Service G

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔		↔		↔		↔		↔
Traffic Volume (veh/h)	105	297	65	128	330	131	96	1037	104	189	1200	152
Future Volume (veh/h)	105	297	65	128	330	131	96	1037	104	189	1200	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1900	1885	1900	1870	1885	1841	1885	1885	1856	1885
Adj Flow Rate, veh/h	105	297	65	128	330	131	96	1037	104	189	1200	152
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	0	1	0	2	1	4	1	1	3	1
Cap, veh/h	226	557	122	301	480	191	147	1166	117	237	1525	193
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.36	0.36	0.36	0.07	0.48	0.48
Sat Flow, veh/h	937	1497	328	1026	1292	513	406	3206	321	1795	3146	397
Grp Volume(v), veh/h	105	0	362	128	0	461	96	565	576	189	671	681
Grp Sat Flow(s),veh/h/ln	937	0	1824	1026	0	1804	406	1749	1779	1795	1763	1780
Q Serve(g_s), s	9.7	0.0	14.1	10.1	0.0	19.6	15.0	27.6	27.6	5.8	28.7	29.0
Cycle Q Clear(g_c), s	29.2	0.0	14.1	24.3	0.0	19.6	33.0	27.6	27.6	5.8	28.7	29.0
Prop In Lane	1.00		0.18	1.00		0.28	1.00		0.18	1.00		0.22
Lane Grp Cap(c), veh/h	226	0	678	301	0	671	147	636	647	237	855	863
V/C Ratio(X)	0.46	0.00	0.53	0.42	0.00	0.69	0.66	0.89	0.89	0.80	0.78	0.79
Avail Cap(c_a), veh/h	321	0	864	406	0	855	147	636	647	237	855	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	0.0	22.3	31.8	0.0	24.0	40.1	27.2	27.2	21.3	19.4	19.5
Incr Delay (d2), s/veh	1.5	0.0	0.7	1.0	0.0	1.6	20.6	16.9	16.8	17.0	7.1	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	3.4	1.7	0.0	4.8	2.4	9.2	9.3	2.3	7.2	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.9	0.0	23.0	32.8	0.0	25.7	60.7	44.1	44.0	38.3	26.6	26.8
LnGrp LOS	D	A	C	C	A	C	E	D	D	D	C	C
Approach Vol, veh/h	467			589			1237			1541		
Approach Delay, s/veh	26.3			27.2			45.3			28.1		
Approach LOS	C			C			D			C		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	11.0	39.0	40.7		50.0		40.7					
Change Period (Y+Rc), s	4.5	6.0	7.0		6.0		7.0					
Max Green Setting (Gmax), s	6.5	33.0	43.0		44.0		43.0					
Max Q Clear Time (g_c+I1), s	7.8	35.0	31.2		31.0		26.3					
Green Ext Time (p_c), s	0.0	0.0	2.5		8.4		3.9					
Intersection Summary												
HCM 6th Ctrl Delay	33.3											
HCM 6th LOS	C											

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔		↔	
Traffic Volume (vph)	0	51	0	1452	1544	17
Future Volume (vph)	0	51	0	1452	1544	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Ped Bike Factor						
Frt	0.865		0.998			
Fit Protected						
Satd. Flow (prot)	0	1644	0	4988	3499	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	4988	3499	0
Link Speed (k/h)	60		60		50	
Link Distance (m)	63.0		90.2		135.8	
Travel Time (s)	3.8		5.4		9.8	
Confl. Peds. (#/hr)	2		2		2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	4%	3%	0%
Adj. Flow (vph)	0	51	0	1452	1544	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	51	0	1452	1561	0
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	53.2%		ICU Level of Service A			
Analysis Period (min)	15					

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑	↑↑↑	↑↑	↑	
Traffic Vol, veh/h	0	51	0	1452	1544	17
Future Vol, veh/h	0	51	0	1452	1544	17
Conflicting Peds, #/hr	2	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	51	0	1452	1544	17

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	783	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	341	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	340	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	340	-
HCM Lane V/C Ratio	-	0.15	-
HCM Control Delay (s)	-	17.4	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.5	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑
Traffic Volume (vph)	296	1243	184	245	1643	170	324	940	321	332	917	345
Future Volume (vph)	296	1243	184	245	1643	170	324	940	321	332	917	345
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor			0.99	1.00			1.00				1.00	
Frt			0.850			0.850			0.850		0.959	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	5085	1509	1752	5036	1417	1752	5187	1553	1641	4607	0
Fit Permitted	0.097			0.104			0.129			0.133		
Satd. Flow (perm)	184	5085	1487	192	5036	1417	238	5187	1553	230	4607	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			100			237		80	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		117.7			375.6			511.5			90.2	
Travel Time (s)		7.1			22.5			30.7			6.5	
Confl. Peds. (#/hr)			3	3			3					3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	7%	3%	3%	14%	3%	0%	4%	10%	7%	9%
Adj. Flow (vph)	296	1243	184	245	1643	170	324	940	321	332	917	345
Shared Lane Traffic (%)												
Lane Group Flow (vph)	296	1243	184	245	1643	170	324	940	321	332	1262	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	17.0	47.0	47.0	18.0	48.0	48.0	14.0	37.0	37.0	18.0	41.0	
Total Split (%)	14.2%	39.2%	39.2%	15.0%	40.0%	40.0%	11.7%	30.8%	30.8%	15.0%	34.2%	
Maximum Green (s)	13.0	41.0	41.0	14.0	42.0	42.0	10.0	31.0	31.0	14.0	35.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	56.2	41.2	41.2	57.8	42.0	42.0	43.0	31.0	31.0	51.0	35.0	
Actuated g/C Ratio	0.47	0.34	0.34	0.48	0.35	0.35	0.36	0.26	0.26	0.42	0.29	
v/c Ratio	1.13	0.71	0.32	0.90	0.93	0.30	1.54	0.70	0.56	1.27	0.90	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

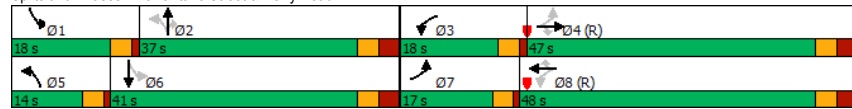
(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	110.7	35.6	19.5	63.7	48.4	13.6	288.4	43.6	14.6	174.4	48.1	
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	110.7	35.6	19.5	63.7	48.4	13.6	288.4	43.6	14.6	174.4	48.1	
LOS	F	D	B	E	D	B	F	D	B	F	D	
Approach Delay	46.8			47.4			87.8			74.4		
Approach LOS	D			D			F			E		
Queue Length 50th (m)	~68.8	105.0	26.3	41.5	142.8	11.8	~96.1	77.5	16.4	~85.3	104.1	
Queue Length 95th (m)	m#120.3	m121.5	m42.6	#90.0	#174.9	29.3	#155.4	93.6	46.1	#145.1	#127.9	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0		35.0		45.0		70.0		70.0	
Base Capacity (vph)	261	1746	576	274	1762	560	211	1339	576	262	1400	
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	1.13	0.71	0.32	0.89	0.93	0.30	1.54	0.70	0.56	1.27	0.90	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.54
 Intersection Signal Delay: 62.6
 Intersection LOS: E
 Intersection Capacity Utilization 116.1%
 ICU Level of Service H
 Analysis Period (min) 15
 ~ 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.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔
Traffic Volume (veh/h)	296	1243	184	245	1643	170	324	940	321	332	917	345
Future Volume (veh/h)	296	1243	184	245	1643	170	324	940	321	332	917	345
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1870	1796	1856	1856	1693	1856	1900	1841	1752	1796	1767
Adj Flow Rate, veh/h	296	1243	184	245	1643	170	324	940	321	332	917	345
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	7	3	3	14	3	0	4	10	7	9
Cap, veh/h	266	1801	536	300	1773	501	225	1340	402	293	1023	384
Arrive On Green	0.11	0.35	0.35	0.11	0.35	0.35	0.08	0.26	0.26	0.12	0.29	0.29
Sat Flow, veh/h	1810	5106	1518	1767	5066	1431	1767	5187	1554	1668	3507	1316
Grp Volume(v), veh/h	296	1243	184	245	1643	170	324	940	321	332	855	407
Grp Sat Flow(s), veh/h/ln	1810	1702	1518	1767	1689	1431	1767	1729	1554	1668	1635	1554
Q Serve(g_s), s	13.0	25.0	10.7	10.5	37.4	10.5	10.0	19.7	23.2	14.0	30.1	30.2
Cycle Q Clear(g_c), s	13.0	25.0	10.7	10.5	37.4	10.5	10.0	19.7	23.2	14.0	30.1	30.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.85
Lane Grp Cap(c), veh/h	266	1801	536	300	1773	501	225	1340	402	293	954	453
V/C Ratio(X)	1.11	0.69	0.34	0.82	0.93	0.34	1.44	0.70	0.80	1.13	0.90	0.90
Avail Cap(c_a), veh/h	266	1801	536	320	1773	501	225	1340	402	293	954	453
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	33.2	28.6	26.1	37.5	28.8	36.2	40.3	41.6	32.7	40.8	40.8
Incr Delay (d2), s/veh	88.9	2.2	1.7	14.3	9.9	1.8	222.1	3.1	15.3	92.8	12.8	23.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	9.5	7.5	3.0	3.9	12.2	2.8	17.3	6.5	8.2	11.9	10.8	11.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	123.5	35.4	30.3	40.4	47.4	30.6	258.3	43.4	56.9	125.5	53.6	64.1
LnGrp LOS	F	D	C	D	D	C	F	D	E	F	D	E
Approach Vol, veh/h	1723			2058			1585			1594		
Approach Delay, s/veh	50.0			45.2			90.1			71.2		
Approach LOS	D			D			F			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.0	37.0	16.7	48.3	14.0	41.0	17.0	48.0				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	14.0	31.0	14.0	41.0	10.0	35.0	13.0	42.0				
Max Q Clear Time (g_c+I1), s	16.0	25.2	12.5	27.0	12.0	32.2	15.0	39.4				
Green Ext Time (p_c), s	0.0	3.9	0.2	8.7	0.0	2.1	0.0	2.3				

Intersection Summary

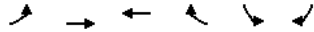
HCM 6th Ctrl Delay 62.6
 HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑↑↑	↑↑↑		↔	
Traffic Volume (vph)	9	1640	2110	146	60	3
Future Volume (vph)	9	1640	2110	146	60	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.990		0.994	
Flt Protected	0.950				0.955	
Satd. Flow (prot)	1805	5085	5088	0	1804	0
Flt Permitted	0.950				0.955	
Satd. Flow (perm)	1805	5085	5088	0	1804	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%
Adj. Flow (vph)	9	1640	2110	146	60	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	1640	2256	0	63	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.2%
Analysis Period (min)	15
	ICU Level of Service A

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Intersection

Int Delay, s/veh	12.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑↑↑	↑↑↑		↔	
Traffic Vol, veh/h	9	1640	2110	146	60	3
Future Vol, veh/h	9	1640	2110	146	60	3
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	1	0	0	0
Mvmt Flow	9	1640	2110	146	60	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2258	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	5.3	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	3.1	-	-
Pot Cap-1 Maneuver	95	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	95	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	\$ 753.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	95	-	-	-	31
HCM Lane V/C Ratio	0.095	-	-	-	2.032
HCM Control Delay (s)	46.8	-	-	-	\$ 753.6
HCM Lane LOS	E	-	-	-	F
HCM 95th %tile Q(veh)	0.3	-	-	-	7.3

Notes

--: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	90	1298	163	412	1603	138	192	167	282	131	315	107
Future Volume (vph)	90	1298	163	412	1603	138	192	167	282	131	315	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.94	1.00			1.00	0.99		1.00	0.99	
Frt			0.850		0.988			0.906			0.962	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	5085	1615	1787	5074	0	1805	1677	0	1770	1804	0
Fit Permitted	0.124			0.112			0.256			0.222		
Satd. Flow (perm)	222	5085	1515	210	5074	0	485	1677	0	412	1804	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94		20			74			15	
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		171.2			370.5			215.4			213.5	
Travel Time (s)		10.3			22.2			12.9			12.8	
Conf. Peds. (#/hr)			27	27			9		9	9		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	2%	0%	1%	1%	1%	0%	0%	2%	2%	1%	0%
Adj. Flow (vph)	90	1298	163	412	1603	138	192	167	282	131	315	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	1298	163	412	1741	0	192	449	0	131	422	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	55.0	55.0	55.0	21.0	76.0		44.0	44.0		44.0	44.0	
Total Split (%)	45.8%	45.8%	45.8%	17.5%	63.3%		36.7%	36.7%		36.7%	36.7%	
Maximum Green (s)	49.0	49.0	49.0	17.0	70.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0	31.0	31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effect Green (s)	49.0	49.0	49.0	72.0	70.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.41	0.41	0.41	0.60	0.58		0.32	0.32		0.32	0.32	
v/c Ratio	1.00	0.63	0.24	1.18	0.59		1.25	0.77		1.01	0.73	

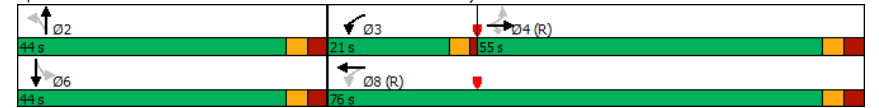
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	133.9	29.9	11.1	123.1	7.2		193.1	41.1		123.6	43.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	133.9	29.9	11.1	123.1	7.2		193.1	41.1		123.6	43.5	
LOS	F	C	B	F	A		F	D		F	D	
Approach Delay		33.9			29.4			86.6			62.5	
Approach LOS		C			C			F			E	
Queue Length 50th (m)	21.9	92.3	10.5	-93.1	28.2		-59.4	85.2		-32.7	89.5	
Queue Length 95th (m)	#58.1	108.5	25.5	m#99.3	m29.1		#107.4	127.6		#75.2	128.4	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	90	2076	674	349	2968		153	581		130	581	
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	1.00	0.63	0.24	1.18	0.59		1.25	0.77		1.01	0.73	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.25
 Intersection Signal Delay: 42.0 Intersection LOS: D
 Intersection Capacity Utilization 111.0% ICU Level of Service H
 Analysis Period (min) 15
 ~ 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.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	90	1298	163	412	1603	138	192	167	282	131	315	107
Future Volume (veh/h)	90	1298	163	412	1603	138	192	167	282	131	315	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1870	1900	1885	1885	1885	1900	1900	1870	1870	1885	1900
Adj Flow Rate, veh/h	90	1298	163	412	1603	138	192	167	282	131	315	107
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	2	0	1	1	1	0	0	2	2	1	0
Cap, veh/h	160	2085	636	390	2809	242	165	200	338	127	425	144
Arrive On Green	0.41	0.41	0.41	0.14	0.58	0.58	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	268	5106	1557	1795	4816	414	978	631	1066	940	1342	456
Grp Volume(v), veh/h	90	1298	163	412	1141	600	192	0	449	131	0	422
Grp Sat Flow(s),veh/h/ln	268	1702	1557	1795	1716	1799	978	0	1697	940	0	1798
Q Serve(g_s), s	38.0	24.2	8.3	17.0	24.9	25.0	12.9	0.0	29.5	8.5	0.0	25.1
Cycle Q Clear(g_c), s	42.0	24.2	8.3	17.0	24.9	25.0	38.0	0.0	29.5	38.0	0.0	25.1
Prop In Lane	1.00		1.00	1.00		0.23	1.00		0.63	1.00		0.25
Lane Grp Cap(c), veh/h	160	2085	636	390	2001	1049	165	0	537	127	0	570
V/C Ratio(X)	0.56	0.62	0.26	1.06	0.57	0.57	1.16	0.00	0.84	1.03	0.00	0.74
Avail Cap(c_a), veh/h	160	2085	636	390	2001	1049	165	0	537	127	0	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.3	28.2	23.5	28.1	15.6	15.6	55.9	0.0	38.1	57.8	0.0	36.6
Incr Delay (d2), s/veh	13.4	1.4	1.0	61.3	1.2	2.3	121.3	0.0	14.3	89.5	0.0	8.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	6.7	2.2	9.5	4.8	5.4	9.6	0.0	10.8	6.3	0.0	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.7	29.6	24.4	89.4	16.8	17.9	177.2	0.0	52.3	147.2	0.0	45.0
LnGrp LOS	D	C	C	F	B	B	F	A	D	F	A	D
Approach Vol, veh/h	1551			2153			641			553		
Approach Delay, s/veh	30.1			31.0			89.8			69.2		
Approach LOS	C			C			F			E		
Timer - Assigned Phs	2		3		4		6		8			
Phs Duration (G+Y+Rc), s	44.0		21.0		55.0		44.0		76.0			
Change Period (Y+Rc), s	6.0		4.0		6.0		6.0		6.0			
Max Green Setting (Gmax), s	38.0		17.0		49.0		38.0		70.0			
Max Q Clear Time (g_c+I1), s	40.0		19.0		44.0		40.0		27.0			
Green Ext Time (p_c), s	0.0		0.0		4.2		0.0		22.0			
Intersection Summary												
HCM 6th Ctrl Delay	42.7											
HCM 6th LOS	D											

