BURNSIDE

55 Port Street East Transportation Study
Mississauga, Ontario

Brown Maple Investments Ltd.

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Executive Summary

R.J. Burnside & Associates Limited (Burnside) was retained by FRAM + Slokker (the Client) to undertake a Transportation Study for a proposed residential development to replace an existing commercial building located at 55 Port Street East in the City of Mississauga.

The proposed development will consist of 35 apartments in a 10-storey tower. Parking will be provided by an underground parking garage with a total of 57 parking spaces for residence and visitors. Access to the below grade garage will be provided via an existing adjacent below grade garage at 65 Port Street East, located immediately to the east. Access to a loading/refuse pickup space is proposed via a full movement driveway on Port Street.

Existing and Future Road Network Operations

Under existing, background and total conditions, during the morning and afternoon peak hours, all study intersections are operating and will operate with excess capacity and a level of service E or better, with some exceptions. The northbound and southbound left-through-right movements at the Lakeshore Road East and Helene Street intersection will exceed capacity and experience high delay during the AM peak hour resulting in a level of service F. Site traffic does not contribute to any of these movements during the AM or PM peak hours. The increases in traffic volumes are due to background traffic growth.

At the intersection of Lakeshore Road East and Hurontario Street both the southbound left turn and eastbound left turn movement queues currently exceed their provided storage and will continue to do so under all future conditions. Site traffic does not add to or impact these movements.

In summary, site traffic is projected to only add 11 trips in the AM peak hour and nine trips in the PM peak hour. This is far less than typical daily variations in traffic and will not be noticeable on the road network.

Delivery / Refuse Pickup Vehicle Access

An Auto Turn analysis confirms that delivery and refuse trucks can access the site via the proposed driveway, both requiring a reverse movement onto Port Street.

TDM

The site is well designed to provide access by pedestrians and cyclists to area sidewalks, bike routes and transit, thus encouraging choices in modes of travel.

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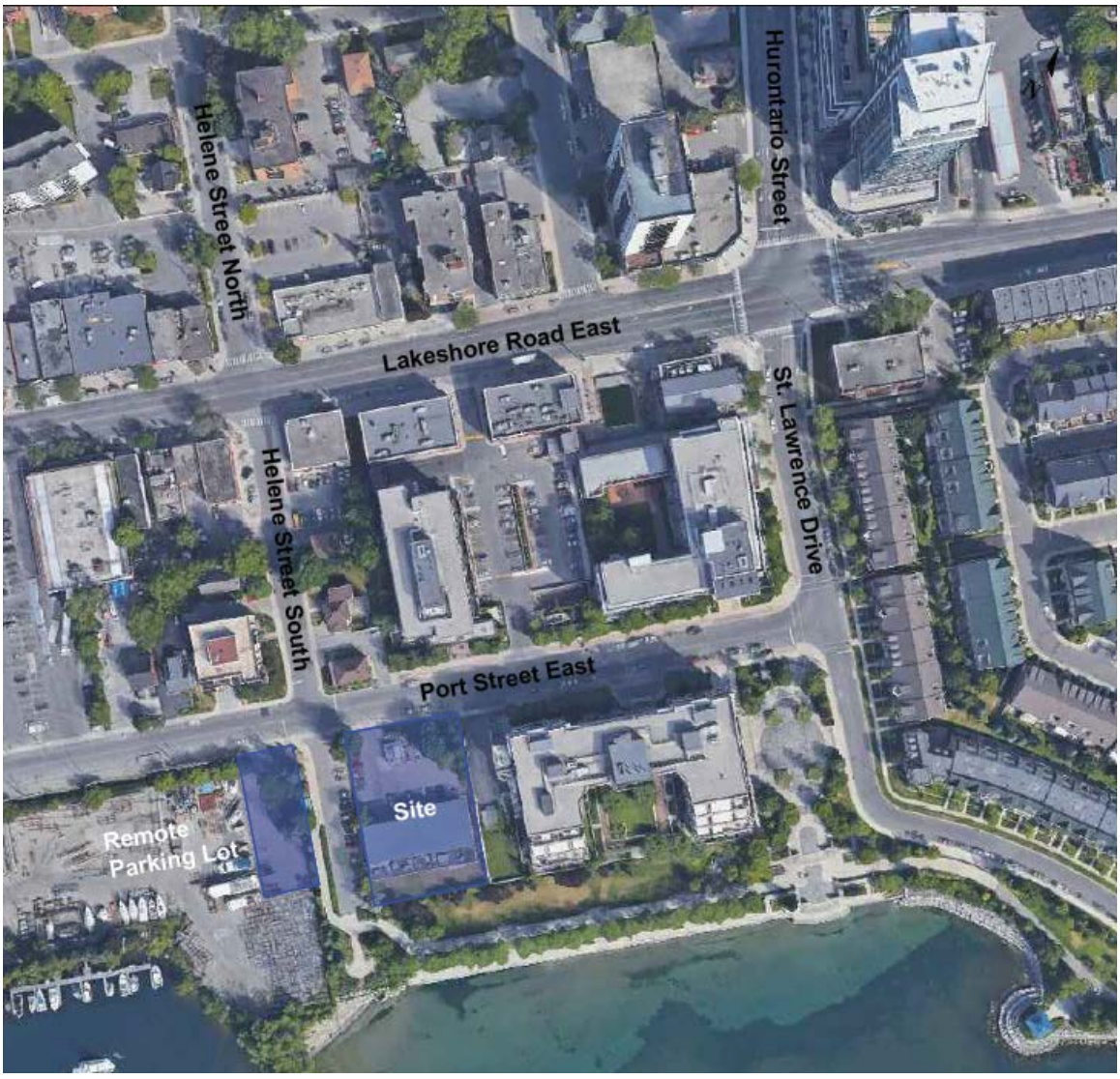
1.0 Introduction

1.1 Background

R.J. Burnside & Associates Limited (Burnside) was retained by FRAM + Slokker (the Client) to undertake a Transportation Study for a proposed residential development located at 55 Port Street East in the City of Mississauga. Currently, the property is occupied by an existing commercial building with a parking lot and additional offsite parking located to the west. The site location is illustrated in Figure 1.

Figure 1: Site Location



Based on the site plan by Giannone, Petricone Associates, dated September 29, 2017, the proposed site will consist of 35 apartments in a 10-storey tower. Parking will be provided by an underground parking garage with a total of 57 parking spaces for residence and visitors. Access to the below grade garage will be provided via an existing adjacent below grade garage at 65 Port Street East, located immediately to the east. Access to a loading/refuse pickup space is proposed via a full movement driveway on Port Street.

1.2 Scope of Work

The study scope of work summarized below was discussed and confirmed with City of Mississauga (City) staff prior to conducting the study.

Analysis Scenarios

- Existing traffic conditions
- 2022 background traffic conditions
- 2027 background traffic conditions
- 2022 total traffic conditions (2022 background traffic plus site traffic)
- 2027 total traffic conditions (2027 background traffic plus site traffic)

Analysis Time Periods

- Weekday AM peak hour (7:00 AM – 9:00 AM)
- Weekday PM peak hour (4:00 PM – 6:00 PM)

Analysis Intersections

- Port Street East / St. Lawrence Drive
- Port Street East / Helene Street South
- Port Street East / Existing Site Driveway
- Port Street East / Existing Driveway to 65 Port Street East
- Lakeshore Road East / Hurontario Street / St. Lawrence Drive
- Lakeshore Road East / Helene Street South

1.3 Intersection Analysis Methodology

Intersection operations were assessed for intersections in the study area using the software program Synchro 9, which employs methodology from the *Highway Capacity Manual (HCM2000 and HCM 2010)*, published by the Transportation Research Board National Research Council. Synchro 9 can analyze both signalized and unsignalized intersections in a road corridor or network taking into account the spacing, interaction, queues and operations between intersections. The analysis has utilized the HCM2000 methodology.

The signalized intersection analysis considers two separate measures of performance:

- The capacity of all intersection movements, which is based on a volume to capacity ratio that measure of the degree of capacity utilized.
- The level of service (LOS) for all intersection movements, which is based on the average control delay per vehicle for the various movements through the intersection and overall. Delay is an indicator of how long a vehicle must wait to complete a movement and is represented by a letter between A and F, with F being the longest delay. The link between LOS and delay (in seconds) for signalized intersections is summarized below.

Level of Service	Control Delay per Vehicle(s)
A	≤10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

The two-way unsignalized intersection analysis considers two separate measures of performance:

- The capacity of the intersection's critical movements, which is based on a volume to capacity ratio.
- The level of service for the critical movements, which is based on the average control delay per vehicle for the various critical movements within the intersection. The link between LOS and delay (in seconds) for unsignalized intersections is summarized below.

Level of Service	Control Delay per Vehicle(s)
A	0 – 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

2.0 Existing Conditions

2.1 Site Context

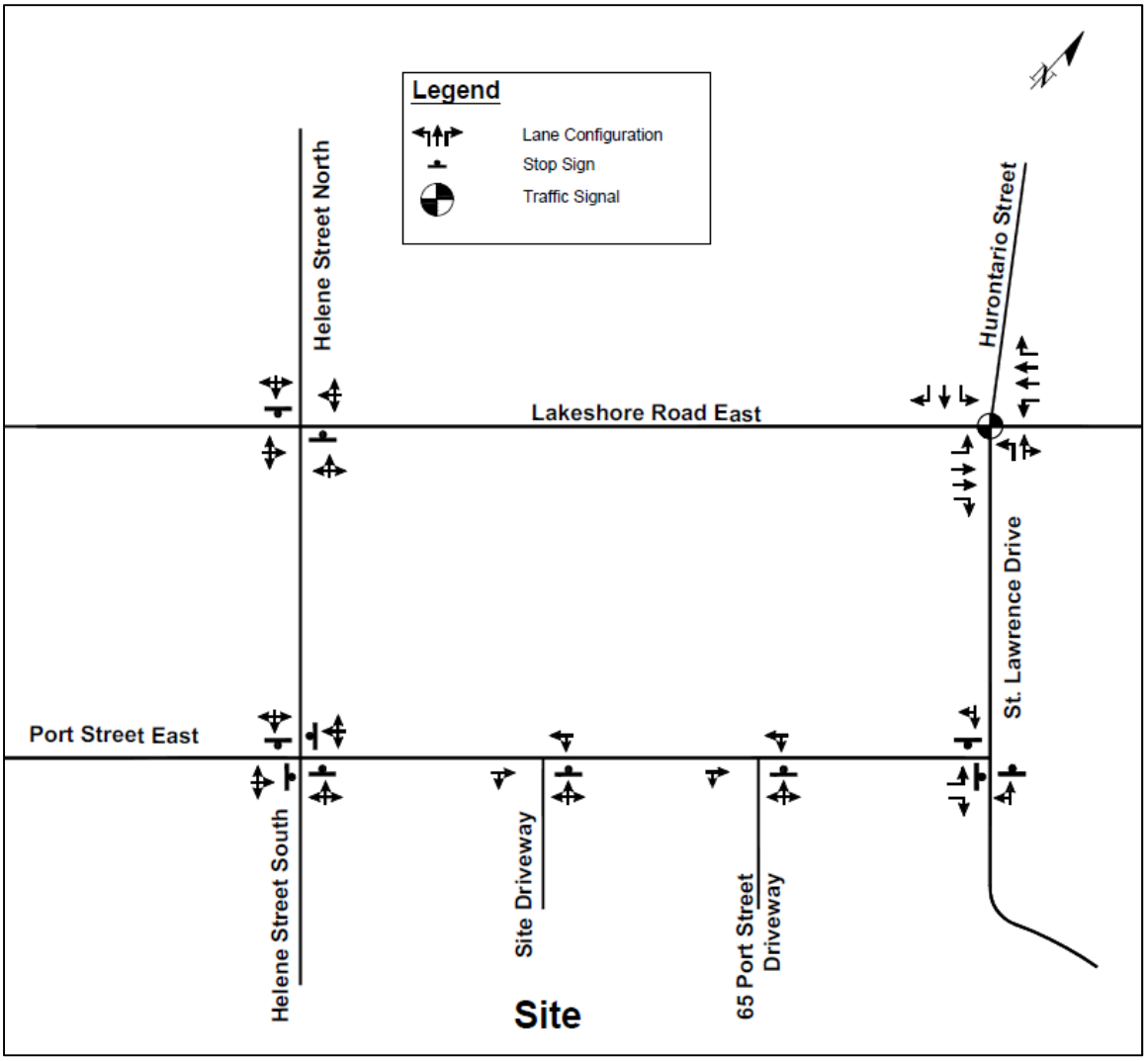
The site is currently occupied by a commercial building. To the north and east is high density residential and commercial uses and to the west is a marina. Lake Ontario is to the south along with a waterfront trail.