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	247	412	145	230	623	72	610	1251	368	100	866	338
Future Volume (vph)	247	412	145	230	623	72	610	1251	368	100	866	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0		100.0				90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor									0.99	1.00		
Frt	0.961				0.984				0.850		0.850	
Fit Protected	0.950				0.950				0.950		0.950	
Satd. Flow (prot)	1770		3426		0		1787		4988		1615	
Fit Permitted	0.155				0.269				0.130		0.211	
Satd. Flow (perm)	289		3426		0		506		3521		0	
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)	35				9				200		248	
Link Speed (k/h)	60				60				60		60	
Link Distance (m)	193.1				250.0				253.7		194.1	
Travel Time (s)	11.6				15.0				15.2		11.6	
Confl. Peds. (#/hr)									1		1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	2%	1%	1%	0%	1%	4%	0%	0%	4%	1%
Adj. Flow (vph)	247	412	145	230	623	72	610	1251	368	100	866	338
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	557	0	230	695	0	610	1251	368	100	866	338
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			2	6	
Detector Phase	7	4		3	8		5	2		2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0		20.0	5.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0		32.0	9.0	32.0
Total Split (s)	21.0	45.0		23.0	47.0		37.0	42.0		42.0	30.0	35.0
Total Split (%)	15.0%	32.1%		16.4%	33.6%		26.4%	30.0%		30.0%	21.4%	25.0%
Maximum Green (s)	17.0	38.0		19.0	40.0		33.0	35.0		35.0	26.0	28.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0		3.0	1.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0		7.0	4.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max		Max	None	Max
Walk Time (s)		7.0			7.0			7.0		7.0		7.0
Flash Dont Walk (s)		18.0			18.0			16.0		16.0		16.0
Pedestrian Calls (#/hr)		0			0			0		0		0
Act Effct Green (s)	50.0	30.8		49.7	30.7		68.2	51.8		51.8	40.5	28.1
Actuated g/C Ratio	0.38	0.24		0.38	0.24		0.52	0.40		0.40	0.31	0.22
v/c Ratio	0.84	0.66		0.66	0.83		1.17	0.63		0.49	0.44	0.80

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

6: Ontario Street & Louis St. Laurent Avenue

Total 2031 PM Peak Hour

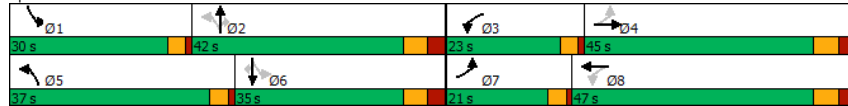


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	54.1	46.3		34.7	55.9		130.4	34.6	16.4	27.2	55.8	19.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	46.3		34.7	55.9		130.4	34.6	16.4	27.2	55.8	19.2
LOS	D	D		C	E		F	C	B	C	E	B
Approach Delay	48.7			50.6			57.8			44.1		
Approach LOS	D			D			E			D		
Queue Length 50th (m)	44.7	68.0		41.1	93.8		~181.5	99.9	32.3	13.5	83.0	20.6
Queue Length 95th (m)	#88.9	89.8		60.9	116.9		#279.5	134.9	70.9	26.6	107.5	58.7
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0		20.0		50.0		50.0		50.0			
Base Capacity (vph)	306	1028		391	1091		520	1985	754	457	1076	539
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.54		0.59	0.64		1.17	0.63	0.49	0.22	0.80	0.63

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	130.1
Natural Cycle:	100
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.17
Intersection Signal Delay:	51.8
Intersection Capacity Utilization:	102.1%
Analysis Period (min):	15
ICU Level of Service G	Intersection LOS: D
ICU Level of Service G	
- 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.	

Splits and Phases: 6: Ontario Street & Louis St. Laurent Avenue



HCM 6th Signalized Intersection Summary

(190237) 550 Ontario St S, RR 25, Milton

6: Ontario Street & Louis St. Laurent Avenue

Total 2031 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	247	412	145	230	623	72	610	1251	368	100	866	338
Future Volume (veh/h)	247	412	145	230	623	72	610	1251	368	100	866	338
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1885	1870	1885	1885	1900	1885	1841	1900	1900	1841	1885
Adj Flow Rate, veh/h	247	412	145	230	623	72	610	1251	368	100	866	338
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	1	2	1	1	0	1	4	0	0	4	1
Cap, veh/h	308	622	217	342	751	87	544	2094	671	231	1096	348
Arrive On Green	0.12	0.24	0.24	0.11	0.23	0.23	0.26	0.42	0.42	0.06	0.22	0.22
Sat Flow, veh/h	1781	2606	907	1795	3236	373	1795	5025	1609	1810	5025	1595
Grp Volume(v), veh/h	247	282	275	230	344	351	610	1251	368	100	866	338
Grp Sat Flow(s), veh/h/ln	1781	1791	1722	1795	1791	1818	1795	1675	1609	1810	1675	1595
Q Serve(g_s), s	13.4	18.2	18.6	12.3	23.5	23.5	33.0	24.8	22.2	5.4	20.9	27.0
Cycle Q Clear(g_c), s	13.4	18.2	18.6	12.3	23.5	23.5	33.0	24.8	22.2	5.4	20.9	27.0
Prop In Lane	1.00		0.53	1.00		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	308	428	411	342	416	422	544	2094	671	231	1096	348
V/C Ratio(X)	0.80	0.66	0.67	0.67	0.83	0.83	1.12	0.60	0.55	0.43	0.79	0.97
Avail Cap(c_a), veh/h	329	530	510	403	558	567	544	2094	671	492	1096	348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	44.1	44.3	33.1	46.8	46.9	35.1	29.1	28.3	35.5	47.4	49.8
Incr Delay (d2), s/veh	12.6	2.1	2.4	3.5	7.6	7.6	76.6	1.3	3.2	1.3	5.8	41.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	5.2	6.4	6.3	4.2	8.9	9.0	21.3	7.0	6.4	1.9	7.3	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	46.8	46.3	46.7	36.5	54.4	54.5	111.8	30.3	31.5	36.8	53.2	91.2
LnGrp LOS	D	D	D	D	D	D	F	C	C	D	D	F
Approach Vol, veh/h	804			925			2229			1304		
Approach Delay, s/veh	46.6			50.0			52.8			61.8		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.5	60.5	18.7	37.6	37.0	35.0	19.5	36.8				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	26.0	35.0	19.0	38.0	33.0	28.0	17.0	40.0				
Max Q Clear Time (g_c+I1), s	7.4	26.8	14.3	20.6	35.0	29.0	15.4	25.5				
Green Ext Time (p_c), s	0.3	6.1	0.4	3.7	0.0	0.0	0.2	4.3				

Intersection Summary

HCM 6th Ctrl Delay	53.6
HCM 6th LOS	D

Appendix L

2031 Future Total with Background Development Growth Traffic Operations Reports



Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	95	122	60	88	156	84	38	1588	37	61	928	59
Future Volume (vph)	95	122	60	88	156	84	38	1588	37	61	928	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99	0.99		1.00					
Fit		0.951			0.947			0.997			0.991	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1735	0	1770	1706	0	1752	3395	0	1597	3357	0
Fit Permitted	0.549			0.643			0.254			0.095		
Satd. Flow (perm)	997	1735	0	1187	1706	0	469	3395	0	160	3357	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			5			3				8
Link Speed (k/h)		60			60			60				50
Link Distance (m)		66.2			94.7			135.8				142.5
Travel Time (s)		4.0			5.7			8.1				10.3
Conf. Peds. (#/hr)	7		10	10		7		7		7		7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	4%	2%	2%	3%	8%	3%	6%	3%	13%	7%	0%
Adj. Flow (vph)	95	122	60	88	156	84	38	1588	37	61	928	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	182	0	88	240	0	38	1625	0	61	987	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0	
Total Split (s)	52.0	52.0		52.0	52.0		48.0	48.0		48.0	48.0	
Total Split (%)	52.0%	52.0%		52.0%	52.0%		48.0%	48.0%		48.0%	48.0%	
Maximum Green (s)	45.0	45.0		45.0	45.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	14.8	14.8		14.8	14.8		42.1	42.1		42.1	42.1	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.60	0.60		0.60	0.60	
v/c Ratio	0.45	0.46		0.35	0.66		0.13	0.80		0.64	0.49	

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	31.0	23.4		27.2	33.7		8.8	15.4		47.3	9.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.0	23.4		27.2	33.7		8.8	15.4		47.3	9.4	
LOS	C	C		C	C		A	B		D	A	
Approach Delay		26.0			32.0			15.2			11.6	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	11.4	17.9		10.4	29.7		2.0	78.8		4.8	35.1	
Queue Length 95th (m)	24.7	35.1		22.4	51.4		7.5	134.8		#28.8	60.7	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	643	1130			765		1102	282	2044		96	2023
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	0.15	0.16		0.12	0.22		0.13	0.80		0.64	0.49	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 70

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 16.6

Intersection LOS: B

Intersection Capacity Utilization 91.0%

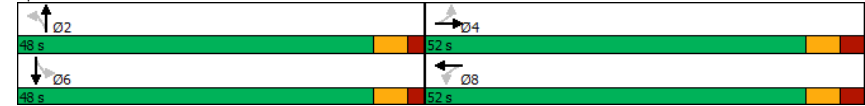
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	95	122	60	88	156	84	38	1588	37	61	928	59
Future Volume (veh/h)	95	122	60	88	156	84	38	1588	37	61	928	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1856	1781	1856	1811	1856	1707	1796	1900
Adj Flow Rate, veh/h	95	122	60	88	156	84	38	1588	37	61	928	59
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	2	2	3	8	3	6	3	13	7	0
Cap, veh/h	262	309	152	311	301	162	314	1925	45	147	1824	116
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.56	0.56	0.56	0.56	0.56	0.56
Sat Flow, veh/h	1115	1160	570	1193	1130	608	565	3437	80	283	3257	207
Grp Volume(v), veh/h	95	0	182	88	0	240	38	794	831	61	486	501
Grp Sat Flow(s),veh/h/ln	1115	0	1730	1193	0	1738	565	1721	1796	283	1706	1757
Q Serve(g_s), s	5.9	0.0	6.5	4.9	0.0	8.8	3.3	28.2	28.4	13.6	13.1	13.1
Cycle Q Clear(g_c), s	14.8	0.0	6.5	11.4	0.0	8.8	16.5	28.2	28.4	42.0	13.1	13.1
Prop In Lane	1.00		0.33	1.00		0.35	1.00		0.04	1.00		0.12
Lane Grp Cap(c), veh/h	262	0	461	311	0	463	314	964	1006	147	956	984
V/C Ratio(X)	0.36	0.00	0.39	0.28	0.00	0.52	0.12	0.82	0.83	0.41	0.51	0.51
Avail Cap(c_a), veh/h	634	0	1038	709	0	1043	314	964	1006	147	956	984
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.7	0.0	22.5	27.2	0.0	23.4	15.2	13.5	13.5	31.8	10.1	10.1
Incr Delay (d2), s/veh	0.8	0.0	0.5	0.5	0.0	0.9	0.8	7.9	7.8	8.4	1.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.8	0.0	2.6	1.5	0.0	3.5	0.4	5.3	5.4	1.9	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	0.0	23.1	27.7	0.0	24.3	16.0	21.4	21.3	40.2	12.1	12.0
LnGrp LOS	C	A	C	C	A	C	B	C	C	D	B	B
Approach Vol, veh/h	277			328			1663			1048		
Approach Delay, s/veh	25.6			25.2			21.2			13.7		
Approach LOS	C			C			C			B		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	48.0		27.0		48.0		27.0					
Change Period (Y+Rc), s	6.0		7.0		6.0		7.0					
Max Green Setting (Gmax), s	42.0		45.0		42.0		45.0					
Max Q Clear Time (g_c+I1), s	30.4		16.8		44.0		13.4					
Green Ext Time (p_c), s	8.9		1.8		0.0		2.3					

Intersection Summary		
HCM 6th Ctrl Delay	19.6	
HCM 6th LOS	B	

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔↔↔	↔↔	
Traffic Volume (vph)	0	65	0	1686	1084	4
Future Volume (vph)	0	65	0	1686	1084	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Frt	0.865		0.999			
Fit Protected						
Satd. Flow (prot)	0	1644	0	4893	3403	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	4893	3403	0
Link Speed (k/h)	60		60		50	
Link Distance (m)	63.0		90.2		135.8	
Travel Time (s)	3.8		5.4		9.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	65	0	1686	1084	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	65	0	1686	1088	0
Sign Control	Stop		Free		Free	

Intersection Summary		
Area Type:	Other	
Control Type:	Unsignalized	
Intersection Capacity Utilization	40.8%	ICU Level of Service A
Analysis Period (min)	15	

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑	↑↑↑	↑↑	↑	
Traffic Vol, veh/h	0	65	0	1686	1084	4
Future Vol, veh/h	0	65	0	1686	1084	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	65	0	1686	1084	4

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	544	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	488	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	488	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	488	-
HCM Lane V/C Ratio	-	0.133	-
HCM Control Delay (s)	-	13.5	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.5	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑
Traffic Volume (vph)	261	1239	226	207	623	157	159	1228	247	156	869	113
Future Volume (vph)	261	1239	226	207	623	157	159	1228	247	156	869	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor			0.99	1.00					0.98	1.00		
Frt			0.850			0.850			0.850		0.983	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	5036	1538	1641	4940	1495	1671	4940	1524	1736	4786	0
Fit Permitted	0.358			0.109			0.137			0.125		
Satd. Flow (perm)	654	5036	1515	188	4940	1495	241	4940	1499	228	4786	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			113			157			221		19	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		117.7			375.6			511.5			90.2	
Travel Time (s)		7.1			22.5			30.7			6.5	
Confl. Peds. (#/hr)			3	3					5	5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	3%	5%	10%	5%	8%	8%	5%	6%	4%	7%	3%
Adj. Flow (vph)	261	1239	226	207	623	157	159	1228	247	156	869	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	1239	226	207	623	157	159	1228	247	156	982	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	25.1	41.0	41.0	27.0	42.9	42.9	14.0	39.0	39.0	13.0	38.0	
Total Split (%)	20.9%	34.2%	34.2%	22.5%	35.8%	35.8%	11.7%	32.5%	32.5%	10.8%	31.7%	
Maximum Green (s)	21.1	35.0	35.0	23.0	36.9	36.9	10.0	33.0	33.0	9.0	32.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	59.5	42.0	42.0	60.5	42.4	42.4	44.9	33.0	33.0	43.1	32.1	
Actuated g/C Ratio	0.50	0.35	0.35	0.50	0.35	0.35	0.37	0.28	0.28	0.36	0.27	
v/c Ratio	0.56	0.70	0.38	0.72	0.36	0.25	0.77	0.90	0.43	0.80	0.76	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

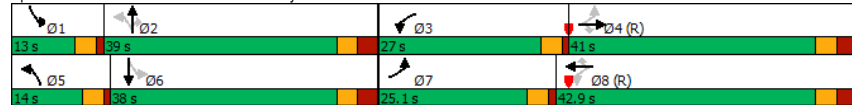
(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	14.3	33.1	18.5	37.2	30.0	5.6	49.6	52.4	8.9	55.1	44.0	
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	14.3	33.1	18.5	37.2	30.0	5.6	49.6	52.4	8.9	55.1	44.0	
LOS	B	C	B	D	C	A	D	D	A	E	D	
Approach Delay	28.3			27.6			45.5			45.6		
Approach LOS	C			C			D			D		
Queue Length 50th (m)	42.6	105.6	32.9	30.3	41.4	0.0	25.8	107.8	4.8	25.2	80.7	
Queue Length 95th (m)	61.5	128.3	58.7	55.1	56.4	15.6	#54.4	#134.2	26.5	#57.8	97.9	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0		70.0	70.0				
Base Capacity (vph)	530	1760	602	377	1747	630	209	1358	572	194	1296	
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	0.49	0.70	0.38	0.55	0.36	0.25	0.76	0.90	0.43	0.80	0.76	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 36.9
 Intersection Capacity Utilization 100.9%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔
Traffic Volume (veh/h)	261	1239	226	207	623	157	159	1228	247	156	869	113
Future Volume (veh/h)	261	1239	226	207	623	157	159	1228	247	156	869	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1856	1826	1752	1826	1781	1781	1826	1811	1841	1796	1856
Adj Flow Rate, veh/h	261	1239	226	207	623	157	159	1228	247	156	869	113
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	3	5	10	5	8	8	5	6	4	7	3
Cap, veh/h	449	1957	596	285	1848	558	248	1371	420	205	1171	152
Arrive On Green	0.11	0.39	0.39	0.10	0.37	0.37	0.08	0.28	0.28	0.08	0.27	0.27
Sat Flow, veh/h	1753	5066	1544	1668	4985	1506	1697	4985	1526	1753	4391	568
Grp Volume(v), veh/h	261	1239	226	207	623	157	159	1228	247	156	646	336
Grp Sat Flow(s), veh/h/ln	1753	1689	1544	1668	1662	1506	1697	1662	1526	1753	1635	1690
Q Serve(g_s), s	10.8	23.8	12.6	9.0	10.8	8.8	8.1	28.4	16.8	7.7	21.7	21.8
Cycle Q Clear(g_c), s	10.8	23.8	12.6	9.0	10.8	8.8	8.1	28.4	16.8	7.7	21.7	21.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	449	1957	596	285	1848	558	248	1371	420	205	872	451
V/C Ratio(X)	0.58	0.63	0.38	0.73	0.34	0.28	0.64	0.90	0.59	0.76	0.74	0.75
Avail Cap(c_a), veh/h	560	1957	596	443	1848	558	248	1371	420	205	872	451
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	29.9	26.5	24.2	27.2	26.5	30.8	41.8	37.6	32.6	40.2	40.3
Incr Delay (d2), s/veh	1.2	1.6	1.8	3.5	0.5	1.3	5.5	9.4	5.9	15.4	5.6	10.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.0	11.0	6.2	4.4	5.4	4.2	4.8	14.7	9.0	5.9	11.8	13.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	31.5	28.3	27.7	27.7	27.8	36.3	51.3	43.6	48.0	45.8	51.0
LnGrp LOS	C	C	C	C	C	C	D	D	D	D	D	D
Approach Vol, veh/h	1726			987			1634			1138		
Approach Delay, s/veh	29.5			27.7			48.6			47.7		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	39.0	15.6	52.4	14.0	38.0	17.5	50.5				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	9.0	33.0	23.0	35.0	10.0	32.0	21.1	36.9				
Max Q Clear Time (g_c+I1), s	9.7	30.4	11.0	25.8	10.1	23.8	12.8	12.8				
Green Ext Time (p_c), s	0.0	2.0	0.6	6.3	0.0	4.4	0.7	5.9				

Intersection Summary

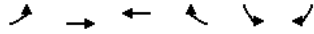
HCM 6th Ctrl Delay 38.6
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑↑	↑↑↑		↘	
Traffic Volume (vph)	2	1574	939	34	76	4
Future Volume (vph)	2	1574	939	34	76	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.995		0.993	
Flt Protected	0.950				0.955	
Satd. Flow (prot)	1805	5085	4969	0	1372	0
Flt Permitted	0.950				0.955	
Satd. Flow (perm)	1805	5085	4969	0	1372	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	0%	33%	0%
Adj. Flow (vph)	2	1574	939	34	76	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	1574	973	0	80	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑↑	↑↑↑		↘	
Traffic Vol, veh/h	2	1574	939	34	76	4
Future Vol, veh/h	2	1574	939	34	76	4
Conflicting Peds, #/hr	7	0	0	7	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	4	0	33	0
Mvmt Flow	2	1574	939	34	76	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	980	0	0
Stage 1	-	-	963
Stage 2	-	-	634
Critical Hdwy	5.3	-	6.36
Critical Hdwy Stg 1	-	-	7.26
Critical Hdwy Stg 2	-	-	6.66
Follow-up Hdwy	3.1	-	4.13
Pot Cap-1 Maneuver	406	-	113
Stage 1	-	-	207
Stage 2	-	-	380
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	404	-	111
Mov Cap-2 Maneuver	-	-	111
Stage 1	-	-	205
Stage 2	-	-	378

Approach	EB	WB	SB
HCM Control Delay, s	0	0	88.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	404	-	-	-	115
HCM Lane V/C Ratio	0.005	-	-	-	0.696
HCM Control Delay (s)	14	-	-	-	88.2
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	3.7

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	123	1357	37	118	667	85	59	99	195	98	79	67
Future Volume (vph)	123	1357	37	118	667	85	59	99	195	98	79	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		1.00	0.99	0.99		1.00	0.99	
Frt			0.850		0.983		0.901			0.931		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	5036	1568	1770	4795	0	1770	1661	0	1703	1657	0
Flt Permitted	0.355			0.118			0.646			0.441		
Satd. Flow (perm)	629	5036	1524	220	4795	0	1195	1661	0	789	1657	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)			64		31		89		38		38	
Link Speed (k/h)		60					60		60			
Link Distance (m)		171.2			370.5		215.4		213.5			
Travel Time (s)		10.3			22.2		12.9		12.8			
Conf. Peds. (#/hr)	5		5	5		5	8		3	3		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	3%	3%	2%	6%	6%	2%	2%	2%	6%	3%	9%
Adj. Flow (vph)	123	1357	37	118	667	85	59	99	195	98	79	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	1357	37	118	752	0	59	294	0	98	146	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8		2			6		6
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	61.8	61.8	61.8	12.2	74.0		46.0	46.0		46.0	46.0	
Total Split (%)	51.5%	51.5%	51.5%	10.2%	61.7%		38.3%	38.3%		38.3%	38.3%	
Maximum Green (s)	55.8	55.8	55.8	8.2	68.0		40.0	40.0		40.0	40.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0		31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)	56.1	56.1	56.1	70.0	68.0		40.0	40.0		40.0	40.0	
Actuated g/C Ratio	0.47	0.47	0.47	0.58	0.57		0.33	0.33		0.33	0.33	
v/c Ratio	0.42	0.58	0.05	0.52	0.28		0.15	0.48		0.37	0.25	

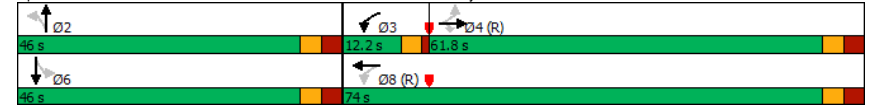
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	26.8	24.5	1.6	14.0	9.2		29.4	24.6		35.6	22.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.8	24.5	1.6	14.0	9.2		29.4	24.6		35.6	22.7	
LOS	C	C	A	B	A		C	C		D	C	
Approach Delay		24.2			9.8			25.4			27.9	
Approach LOS		C			A			C			C	
Queue Length 50th (m)	19.8	87.9	0.0	15.9	42.4		10.2	39.5		18.4	19.0	
Queue Length 95th (m)	38.2	103.2	2.5	m9.8	41.5		20.9	66.6		35.1	36.1	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	294	2355	746	234	2730		398	613		263	577	
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	0.42	0.58	0.05	0.50	0.28		0.15	0.48		0.37	0.25	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 20.4 Intersection LOS: C
 Intersection Capacity Utilization 104.2% ICU Level of Service G
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	123	1357	37	118	667	85	59	99	195	98	79	67
Future Volume (veh/h)	123	1357	37	118	667	85	59	99	195	98	79	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1796	1856	1856	1870	1811	1811	1870	1870	1811	1856	1767	1677
Adj Flow Rate, veh/h	123	1357	37	118	667	85	59	99	195	98	79	67
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	3	2	6	6	2	2	2	6	3	9
Cap, veh/h	391	2457	759	261	2518	318	395	187	368	259	308	261
Arrive On Green	0.49	0.49	0.49	0.05	0.57	0.57	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	681	5066	1564	1781	4443	561	1236	560	1103	1048	924	784
Grp Volume(v), veh/h	123	1357	37	118	493	259	59	0	294	98	0	146
Grp Sat Flow(s),veh/h/ln	681	1689	1564	1781	1648	1707	1236	0	1662	1048	0	1708
Q Serve(g_s), s	13.6	22.6	1.5	3.8	9.1	9.3	4.4	0.0	17.2	10.0	0.0	7.5
Cycle Q Clear(g_c), s	13.6	22.6	1.5	3.8	9.1	9.3	11.9	0.0	17.2	27.2	0.0	7.5
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.66	1.00		0.46
Lane Grp Cap(c), veh/h	391	2457	759	261	1868	967	395	0	554	259	0	569
V/C Ratio(X)	0.31	0.55	0.05	0.45	0.26	0.27	0.15	0.00	0.53	0.38	0.00	0.26
Avail Cap(c_a), veh/h	391	2457	759	297	1868	967	395	0	554	259	0	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	21.7	16.3	16.6	13.2	13.3	33.5	0.0	32.4	43.4	0.0	29.2
Incr Delay (d2), s/veh	2.1	0.9	0.1	1.2	0.3	0.7	0.8	0.0	3.6	4.2	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.7	9.3	0.6	1.6	3.2	3.5	1.9	0.0	9.2	4.1	0.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	22.6	16.4	17.9	13.6	14.0	34.3	0.0	36.0	47.6	0.0	30.2
LnGrp LOS	C	C	B	B	B	B	C	A	D	D	A	C
Approach Vol, veh/h	1517			870			353			244		
Approach Delay, s/veh	22.4			14.3			35.7			37.2		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	2		3		4		6		8			
Phs Duration (G+Y+Rc), s	46.0		9.8		64.2		46.0		74.0			
Change Period (Y+Rc), s	6.0		4.0		6.0		6.0		6.0			
Max Green Setting (Gmax), s	40.0		8.2		55.8		40.0		68.0			
Max Q Clear Time (g_c+I1), s	19.2		5.8		24.6		29.2		11.3			
Green Ext Time (p_c), s	2.4		0.1		16.0		1.1		6.8			

Intersection Summary	
HCM 6th Ctrl Delay	22.8
HCM 6th LOS	C

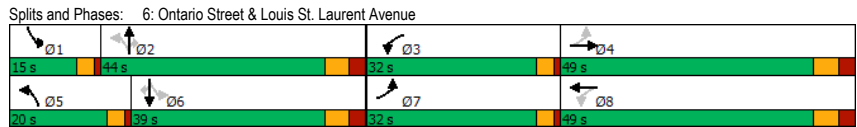
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	408	697	335	413	713	311	238	917	230	140	992	172
Future Volume (vph)	408	697	335	413	713	311	238	917	230	140	992	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor					0.99				0.98			1.00
Frt	0.951				0.954				0.850		0.850	
Fit Protected	0.950				0.950				0.950		0.950	
Satd. Flow (prot)	1752		3333		0		1736		3275		0	
Fit Permitted	0.095				0.095				0.111		0.196	
Satd. Flow (perm)	175		3333		0		174		3275		0	
Right Turn on Red				Yes						Yes		
Satd. Flow (RTOR)				59						50		
Link Speed (k/h)				60						60		
Link Distance (m)				193.1						250.0		
Travel Time (s)				11.6						15.0		
Confl. Peds. (#/hr)	3				3				2		2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	4%	4%	6%	10%	7%	5%	6%	7%	6%
Adj. Flow (vph)	408	697	335	413	713	311	238	917	230	140	992	172
Shared Lane Traffic (%)												
Lane Group Flow (vph)	408	1032	0	413	1024	0	238	917	230	140	992	172
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6		6
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1		6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	32.0	49.0		32.0	49.0		20.0	44.0	44.0	15.0	39.0	39.0
Total Split (%)	22.9%	35.0%		22.9%	35.0%		14.3%	31.4%	31.4%	10.7%	27.9%	27.9%
Maximum Green (s)	28.0	42.0		28.0	42.0		16.0	37.0	37.0	11.0	32.0	32.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		18.0			18.0			16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	73.0	42.0		73.0	42.0		55.0	37.5	37.5	45.5	32.0	32.0
Actuated g/C Ratio	0.52	0.30		0.52	0.30		0.39	0.27	0.27	0.32	0.23	0.23
v/c Ratio	1.00	0.99		1.02	1.01		0.99	0.71	0.43	0.65	0.90	0.39

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	87.5	71.7		92.5	76.0		92.2	50.0	14.3	44.0	63.7	16.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	71.7		92.5	76.0		92.2	50.0	14.3	44.0	63.7	16.8
LOS	F	E		F	E		F	D	B	D	E	B
Approach Delay	76.2			80.7			51.3			55.4		
Approach LOS	E			F			D			E		
Queue Length 50th (m)	~103.1	151.0		~110.5	~153.6		53.5	89.3	12.8	26.8	103.5	11.0
Queue Length 95th (m)	#173.8	#200.5		#179.2	#202.8		#110.8	106.2	37.6	43.2	#127.5	32.8
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0			20.0			50.0			50.0		
Base Capacity (vph)	406	1041		403	1017		241	1297	531	221	1108	444
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.99		1.02	1.01		0.99	0.71	0.43	0.63	0.90	0.39

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Natural Cycle: 110	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 66.3	Intersection LOS: E
Intersection Capacity Utilization 103.6%	ICU Level of Service G
Analysis Period (min) 15	
- 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.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔
Traffic Volume (veh/h)	408	697	335	413	713	311	238	917	230	140	992	172
Future Volume (veh/h)	408	697	335	413	713	311	238	917	230	140	992	172
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1811	1752	1796	1826	1811	1796	1811
Adj Flow Rate, veh/h	408	697	335	413	713	311	238	917	230	140	992	172
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3	4	4	6	10	7	5	6	7	6
Cap, veh/h	405	692	332	402	710	310	257	1311	413	229	1121	350
Arrive On Green	0.20	0.30	0.30	0.20	0.30	0.30	0.11	0.27	0.27	0.08	0.23	0.23
Sat Flow, veh/h	1767	2307	1108	1753	2367	1032	1668	4904	1544	1725	4904	1531
Grp Volume(v), veh/h	408	533	499	413	527	497	238	917	230	140	992	172
Grp Sat Flow(s), veh/h/ln	1767	1763	1652	1753	1749	1651	1668	1635	1544	1725	1635	1531
Q Serve(g_s), s	28.0	42.0	42.0	28.0	42.0	42.0	15.0	23.6	18.0	8.6	27.4	13.7
Cycle Q Clear(g_c), s	28.0	42.0	42.0	28.0	42.0	42.0	15.0	23.6	18.0	8.6	27.4	13.7
Prop In Lane	1.00		0.67	1.00		0.63	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	405	529	496	402	525	495	257	1311	413	229	1121	350
V/C Ratio(X)	1.01	1.01	1.01	1.03	1.00	1.00	0.93	0.70	0.56	0.61	0.89	0.49
Avail Cap(c_a), veh/h	405	529	496	402	525	495	257	1311	413	234	1121	350
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	49.0	49.0	45.3	49.0	49.0	37.7	46.2	44.2	38.6	52.2	46.9
Incr Delay (d2), s/veh	46.7	40.9	42.3	52.0	40.2	41.5	36.8	3.1	5.3	4.5	10.3	4.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%), veh/ln	17.6	27.5	26.3	18.4	27.2	26.1	11.5	12.4	10.0	5.6	15.1	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	92.0	89.9	91.3	97.3	89.2	90.5	74.6	49.3	49.5	43.1	62.5	51.8
LnGrp LOS	F	F	F	F	F	F	E	D	D	D	E	D
Approach Vol, veh/h	1440			1437			1385			1304		
Approach Delay, s/veh	91.0			92.0			53.7			59.0		
Approach LOS	F			F			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.6	44.4	32.0	49.0	20.0	39.0	32.0	49.0				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	11.0	37.0	28.0	42.0	16.0	32.0	28.0	42.0				
Max Q Clear Time (g_c+I1), s	10.6	25.6	30.0	44.0	17.0	29.4	30.0	44.0				
Green Ext Time (p_c), s	0.0	6.0	0.0	0.0	0.0	1.8	0.0	0.0				

Intersection Summary	
HCM 6th Ctrl Delay	74.5
HCM 6th LOS	E

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	89	234	51	101	260	110	76	1322	82	152	1672	123
Future Volume (vph)	89	234	51	101	260	110	76	1322	82	152	1672	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		0.99	1.00		1.00		1.00		1.00	
Frt		0.973			0.955			0.991			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1827	0	1787	1796	0	1787	3438	0	1787	3469	0
Flt Permitted	0.330			0.475			0.120			0.106		
Satd. Flow (perm)	620	1827	0	889	1796	0	226	3438	0	199	3469	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			27			7			10	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	3		7	7		3	2		8	8		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	0%	1%	0%	2%	1%	4%	1%	1%	3%	1%
Adj. Flow (vph)	89	234	51	101	260	110	76	1322	82	152	1672	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	285	0	101	370	0	76	1404	0	152	1795	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		4.5	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		9.0	21.0	
Total Split (s)	50.0	50.0		50.0	50.0		39.0	39.0		11.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		39.0%	39.0%		11.0%	50.0%	
Maximum Green (s)	43.0	43.0		43.0	43.0		33.0	33.0		6.5	44.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	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		4.5	6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	20.0	20.0		20.0	20.0		33.2	33.2		45.7	44.2	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.43	0.43		0.59	0.57	
v/c Ratio	0.56	0.60		0.44	0.76		0.78	0.95		0.61	0.90	

Lanes, Volumes, Timings
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	38.4	29.7		29.8	35.1		75.9	37.8		21.8	24.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	38.4	29.7		29.8	35.1		75.9	37.8		21.8	24.2	
LOS	D	C		C	D		E	D		C	C	
Approach Delay		31.8			34.0			39.8			24.0	
Approach LOS		C			C			D			C	
Queue Length 50th (m)	11.8	37.4		12.9	48.6		9.6	104.3		9.3	116.0	
Queue Length 95th (m)	26.5	60.5		26.8	77.5		#39.8	#186.3		#35.3	#219.1	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	346	1023		496	1015		97	1478		251	1988	
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	0.26	0.28		0.20	0.36		0.78	0.95		0.61	0.90	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 77.3

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 31.2

Intersection LOS: C

Intersection Capacity Utilization 113.2%

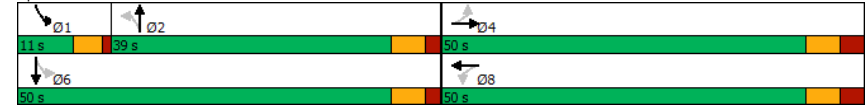
ICU Level of Service H

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	89	234	51	101	260	110	76	1322	82	152	1672	123
Future Volume (veh/h)	89	234	51	101	260	110	76	1322	82	152	1672	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1900	1885	1900	1870	1885	1841	1885	1885	1856	1885
Adj Flow Rate, veh/h	89	234	51	101	260	110	76	1322	82	152	1672	123
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	0	1	0	2	1	4	1	1	3	1
Cap, veh/h	225	469	102	292	396	168	99	1361	84	217	1765	129
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.41	0.41	0.41	0.07	0.53	0.53
Sat Flow, veh/h	1017	1497	326	1099	1264	535	265	3343	207	1795	3330	243
Grp Volume(v), veh/h	89	0	285	101	0	370	76	690	714	152	878	917
Grp Sat Flow(s),veh/h/ln	1017	0	1824	1099	0	1799	265	1749	1801	1795	1763	1810
Q Serve(g_s), s	6.9	0.0	10.6	6.8	0.0	14.8	3.9	32.1	32.3	3.8	38.7	40.1
Cycle Q Clear(g_c), s	21.6	0.0	10.6	17.4	0.0	14.8	33.8	32.1	32.3	3.8	38.7	40.1
Prop In Lane	1.00		0.18	1.00		0.30	1.00		0.11	1.00		0.13
Lane Grp Cap(c), veh/h	225	0	572	292	0	564	99	712	733	217	934	959
V/C Ratio(X)	0.40	0.00	0.50	0.35	0.00	0.66	0.77	0.97	0.97	0.70	0.94	0.96
Avail Cap(c_a), veh/h	433	0	945	516	0	932	99	712	733	234	934	959
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	0.0	23.2	30.3	0.0	24.6	41.2	24.1	24.2	19.0	18.3	18.6
Incr Delay (d2), s/veh	1.1	0.0	0.7	0.7	0.0	1.3	42.5	27.1	27.4	8.2	18.0	20.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	2.5	1.2	0.0	3.6	2.3	11.1	11.6	1.1	9.8	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.1	0.0	23.9	31.0	0.0	25.9	83.7	51.2	51.6	27.3	36.3	38.9
LnGrp LOS	D	A	C	C	A	C	F	D	D	C	D	D
Approach Vol, veh/h	374			471			1480			1947		
Approach Delay, s/veh	26.5			27.0			53.0			36.8		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2	4		6		8					
Phs Duration (G+Y+Rc), s	10.2	39.8	33.0		50.0		33.0					
Change Period (Y+Rc), s	4.5	6.0	7.0		6.0		7.0					
Max Green Setting (Gmax), s	6.5	33.0	43.0		44.0		43.0					
Max Q Clear Time (g_c+I1), s	5.8	35.8	23.6		42.1		19.4					
Green Ext Time (p_c), s	0.0	0.0	2.4		1.7		3.4					
Intersection Summary												
HCM 6th Ctrl Delay	40.5											
HCM 6th LOS	D											