2.2 Existing Road network

The existing study road network is described below and illustrated in Figure 2, including existing traffic control. All roads are under the jurisdiction of the City.

Lakeshore Road East	Lakeshore Road East is an east-west major arterial road with a posted speed limit of 50 km/h. The roadway consists of a 4-lane urban cross section with layby bays for parking and sidewalks provided on both sides.
Helene Street	Helene Street is a north-south local road with an assumed unposted speed limit of 50 km/h. The roadway consists of a 2-lane urban cross section with sidewalks provided on both sides. The portion of Helene Street South, south of Port Street East is used as a public parking lot for visitors to the Waterfront Trail.
Port Street East	Port Street East is an east-west local road consisting of a 2-lane urban cross section. It has an assumed unposted speed limit of 50 km/h with sidewalks provided on both sides (there are some gaps in the sidewalk on the north side). Parking is prohibited along the frontage of the site on both sides of the road, whereas on-street parking is available to the east on both sides of the road. Condo buildings to the north and east have on-street pickup and drop off areas.
Hurontario Street / St. Lawrence Drive	Hurontario Street is a north-south major arterial road terminating at Lakeshore Road East. To the south it is a local road named St. Lawrence Drive. Hurontario Street has a 4-lane urban cross section and a posted speed limit of 50 km/h with sidewalks provided on both sides. St. Lawrence Drive has a 2-lane urban cross section with an assumed unposted speed limit of 50 km/h and sidewalks provided on both sides.

Figure 2: Existing Study Road Network



2.3 Existing Transit Services

The subject site is approximately a 3-4 minute walk to/from the nearest Mississauga Transit (MiWay) bus stops located along Lakeshore Road East. The site is also approximately a 7-minute walk to/from GO Transit's Port Credit station to the north providing access to additional bus routes. The location of bus and train routes nearest to the site are shown in Figure 3 with route frequency shown in Table 1.

Figure 3: Existing MiWay and GO Transit Routes

Image Courtesy of MiWay

Table 1: Transit Service

Agency	Route Number (Name)	Frequency	Days and Hours of Operations
MiWay	23 (Lakeshore)	10 to 20 minutes	4:25 AM – 1:55 AM Monday to Friday 5:09 AM – 12:48 AM Saturday 8:05 AM – 2:25 AM Sunday
GO Transit	18 (Lakeshore West)	30 to 40 minutes	5:03 AM – 1:51 AM Monday to Friday 6:43 AM – 1:51 AM Saturday & Sunday

Both MiWay and GO Transit provide excellent transit access to the site almost 24 hours a day, 7 days a week, combined.

2.4 Existing Traffic Volumes

Turning movement traffic counts were undertaken during the weekday AM peak period (7:00 AM - 9:00 AM) and PM peak period (4:00 PM - 6:00 PM) to obtain current traffic volumes. The weekday AM and PM peak hours were selected as these are the typical peak traffic periods for this type of development. The traffic counts were carried out by Accu-Traffic Inc. (ACI) and Ontario Traffic Inc. (OTI).

In addition to the analysis intersections counted above, the driveway to an offsite parking lot being utilized by the current users at 55 Port Street was also counted. The location, dates and sources of each count are summarized in Table 2.

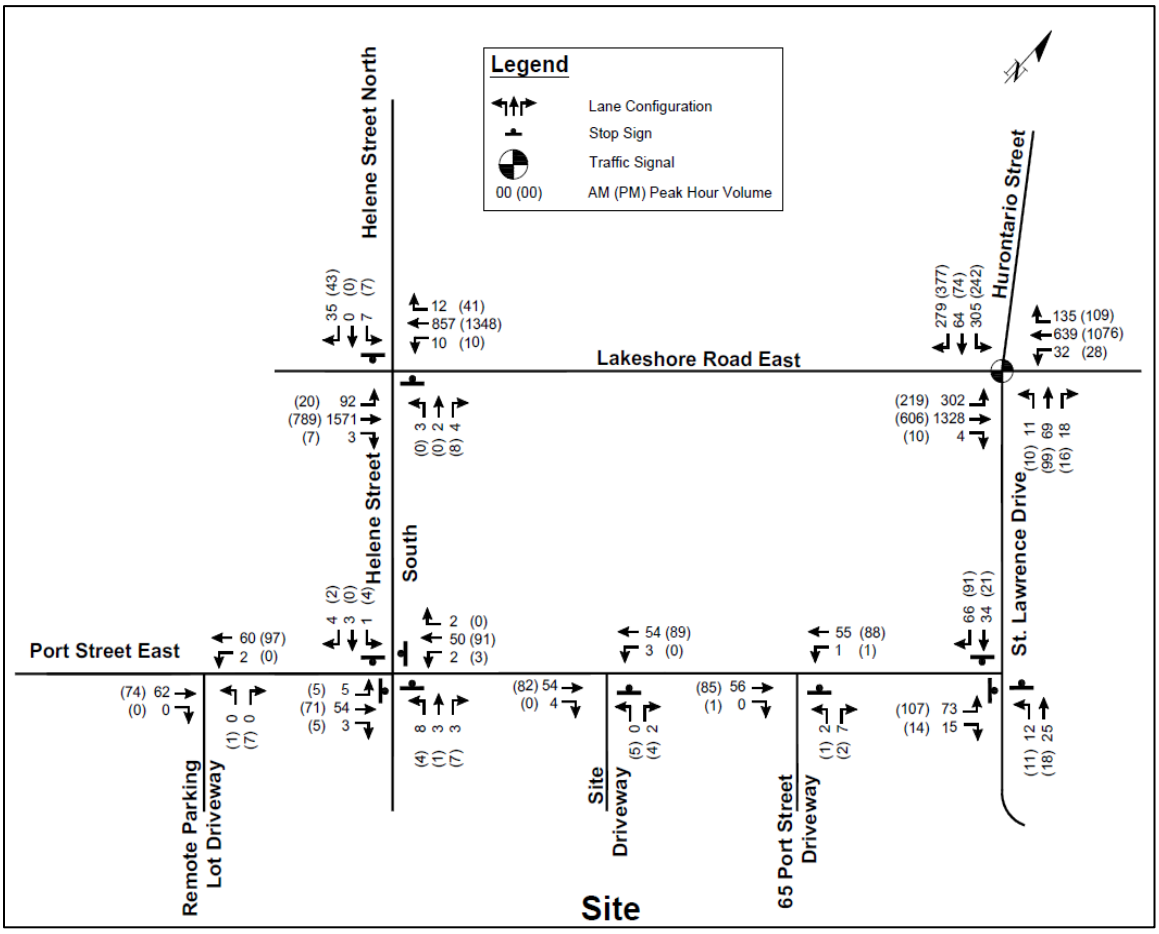
Table 2: Traffic Count Summary

Location	Date	Source
Lakeshore Road East / Hurontario Street / St. Lawrence Drive	Thursday, January 25, 2018	OTI
Port Street East / St. Lawrence Drive	Tuesday, January 16, 2018	ACI
Port Street East / 65 Port Street East Driveway	Tuesday, January 16, 2018	ACI
Port Street East / Site Driveway	Tuesday, January 16, 2018 Thursday, January 25, 2018	ACI OTI
Port Street East / Helene Street	Tuesday, January 16, 2018 Thursday, January 25, 2018	ACI OTI
Lakeshore Road East / Helene Street	Thursday, January 25, 2018	OTI
Port Street East / 55 Port St. Off Site Parking Lot Driveway	Thursday, January 25, 2018	OTI

Traffic operations were observed during both peak periods to note any problems or potential concerns, however no notable occurrences were observed.

A minor imbalance was observed in the traffic data. Adjustments were made to the through volumes between Helene Street and the 65 Port Street East driveway. Adjustments were also made on the through volumes between Lakeshore Road East and Port Street East on St. Lawrence Drive. The balanced existing weekday AM and PM peak hour intersection turning movement volumes are illustrated in Figure 4 and the traffic count summaries are provided in Appendix A.

Figure 4: Existing Traffic Volumes



3.0 Future Background Conditions

Future background traffic consists of existing traffic, background traffic growth and traffic from other developments. Background traffic growth and traffic from other developments are discussed below. The horizon year of 2022 and 2027 were selected for future projections. There are no planned road network improvements in the study area within the horizon years.

3.1 Background Traffic Growth

The peak hour growth rates provided by the City are shown in Table 3. The growth rates were compounded annually and applied to the through movements on Lakeshore Road East and Hurontario Street and turning movements between both roads. Growth was not applied to any other study roadways since the area south of Lakeshore is fully built.

Table 3 : Traffic Growth Rates

Street	Hurontario Street				Lakeshore Road East			
Time	AM		PM		AM		PM	
Direction	NB	SB	NB	SB	EB	WB	EB	WB
Growth from Existing to 2022	0.0%	1.5%	0.5%	1.0%	0.25%	1.75%	1.25%	0.50%
Growth from 2022 to 2027	1.0%	1.0%	1.0%	0.5%				

3.2 Background Developments

Following consultation with City staff, two background developments were identified to be within the vicinity of the site and are anticipated to be built within the study horizon years as follows.

8 Ann Street

- Located northwest of Lakeshore Road East / Hurontario Street.
- 69 condominium apartments.
- Total of 29 trips during the AM peak hour and 33 trips during the PM peak hour will be generated. The peak hour trips were based on an excerpt of trip distribution and assignment from *6, 8, 10 Ann Street Traffic Impact Study*, by GHD, dated October 2014

70 Mississauga Road South Phase 1

- Located west of the Credit River and south of Lake Shore Road West.
- 810 apartments, 210 townhouses and 200,000 ft^2 commercial space are proposed in Phase 1 according to the *Port Credit West Village Master Plan, Urban Design Study & Planning Justification Report*, by BA Group, dated August 2017.
- Trip Generation was based on rates given in the *70 Mississauga Road South & 181 Lakeshore Road West Urban Transportation Considerations For OPA, ZBA and Draft Plan of Subdivision* (70 Mississauga TIS), by BA Group, dated August 2017. The estimated trips for the weekday AM and PM peak hour projected to travel through the study area are 407 trips and 351 trips respectively. Distribution of the generated trips were also based on the 70 Mississauga TIS.

The related background traffic figures are provided background in Appendix B.

3.3 Future Background Traffic Volumes

Background traffic volumes consist of the application of the growth per annum (up to the horizon year 2027) to existing volumes as shown in Figure 4, along with the traffic from background developments. The resulting traffic volumes are illustrated in Figure 5 and Figure 6 for horizon years 2022 and 2027, respectively.