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔↔↔	↔↔	↔
Traffic Volume (vph)	0	51	0	1524	1805	17
Future Volume (vph)	0	51	0	1524	1805	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Ped Bike Factor						
Frt	0.865		0.999			
Fit Protected						
Satd. Flow (prot)	0	1644	0	4988	3502	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	4988	3502	0
Link Speed (k/h)	60		60			
Link Distance (m)	63.0		90.2			
Travel Time (s)	3.8		5.4			
Confl. Peds. (#/hr)	2		2		2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	4%	3%	0%
Adj. Flow (vph)	0	51	0	1524	1805	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	51	0	1524	1822	0
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	60.4%			ICU Level of Service B		
Analysis Period (min)	15					

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑	↑↑↑	↑↑	↑	
Traffic Vol, veh/h	0	51	0	1524	1805	17
Future Vol, veh/h	0	51	0	1524	1805	17
Conflicting Peds, #/hr	2	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	51	0	1524	1805	17

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	913	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	280	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	280	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	280	-
HCM Lane V/C Ratio	-	0.182	-
HCM Control Delay (s)	-	20.7	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.7	-

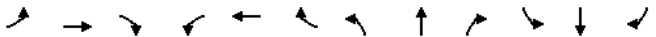
Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑
Traffic Volume (vph)	211	948	133	179	1225	121	261	1159	228	273	1301	243
Future Volume (vph)	211	948	133	179	1225	121	261	1159	228	273	1301	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor			0.99	1.00			1.00					1.00
Frt			0.850			0.850			0.850			0.976
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	5085	1509	1752	5036	1417	1752	5187	1553	1641	4707	0
Fit Permitted	0.117			0.208			0.129			0.114		
Satd. Flow (perm)	222	5085	1487	383	5036	1417	238	5187	1553	197	4707	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			100			212			32
Link Speed (k/h)		60			60			60				50
Link Distance (m)		117.7			375.6			511.5				90.2
Travel Time (s)		7.1			22.5			30.7				6.5
Confl. Peds. (#/hr)			3	3			3					3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	7%	3%	3%	14%	3%	0%	4%	10%	7%	9%
Adj. Flow (vph)	211	948	133	179	1225	121	261	1159	228	273	1301	243
Shared Lane Traffic (%)												
Lane Group Flow (vph)	211	948	133	179	1225	121	261	1159	228	273	1544	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	
Total Split (s)	17.0	47.0	47.0	18.0	48.0	48.0	14.0	37.0	37.0	18.0	41.0	
Total Split (%)	14.2%	39.2%	39.2%	15.0%	40.0%	40.0%	11.7%	30.8%	30.8%	15.0%	34.2%	
Maximum Green (s)	13.0	41.0	41.0	14.0	42.0	42.0	10.0	31.0	31.0	14.0	35.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effect Green (s)	57.3	43.2	43.2	56.7	42.9	42.9	43.0	31.0	31.0	51.0	35.0	
Actuated g/C Ratio	0.48	0.36	0.36	0.47	0.36	0.36	0.36	0.26	0.26	0.42	0.29	
v/c Ratio	0.80	0.52	0.22	0.57	0.68	0.21	1.24	0.87	0.41	1.08	1.11	

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

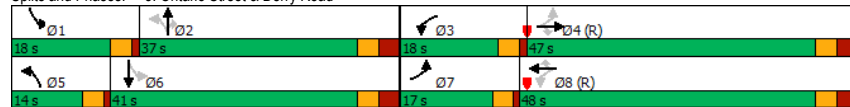


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	38.3	33.0	18.3	23.8	35.2	8.5	168.2	50.5	8.4	111.7	98.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	38.3	33.0	18.3	23.8	35.2	8.5	168.2	50.5	8.4	111.7	98.1	
LOS	D	C	B	C	D	A	F	D	A	F	F	
Approach Delay	32.4			31.8			63.3			100.1		
Approach LOS	C			C			E			F		
Queue Length 50th (m)	37.5	74.5	15.6	23.5	94.8	3.4	~63.1	100.9	3.0	~59.8	~158.1	
Queue Length 95th (m)	#67.6	90.7	33.1	37.6	112.0	16.8	#118.2	119.5	23.6	#115.9	#189.6	
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0		45.0		70.0					
Base Capacity (vph)	279	1829	599	347	1800	570	211	1339	558	252	1395	
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	0.76	0.52	0.22	0.52	0.68	0.21	1.24	0.87	0.41	1.08	1.11	

Intersection Summary

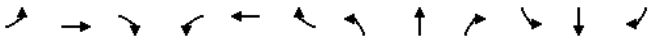
Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.24
 Intersection Signal Delay: 59.9
 Intersection Capacity Utilization 105.2%
 Analysis Period (min) 15
 ~ 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.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔↔↔	↔
Traffic Volume (veh/h)	211	948	133	179	1225	121	261	1159	228	273	1301	243
Future Volume (veh/h)	211	948	133	179	1225	121	261	1159	228	273	1301	243
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1870	1796	1856	1856	1693	1856	1900	1841	1752	1796	1767
Adj Flow Rate, veh/h	211	948	133	179	1225	121	261	1159	228	273	1301	243
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	7	3	3	14	3	0	4	10	7	9
Cap, veh/h	291	1928	574	325	1867	527	207	1340	402	271	1210	226
Arrive On Green	0.09	0.38	0.38	0.08	0.37	0.37	0.08	0.26	0.26	0.12	0.29	0.29
Sat Flow, veh/h	1810	5106	1519	1767	5066	1431	1767	5187	1554	1668	4148	775
Grp Volume(v), veh/h	211	948	133	179	1225	121	261	1159	228	273	1025	519
Grp Sat Flow(s),veh/h/ln	1810	1702	1519	1767	1689	1431	1767	1729	1554	1668	1635	1654
Q Serve(g_s), s	8.6	17.0	7.2	7.4	24.2	7.0	10.0	25.6	15.3	14.0	35.0	35.0
Cycle Q Clear(g_c), s	8.6	17.0	7.2	7.4	24.2	7.0	10.0	25.6	15.3	14.0	35.0	35.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	291	1928	574	325	1867	527	207	1340	402	271	954	482
V/C Ratio(X)	0.72	0.49	0.23	0.55	0.66	0.23	1.26	0.86	0.57	1.01	1.08	1.08
Avail Cap(c_a), veh/h	325	1928	574	388	1867	527	207	1340	402	271	954	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	28.5	25.5	21.9	31.5	26.1	34.4	42.5	38.7	31.1	42.5	42.5
Incr Delay (d2), s/veh	6.9	0.9	0.9	1.5	1.8	1.0	149.6	7.6	5.7	56.5	51.5	62.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	4.9	1.9	2.1	7.0	1.8	11.7	9.0	4.9	8.2	17.4	19.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	29.4	26.4	23.3	33.4	27.1	184.0	50.1	44.4	87.6	94.0	105.2
LnGrp LOS	C	C	C	C	C	C	F	D	D	F	F	F
Approach Vol, veh/h	1292			1525			1648			1817		
Approach Delay, s/veh	29.5			31.7			70.5			96.3		
Approach LOS	C			C			E			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.0	37.0	13.7	51.3	14.0	41.0	14.8	50.2				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	14.0	31.0	14.0	41.0	10.0	35.0	13.0	42.0				
Max Q Clear Time (g_c+I1), s	16.0	27.6	9.4	19.0	12.0	37.0	10.6	26.2				
Green Ext Time (p_c), s	0.0	2.6	0.3	8.6	0.0	0.0	0.2	9.1				

Intersection Summary

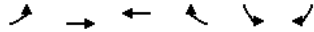
HCM 6th Ctrl Delay 60.1
 HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵ ↑↑↑	↑↑↑	↑↑↑		↵	
Traffic Volume (vph)	9	1229	1597	147	60	3
Future Volume (vph)	9	1229	1597	147	60	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.987		0.994	
Flt Protected	0.950				0.955	
Satd. Flow (prot)	1805	5085	5073	0	1804	0
Flt Permitted	0.950				0.955	
Satd. Flow (perm)	1805	5085	5073	0	1804	0
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%
Adj. Flow (vph)	9	1229	1597	147	60	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	1229	1744	0	63	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵ ↑↑↑	↑↑↑	↑↑↑		↵	
Traffic Vol, veh/h	9	1229	1597	147	60	3
Future Vol, veh/h	9	1229	1597	147	60	3
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	1	0	0	0
Mvmt Flow	9	1229	1597	147	60	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1746	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	5.3	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	3.1	-	-
Pot Cap-1 Maneuver	172	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	172	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	156.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	172	-	-	-	75
HCM Lane V/C Ratio	0.052	-	-	-	0.84
HCM Control Delay (s)	27.1	-	-	-	156.4
HCM Lane LOS	D	-	-	-	F
HCM 95th %tile Q(veh)	0.2	-	-	-	4.2

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	65	959	114	289	1158	97	135	117	198	92	221	77
Future Volume (vph)	65	959	114	289	1158	97	135	117	198	92	221	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.94	0.99			0.99	0.99		0.99	0.99	
Frt			0.850		0.988			0.906			0.961	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	5085	1615	1787	5074	0	1805	1677	0	1770	1802	0
Fit Permitted	0.210			0.211			0.422			0.399		
Satd. Flow (perm)	376	5085	1515	393	5074	0	797	1677	0	739	1802	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89		19			74			15	
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		171.2			370.5			215.4			213.5	
Travel Time (s)		10.3			22.2			12.9			12.8	
Conf. Peds. (#/hr)			27	27			9		9	9		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	2%	0%	1%	1%	1%	0%	0%	2%	2%	1%	0%
Adj. Flow (vph)	65	959	114	289	1158	97	135	117	198	92	221	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	959	114	289	1255	0	135	315	0	92	298	0
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0	26.0	9.5	44.7		16.7	16.7		16.7	16.7	
Total Split (s)	55.0	55.0	55.0	21.0	76.0		44.0	44.0		44.0	44.0	
Total Split (%)	45.8%	45.8%	45.8%	17.5%	63.3%		36.7%	36.7%		36.7%	36.7%	
Maximum Green (s)	49.0	49.0	49.0	17.0	70.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	1.0	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	
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	31.0	31.0	31.0	31.0	31.0		26.0	26.0		26.0	26.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)	51.7	51.7	51.7	72.0	70.0		38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.43	0.43	0.43	0.60	0.58		0.32	0.32		0.32	0.32	
v/c Ratio	0.40	0.44	0.16	0.72	0.42		0.54	0.54		0.39	0.51	

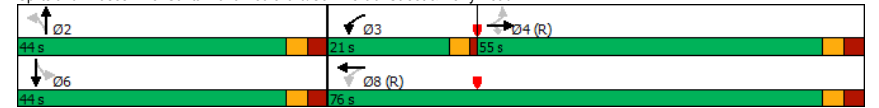
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	34.2	25.1	7.5	18.5	6.6		43.1	29.5		38.2	35.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.2	25.1	7.5	18.5	6.6		43.1	29.5		38.2	35.4	
LOS	C	C	A	B	A		D	C		D	D	
Approach Delay		23.9			8.8			33.6				36.1
Approach LOS		C			A			C				D
Queue Length 50th (m)	11.0	60.2	3.6	12.2	19.7		27.5	48.9		17.8	57.0	
Queue Length 95th (m)	26.8	75.4	15.5	m20.3	m20.8		50.0	79.0		34.5	85.9	
Internal Link Dist (m)		147.2			346.5			191.4				189.5
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	161	2189	703	433	2967		252	581		234	580	
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	0.40	0.44	0.16	0.67	0.42		0.54	0.54		0.39	0.51	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 19.9 Intersection LOS: B
 Intersection Capacity Utilization 101.8% ICU Level of Service G
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	65	959	114	289	1158	97	135	117	198	92	221	77
Future Volume (veh/h)	65	959	114	289	1158	97	135	117	198	92	221	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1870	1900	1885	1885	1885	1900	1900	1870	1870	1885	1900
Adj Flow Rate, veh/h	65	959	114	289	1158	97	135	117	198	92	221	77
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	2	0	1	1	1	0	0	2	2	1	0
Cap, veh/h	250	2276	696	415	2816	236	258	200	338	231	422	147
Arrive On Green	0.45	0.45	0.45	0.10	0.58	0.58	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	426	5106	1561	1795	4828	404	1094	630	1067	1061	1333	464
Grp Volume(v), veh/h	65	959	114	289	823	432	135	0	315	92	0	298
Grp Sat Flow(s), veh/h/ln	426	1702	1561	1795	1716	1801	1094	0	1697	1061	0	1797
Q Serve(g_s), s	12.0	15.4	5.2	10.0	15.8	15.8	0.0	18.7	9.6	0.0	16.3	
Cycle Q Clear(g_c), s	12.0	15.4	5.2	10.0	15.8	15.8	30.1	0.0	18.7	28.2	0.0	16.3
Prop In Lane	1.00		1.00	1.00	0.22	1.00		0.63	1.00		0.26	
Lane Grp Cap(c), veh/h	250	2276	696	415	2001	1051	258	0	537	231	0	569
V/C Ratio(X)	0.26	0.42	0.16	0.70	0.41	0.41	0.52	0.00	0.59	0.40	0.00	0.52
Avail Cap(c_a), veh/h	250	2276	696	482	2001	1051	258	0	537	231	0	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.8	22.7	19.9	16.2	13.7	13.7	45.9	0.0	34.4	46.3	0.0	33.6
Incr Delay (d2), s/veh	2.5	0.6	0.5	3.6	0.6	1.2	7.4	0.0	4.6	5.1	0.0	3.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.9	4.0	1.3	2.4	3.0	3.3	3.4	0.0	6.2	2.3	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	24.3	23.3	20.4	19.8	14.3	14.9	53.3	0.0	39.0	51.3	0.0	37.0
LnGrp LOS	C	C	C	B	B	B	D	A	D	D	A	D
Approach Vol, veh/h	1138			1544			450			390		
Approach Delay, s/veh	23.0			15.5			43.3			40.4		
Approach LOS	C			B			D			D		
Timer - Assigned Phs	2		3		4		6		8			
Phs Duration (G+Y+Rc), s	44.0		16.5		59.5		44.0		76.0			
Change Period (Y+Rc), s	6.0		4.0		6.0		6.0		6.0			
Max Green Setting (Gmax), s	38.0		17.0		49.0		38.0		70.0			
Max Q Clear Time (g_c+I1), s	32.1		12.0		17.4		30.2		17.8			
Green Ext Time (p_c), s	1.5		0.5		11.5		1.5		14.1			
Intersection Summary												
HCM 6th Ctrl Delay	24.3											
HCM 6th LOS	C											

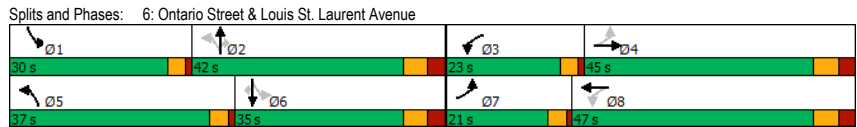
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	261	663	190	268	758	274	490	1131	312	398	910	314
Future Volume (vph)	261	663	190	268	758	274	490	1131	312	398	910	314
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0		100.0			90.0			
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor									0.99	1.00		
Frt	0.967				0.960				0.850		0.850	
Fit Protected	0.950				0.950				0.950		0.950	
Satd. Flow (prot)	1770		3449		0		1787		4988		1615	
Fit Permitted	0.103				0.100				0.125		0.143	
Satd. Flow (perm)	192		3449		0		188		3440		0	
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)	26				37				187		220	
Link Speed (k/h)	60				60				60		60	
Link Distance (m)	193.1				250.0				253.7		194.1	
Travel Time (s)	11.6				15.0				15.2		11.6	
Confl. Peds. (#/hr)									1		1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	2%	1%	1%	0%	1%	4%	0%	0%	4%	1%
Adj. Flow (vph)	261	663	190	268	758	274	490	1131	312	398	910	314
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	853	0	268	1032	0	490	1131	312	398	910	314
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			2	6	
Detector Phase	7	4		3	8		5	2		2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0		20.0	5.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0		32.0	9.0	32.0
Total Split (s)	21.0	45.0		23.0	47.0		37.0	42.0		42.0	30.0	35.0
Total Split (%)	15.0%	32.1%		16.4%	33.6%		26.4%	30.0%		30.0%	21.4%	25.0%
Maximum Green (s)	17.0	38.0		19.0	40.0		33.0	35.0		35.0	26.0	28.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0		3.0	1.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0		7.0	4.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max		Max	None	Max
Walk Time (s)		7.0			7.0			7.0		7.0		7.0
Flash Dont Walk (s)		18.0			18.0			16.0		16.0		16.0
Pedestrian Calls (#/hr)		0			0			0		0		0
Act Effct Green (s)	58.7	38.7		61.3	40.0		68.0	35.0		35.0	57.0	28.0
Actuated g/C Ratio	0.42	0.28		0.44	0.29		0.49	0.25		0.25	0.41	0.20
v/c Ratio	0.96	0.88		0.92	1.02		1.02	0.91		0.58	1.01	0.91