Figure 5: 2022 Background Traffic Volumes

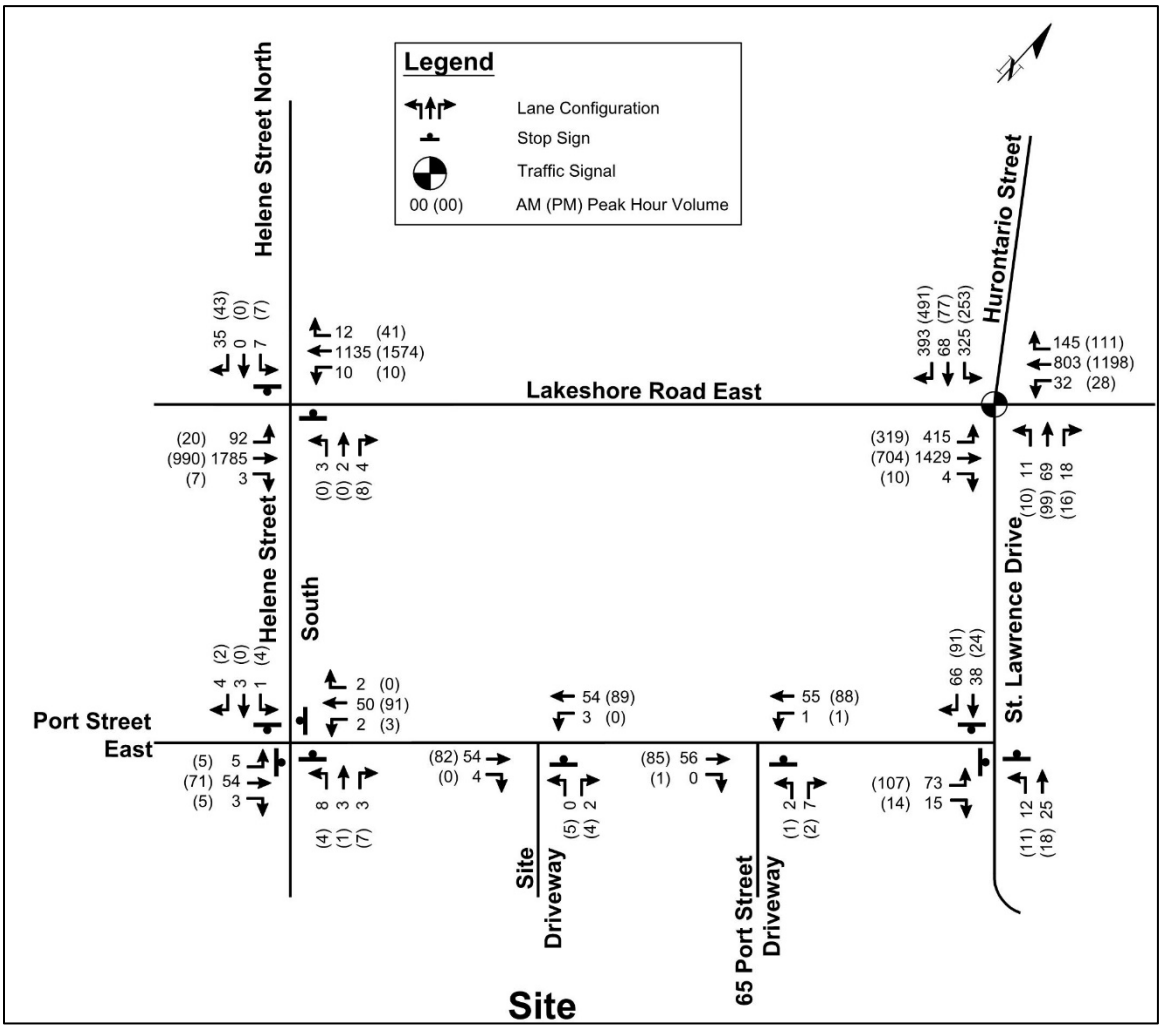
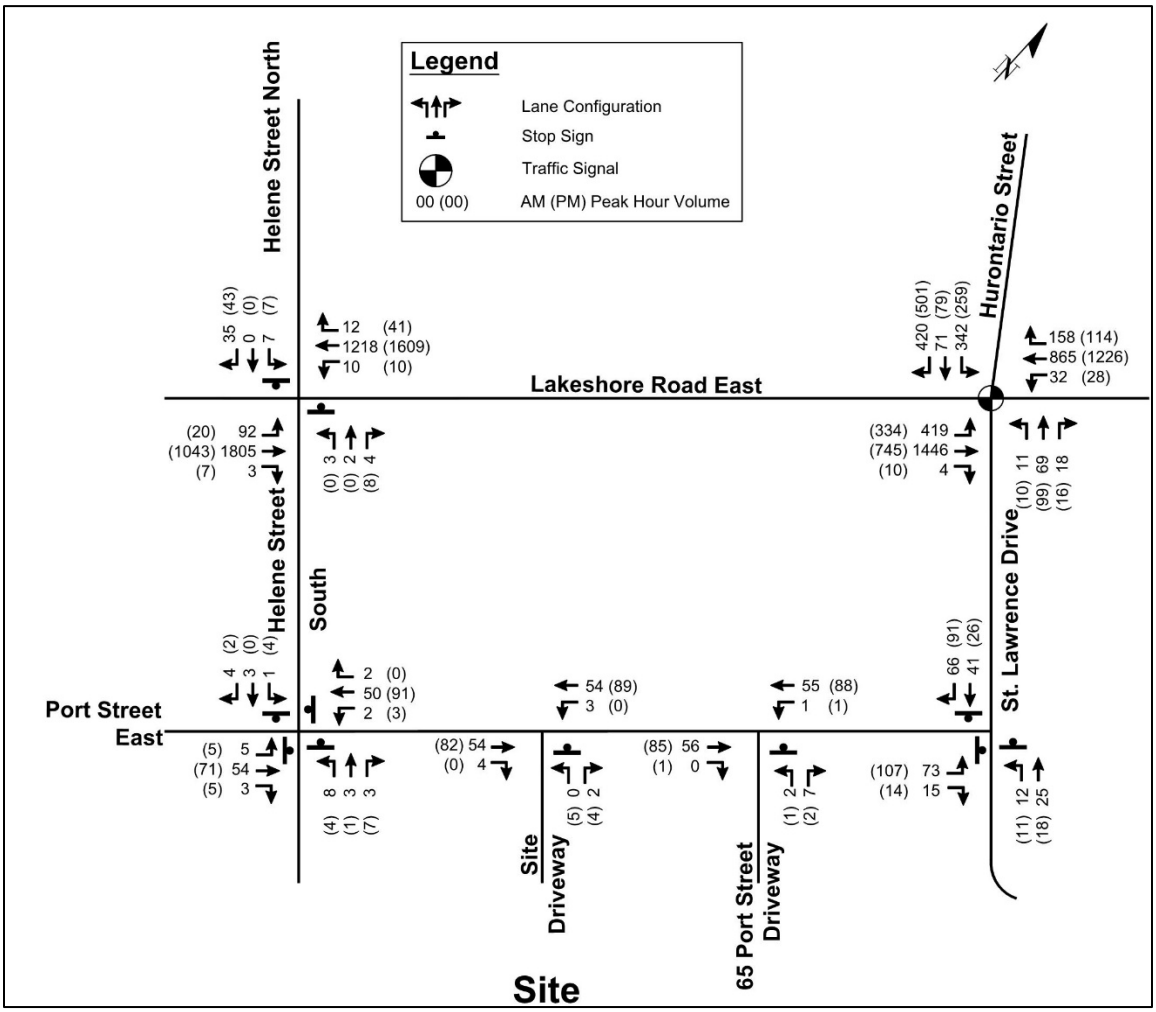


Figure 6 : 2027 Background Traffic Volumes



4.0 Proposed Development

The proposed development will consist of a 10-storey tower with 35 apartments. The existing site access will be removed. Access to a below grade garage, with 57 parking spaces, will be provided via an existing adjacent below grade garage at 65 Port Street East. The proposed site plan is shown in Figure 7**.**

4.1 Trip Generation

Trip generation for the proposed development was based upon information contained in *the Trip Generation Manual, 9th Edition*, published by the Institute of Transportation Engineers. The Land Use Code for Residential Condominium / Townhouses (230) was used in the generation of new trips, which are summarized in Table 4. Table 4 also shows the existing site traffic that will disappear with the new development and the resulting new trips.

Table 4: Site Traffic Generation

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour		
	In	Out	Total	In	Out	Total
Trip Rates	0.11	0.51	0.62	0.46	0.29	0.75
Site Trips	4	18	22	16	10	26
Existing Site Trips	-9	-2	-11	0	-17	-17
New Trips	-5	+16	+11	+16	-7	+9

4.2 Trip Distribution and Assignment

Trip distribution was derived from TTS data, the available road network and existing travel patterns at the driveway to 65 Port Street. The estimated distribution of site trips is summarized in Table 5.

Table 5: Trip Distribution

To/From	Via	Distribution
North	Hurontario Street	65%
East	Lakeshore Road East	20%
West	Lake Shore Road East	15%
	Total	**100%**

The resulting site traffic assignment is shown in Figure 8.