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	83.6	58.4		72.7	81.3		86.7	62.1	22.6	88.2	68.8	21.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.6	58.4		72.7	81.3		86.7	62.1	22.6	88.2	68.8	21.9
LOS	F	E		E	F		F	E	C	F	E	C
Approach Delay	64.3			79.5			62.0			64.4		
Approach LOS	E			E			E			E		
Queue Length 50th (m)	59.1	123.1		59.5	~163.6		~133.0	117.8	31.1	~99.6	96.0	23.9
Queue Length 95th (m)	#116.5	#159.2		#112.5	#208.1		#205.4	#143.4	63.8	#169.9	#121.2	58.5
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0		20.0		50.0		50.0		50.0			
Base Capacity (vph)	272	972		300	1009		479	1247	538	395	997	495
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.88		0.89	1.02		1.02	0.91	0.58	1.01	0.91	0.63

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Natural Cycle:	120
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.02
Intersection Signal Delay:	66.9
Intersection Capacity Utilization:	107.2%
Analysis Period (min):	15
ICU Level of Service G	Intersection LOS: E
~ 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.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	261	663	190	268	758	274	490	1131	312	398	910	314
Future Volume (veh/h)	261	663	190	268	758	274	490	1131	312	398	910	314
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1885	1870	1885	1885	1900	1885	1841	1900	1900	1841	1885
Adj Flow Rate, veh/h	261	663	190	268	758	274	490	1131	312	398	910	314
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	1	2	1	1	0	1	4	0	0	4	1
Cap, veh/h	268	788	226	306	736	266	485	1256	402	400	1005	319
Arrive On Green	0.12	0.29	0.29	0.12	0.29	0.29	0.24	0.25	0.25	0.19	0.20	0.20
Sat Flow, veh/h	1781	2748	787	1795	2577	931	1795	5025	1608	1810	5025	1595
Grp Volume(v), veh/h	261	432	421	268	527	505	490	1131	312	398	910	314
Grp Sat Flow(s), veh/h/ln	1781	1791	1744	1795	1791	1718	1795	1675	1608	1810	1675	1595
Q Serve(g_s), s	16.4	31.7	31.8	14.6	40.0	40.0	33.0	30.5	25.3	25.8	24.8	27.4
Cycle Q Clear(g_c), s	16.4	31.7	31.8	14.6	40.0	40.0	33.0	30.5	25.3	25.8	24.8	27.4
Prop In Lane	1.00		0.45	1.00		0.54	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	268	514	500	306	512	491	485	1256	402	400	1005	319
V/C Ratio(X)	0.97	0.84	0.84	0.87	1.03	1.03	1.01	0.90	0.78	1.00	0.91	0.98
Avail Cap(c_a), veh/h	268	514	500	334	512	491	485	1256	402	400	1005	319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.3	46.9	46.9	34.1	50.0	50.0	41.5	50.8	48.9	41.1	54.7	55.8
Incr Delay (d2), s/veh	47.9	11.9	12.3	20.7	47.5	48.4	43.3	10.5	13.7	43.9	13.1	46.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	8.0	12.6	12.3	6.3	20.5	19.7	16.6	11.2	9.5	13.5	9.5	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	91.1	58.9	59.3	54.8	97.5	98.4	84.8	61.3	62.5	85.0	67.8	102.3
LnGrp LOS	F	E	E	D	F	F	F	E	E	F	E	F
Approach Vol, veh/h	1114			1300			1933			1622		
Approach Delay, s/veh	66.6			89.1			67.5			78.7		
Approach LOS	E			F			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.0	42.0	20.9	47.1	37.0	35.0	21.0	47.0				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	26.0	35.0	19.0	38.0	33.0	28.0	17.0	40.0				
Max Q Clear Time (g_c+I1), s	27.8	32.5	16.6	33.8	35.0	29.4	18.4	42.0				
Green Ext Time (p_c), s	0.0	2.0	0.3	2.2	0.0	0.0	0.0	0.0				

Intersection Summary	
HCM 6th Ctrl Delay	75.1
HCM 6th LOS	E

Appendix M

2031 Future Total Traffic Operations with Improvements Reports



Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	155	76	112	198	105	48	1192	47	68	800	66
Future Volume (vph)	119	155	76	112	198	105	48	1192	47	68	800	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		0.99		0.99		1.00				
Flt		0.951			0.948			0.994			0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1735	0	1770	1708	0	1752	3384	0	1597	3353	0
Flt Permitted	0.423			0.564			0.296			0.168		
Satd. Flow (perm)	769	1735	0	1042	1708	0	546	3384	0	282	3353	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			26			5			11	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	7		10	10		7		7	7			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	4%	2%	2%	3%	8%	3%	6%	3%	13%	7%	0%
Adj. Flow (vph)	119	155	76	112	198	105	48	1192	47	68	800	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	231	0	112	303	0	48	1239	0	68	866	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	17.0	17.0		17.0	17.0		21.0	21.0		21.0	21.0	
Total Split (s)	50.0	50.0		50.0	50.0		50.0	50.0		50.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	43.0	43.0		43.0	43.0		44.0	44.0		44.0	44.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		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?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	17.3	17.3		17.3	17.3		44.2	44.2		44.2	44.2	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.59	0.59		0.59	0.59	
v/c Ratio	0.67	0.54		0.46	0.73		0.15	0.62		0.41	0.43	

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

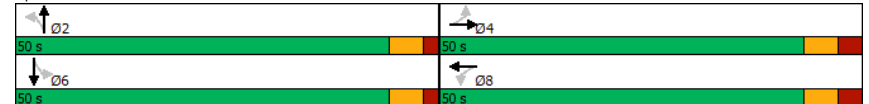
Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	44.7	26.3		30.9	34.7		9.8	12.2		19.5	9.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	44.7	26.3		30.9	34.7		9.8	12.2		19.5	9.8	
LOS	D	C		C	C		A	B		B	A	
Approach Delay		32.5			33.7			12.1			10.5	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	16.0	25.7		14.2	37.8		2.8	55.1		4.8	32.5	
Queue Length 95th (m)	33.6	46.0		29.0	63.6		10.0	95.0		20.2	57.4	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0				35.0			15.0			40.0	
Base Capacity (vph)	445	1018		603	1000		323	2008		167	1992	
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	0.27	0.23		0.19	0.30		0.15	0.62		0.41	0.43	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	74.5
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	17.0
Intersection Capacity Utilization:	95.0%
Intersection LOS:	B
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 1: Ontario Street & Laurier Avenue



HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	119	155	76	112	198	105	48	1192	47	68	800	66
Future Volume (veh/h)	119	155	76	112	198	105	48	1192	47	68	800	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1856	1781	1856	1811	1856	1707	1796	1900
Adj Flow Rate, veh/h	119	155	76	112	198	105	48	1192	47	68	800	66
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	2	2	3	8	3	6	3	13	7	0
Cap, veh/h	257	356	175	316	349	185	328	1806	71	203	1707	141
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.54	0.54	0.54	0.54	0.54	0.54
Sat Flow, veh/h	1054	1162	570	1143	1137	603	633	3374	133	410	3190	263
Grp Volume(v), veh/h	119	0	231	112	0	303	48	608	631	68	428	438
Grp Sat Flow(s), veh/h/ln	1054	0	1732	1143	0	1740	633	1721	1786	410	1706	1747
Q Serve(g_s), s	8.8	0.0	8.8	7.1	0.0	12.0	4.2	20.9	20.9	11.7	12.8	12.8
Cycle Q Clear(g_c), s	20.8	0.0	8.8	15.9	0.0	12.0	17.0	20.9	20.9	32.6	12.8	12.8
Prop In Lane	1.00		0.33	1.00		0.35	1.00		0.07	1.00		0.15
Lane Grp Cap(c), veh/h	257	0	531	316	0	534	328	921	956	203	913	935
V/C Ratio(X)	0.46	0.00	0.44	0.35	0.00	0.57	0.15	0.66	0.66	0.34	0.47	0.47
Avail Cap(c_a), veh/h	485	0	906	563	0	910	328	921	956	203	913	935
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	0.0	22.8	29.2	0.0	23.9	17.1	13.7	13.7	25.5	11.9	11.9
Incr Delay (d2), s/veh	1.3	0.0	0.6	0.7	0.0	1.0	0.9	3.7	3.6	4.4	1.7	1.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.5	0.0	2.0	1.3	0.0	2.8	0.4	2.8	2.9	0.9	2.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	34.0	0.0	23.4	29.8	0.0	24.9	18.1	17.4	17.3	29.9	13.6	13.5
LnGrp LOS	C	A	C	C	A	C	B	B	B	C	B	B
Approach Vol, veh/h	350			415			1287			934		
Approach Delay, s/veh	27.0			26.2			17.4			14.7		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	50.0		32.2		50.0		32.2					
Change Period (Y+Rc), s	6.0		7.0		6.0		7.0					
Max Green Setting (Gmax), s	44.0		43.0		44.0		43.0					
Max Q Clear Time (g_c+I1), s	22.9		22.8		34.6		17.9					
Green Ext Time (p_c), s	10.5		2.2		4.9		2.8					
Intersection Summary												
HCM 6th Ctrl Delay	18.9											
HCM 6th LOS	B											

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔↔↔	↔↔	
Traffic Volume (vph)	0	66	0	1478	1123	4
Future Volume (vph)	0	66	0	1478	1123	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Frt	0.865		0.999			
Fit Protected						
Satd. Flow (prot)	0	1644	0	4893	3403	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	4893	3403	0
Link Speed (k/h)	60		60		50	
Link Distance (m)	63.0		90.2		135.8	
Travel Time (s)	3.8		5.4		9.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	66	0	1478	1123	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	66	0	1478	1127	0
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 41.9%						ICU Level of Service A
Analysis Period (min) 15						

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑	↑↑↑	↑↑	↑	
Traffic Vol, veh/h	0	66	0	1478	1123	4
Future Vol, veh/h	0	66	0	1478	1123	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	66	0	1478	1123	4

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	564	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	474	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	474	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	474	-	-
HCM Lane V/C Ratio	-	0.139	-	-
HCM Control Delay (s)	-	13.8	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑
Traffic Volume (vph)	366	1595	315	278	885	218	184	837	345	181	838	159
Future Volume (vph)	366	1595	315	278	885	218	184	837	345	181	838	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	10.0			85.0			100.0					7.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor			0.99	1.00					0.98	1.00		
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	5036	1538	1641	4940	1495	1671	4940	1524	1736	4848	1568
Fit Permitted	0.207			0.106			0.218			0.219		
Satd. Flow (perm)	378	5036	1515	183	4940	1495	384	4940	1499	400	4848	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124			193			345			159
Link Speed (k/h)		60			60			60				50
Link Distance (m)		117.7			375.6			511.5				90.2
Travel Time (s)		7.1			22.5			30.7				6.5
Confl. Peds. (#/hr)			3	3					5	5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	3%	5%	10%	5%	8%	8%	5%	6%	4%	7%	3%
Adj. Flow (vph)	366	1595	315	278	885	218	184	837	345	181	838	159
Shared Lane Traffic (%)												
Lane Group Flow (vph)	366	1595	315	278	885	218	184	837	345	181	838	159
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
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	16.7
Total Split (s)	24.0	42.0	42.0	25.0	43.0	43.0	12.0	41.0	41.0	12.0	41.0	41.0
Total Split (%)	20.0%	35.0%	35.0%	20.8%	35.8%	35.8%	10.0%	34.2%	34.2%	10.0%	34.2%	34.2%
Maximum Green (s)	20.0	36.0	36.0	21.0	37.0	37.0	8.0	35.0	35.0	8.0	35.0	35.0
Yellow Time (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
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
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
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
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	33.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	59.4	38.0	38.0	58.6	37.6	37.6	45.0	35.0	35.0	45.0	35.0	35.0
Actuated g/C Ratio	0.50	0.32	0.32	0.49	0.31	0.31	0.38	0.29	0.29	0.38	0.29	0.29
v/c Ratio	0.90	1.00	0.56	0.87	0.57	0.36	0.80	0.58	0.51	0.76	0.59	0.28

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

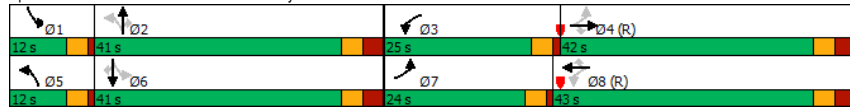
(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	31.7	55.5	22.7	56.8	36.4	8.0	52.8	38.2	6.2	46.8	38.5	6.2
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	31.7	55.5	22.7	56.8	36.4	8.0	52.8	38.2	6.2	46.8	38.5	6.2
LOS	C	E	C	E	D	A	D	D	A	D	D	A
Approach Delay	47.1			36.0			32.1			35.4		
Approach LOS	D			D			C			D		
Queue Length 50th (m)	57.9	~161.2	56.0	50.1	67.6	4.4	29.9	64.8	0.0	29.2	65.1	0.0
Queue Length 95th (m)	m#72.7	m#185.8	m66.2	#93.7	82.3	23.4	#60.8	79.4	22.8	#56.1	79.8	16.2
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0	70.0		70.0				
Base Capacity (vph)	414	1595	564	347	1549	601	229	1440	681	239	1414	569
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	0.88	1.00	0.56	0.80	0.57	0.36	0.80	0.58	0.51	0.76	0.59	0.28

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 74 (62%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 39.1 Intersection LOS: D
 Intersection Capacity Utilization 106.3% ICU Level of Service G
 Analysis Period (min) 15
 ~ 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.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖
Traffic Volume (veh/h)	366	1595	315	278	885	218	184	837	345	181	838	159
Future Volume (veh/h)	366	1595	315	278	885	218	184	837	345	181	838	159
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1856	1826	1752	1826	1781	1781	1826	1811	1841	1796	1856
Adj Flow Rate, veh/h	366	1595	315	278	885	218	184	837	345	181	838	159
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	3	5	10	5	8	8	5	6	4	7	3
Cap, veh/h	421	1674	510	306	1584	478	251	1454	445	246	1430	456
Arrive On Green	0.16	0.33	0.33	0.14	0.32	0.32	0.07	0.29	0.29	0.07	0.29	0.29
Sat Flow, veh/h	1753	5066	1543	1668	4985	1505	1697	4985	1527	1753	4904	1564
Grp Volume(v), veh/h	366	1595	315	278	885	218	184	837	345	181	838	159
Grp Sat Flow(s), veh/h/ln	1753	1689	1543	1668	1662	1505	1697	1662	1527	1753	1635	1564
Q Serve(g_s), s	16.6	36.9	20.6	14.9	17.7	13.9	8.0	17.2	24.8	8.0	17.5	9.6
Cycle Q Clear(g_c), s	16.6	36.9	20.6	14.9	17.7	13.9	8.0	17.2	24.8	8.0	17.5	9.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	421	1674	510	306	1584	478	251	1454	445	246	1430	456
V/C Ratio(X)	0.87	0.95	0.62	0.91	0.56	0.46	0.73	0.58	0.77	0.74	0.59	0.35
Avail Cap(c_a), veh/h	438	1674	510	357	1584	478	251	1454	445	246	1430	456
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.6	39.3	33.8	33.4	34.0	32.7	32.4	36.2	38.9	31.4	36.3	33.5
Incr Delay (d2), s/veh	16.4	13.3	5.5	24.0	1.4	3.1	10.4	1.7	12.4	10.9	1.8	2.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	6.0	12.7	6.2	6.1	5.3	4.0	3.4	5.2	8.2	3.4	5.5	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	41.0	52.6	39.3	57.4	35.4	35.8	42.8	37.8	51.3	42.3	38.1	35.6
LnGrp LOS	D	D	D	E	D	D	D	D	D	D	D	D
Approach Vol, veh/h	2276			1381			1366			1178		
Approach Delay, s/veh	48.9			39.9			41.9			38.4		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	41.0	21.3	45.7	12.0	41.0	22.9	44.1				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	8.0	35.0	21.0	36.0	8.0	35.0	20.0	37.0				
Max Q Clear Time (g_c+I1), s	10.0	26.8	16.9	38.9	10.0	19.5	18.6	19.7				
Green Ext Time (p_c), s	0.0	4.8	0.4	0.0	0.0	6.7	0.2	7.5				

Intersection Summary

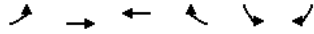
HCM 6th Ctrl Delay 43.3
 HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕	↕↕↕	↕↕↕		↕	↕
Traffic Volume (vph)	2	2087	1266	35	77	4
Future Volume (vph)	2	2087	1266	35	77	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.996			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	5085	4973	0	1357	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	5085	4973	0	1357	1615
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	4%	0%	33%	0%
Adj. Flow (vph)	2	2087	1266	35	77	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	2087	1301	0	77	4
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 AM Peak Hour

Intersection						
Int Delay, s/veh	9.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕	↕↕↕	↕↕↕		↕	↕
Traffic Vol, veh/h	2	2087	1266	35	77	4
Future Vol, veh/h	2	2087	1266	35	77	4
Conflicting Peds, #/hr	7	0	0	7	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	4	0	33	0
Mvmt Flow	2	2087	1266	35	77	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1308	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	5.3	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	3.1	-	-
Pot Cap-1 Maneuver	282	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	280	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	\$ 389.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	280	-	-	-	53	351
HCM Lane V/C Ratio	0.007	-	-	-	1.453	0.011
HCM Control Delay (s)	17.9	-	-	-	\$ 408.9	15.4
HCM Lane LOS	C	-	-	-	F	C
HCM 95th %tile Q(veh)	0	-	-	-	7.1	0

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	174	1806	53	168	908	121	84	141	278	140	113	96
Future Volume (vph)	174	1806	53	168	908	121	84	141	278	140	113	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97	0.99		0.99	1.00		0.99
Frt			0.850			0.850			0.900			0.931
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	5036	1568	1770	4893	1524	1770	1660	0	1703	1657	0
Flt Permitted	0.231			0.087			0.627			0.212		
Satd. Flow (perm)	409	5036	1524	162	4893	1481	1160	1660	0	380	1657	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)			109		121			84			43	
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		171.2			370.5			215.4			213.5	
Travel Time (s)		10.3			22.2			12.9			12.8	
Conf. Peds. (#/hr)	5		5	5		5	8		3	3		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	7%	3%	3%	2%	6%	6%	2%	2%	2%	6%	3%	9%
Adj. Flow (vph)	174	1806	53	168	908	121	84	141	278	140	113	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	1806	53	168	908	121	84	419	0	140	209	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	4	3	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	10.0	10.0		5.0	10.0	
Minimum Split (s)	9.5	26.0	26.0	9.5	44.7	44.7	16.7	16.7		9.5	16.7	
Total Split (s)	13.0	52.0	52.0	13.0	52.0	52.0	42.0	42.0		13.0	55.0	
Total Split (%)	10.8%	43.3%	43.3%	10.8%	43.3%	43.3%	35.0%	35.0%		10.8%	45.8%	
Maximum Green (s)	8.5	46.0	46.0	9.0	46.0	46.0	36.0	36.0		8.5	49.0	
Yellow Time (s)	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.5	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	3.0	3.0		1.0	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	
Total Lost Time (s)	4.5	6.0	6.0	4.0	6.0	6.0	6.0	6.0		4.5	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0			7.0	
Flash Dont Walk (s)		31.0	31.0		31.0	31.0	26.0	26.0			26.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0			0	
Act Effect Green (s)	56.0	46.0	46.0	57.0	46.0	46.0	36.1	36.1		50.5	49.0	
Actuated g/C Ratio	0.47	0.38	0.38	0.48	0.38	0.38	0.30	0.30		0.42	0.41	
v/c Ratio	0.62	0.94	0.08	0.85	0.48	0.19	0.24	0.75		0.56	0.30	

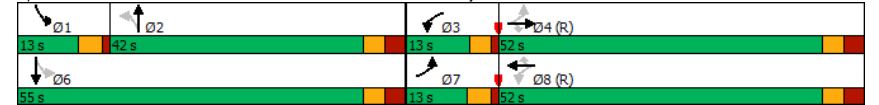
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	27.7	46.0	0.2	52.2	19.4	5.5	34.0	39.7		31.1	20.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	27.7	46.0	0.2	52.2	19.4	5.5	34.0	39.7		31.1	20.1	
LOS	C	D	A	D	B	A	C	D		C	C	
Approach Delay			43.2			22.6		38.8				24.5
Approach LOS			D			C		D				C
Queue Length 50th (m)	23.1	155.8	0.0	8.5	71.0	12.4	15.7	76.2		21.6	26.8	
Queue Length 95th (m)	37.2	#189.8	0.0	m#56.8	85.5	m#19.1	29.9	116.6		36.0	45.7	
Internal Link Dist (m)		147.2			346.5			191.4				189.5
Turn Bay Length (m)	25.0		35.0	25.0		25.0		20.0				20.0
Base Capacity (vph)	281	1930	651	197	1875	642	349	558		253	702	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.62	0.94	0.08	0.85	0.48	0.19	0.24	0.75		0.55	0.30	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 35.0 Intersection LOS: D
 Intersection Capacity Utilization 98.4% ICU Level of Service F
 Analysis Period (min) 15
 # 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.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



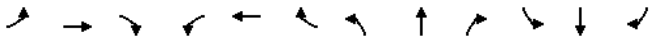
HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (veh/h)	174	1806	53	168	908	121	84	141	278	140	113	96
Future Volume (veh/h)	174	1806	53	168	908	121	84	141	278	140	113	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1796	1856	1856	1870	1811	1811	1870	1870	1811	1856	1767	1767
Adj Flow Rate, veh/h	174	1806	53	168	908	121	84	141	278	140	113	96
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	3	2	6	6	2	2	2	6	3	9
Cap, veh/h	310	1951	602	201	1895	585	411	168	332	242	377	320
Arrive On Green	0.07	0.39	0.39	0.07	0.38	0.38	0.30	0.30	0.30	0.07	0.41	0.41
Sat Flow, veh/h	1711	5066	1562	1781	4944	1525	1166	559	1102	1725	924	785
Grp Volume(v), veh/h	174	1806	53	168	908	121	84	0	419	140	0	209
Grp Sat Flow(s),veh/h/ln	1711	1689	1562	1781	1648	1525	1166	0	1661	1725	0	1709
Q Serve(g_s), s	7.4	40.9	2.6	6.8	16.6	6.4	6.5	0.0	28.3	6.5	0.0	9.9
Cycle Q Clear(g_c), s	7.4	40.9	2.6	6.8	16.6	6.4	6.5	0.0	28.3	6.5	0.0	9.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.66	1.00		0.46
Lane Grp Cap(c), veh/h	310	1951	602	201	1895	585	411	0	500	242	0	698
V/C Ratio(X)	0.56	0.93	0.09	0.83	0.48	0.21	0.20	0.00	0.84	0.58	0.00	0.30
Avail Cap(c_a), veh/h	310	1951	602	205	1895	585	411	0	500	243	0	698
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.6	35.2	23.5	28.2	27.9	24.8	31.6	0.0	39.2	29.0	0.0	23.9
Incr Delay (d2), s/veh	2.3	9.0	0.3	24.5	0.9	0.8	1.1	0.0	15.4	3.4	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	12.8	0.7	3.1	4.6	1.7	1.5	0.0	10.4	2.0	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	44.3	23.8	52.7	28.8	25.6	32.7	0.0	54.7	32.4	0.0	25.0
LnGrp LOS	C	D	C	D	C	C	C	A	D	C	A	C
Approach Vol, veh/h	2033			1197			503			349		
Approach Delay, s/veh	42.0			31.8			51.0			28.0		
Approach LOS	D			C			D			C		
Timer - Assigned Phs	1	2	3	4	6	7	8					
Phs Duration (G+Y+Rc), s	12.9	42.1	12.8	52.2	55.0	13.0	52.0					
Change Period (Y+Rc), s	4.5	6.0	4.0	6.0	6.0	4.5	6.0					
Max Green Setting (Gmax), s	8.5	36.0	9.0	46.0	49.0	8.5	46.0					
Max Q Clear Time (g_c+I1), s	8.5	30.3	8.8	42.9	11.9	9.4	18.6					
Green Ext Time (p_c), s	0.0	1.7	0.0	2.8	1.6	0.0	8.8					
Intersection Summary												
HCM 6th Ctrl Delay	38.9											
HCM 6th LOS	D											
Notes												
User approved pedestrian interval to be less than phase max green.												

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 AM Peak Hour

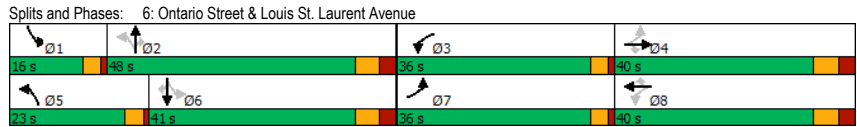
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	382	613	374	464	539	60	202	873	187	46	1203	180
Future Volume (vph)	382	613	374	464	539	60	202	873	187	46	1203	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	1.00					0.98			0.98	1.00		
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3505	1568	1736	3471	1524	1641	4848	1538	1703	4848	1524
Fit Permitted	0.361			0.166			0.102			0.296		
Satd. Flow (perm)	665	3505	1568	303	3471	1498	176	4848	1514	530	4848	1524
Right Turn on Red			Yes			Yes			Yes		Yes	
Satd. Flow (RTOR)			248			125			154		125	
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		193.1			250.0			253.7			194.1	
Travel Time (s)		11.6			15.0			15.2			11.6	
Confl. Peds. (#/hr)	3				3			2		2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	4%	4%	6%	10%	7%	5%	6%	7%	6%
Adj. Flow (vph)	382	613	374	464	539	60	202	873	187	46	1203	180
Shared Lane Traffic (%)												
Lane Group Flow (vph)	382	613	374	464	539	60	202	873	187	46	1203	180
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
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.0	26.0	26.0	9.0	26.0	26.0	9.0	32.0	32.0	9.0	32.0	32.0
Total Split (s)	36.0	40.0	40.0	36.0	40.0	40.0	23.0	48.0	48.0	16.0	41.0	41.0
Total Split (%)	25.7%	28.6%	28.6%	25.7%	28.6%	28.6%	16.4%	34.3%	34.3%	11.4%	29.3%	29.3%
Maximum Green (s)	32.0	33.0	33.0	32.0	33.0	33.0	19.0	41.0	41.0	12.0	34.0	34.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	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
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
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Flash Dont Walk (s)	18.0	18.0		18.0	18.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		0	0		0	0		0		0	0	
Act Effect Green (s)	55.9	28.4	28.4	64.6	34.0	34.0	57.4	45.0	45.0	44.9	34.2	34.2
Actuated g/C Ratio	0.43	0.22	0.22	0.49	0.26	0.26	0.44	0.34	0.34	0.34	0.26	0.26
v/c Ratio	0.78	0.81	0.70	0.97	0.60	0.12	0.79	0.52	0.30	0.18	0.95	0.37

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 AM Peak Hour

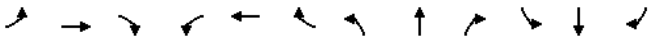


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	34.0	58.2	23.6	68.0	46.8	0.5	53.2	37.6	9.8	25.7	64.1	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	58.2	23.6	68.0	46.8	0.5	53.2	37.6	9.8	25.7	64.1	16.8
LOS	C	E	C	E	D	A	D	D	A	C	E	B
Approach Delay	42.0			53.5			36.0			56.9		
Approach LOS	D			D			D			E		
Queue Length 50th (m)	66.1	86.7	32.5	104.0	69.5	0.0	39.3	74.5	6.5	7.5	125.4	12.2
Queue Length 95th (m)	94.0	110.4	71.1	#183.9	96.3	0.0	#75.9	94.0	26.3	16.2	#167.0	35.1
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0		20.0		50.0		50.0		50.0		50.0	
Base Capacity (vph)	585	889	582	501	928	492	291	1663	620	307	1267	490
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	0.65	0.69	0.64	0.93	0.58	0.12	0.69	0.52	0.30	0.15	0.95	0.37

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	131
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.97
Intersection Signal Delay:	47.1
Intersection Capacity Utilization:	95.4%
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔			
Traffic Volume (veh/h)	382	613	374	464	539	60	202	873	187	46	1203	180			
Future Volume (veh/h)	382	613	374	464	539	60	202	873	187	46	1203	180			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1811	1752	1796	1826	1811	1796	1811			
Adj Flow Rate, veh/h	382	613	0	464	539	0	202	873	187	46	1203	180			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	3	3	3	4	4	6	10	7	5	6	7	6			
Cap, veh/h	492	741		496	867		246	1708	538	221	1363	426			
Arrive On Green	0.19	0.21	0.00	0.23	0.25	0.00	0.10	0.35	0.35	0.03	0.28	0.28			
Sat Flow, veh/h	1767	3526	1572	1753	3497	1535	1668	4904	1545	1725	4904	1532			
Grp Volume(v), veh/h	382	613	0	464	539	0	202	873	187	46	1203	180			
Grp Sat Flow(s), veh/h/ln	1767	1763	1572	1753	1749	1535	1668	1635	1545	1725	1635	1532			
Q Serve(g_s), s	20.2	20.3	0.0	25.0	16.8	0.0	10.2	17.3	11.0	2.3	28.7	11.8			
Cycle Q Clear(g_c), s	20.2	20.3	0.0	25.0	16.8	0.0	10.2	17.3	11.0	2.3	28.7	11.8			
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	492	741		496	867		246	1708	538	221	1363	426			
V/C Ratio(X)	0.78	0.83		0.94	0.62		0.82	0.51	0.35	0.21	0.88	0.42			
Avail Cap(c_a), veh/h	617	951		553	944		334	1708	538	335	1363	426			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	29.0	46.2	0.0	29.8	40.9	0.0	30.4	31.6	29.5	30.2	42.2	36.1			
Incr Delay (d2), s/veh	4.9	4.8	0.0	22.4	1.1	0.0	11.2	1.1	1.8	0.5	8.5	3.1			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%), veh/ln	6.3	7.3	0.0	9.8	5.5	0.0	3.5	5.0	3.1	0.7	9.5	3.6			
Unsig. Movement Delay, s/veh															
LnGrp Delay(d), s/veh	33.9	51.0	0.0	52.2	42.0	0.0	41.6	32.7	31.3	30.7	50.8	39.2			
LnGrp LOS	C	D		D	D		D	C	C	C	D	D			
Approach Vol, veh/h	995			A			1003			A			1262		
Approach Delay, s/veh	44.4						46.7			33.9			48.7		
Approach LOS	D						D			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8							
Phs Duration (G+Y+Rc), s	8.0	49.6	32.0	32.7	16.6	41.0	27.4	37.3							
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0							
Max Green Setting (Gmax), s	12.0	41.0	32.0	33.0	19.0	34.0	32.0	33.0							
Max Q Clear Time (g_c+I1), s	4.3	19.3	27.0	22.3	12.2	30.7	22.2	18.8							
Green Ext Time (p_c), s	0.1	8.1	1.0	3.4	0.4	2.5	1.2	3.4							

Intersection Summary	
HCM 6th Ctrl Delay	43.4
HCM 6th LOS	D

Notes
 Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	297	65	128	330	131	96	1037	104	189	1200	152
Future Volume (vph)	105	297	65	128	330	131	96	1037	104	189	1200	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	15.0			25.0			15.0			20.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00		1.00		1.00		1.00		1.00
Frt		0.973			0.957			0.986			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1827	0	1787	1800	0	1787	3419	0	1787	3443	0
Flt Permitted	0.144			0.328			0.096			0.090		
Satd. Flow (perm)	271	1827	0	615	1800	0	181	3419	0	169	3443	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			19			12			17	
Link Speed (k/h)		60			60			60			50	
Link Distance (m)		66.2			94.7			135.8			142.5	
Travel Time (s)		4.0			5.7			8.1			10.3	
Conf. Peds. (#/hr)	3		7	7		3	2		8	8		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	0%	1%	0%	2%	1%	4%	1%	1%	3%	1%
Adj. Flow (vph)	105	297	65	128	330	131	96	1037	104	189	1200	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	362	0	128	461	0	96	1141	0	189	1352	0
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)	3.0	10.0		3.0	10.0		3.0	15.0		5.0	15.0	
Minimum Split (s)	7.0	17.0		7.0	17.0		7.0	21.0		9.5	21.0	
Total Split (s)	8.0	36.5		7.0	35.5		8.0	47.1		14.0	53.1	
Total Split (%)	7.6%	34.9%		6.7%	33.9%		7.6%	45.0%		13.4%	50.8%	
Maximum Green (s)	4.0	29.5		3.0	28.5		4.0	41.1		10.0	47.1	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	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)	4.0	7.0		4.0	7.0		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		19.0			19.0			14.0			14.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	35.5	28.5		33.5	27.5		47.5	41.5		57.1	47.1	
Actuated g/C Ratio	0.34	0.28		0.32	0.27		0.46	0.40		0.55	0.45	
v/c Ratio	0.70	0.71		0.55	0.94		0.67	0.83		0.78	0.86	

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

1: Ontario Street & Laurier Avenue

Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	49.2	41.6		35.2	64.5		37.5	34.4		41.7	32.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	49.2	41.6		35.2	64.5		37.5	34.4		41.7	32.0	
LOS	D	D		D	E		D	C		D	C	
Approach Delay		43.3			58.2			34.6			33.2	
Approach LOS		D			E			C			C	
Queue Length 50th (m)	14.7	67.2		18.1	92.2		9.4	113.7		21.9	132.4	
Queue Length 95th (m)	#34.3	100.8		31.8	#153.7		#24.1	143.2		#57.2	165.1	
Internal Link Dist (m)		42.2			70.7			111.8			118.5	
Turn Bay Length (m)	15.0			35.0			15.0			40.0		
Base Capacity (vph)	151	527		232	509		144	1375		249	1574	
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	0.70	0.69		0.55	0.91		0.67	0.83		0.76	0.86	
Intersection Summary												
Area Type:	Other											
Cycle Length:	104.6											
Actuated Cycle Length:	103.6											
Natural Cycle:	90											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.94											
Intersection Signal Delay:	38.7											
Intersection Capacity Utilization:	92.1%											
ICU Level of Service:	F											
Analysis Period (min):	15											
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												
Splits and Phases: 1: Ontario Street & Laurier Avenue												

HCM 6th Signalized Intersection Summary
1: Ontario Street & Laurier Avenue

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	105	297	65	128	330	131	96	1037	104	189	1200	152
Future Volume (veh/h)	105	297	65	128	330	131	96	1037	104	189	1200	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1900	1885	1900	1870	1885	1841	1885	1885	1856	1885
Adj Flow Rate, veh/h	105	297	65	128	330	131	96	1037	104	189	1200	152
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	0	1	0	2	1	4	1	1	3	1
Cap, veh/h	157	419	92	225	350	139	183	1320	132	274	1420	179
Arrive On Green	0.04	0.28	0.28	0.03	0.27	0.27	0.04	0.41	0.41	0.08	0.45	0.45
Sat Flow, veh/h	1795	1496	327	1795	1291	512	1795	3206	321	1795	3146	397
Grp Volume(v), veh/h	105	0	362	128	0	461	96	565	576	189	671	681
Grp Sat Flow(s),veh/h/ln	1795	0	1823	1795	0	1803	1795	1749	1779	1795	1763	1780
Q Serve(g_s), s	4.0	0.0	18.6	3.0	0.0	26.1	3.2	29.3	29.4	6.0	35.2	35.5
Cycle Q Clear(g_c), s	4.0	0.0	18.6	3.0	0.0	26.1	3.2	29.3	29.4	6.0	35.2	35.5
Prop In Lane	1.00		0.18	1.00		0.28	1.00		0.18	1.00		0.22
Lane Grp Cap(c), veh/h	157	0	511	225	0	488	183	720	732	274	796	803
V/C Ratio(X)	0.67	0.00	0.71	0.57	0.00	0.94	0.52	0.79	0.79	0.69	0.84	0.85
Avail Cap(c_a), veh/h	157	0	515	225	0	492	183	720	732	306	796	803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	0.0	33.7	36.2	0.0	37.3	22.9	26.7	26.7	21.4	25.4	25.5
Incr Delay (d2), s/veh	10.4	0.0	4.4	3.3	0.0	27.0	2.7	8.4	8.3	5.7	10.6	10.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	6.1	1.0	0.0	11.4	0.9	8.7	8.9	1.8	11.0	11.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	0.0	38.1	39.5	0.0	64.3	25.6	35.1	35.0	27.1	35.9	36.3
LnGrp LOS	D	A	D	D	A	E	C	D	D	C	D	D
Approach Vol, veh/h	467			589			1237			1541		
Approach Delay, s/veh	39.1			58.9			34.3			35.0		
Approach LOS	D			E			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.1	49.0	7.0	36.3	8.0	53.1	8.0	35.3				
Change Period (Y+Rc), s	4.0	6.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	10.0	41.1	3.0	29.5	4.0	47.1	4.0	28.5				
Max Q Clear Time (g_c+I1), s	8.0	31.4	5.0	20.6	5.2	37.5	6.0	28.1				
Green Ext Time (p_c), s	0.1	5.6	0.0	1.6	0.0	6.6	0.0	0.1				