Figure 7 : Proposed Site Plan

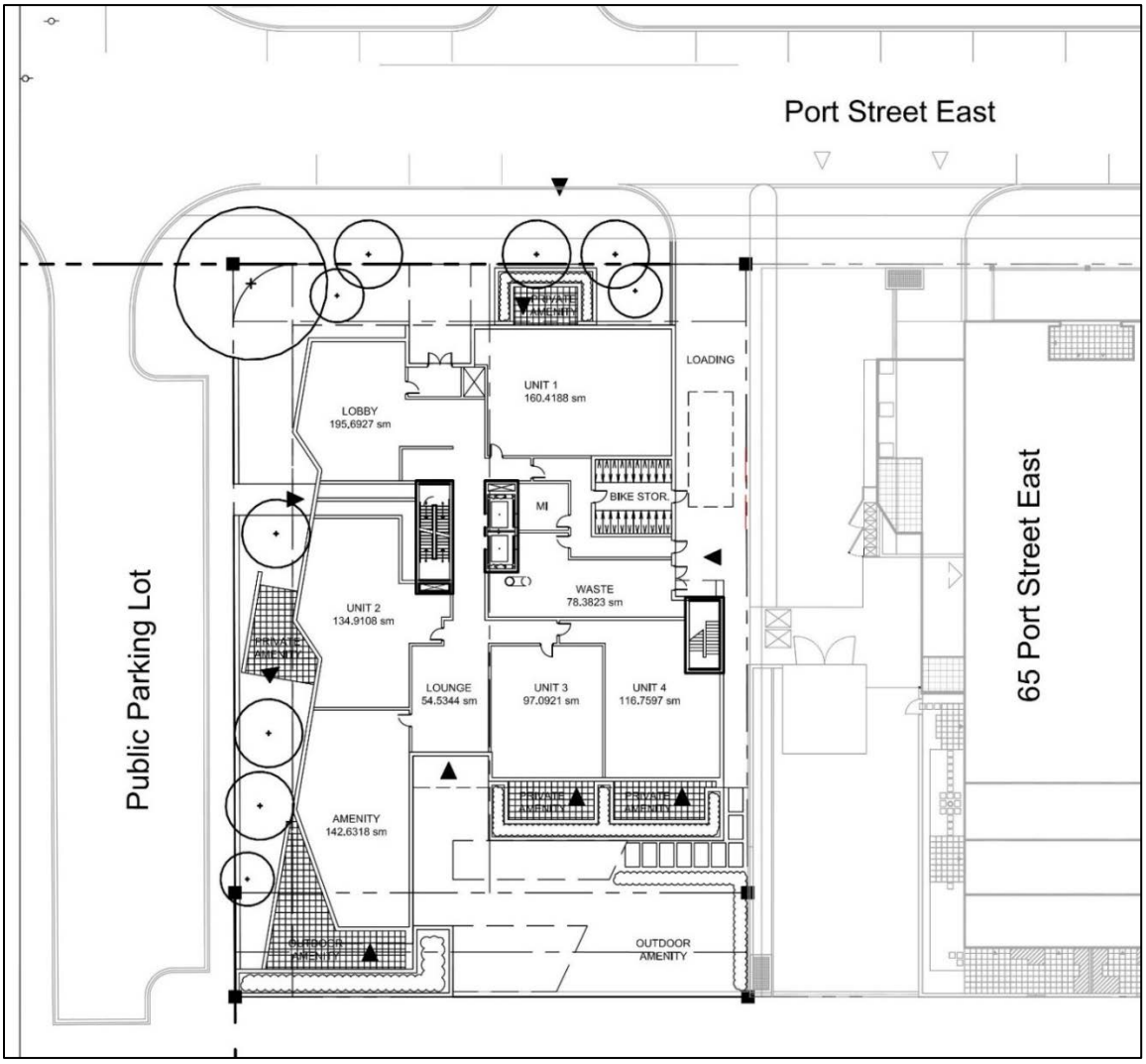
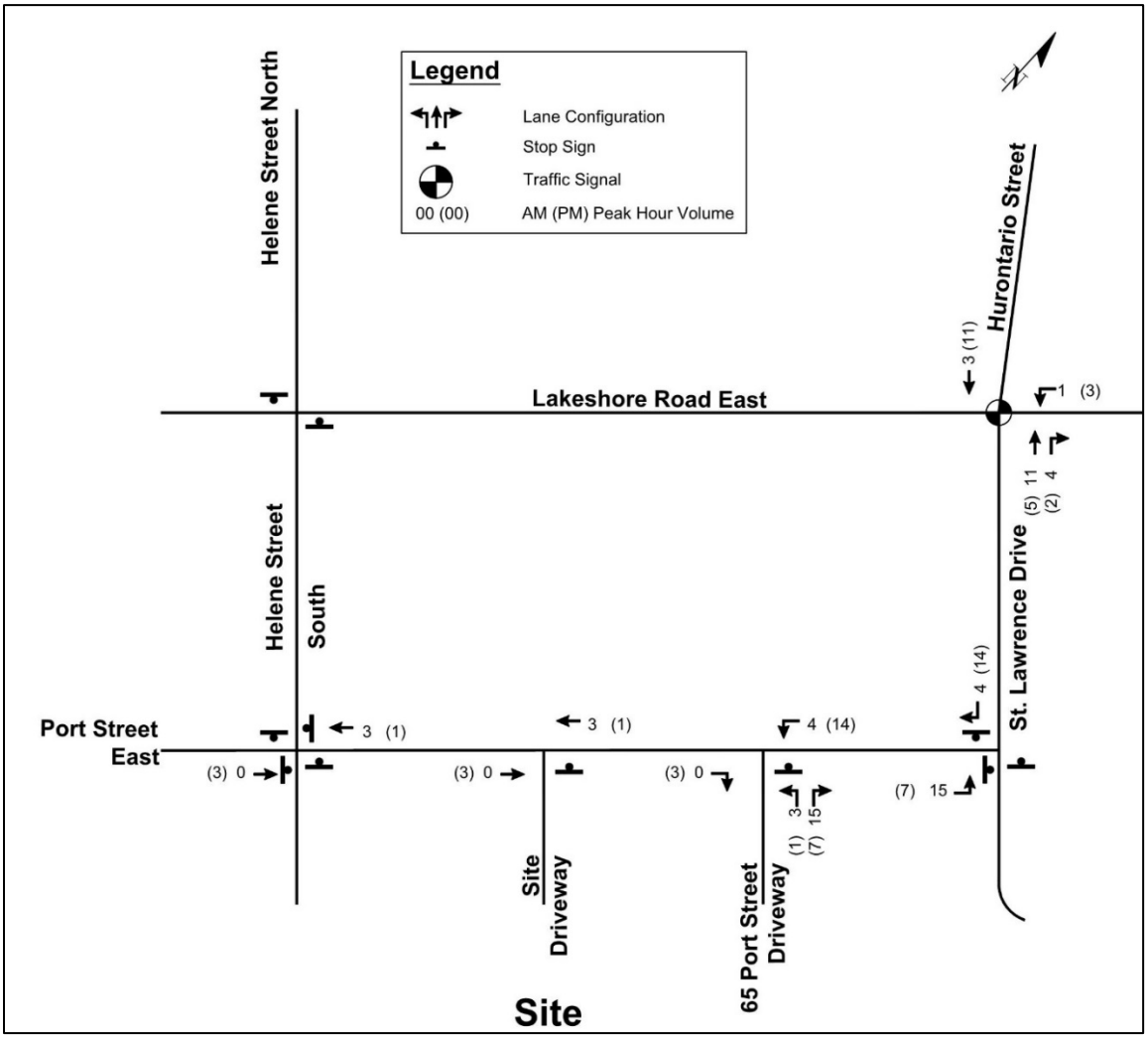


Figure 8: Site Traffic Volumes



5.0 Total Traffic Conditions

5.1 Total Traffic Volumes

The existing site driveway and offsite parking lot will be removed with the full buildout of the proposed residential development. Access to the proposed below grade garage will be via the adjacent 65 Port Street driveway and below grade garage to the east.

The future total traffic volumes consist of the background traffic volumes in Figure 5 and Figure 6 plus the site trips generated from the proposed site shown in Figure 8, and minus the existing trips removed from the existing site driveway and offsite parking lot provided in Appendix C. The resulting 2022 and 2027 total traffic volumes are shown in Figure 9 and Figure 10.

Figure 9: 2022 Total Traffic Volumes

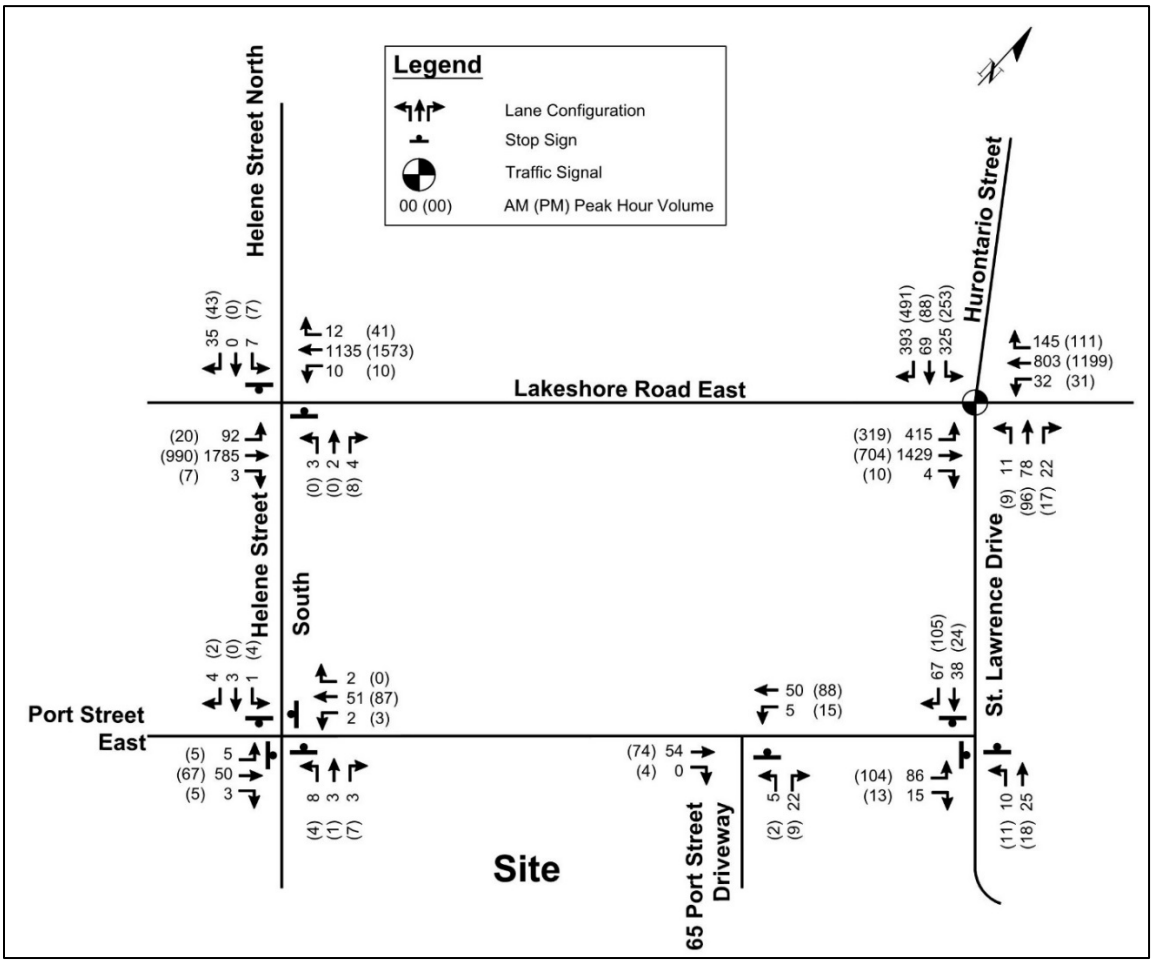
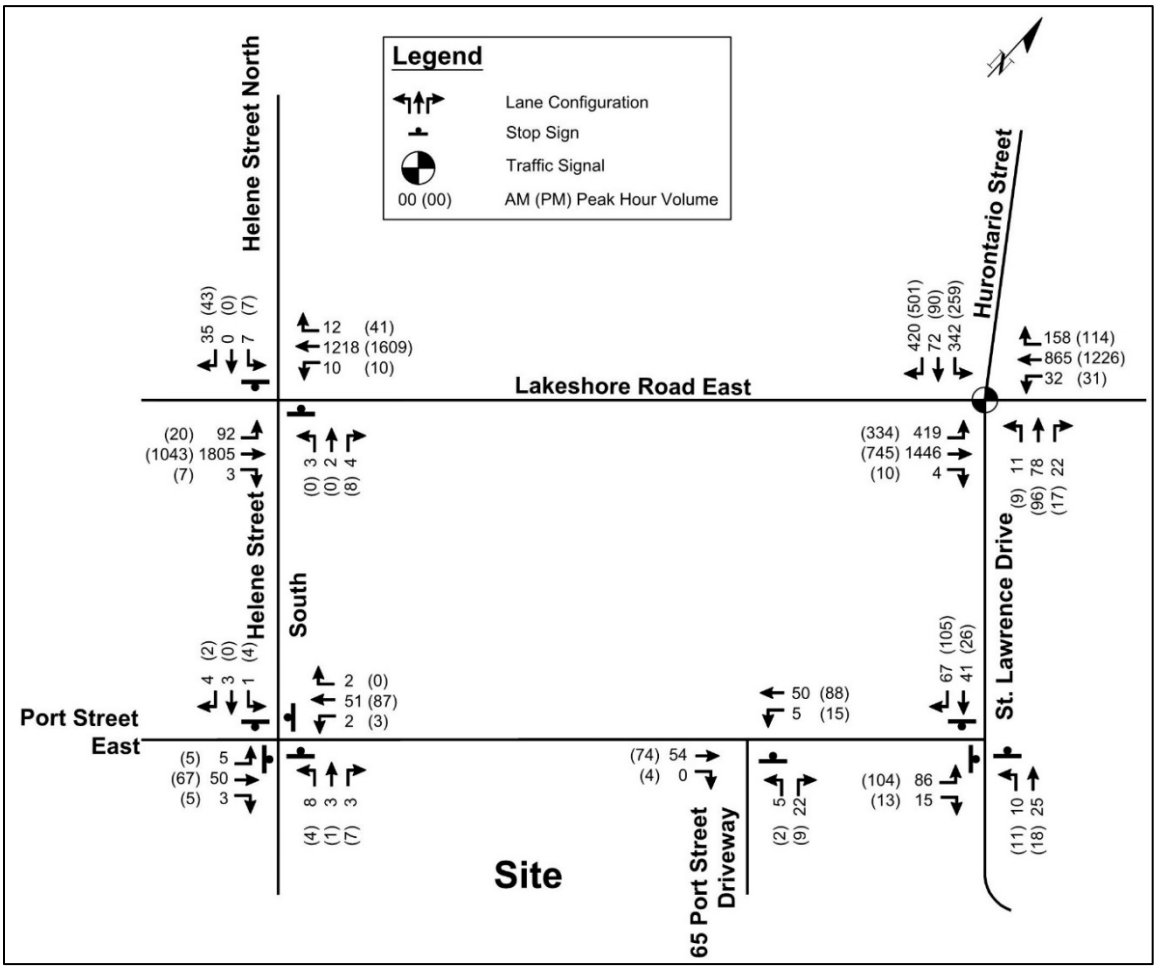


Figure 10: 2027 Total Traffic Volumes



6.0 Traffic Operations Analysis

Traffic operations analyses were conducted for existing and future traffic volumes for the weekday AM and PM peak hours at all study intersections.