Intersection Summary												
HCM 6th Ctrl Delay	39.0											
HCM 6th LOS	D											

Notes
User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔↔↔	↔↔	↔
Traffic Volume (vph)	0	51	0	1452	1544	17
Future Volume (vph)	0	51	0	1452	1544	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.91	0.95	0.95
Ped Bike Factor						
Frt	0.865		0.998			
Fit Protected						
Satd. Flow (prot)	0	1644	0	4988	3499	0
Fit Permitted						
Satd. Flow (perm)	0	1644	0	4988	3499	0
Link Speed (k/h)	60		60	50		
Link Distance (m)	63.0		90.2	135.8		
Travel Time (s)	3.8		5.4	9.8		
Confl. Peds. (#/hr)	2		2			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	4%	3%	0%
Adj. Flow (vph)	0	51	0	1452	1544	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	51	0	1452	1561	0
Sign Control	Stop		Free Free			

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization 53.2%	ICU Level of Service A
Analysis Period (min)	15

HCM 6th TWSC
2: Ontario Street & East Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑	↑↑↑	↑↑	↑↓	
Traffic Vol, veh/h	0	51	0	1452	1544	17
Future Vol, veh/h	0	51	0	1452	1544	17
Conflicting Peds, #/hr	2	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	51	0	1452	1544	17

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	783	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.9	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.3	-
Pot Cap-1 Maneuver	0	341	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	340	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	340	-
HCM Lane V/C Ratio	-	0.15	-
HCM Control Delay (s)	-	17.4	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.5	-

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑	↑	↑↑↑	↑
Traffic Volume (vph)	296	1243	184	245	1643	170	324	940	321	332	917	345
Future Volume (vph)	296	1243	184	245	1643	170	324	940	321	332	917	345
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	65.0		35.0	35.0		45.0	70.0		70.0	0.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	10.0			85.0			100.0			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor			0.99	1.00			1.00					0.99
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	5085	1509	1752	5036	1417	1752	5187	1553	1641	4848	1482
Fit Permitted	0.126			0.136			0.189			0.144		
Satd. Flow (perm)	239	5085	1487	251	5036	1417	348	5187	1553	249	4848	1460
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			100			321			345
Link Speed (k/h)		60			60			60				50
Link Distance (m)		117.7			375.6			511.5				90.2
Travel Time (s)		7.1			22.5			30.7				6.5
Confl. Peds. (#/hr)			3	3			3					3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	7%	3%	3%	14%	3%	0%	4%	10%	7%	9%
Adj. Flow (vph)	296	1243	184	245	1643	170	324	940	321	332	917	345
Shared Lane Traffic (%)												
Lane Group Flow (vph)	296	1243	184	245	1643	170	324	940	321	332	917	345
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
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.0	26.7	26.7	9.0	26.7	26.7	9.0	16.7	16.7	9.0	16.7	16.7
Total Split (s)	25.0	35.0	35.0	23.0	33.0	33.0	23.0	37.0	37.0	25.0	39.0	39.0
Total Split (%)	20.8%	29.2%	29.2%	19.2%	27.5%	27.5%	19.2%	30.8%	30.8%	20.8%	32.5%	32.5%
Maximum Green (s)	21.0	29.0	29.0	19.0	27.0	27.0	19.0	31.0	31.0	21.0	33.0	33.0
Yellow Time (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
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	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	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
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
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
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0	30.0		30.0	30.0		33.0	33.0		33.0	33.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	52.3	31.8	31.8	47.7	29.5	29.5	51.8	31.5	31.5	56.2	33.7	33.7
Actuated g/C Ratio	0.44	0.26	0.26	0.40	0.25	0.25	0.43	0.26	0.26	0.47	0.28	0.28
v/c Ratio	0.86	0.92	0.39	0.81	1.33	0.40	0.89	0.69	0.50	0.94	0.67	0.53

Lanes, Volumes, Timings
3: Ontario Street & Derry Road

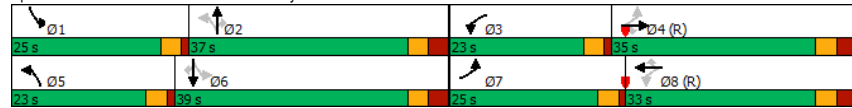
(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	65.7	66.3	41.9	49.0	190.1	20.0	52.1	43.1	6.7	64.8	41.4	6.7
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	65.7	66.3	41.9	49.0	190.1	20.0	52.1	43.1	6.7	64.8	41.4	6.7
LOS	E	E	D	D	F	B	D	D	A	E	D	A
Approach Delay	63.6			159.2			37.6			38.8		
Approach LOS	E			F			D			D		
Queue Length 50th (m)	72.5	100.2	23.5	41.6	~201.3	14.2	52.3	77.5	0.0	61.8	74.5	0.0
Queue Length 95th (m)	m86.6	m#143.4	m37.9	#75.7	#234.3	35.7	#104.2	93.6	23.0	#118.6	90.6	23.9
Internal Link Dist (m)	93.7		351.6		487.5		66.2					
Turn Bay Length (m)	65.0		35.0	35.0	45.0	70.0		70.0				
Base Capacity (vph)	379	1345	467	342	1237	423	374	1361	644	360	1360	657
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	0.78	0.92	0.39	0.72	1.33	0.40	0.87	0.69	0.50	0.92	0.67	0.53

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.33
Intersection Signal Delay:	80.3
Intersection LOS:	F
Intersection Capacity Utilization:	116.1%
ICU Level of Service:	H
Analysis Period (min):	15
~	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.

Splits and Phases: 3: Ontario Street & Derry Road



HCM 6th Signalized Intersection Summary
3: Ontario Street & Derry Road

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖	↖	↖↖↖	↖
Traffic Volume (veh/h)	296	1243	184	245	1643	170	324	940	321	332	917	345
Future Volume (veh/h)	296	1243	184	245	1643	170	324	940	321	332	917	345
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1870	1796	1856	1856	1693	1856	1900	1841	1752	1796	1767
Adj Flow Rate, veh/h	296	1243	184	245	1643	170	324	940	321	332	917	345
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	2	7	3	3	14	3	0	4	10	7	9
Cap, veh/h	327	1473	438	294	1322	373	372	1364	409	371	1349	410
Arrive On Green	0.15	0.29	0.29	0.12	0.26	0.26	0.15	0.26	0.26	0.16	0.28	0.28
Sat Flow, veh/h	1810	5106	1518	1767	5066	1429	1767	5187	1555	1668	4904	1492
Grp Volume(v), veh/h	296	1243	184	245	1643	170	324	940	321	332	917	345
Grp Sat Flow(s), veh/h/ln	1810	1702	1518	1767	1689	1429	1767	1729	1555	1668	1635	1492
Q Serve(g_s), s	15.3	27.5	11.8	12.0	31.3	12.0	15.8	19.6	23.0	17.1	20.0	26.2
Cycle Q Clear(g_c), s	15.3	27.5	11.8	12.0	31.3	12.0	15.8	19.6	23.0	17.1	20.0	26.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	327	1473	438	294	1322	373	372	1364	409	371	1349	410
V/C Ratio(X)	0.91	0.84	0.42	0.83	1.24	0.46	0.87	0.69	0.78	0.89	0.68	0.84
Avail Cap(c_a), veh/h	377	1473	438	362	1322	373	387	1364	409	393	1349	410
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.4	40.2	34.6	30.5	44.3	37.2	28.5	39.8	41.1	28.2	38.8	41.0
Incr Delay (d2), s/veh	22.8	6.1	2.9	12.9	116.0	4.0	18.4	2.9	14.0	21.4	2.8	18.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	6.7	9.1	3.5	4.5	23.7	3.5	6.2	6.5	8.0	6.8	6.4	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	57.3	46.2	37.5	43.3	160.4	41.2	46.9	42.7	55.1	49.6	41.6	59.4
LnGrp LOS	E	D	D	D	F	D	D	D	E	D	D	E
Approach Vol, veh/h	1723			2058			1585			1594		
Approach Delay, s/veh	47.2			136.6			46.1			47.1		
Approach LOS	D			F			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.4	37.6	18.4	40.6	22.0	39.0	21.7	37.3				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	21.0	31.0	19.0	29.0	19.0	33.0	21.0	27.0				
Max Q Clear Time (g_c+I1), s	19.1	25.0	14.0	29.5	17.8	28.2	17.3	33.3				
Green Ext Time (p_c), s	0.3	3.9	0.4	0.0	0.2	3.3	0.4	0.0				

Intersection Summary

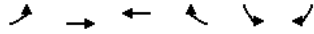
HCM 6th Ctrl Delay	73.3
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Lanes, Volumes, Timings
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔↔↔	↔↔↔		↔	↔
Traffic Volume (vph)	9	1640	2110	146	60	3
Future Volume (vph)	9	1640	2110	146	60	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	65.0				7.5	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.990			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	5085	5088	0	1805	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	5085	5088	0	1805	1615
Link Speed (k/h)		60	60		60	
Link Distance (m)		370.5	117.7		69.8	
Travel Time (s)		22.2	7.1		4.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%
Adj. Flow (vph)	9	1640	2110	146	60	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	1640	2256	0	60	3
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM 6th TWSC
4: Derry Road & South Driveway

(190237) 550 Ontario St S, RR 25, Milton
Total 2031 PM Peak Hour

Intersection						
Int Delay, s/veh	11.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔↔↔	↔↔↔		↔	↔
Traffic Vol, veh/h	9	1640	2110	146	60	3
Future Vol, veh/h	9	1640	2110	146	60	3
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	2	1	0	0	0
Mvmt Flow	9	1640	2110	146	60	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2258	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	5.3	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	3.1	-	-
Pot Cap-1 Maneuver	95	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	95	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	\$ 713.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	95	-	-	-	30	172
HCM Lane V/C Ratio	0.095	-	-	-	2	0.017
HCM Control Delay (s)	46.8	-	-	-	\$ 748.3	26.3
HCM Lane LOS	E	-	-	-	F	D
HCM 95th %tile Q(veh)	0.3	-	-	-	7	0.1

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔↔	↔	↔	↔↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	90	1298	163	412	1603	138	192	167	282	131	315	107
Future Volume (vph)	90	1298	163	412	1603	138	192	167	282	131	315	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		35.0	25.0		0.0	25.0		0.0	20.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	85.0			100.0			60.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.94	1.00			1.00	0.99		1.00	0.99	
Frt			0.850			0.850		0.906			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	5085	1615	1787	5136	1599	1805	1677	0	1770	1804	0
Flt Permitted	0.122			0.109			0.120			0.199		
Satd. Flow (perm)	219	5085	1515	204	5136	1599	227	1677	0	369	1804	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			186			150			71			13
Link Speed (k/h)	60			60			60			60		
Link Distance (m)	171.2			370.5			215.4			213.5		
Travel Time (s)	10.3			22.2			12.9			12.8		
Conf. Peds. (#/hr)			27	27			9		9	9		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	2%	0%	1%	1%	1%	0%	0%	2%	2%	1%	0%
Adj. Flow (vph)	90	1298	163	412	1603	138	192	167	282	131	315	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	1298	163	412	1603	138	192	449	0	131	422	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.5	20.0	20.0	5.0	20.0	20.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	9.0	26.0	26.0	9.5	44.7	44.7	9.5	16.7		9.5	16.7	
Total Split (s)	13.6	29.0	29.0	39.6	55.0	55.0	17.0	40.0		11.4	34.4	
Total Split (%)	11.3%	24.2%	24.2%	33.0%	45.8%	45.8%	14.2%	33.3%		9.5%	28.7%	
Maximum Green (s)	9.1	23.0	23.0	35.6	49.0	49.0	12.5	34.0		6.9	28.4	
Yellow Time (s)	3.5	3.0	3.0	3.0	3.0	3.0	3.5	3.0		3.5	3.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0		1.0	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	
Total Lost Time (s)	4.5	6.0	6.0	4.0	6.0	6.0	4.5	6.0		4.5	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		31.0	31.0		31.0	31.0		26.0			26.0	
Pedestrian Calls (#/hr)		0	0		0	0		0			0	
Act Efect Green (s)	42.3	32.7	32.7	64.6	50.0	50.0	46.6	34.0		37.3	28.9	
Actuated g/C Ratio	0.35	0.27	0.27	0.54	0.42	0.42	0.39	0.28		0.31	0.24	
v/c Ratio	0.51	0.94	0.30	0.91	0.75	0.18	0.78	0.85		0.67	0.95	

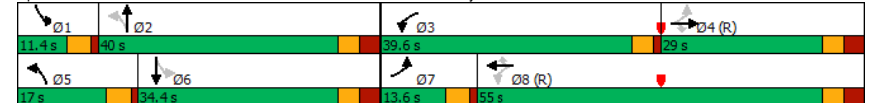
Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	33.5	56.6	5.4	45.2	58.2	23.3	48.7	50.8		44.5	76.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	33.5	56.6	5.4	45.2	58.2	23.3	48.7	50.8		44.5	76.5	
LOS	C	E	A	D	E	C	D	D		D	E	
Approach Delay		49.9			53.5			50.2			68.9	
Approach LOS		D			D			D			E	
Queue Length 50th (m)	10.6	115.8	0.0	100.1	152.5	17.2	32.1	90.5		21.1	101.4	
Queue Length 95th (m)	26.6	#183.9	13.5	m90.5	m131.2	m15.2	#64.7	#148.3		#40.6	#167.3	
Internal Link Dist (m)		147.2			346.5			191.4			189.5	
Turn Bay Length (m)	25.0		35.0	25.0			25.0			20.0		
Base Capacity (vph)	191	1386	548	579	2139	753	253	526		195	443	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.47	0.94	0.30	0.71	0.75	0.18	0.76	0.85		0.67	0.95	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 53.6 Intersection LOS: D
 Intersection Capacity Utilization 109.7% ICU Level of Service H
 Analysis Period (min) 15
 # 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.

Splits and Phases: 5: Santa Maria Boulevard/Commercial Street & Derry Road



HCM 6th Signalized Intersection Summary (190237) 550 Ontario St S, RR 25, Milton
 5: Santa Maria Boulevard/Commercial Street & Derry Road Total 2031 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	90	1298	163	412	1603	138	192	167	282	131	315	107
Future Volume (veh/h)	90	1298	163	412	1603	138	192	167	282	131	315	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1870	1900	1885	1885	1885	1900	1900	1870	1870	1885	1900
Adj Flow Rate, veh/h	90	1298	163	412	1603	138	192	167	282	131	315	107
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	2	0	1	1	1	0	0	2	2	1	0
Cap, veh/h	196	1408	422	452	2227	670	245	179	302	186	331	113
Arrive On Green	0.05	0.28	0.28	0.21	0.43	0.43	0.09	0.28	0.28	0.06	0.25	0.25
Sat Flow, veh/h	1725	5106	1531	1795	5147	1548	1810	631	1065	1781	1342	456
Grp Volume(v), veh/h	90	1298	163	412	1603	138	192	0	449	131	0	422
Grp Sat Flow(s),veh/h/ln	1725	1702	1531	1795	1716	1548	1810	0	1696	1781	0	1797
Q Serve(g_s), s	4.4	29.6	10.4	22.0	30.8	6.7	9.2	0.0	31.0	6.6	0.0	27.7
Cycle Q Clear(g_c), s	4.4	29.6	10.4	22.0	30.8	6.7	9.2	0.0	31.0	6.6	0.0	27.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.63	1.00		0.25
Lane Grp Cap(c), veh/h	196	1408	422	452	2227	670	245	0	481	186	0	444
V/C Ratio(X)	0.46	0.92	0.39	0.91	0.72	0.21	0.78	0.00	0.93	0.70	0.00	0.95
Avail Cap(c_a), veh/h	238	1408	422	603	2227	670	264	0	481	186	0	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.5	42.2	35.2	33.8	28.0	21.2	31.9	0.0	41.9	34.7	0.0	44.4
Incr Delay (d2), s/veh	1.7	11.4	2.7	15.0	2.0	0.7	13.3	0.0	27.6	11.3	0.0	31.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	10.5	3.1	8.3	8.4	1.7	3.7	0.0	13.0	2.6	0.0	13.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.2	53.6	37.9	48.7	30.1	21.9	45.2	0.0	69.5	46.0	0.0	76.4
LnGrp LOS	C	D	D	D	C	C	D	A	E	D	A	E
Approach Vol, veh/h	1551			2153			641			553		
Approach Delay, s/veh	50.6			33.1			62.2			69.2		
Approach LOS	D			C			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.4	40.0	29.5	39.1	15.7	35.7	10.7	57.9				
Change Period (Y+Rc), s	4.5	6.0	4.0	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	6.9	34.0	35.6	23.0	12.5	28.4	9.1	49.0				
Max Q Clear Time (g_c+I1), s	8.6	33.0	24.0	31.6	11.2	29.7	6.4	32.8				
Green Ext Time (p_c), s	0.0	0.4	1.5	0.0	0.1	0.0	0.1	11.6				
Intersection Summary												
HCM 6th Ctrl Delay	46.5											
HCM 6th LOS	D											
Notes												
User approved pedestrian interval to be less than phase max green.												