6.1 Existing Traffic Operations

Existing traffic operations were assessed based on the existing road network as shown in Figure 2 and existing traffic volumes shown in Figure 4. Existing traffic operations, utilizing existing signal timings (as provided by the City and contained in Appendix A), are shown in Table 6 for the signalized intersection of Hurontario Street and Lakeshore Road and Table 7 for all unsignalized intersections. Detailed Synchro reports are provided in Appendix D.

Table 6: Existing Signalized Lakeshore Road East / Hurontario Street Operations

Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
	v/c	LOS	v/c	LOS
Overall	0.82	C	0.87	C
Eastbound Left	0.82	C	0.98	F
Eastbound Through	0.75	C	0.34	B
Eastbound Right	0.00	B	0.01	B
Westbound Left	0.42	D	0.10	C
Westbound Through	0.46	C	0.78	C
Westbound Right	0.14	C	0.13	C
Northbound Left	0.03	C	0.02	C
Northbound Through-Right	0.14	C	0.20	C
Southbound Left	0.78	D	0.64	D
Southbound Through	0.11	C	0.12	C
Southbound Right	0.40	C	0.65	C

Note: v/c—volume to capacity, LOS—level of service

Under existing conditions, all traffic movements at Hurontario and Lakeshore are operating with excess capacity and level of service E or better with the exception of the eastbound left during the PM peak hour. This movement is approaching capacity and has a level of service F.

Table 7: Existing Unsignalized Intersection Operations

Intersection & Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
	v/c	LOS	v/c	LOS
Port Street East / St. Lawrence Drive				
Eastbound Left-Right	0.15	A	0.21	A
Northbound Left-Through	0.06	A	0.05	A
Southbound Through-Right	0.15	A	0.17	A
Port Street East / 65 Port Street Driveway				
Westbound Left -Through	0.00	A	0.00	A
Northbound Left-Right	0.01	A	0.00	A
Port Street East / Site Driveway				
Westbound Left-Through	0.00	A	0.00	A
Northbound Left-Right	0.00	A	0.01	A
Port Street East / Helene Street				
Eastbound Left -Through-Right	0.09	A	0.12	A
Westbound Left -Through-Right	0.08	A	0.15	A
Northbound Left-Through-Right	0.02	A	0.02	A
Southbound Left-Through-Right	0.01	A	0.01	A

Table 7: Existing Unsignalized Intersection Operations Continued

Intersection & Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
	v/c	LOS	v/c	LOS
Lakeshore Road East / Helene Street				
Eastbound Left -Through	0.12	A	0.04	A
Westbound Left -Through	0.03	A	0.02	A
Northbound Left-Through-Right	0.41	F	0.02	B
Southbound Left-Through-Right	0.39	F	0.26	D

Note: v/c—volume to capacity, LOS—level of service

Under existing conditions, all unsignalized intersections are operating with excess capacity and level of service E or better. However, during the AM peak hour, while both the northbound left-through-right movement and the southbound left-through-right movement at the Lakeshore Road East and Helene Street intersection have excess capacity, longer delays are encountered due to high traffic volumes on Lakeshore Road East.

6.2 Future Traffic Operations

Based on 2022 and 2027 background and total traffic volumes found in Figure 5, Figure 6, Figure 9 and Figure 10, intersection operations were assessed and summarized in Table 8 and Table 9 for Hurontario Street and Lakeshore Road and in Table 10 and Table 11 for unsignalized intersections, respectively. Detailed Synchro reports are provided in Appendix E and Appendix G for 2022 background and total conditions and in Appendix F and Appendix H for 2027 background and total conditions, respectively.

Table 8: Existing and Future Hurontario St/Lakeshore Road East Intersection Operations (AM Peak Hour)

Movement	Existing		Background Total				Future Total			
			2022		2027		2022		2027	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Overall	0.82	C	0.87	C	0.90	D	0.88	C	0.91	D
Eastbound Left	0.82	C	0.94	D	0.99	E	0.94	D	0.99	E
Eastbound Through	0.75	C	0.77	C	0.78	C	0.77	C	0.78	C
Eastbound Right	0.00	B	0.00	B	0.00	B	0.00	B	0.00	B
Westbound Left	0.42	D	0.48	D	0.50	D	0.48	D	0.50	D
Westbound Through	0.46	C	0.65	C	0.71	C	0.65	C	0.71	C
Westbound Right	0.14	C	0.19	C	0.22	C	0.19	C	0.22	C
Northbound Left	0.03	C	0.03	C	0.03	C	0.03	C	0.03	C
Northbound Through-Right	0.14	C	0.16	C	0.16	C	0.18	C	0.18	C
Southbound Left	0.78	D	0.90	E	0.95	E	0.91	E	0.96	E
Southbound Through	0.11	C	0.12	C	0.13	C	0.13	C	0.13	C
Southbound Right	0.40	C	0.60	C	0.65	C	0.60	C	0.65	C

Note: 1. v/c—volume to capacity, LOS—level of service
2. Under background and total conditions, the signal timing was optimized while maintaining the existing cycle length

Table 9: Existing and Future Hurontario St/Lakeshore Road East Intersection Operations (PM Peak Hour)

Movement	Existing		Background Total				Future Total			
			2022		2027		2022		2027	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Overall	0.87	C	0.88	D	0.91	D	0.88	D	0.91	D
Eastbound Left	0.98	F	0.89	E	0.91	E	0.89	E	0.91	E
Eastbound Through	0.34	B	0.38	B	0.40	B	0.38	B	0.40	B
Eastbound Right	0.01	B	0.01	B	0.01	B	0.01	B	0.01	B
Westbound Left	0.10	C	0.12	C	0.13	C	0.13	C	0.14	C
Westbound Through	0.78	C	0.96	D	0.99	E	0.96	D	0.99	E
Westbound Right	0.13	C	0.14	C	0.15	C	0.14	C	0.15	C
Northbound Left	0.02	C	0.03	C	0.03	C	0.02	C	0.02	C
Northbound Through-Right	0.20	C	0.21	C	0.21	C	0.21	C	0.21	C
Southbound Left	0.64	D	0.72	D	0.74	D	0.72	D	0.73	D
Southbound Through	0.12	C	0.14	C	0.14	C	0.16	C	0.16	C
Southbound Right	0.65	C	0.78	C	0.79	C	0.78	C	0.79	C

Note: 1. v/c—volume to capacity, LOS—level of service
2. Under background and total conditions, the signal timing was optimized while maintaining the existing cycle length

Table 10: Existing and Future Unsignalized Intersection Operations (AM Peak Hour)

Intersection & Movement	Existing		Background Total				Future Total			
			2022		2027		2022		2027	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Port Street East / St. Lawrence Drive										
Eastbound Left-Right	0.15	A	0.15	A	0.15	A	0.17	A	0.17	A
Northbound Left-Through-Right	0.06	A	0.06	A	0.06	A	0.06	A	0.06	A
Southbound Left-Through-Right	0.15	A	0.16	A	0.16	A	0.16	A	0.17	A
Port Street East / 65 Port Street Driveway										
Westbound Left -Through	0.00	A	0.00	A	0.00	A	0.00	A	0.00	A
Southbound Through-Right	0.01	A	0.01	A	0.01	A	0.04	A	0.04	A
Port Street East / Site Driveway										
Westbound Left-Through	0.00	A	0.00	A	0.00	A	NA			
Northbound Left-Right	0.00	A	0.00	A	0.00	A				
Port Street East / Helene Street										
Eastbound Left -Through-Right	0.09	A	0.09	A	0.09	A	0.09	A	0.09	A
Westbound Left -Through-Right	0.08	A	0.08	A	0.08	A	0.09	A	0.09	A
Northbound Left-Through-Right	0.02	A	0.02	A	0.02	A	0.02	A	0.02	A
Southbound Left-Through-Right	0.01	A	0.01	A	0.01	A	0.01	A	0.01	A
Lakeshore Road East / Helene Street										
Eastbound Left -Through	0.12	A	0.15	A	0.17	A	0.15	A	0.17	A
Westbound Left -Through	0.03	A	0.04	A	0.04	A	0.04	A	0.04	A
Northbound Left-Through-Right	0.41	F	1.11	F	1.37	F	1.11	F	1.37	F
Southbound Left-Through-Right	0.39	F	1.32	F	2.24	F	1.32	F	2.24	F

Note: 1. v/c—volume to capacity, LOS—level of service

Table 11: Existing and Future Unsignalized Intersection Operations (PM Peak Hour)

Intersection & Movement	Existing		Background Total				Future Total			
			2022		2027		2022		2027	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Port Street East / St. Lawrence Drive										
Eastbound Left-Right	0.21	A	0.21	A	0.21	A	0.20	A	0.20	A
Northbound Left-Through-Right	0.05	A	0.05	A	0.05	A	0.05	A	0.05	A
Southbound Left-Through-Right	0.17	A	0.17	A	0.18	A	0.19	A	0.20	A
Port Street East / 65 Port Street Driveway										
Westbound Left -Through	0.00	A	0.00	A	0.00	A	0.01	A	0.01	A
Northbound Left-Right	0.00	A	0.00	A	0.00	A	0.02	A	0.02	A
Port Street East / Site Driveway										
Northbound Left-Right	0.00	A	0.00	A	0.00	A	NA			
Northbound Left-Right	0.00	A	0.01	A	0.01	A				
Port Street East / Helene Street										
Eastbound Left -Through-Right	0.12	A	0.12	A	0.12	A	0.12	A	0.12	A
Westbound Left -Through-Right	0.15	A	0.15	A	0.15	A	0.14	A	0.14	A
Northbound Left-Through-Right	0.02	A	0.02	A	0.02	A	0.02	A	0.02	A
Southbound Left-Through-Right	0.01	A	0.01	A	0.01	A	0.01	A	0.01	A
Lakeshore Road East / Helene Street										
Eastbound Left -Through	0.04	A	0.05	A	0.06	A	0.05	A	0.06	A
Westbound Left -Through	0.02	A	0.02	A	0.02	A	0.02	A	0.02	A
Northbound Left-Through-Right	0.02	B	0.02	B	0.02	B	0.02	B	0.02	B
Southbound Left-Through-Right	0.26	D	0.54	F	0.63	F	0.54	F	0.63	F

Note: 1. v/c—volume to capacity, LOS—level of service

Under 2022 and 2027 background and total conditions, the Lakeshore Road East and Hurontario Street signalized intersection is projected to operate with excess capacity and a level of service E or better with a few exceptions. The eastbound left turn movement during the AM peak hour and the westbound through movement during the PM peak hour are projected to approach capacity. These results are due to background traffic growth. Site traffic does not contribute to any of these movements during the AM or PM peak hours.

For all unsignalized intersections, critical movements are expected to operate with excess capacity and a level of service E or better. However, the northbound and southbound left-through-right movements at the Lakeshore Road East and Helene Street intersection will exceed capacity and experience high delay during the AM peak hour resulting in a level of service F. Site traffic does not contribute to any of these movements during the AM or PM peak hours. The increases in traffic volumes are due to background traffic growth. Due to these longer delays, it is likely drivers will divert to nearby signalized intersections at Elizabeth Street (to the west) or Hurontario Street (to the east) on Lakeshore Road East.

In summary, site traffic is only adding 11 trips in the AM peak hour and 9 trips in the PM peak hour. This is far less than typical daily variations in traffic and will not be noticeable on the road network.

7.0 Queuing Review

Queuing was reviewed for critical moments at the intersection of at Lakeshore Road East / Hurontario Street under existing and future conditions for both peak hours. There were no identified queuing concerns at other study intersections. Detailed queueing results are provided in Appendix I. A comparison of the existing storage and projected queues are summarized in Table 12.

Table 12 : Queuing Summary at Lakeshore Road East / Hurontario Street

Movement (Peak Hour)	Existing Storage (m)	Queue				
		Existing	2022		2027	
			Background	Total	Background	Total
Southbound Left (AM Peak Hour)	30 / 60 [1]	117	136	137	146	148
Eastbound Left (AM Peak Hour)	45 / 90 [2]	65	138	138	141	141

Notes: 1. Including within painted median
2. Including west of Ann Street

Both the southbound left turn and eastbound left turn movement queues currently exceed their provided storage and will continue to do so under all future conditions. Site traffic does not add to these movements.

8.0 Delivery / Refuse Pickup Vehicle Access Review

An analysis of access to the loading/refuse pickup area was conducted for a Region of Peel refuse truck utilizing AutoTurn. The Region of Peel truck is larger than a typical delivery truck so represents the largest vehicle that would access the site. The analysis is provided in Appendix J and confirms that the proposed driveway geometrics to the loading/refuse areas will accommodate the expected design vehicle. The refuse truck will be required to reverse to/from Port Street to access the loading/refuse area.

9.0 Transportation Demand Management

9.1 Pedestrian Accommodation

The site is well designed to accommodate pedestrian access. Pedestrian connections will be provided to the existing sidewalk Port Street, to the Waterfront Trail to the south and to the public parking lot to the west on Helene Street.

9.2 Cyclist Accommodation

Bicycle storage will be provided in the garage. Cyclist can access the site via Port Street.

9.3 Transit

As summarized in Section 2.3, there are currently several bus routes that serve the site. The nearest bus stops are located along Lakeshore Road East, which is an approximate 3-4 minute walk. In addition, the Port Credit GO Station is an approximate 7-minute walk.

10.0 Conclusions

Under existing, background and total conditions, during the morning and afternoon peak hours, all study intersections are operating and will operate with excess capacity and a level of service E or better, with some exceptions. The northbound and southbound left-through-right movements at the Lakeshore Road East and Helene Street intersection will exceed capacity and experience high delay during the AM peak hour resulting in a level of service F. Site traffic does not contribute to any of these movements during the AM or PM peak hours. The increases in traffic volumes are due to background traffic growth. Due to these longer delays, it is likely drivers will divert to nearby signalized intersections

at Elizabeth Street (to the west) or Hurontario Street (to the east) on Lakeshore Road East.

At the intersection of Lakeshore Road East and Hurontario Street both the southbound left turn and eastbound left turn movement queues currently exceed their provided storage and will continue to do so under all future conditions. Site traffic does not add to these movements.

In summary, site traffic is projected to only add 11 trips in the AM peak hour and 9 trips in the PM peak hour. This is far less than typical daily variations in traffic and will not be noticeable on the road network.

An Auto Turn analysis confirms that delivery and refuse trucks can access the site via the proposed driveway, both requiring a reverse movement onto Port Street.

The site is well designed to provide access by pedestrians and cyclists to area sidewalks, bike routes and transit, thus encouraging choices in modes of travel.

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix A

Existing Traffic Counts and Signal Timing Plan

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

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

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

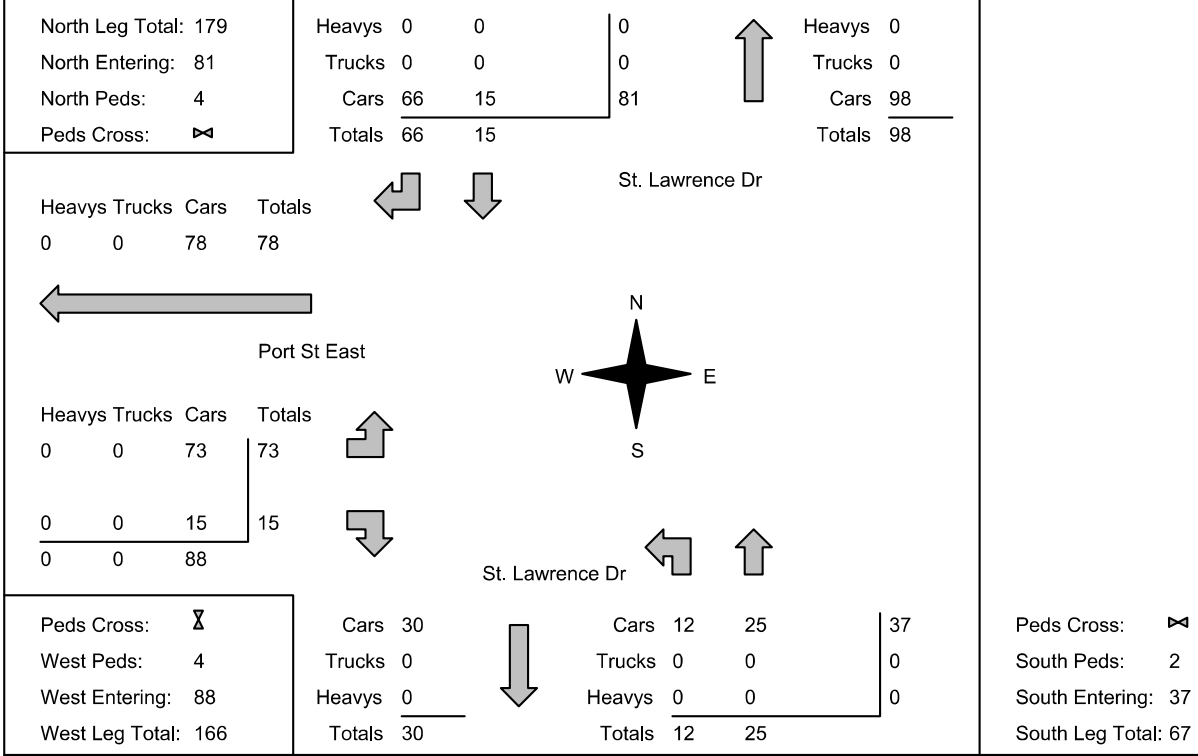
Municipality: Mississauga
Site #: 1800800001
Intersection: St. Lawrence Dr & Port St East
TFR File #: 1
Count date: 16-Jan-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: St. Lawrence Dr runs N/S



Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

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

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

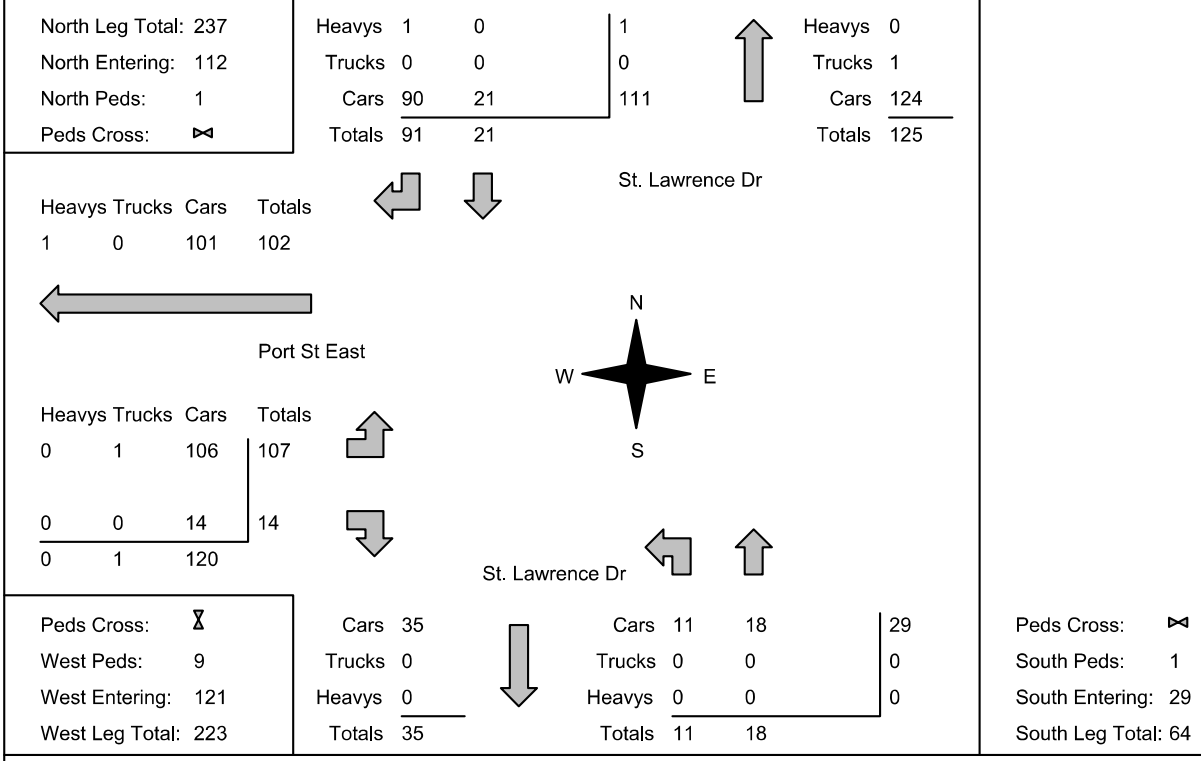
Municipality: Mississauga
Site #: 1800800001
Intersection: St. Lawrence Dr & Port St East
TFR File #: 1
Count date: 16-Jan-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: St. Lawrence Dr runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 1800800002
Intersection: Port St East & Helene St South
TFR File #: 1
Count date: 16-Jan-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Port St East runs W/E

North Leg Total: 28
North Entering: 15
North Peds: 1
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	4	1	10	15
Totals	4	1	10	

Heavys	0
Trucks	0
Cars	13
Totals	13

East Leg Total: 129
East Entering: 64
East Peds: 3
Peds Cross: ⧖

Helene St South

Heavys	Trucks	Cars	Totals
0	0	53	53

Cars	Trucks	Heavys	Totals
11	0	0	11
47	0	0	47
6	0	0	6
64	0	0	

Port St East

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	2	2
0	0	55	55
0	0	2	2
0	0	59	