Lanes, Volumes, Timings (190237) 550 Ontario St S, RR 25, Milton
 6: Ontario Street & Louis St. Laurent Avenue Total 2031 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	247	412	145	230	623	72	610	1251	368	100	866	338
Future Volume (vph)	247	412	145	230	623	72	610	1251	368	100	866	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	20.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	100.0			55.0			100.0			90.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor									0.99	1.00		
Frt	0.961				0.984				0.850			
Fit Protected	0.950				0.950				0.950			
Satd. Flow (prot)	1770		3426		0		1787		4988		1615	
Fit Permitted	0.155				0.269				0.130		0.211	
Satd. Flow (perm)	289		3426		0		506		3521		0	
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)	35				9				200		248	
Link Speed (k/h)	60				60				60		60	
Link Distance (m)	193.1				250.0				253.7		194.1	
Travel Time (s)	11.6				15.0				15.2		11.6	
Confl. Peds. (#/hr)									1		1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	2%	1%	1%	0%	1%	4%	0%	0%	4%	1%
Adj. Flow (vph)	247	412	145	230	623	72	610	1251	368	100	866	338
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	557	0	230	695	0	610	1251	368	100	866	338
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			2	6	
Detector Phase	7	4		3	8		5	2		2	1	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0		20.0	5.0	20.0
Minimum Split (s)	9.0	26.0		9.0	26.0		9.0	32.0		32.0	9.0	32.0
Total Split (s)	21.0	45.0		23.0	47.0		37.0	42.0		42.0	30.0	35.0
Total Split (%)	15.0%	32.1%		16.4%	33.6%		26.4%	30.0%		30.0%	21.4%	25.0%
Maximum Green (s)	17.0	38.0		19.0	40.0		33.0	35.0		35.0	26.0	28.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0		3.0	1.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0		4.0	7.0		4.0	7.0		7.0	4.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max		Max	None	Max
Walk Time (s)		7.0			7.0			7.0		7.0		7.0
Flash Dont Walk (s)		18.0			18.0			16.0		16.0		16.0
Pedestrian Calls (#/hr)		0			0			0		0		0
Act Effct Green (s)	50.0	30.8		49.7	30.7		68.2	51.8		51.8	40.5	28.1
Actuated g/C Ratio	0.38	0.24		0.38	0.24		0.52	0.40		0.40	0.31	0.22
v/c Ratio	0.84	0.66		0.66	0.83		1.17	0.63		0.49	0.44	0.80

Lanes, Volumes, Timings

(190237) 550 Ontario St S, RR 25, Milton

6: Ontario Street & Louis St. Laurent Avenue

Total 2031 PM Peak Hour

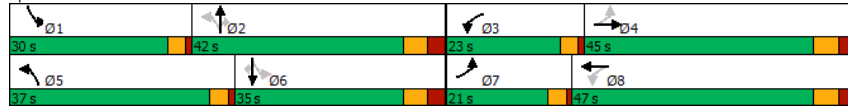


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	54.1	46.3		34.7	55.9		130.4	34.6	16.4	27.2	55.8	19.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	46.3		34.7	55.9		130.4	34.6	16.4	27.2	55.8	19.2
LOS	D	D		C	E		F	C	B	C	E	B
Approach Delay	48.7			50.6			57.8			44.1		
Approach LOS	D			D			E			D		
Queue Length 50th (m)	44.7	68.0		41.1	93.8		~181.5	99.9	32.3	13.5	83.0	20.6
Queue Length 95th (m)	#88.9	89.8		60.9	116.9		#279.5	134.9	70.9	26.6	107.5	58.7
Internal Link Dist (m)	169.1		226.0		229.7		170.1					
Turn Bay Length (m)	45.0		20.0		50.0		50.0		50.0			
Base Capacity (vph)	306	1028		391	1091		520	1985	754	457	1076	539
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.54		0.59	0.64		1.17	0.63	0.49	0.22	0.80	0.63

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	130.1
Natural Cycle:	100
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.17
Intersection Signal Delay:	51.8
Intersection Capacity Utilization:	102.1%
Analysis Period (min):	15
ICU Level of Service G	Intersection LOS: D
ICU Level of Service G	
- 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.	

Splits and Phases: 6: Ontario Street & Louis St. Laurent Avenue



HCM 6th Signalized Intersection Summary

(190237) 550 Ontario St S, RR 25, Milton

6: Ontario Street & Louis St. Laurent Avenue

Total 2031 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	247	412	145	230	623	72	610	1251	368	100	866	338
Future Volume (veh/h)	247	412	145	230	623	72	610	1251	368	100	866	338
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1885	1870	1885	1885	1900	1885	1841	1900	1900	1841	1885
Adj Flow Rate, veh/h	247	412	145	230	623	72	610	1251	368	100	866	338
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	1	2	1	1	0	1	4	0	0	4	1
Cap, veh/h	308	622	217	342	751	87	544	2094	671	231	1096	348
Arrive On Green	0.12	0.24	0.24	0.11	0.23	0.23	0.26	0.42	0.42	0.06	0.22	0.22
Sat Flow, veh/h	1781	2606	907	1795	3236	373	1795	5025	1609	1810	5025	1595
Grp Volume(v), veh/h	247	282	275	230	344	351	610	1251	368	100	866	338
Grp Sat Flow(s), veh/h/ln	1781	1791	1722	1795	1791	1818	1795	1675	1609	1810	1675	1595
Q Serve(g_s), s	13.4	18.2	18.6	12.3	23.5	23.5	33.0	24.8	22.2	5.4	20.9	27.0
Cycle Q Clear(g_c), s	13.4	18.2	18.6	12.3	23.5	23.5	33.0	24.8	22.2	5.4	20.9	27.0
Prop In Lane	1.00		0.53	1.00		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	308	428	411	342	416	422	544	2094	671	231	1096	348
V/C Ratio(X)	0.80	0.66	0.67	0.67	0.83	0.83	1.12	0.60	0.55	0.43	0.79	0.97
Avail Cap(c_a), veh/h	329	530	510	403	558	567	544	2094	671	492	1096	348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	44.1	44.3	33.1	46.8	46.9	35.1	29.1	28.3	35.5	47.4	49.8
Incr Delay (d2), s/veh	12.6	2.1	2.4	3.5	7.6	7.6	76.6	1.3	3.2	1.3	5.8	41.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	5.2	6.4	6.3	4.2	8.9	9.0	21.3	7.0	6.4	1.9	7.3	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	46.8	46.3	46.7	36.5	54.4	54.5	111.8	30.3	31.5	36.8	53.2	91.2
LnGrp LOS	D	D	D	D	D	D	F	C	C	D	D	F
Approach Vol, veh/h	804			925			2229			1304		
Approach Delay, s/veh	46.6			50.0			52.8			61.8		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.5	60.5	18.7	37.6	37.0	35.0	19.5	36.8				
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0				
Max Green Setting (Gmax), s	26.0	35.0	19.0	38.0	33.0	28.0	17.0	40.0				
Max Q Clear Time (g_c+I1), s	7.4	26.8	14.3	20.6	35.0	29.0	15.4	25.5				
Green Ext Time (p_c), s	0.3	6.1	0.4	3.7	0.0	0.0	0.2	4.3				

Intersection Summary

HCM 6th Ctrl Delay	53.6
HCM 6th LOS	D

Appendix N

City of Kitchener PARTS TDM Checklist





PARTS TDM: City of Kitchener TDM Checklist

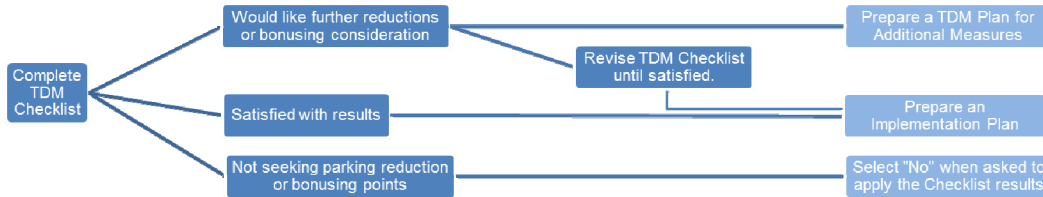
Applicant Name: Korsiak Urban Planning **Date of Application (YY-MM-DD):** _____
Site Location: 550 Ontario St South, Milton **Landowner / Developer Name:** _____
Zone: _____ **TDM Checklist No. (filled by staff):** _____

Using the TDM Report Checklist

The TDM Checklist is one component of submitting a TDM Report, and a tool intended for Developers' use when determining potential parking reductions in exchange for certain TDM measures. Derived from the Region of Waterloo's TDM Checklist and Parking Management Worksheet, this City of Kitchener TDM Checklist is required to be completed for all developments within Station Areas with the exception of residential developments with 6 units or less. Currently, this Checklist applies to lands located within the Station Study Areas identified in PARTS Phase 1, and supersedes the Region's Checklist and Parking Management Worksheet for any developments within those defined areas.

TDM Report Reference Guide

A Reference Guide has been prepared for submission of a TDM Report, and can be found appended to the PARTS Phase 2: TDM Strategy. The general process behind completing a TDM Report is depicted by the diagram below.



* Specific requirements for an Implementation Plan or TDM Plan are included within the Reference Guide.

Instructions to Complete the TDM Checklist

To complete the TDM Checklist, fill out Table A and Table B. Once completed, review the Summary Results in Table C and Table D.

Table A is broken down into two sections. Please complete Table A1 with any applicable parking and bicycle parking requirements from Schedule 6 of the Zoning By-law for your site. Mixed-use developments may also be eligible for shared parking space reductions where the development will use unassigned parking spaces; if in Table A1 you specify parking requirements for multiple land uses, Table A2 will automatically calculate shared parking rates and a percent parking reduction.

Table B indicates optional TDM measures that can included by the developer in exchange for potential parking reductions. Complete Table B for a potential parking reduction.

TABLE A		SHARED PARKING REQUIREMENTS									
Mixed-use developments may be eligible for parking space reductions based on shared parking ratios between uses. Please fill out the yellow boxes in the table below based on the Zoning By-Law requirements for parking and bicycle parking for your land use(s). Orange boxes will automatically show your results.											
TABLE A1. Zoning By-law Requirements			TABLE A2. Shared Parking Rate Breakdown								
Land Use	Parking	Class A Bike Parking	Morning		Noon		Afternoon		Evening		
			Weekday	Weekend	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend	
Office	0	0	0	0	0	0	0	0	0	0	
Medical	0	0	0	0	0	0	0	0	0	0	
Real Estate	0	0	0	0	0	0	0	0	0	0	
Financial Institution	0	0	0	0	0	0	0	0	0	0	
Retail	162	2	81	81	81	122	114	162	122	17	
Personal Services	0	0									
Art Gallery	0	0									
Museum	0	0									
Repair Establishment	0	0									
Restaurant/Take-out Restaurant	0	0	0	0	0	0	0	0	0	0	
Hotel (rooms)	0	0	0	0	0	0	0	0	0	0	
Hotel (Function Space)	0	0	0	0	0	0	0	0	0	0	
Residential - Resident	811	130	730	730	528	528	730	730	811	811	
Residential - Visitor	0	0	0	0	0	0	0	0	0	0	
Total Required Parking	973	132	811	811	609	650	844	892	933	828	
Shared / Unassigned Required Parking	933		Parking Space Reduction		40	% Reduction Over Unshared Parking		4.1			

Shared Parking Summary		Yes or No ?	Resultant Parking Required
Would you like to apply Table A shared rates for a parking reduction?		No	973.0 Spaces
*Note: to apply these rates, 100% of parking must be shared between uses and unassigned. If you would like to use shared parking rates for only a portion of the required parking spaces, you must provide the proposed shared parking rates and applicable reductions in an Implementation Plan or TDM Plan within the TDM Report.			



PARTS TDM: City of Kitchener TDM Checklist

OPTIONAL TDM MEASURES								
Certain TDM measures are required by the Zoning By-Law. Exceeding these minimum requirements is optional and can lead to parking reductions based on the discretion of the City of Kitchener. To complete this form, please fill out the yellow boxes in the table below with details about your development proposal. Please refer to the Urban Design Manual for feature design standards.								
Measure	Features	Parking Reduction Available	To a Maximum Reduction of		Developer Proposes Provision of		Maximum Reduction Allowable	Bonusing Points (TBD)
			Amount	Unit	Amount	Unit		
B1	Provision of bicycle parking spaces beyond the minimum amount required by the Zoning By-law.	1 car space reduction per 5 bicycle spaces beyond minimum Zoning By-law requirement.	10%	of total parking required	0	Bicycle Spaces beyond minimum required	0	
B2	Non-residential uses: provision of shower and change facilities at an amount of not less than 13m2 in equal proportion of male and female facilities (Note: maximum reduction amount calculated based on required bicycle parking).	2 car space reduction for each additional shower facility provided at (13m2).	0	parking space(s)	0	m2 of shower / change facilities	0	
B3*	Non-residential (office) uses: Provision of 1 car share vehicle and dedicated parking space in a priority location that is publically accessible for a development with at least 25 required parking spaces, and 1 additional car share vehicle and dedicated parking space for every 50 additional required parking spaces. (Note: maximum reduction amount calculated based on required parking).	4 car space reduction for each car share vehicle and dedicated parking space provided	0	parking space(s)	0	Non-residential car share vehicle(s) and Space(s)	0	
	Residential uses: Provision of 1 car share vehicle and dedicated parking space in a priority location that is publically accessible unless it is a private shared vehicle for every 75 dwelling units. (Note: maximum reduction amount calculated based on required parking).	4 car space reduction for each car share vehicle and dedicated parking space provided	40	parking space(s)	0	Residential car share vehicle(s) and Space(s)	0	
B4	Non-residential uses: Provision of ride share parking spaces in a priority location.	3 car space reduction for each ride share space	5%	of total parking required	0	Priority Car Pool Spaces	0	
B5	Provision of active uses at-grade along street frontages.	1% car space reduction	1%	of total parking required	<input checked="" type="checkbox"/> Yes	Check "Yes" (left) if you will provide	9	
B6*	The building owner/occupant will provide subsidized transit passes for all occupants for a period of two years.	10% car space reduction	10%	of total parking required	<input type="checkbox"/> Yes	Check "Yes" (left) if you will provide	0	
B7	Building owner/occupant agrees to charge for parking as a separate cost to occupants.	10% car space reduction	10%	of total parking required	<input checked="" type="checkbox"/> Yes	Check "Yes" (left) if you will provide	97	
B8*	Building owner/occupant agrees to join Travelwise (TMA) that provides ride matching services for car/vanpooling and emergency ride home options.	10% car space reduction	10%	of total parking required	<input type="checkbox"/> Yes	Check "Yes" (left) if you will provide	0	
B9	Enhanced bus shelters with seating are provided at the transit stop immediately adjacent to the development in consultation with the City of Kitchener and the Region of Waterloo.	Not Applicable for parking reduction	Can only be applied to bonusing consideration		<input type="checkbox"/> Yes	Check "Yes" (left) if you will provide	0	
B10	Provide television monitors in visible and accessible locations on site and in adjacent transit stops to allow to City of Kitchener and the Region of Waterloo to display information regarding public transportation.	Not Applicable for parking reduction	Can only be applied to bonusing consideration		<input type="checkbox"/> Yes	Check "Yes" (left) if you will provide	0	
B11	Provision of bicycle self-service station equipped with tools necessary to perform basic repairs and maintenance	Not Applicable for parking reduction	Can only be applied to bonusing consideration		<input type="checkbox"/> Yes	Check "Yes" (left) if you will provide	0	
B12	25% to 49% of required parking is located underground or in a structure	Not Applicable for parking reduction	Can only be applied to bonusing consideration		<input type="checkbox"/> Yes	Check "Yes" (left) if you will provide	0	
	50% - 74% of required parking is located underground or in a structure				<input type="checkbox"/> Yes	Check "Yes" (left) if you will provide	0	
	A minimum of 75% of required parking is located underground or in a structure				Select only one option (right)		<input checked="" type="checkbox"/> Yes	Check "Yes" (left) if you will provide
B13	Non-residential use: Implements paid parking system, where price is set greater than the cost of a monthly transit pass, on all or part of the site (e.g. parking permits, paid parking near main entrances, enabled by gate and transponder access, or Pay & Display stations).	1% car space reduction for every 10% of parking spaces under a paid parking system	10%	of total parking required	100%	% of total parking spaces under paid parking system	16	

* If you have selected Measures B3, B6 or B8 for a parking reduction, you must demonstrate to the satisfaction of the Director of Transportation Services that you will be able to achieve the proposed TDM measure, including any ongoing programming or management that may be required for program success.

POTENTIAL PARKING REDUCTION SUMMARY	
Displayed below are the potential reductions to required parking spaces available based on the amounts entered into Table A and Table B above.	
Original # Parking Spaces Required:	973
Shared Parking Reduction:	40
Parking Reduction for TDM Measures B1-B12:	122
Total Parking Reduction:	162
Resultant Parking Requirement:	811
PERCENT REDUCTION	17

BONUSING POINT SCORE SUMMARY *	
If you achieved a Bonusing Points score greater than X, you may be eligible for bonusing. Please contact City of Kitchener staff for more details.	
Total Bonusing Points Achieved	0
Eligible for Bonusing Consideration?	No

Approach to bonusing to be determined by City staff

NEXT STEPS

Thank you for completing the TDM Checklist. Please select whether you would like to apply for a potential parking reduction at the bottom of this page. Refer to the TDM Report Reference Guide for submission requirements to City of Kitchener Staff. If you would like to achieve a greater parking reduction than may be considered through the TDM Checklist, you may develop a TDM Plan as set out in the TDM Report Reference Guide.

Select an Option

Yes

Would you like to apply Table C rates for a parking reduction?

If you selected No, please submit your completed Checklist to City staff for review.

If you selected Yes, please refer to the TDM Report Reference Guide for submission requirements of an Implementation Plan or TDM Plan.