Port St East

Cars	Trucks	Heavys	Totals
65	0	0	65

Helene St South

Peds Cross: ⧖
West Peds: 3
West Entering: 59
West Leg Total: 112

Cars	9
Trucks	0
Heavys	0
Totals	9

Cars	2	0	0	2
Trucks	0	0	0	0
Heavys	0	0	0	0
Totals	2	0	0	

Peds Cross: ⋈
South Peds: 9
South Entering: 2
South Leg Total: 11

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

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

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

Municipality: Mississauga
Site #: 1800800002
Intersection: Port St East & Helene St South
TFR File #: 1
Count date: 16-Jan-18

Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Port St East runs W/E

North Leg Total: 34
North Entering: 20
North Peds: 10
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	7	0	13	20
Totals	7	0	13	

Heavys	0
Trucks	0
Cars	14
Totals	14

East Leg Total: 172
East Entering: 89
East Peds: 2
Peds Cross: ⧖

Heavys	Trucks	Cars	Totals
1	0	88	89

Helene St South

Cars	Trucks	Heavys	Totals
8	0	0	8
79	0	1	80
1	0	0	1
88	0	1	

Port St East

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	5	5
0	1	66	67
0	0	0	0
0	1	71	

Port St East

Cars	Trucks	Heavys	Totals
82	1	0	83

Helene St South

Peds Cross: ⧖
West Peds: 11
West Entering: 72
West Leg Total: 161

Cars	1
Trucks	0
Heavys	0
Totals	1

Cars	2	1	3	6
Trucks	0	0	0	0
Heavys	0	0	0	0
Totals	2	1	3	

Peds Cross: ⋈
South Peds: 10
South Entering: 6
South Leg Total: 7

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period	One Hour Peak
From: 7:00:00	**From:** 8:00:00
To: 9:00:00	**To:** 9:00:00

Municipality: Mississauga
Site #: 1800800003
Intersection: Port St East & Existing Site Drivew
TFR File #: 1
Count date: 16-Jan-18

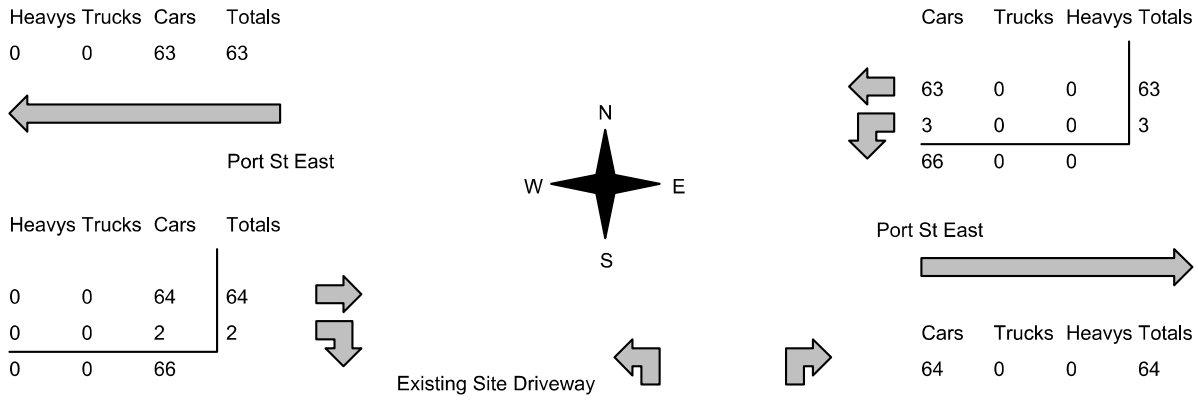
Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Port St East runs W/E

East Leg Total: 130
East Entering: 66
East Peds: 1
Peds Cross: ⧗



Peds Cross: ⧗
West Peds: 2
West Entering: 66
West Leg Total: 129

Cars 5
Trucks 0
Heavys 0
Totals 5

Cars 0 0 0
Trucks 0 0 0
Heavys 0 0 0
Totals 0 0

Peds Cross: ⋈
South Peds: 5
South Entering: 0
South Leg Total: 5

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

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

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

Municipality: Mississauga
Site #: 1800800003
Intersection: Port St East & Existing Site Drivew
TFR File #: 1
Count date: 16-Jan-18

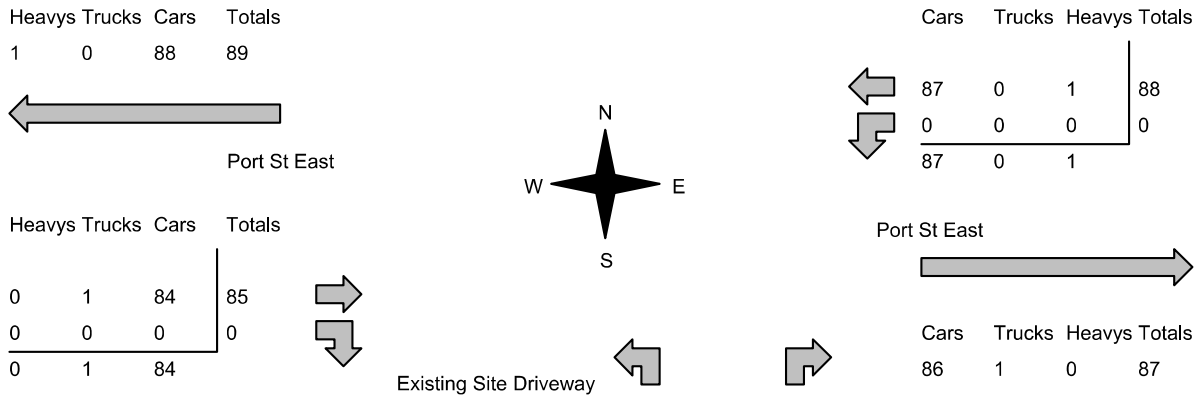
Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Port St East runs W/E

East Leg Total: 175
East Entering: 88
East Peds: 0
Peds Cross: ⧗



Peds Cross: ⧗
West Peds: 1
West Entering: 85
West Leg Total: 174

Cars 0
Trucks 0
Heavys 0
Totals 0

Cars 1 2 3
Trucks 0 0 0
Heavys 0 0 0
Totals 1 2

Peds Cross: ⋈
South Peds: 7
South Entering: 3
South Leg Total: 3

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 1800800004
Intersection: Port St East & Existing Driveway to
TFR File #: 1
Count date: 16-Jan-18

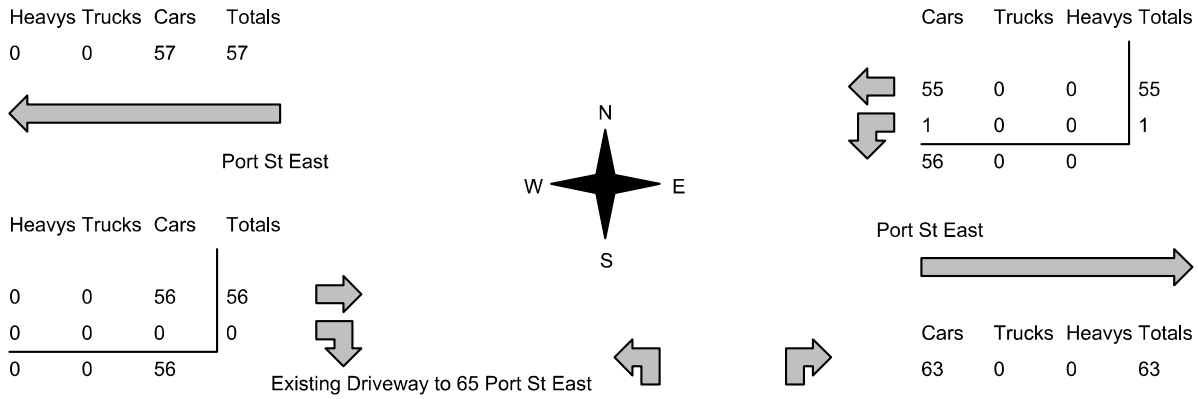
Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Port St East runs W/E

East Leg Total: 119
East Entering: 56
East Peds: 3
Peds Cross: ⧗



Peds Cross: ⧗
West Peds: 4
West Entering: 56
West Leg Total: 113

Cars 1
Trucks 0
Heavys 0
Totals 1

Cars 2 7 9
Trucks 0 0 0
Heavys 0 0 0
Totals 2 7

Peds Cross: ⋈
South Peds: 7
South Entering: 9
South Leg Total: 10

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

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

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

Municipality: Mississauga
Site #: 1800800004
Intersection: Port St East & Existing Driveway to
TFR File #: 1
Count date: 16-Jan-18

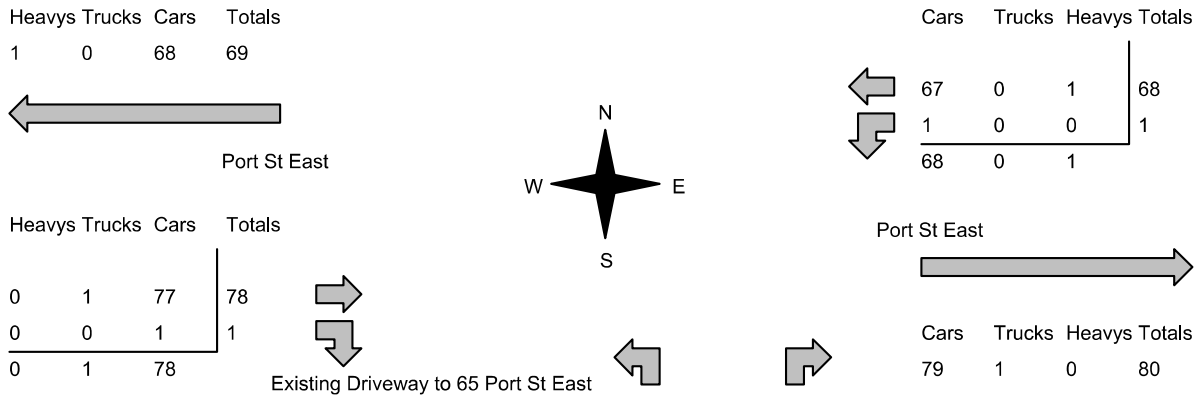
Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Port St East runs W/E

East Leg Total: 149
East Entering: 69
East Peds: 9
Peds Cross: ⧗



Peds Cross: ⧗
West Peds: 1
West Entering: 79
West Leg Total: 148

Cars 2
Trucks 0
Heavys 0
Totals 2

Cars 1 2 3
Trucks 0 0 0
Heavys 0 0 0
Totals 1 2

Peds Cross: ⋈
South Peds: 5
South Entering: 3
South Leg Total: 5

Comments

Ontario Traffic Inc.

Morning Peak Diagram

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

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

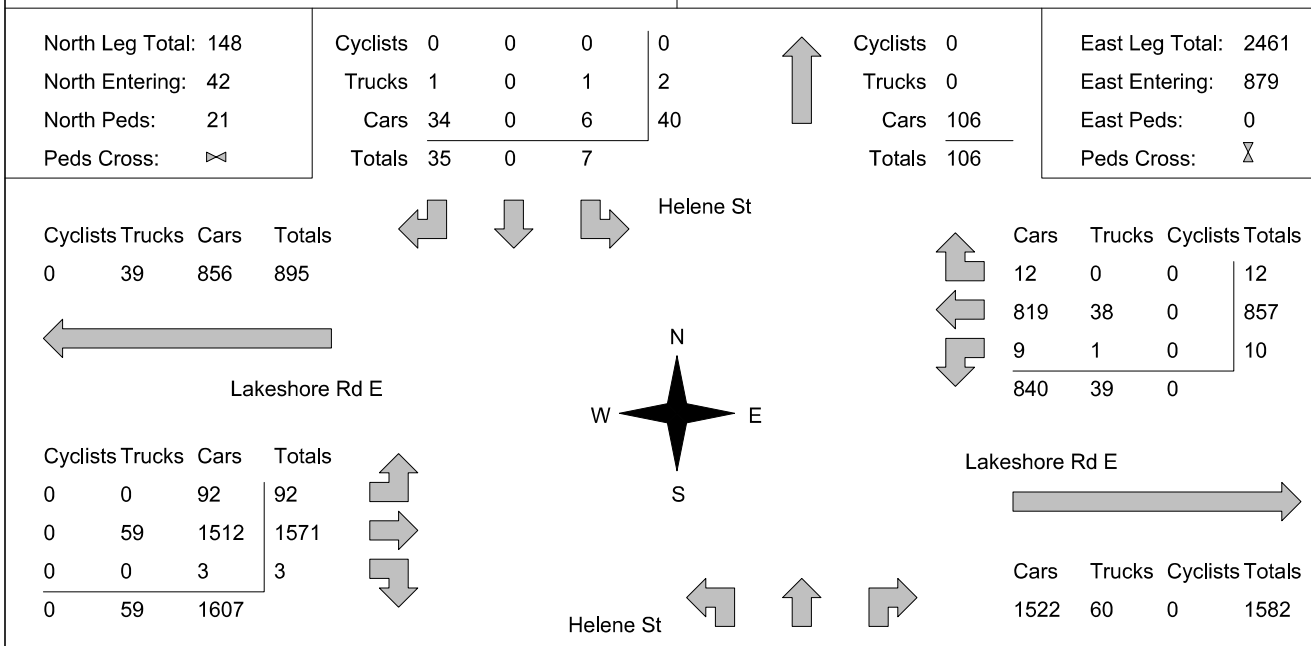
Municipality: Mississauga
Site #: 1804100001
Intersection: Lakeshore Rd E & Helene St
TFR File #: 9
Count date: 25-Jan-18

Weather conditions:

Person(s) who counted:

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

Major Road: Lakeshore Rd E runs W/E



Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

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

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

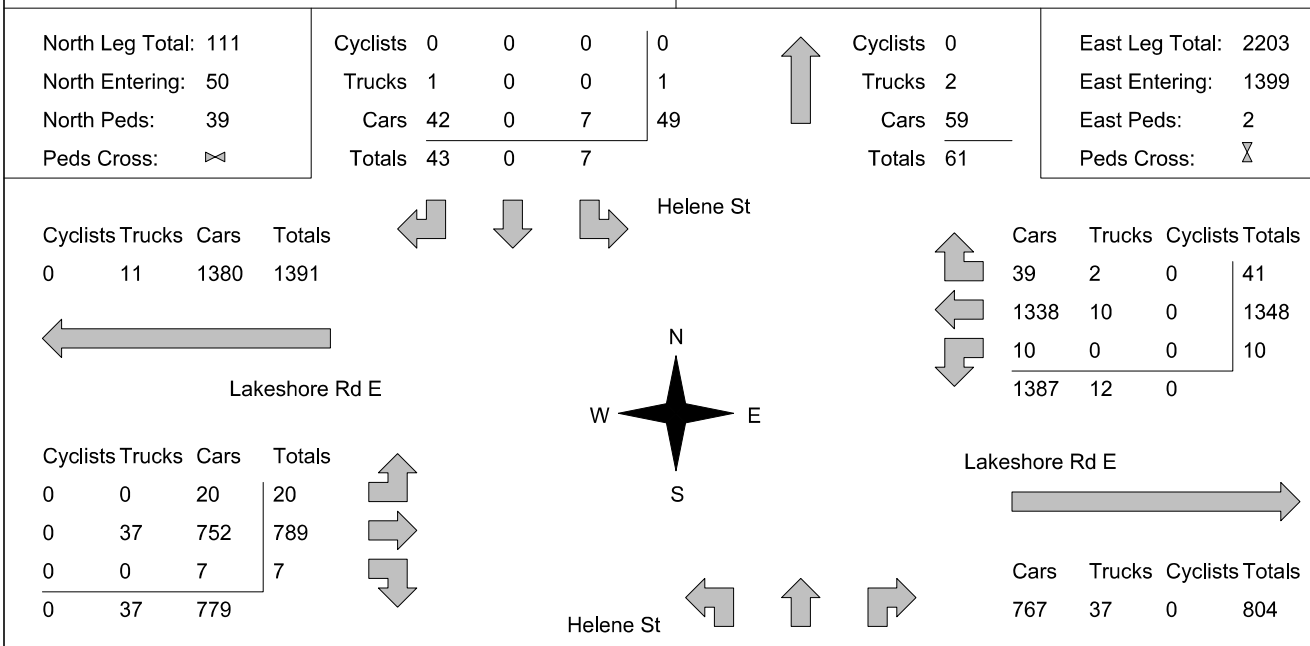
Municipality: Mississauga
Site #: 1804100001
Intersection: Lakeshore Rd E & Helene St
TFR File #: 9
Count date: 25-Jan-18

Weather conditions:

Person(s) who counted:

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

Major Road: Lakeshore Rd E runs W/E



Comments

Ontario Traffic Inc.

Morning Peak Diagram

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

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

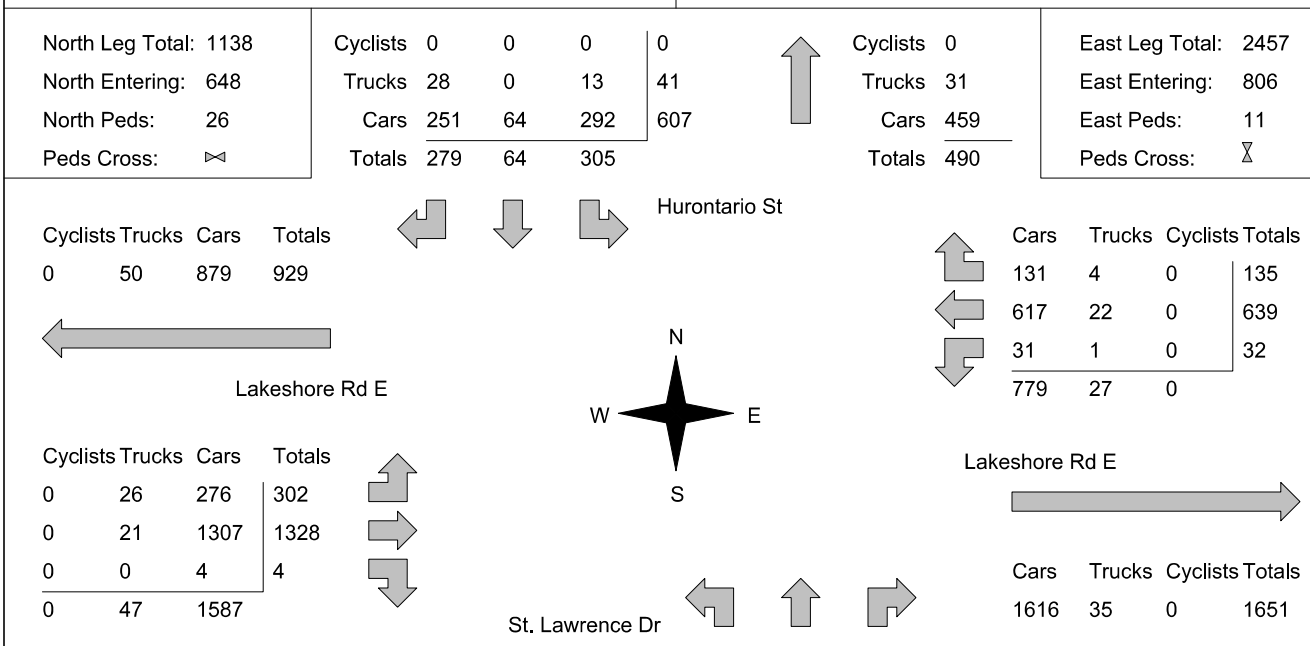
Municipality: MIssissauga
Site #: 1804100002
Intersection: Lakeshore Rd E & Hurontario St-St.
TFR File #: 2
Count date: 25-Jan-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Rd E runs W/E



Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

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

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

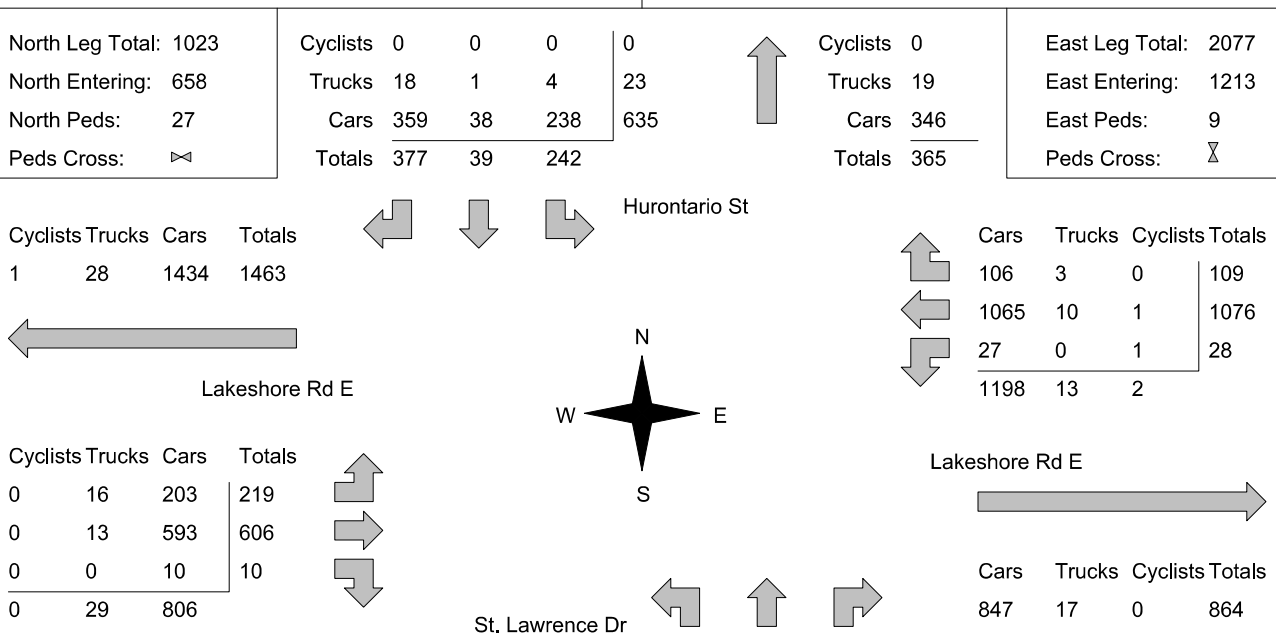
Municipality: MIssissauga
Site #: 1804100002
Intersection: Lakeshore Rd E & Hurontario St-St.
TFR File #: 2
Count date: 25-Jan-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Lakeshore Rd E runs W/E



Comments

Ontario Traffic Inc.

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 1804100003
Intersection: Port St E & Helene St S
TFR File #: 2
Count date: 25-Jan-18

Weather conditions:

Person(s) who counted:

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

Major Road: Port St E runs W/E

North Leg Total: 18
North Entering: 8
North Peds: 5
Peds Cross: ⋈

Cyclists	0	0	0	0
Trucks	0	0	0	0
Cars	4	3	1	8
Totals	4	3	1	

Cyclists	0
Trucks	0
Cars	10
Totals	10

East Leg Total: 101
East Entering: 51
East Peds: 3
Peds Cross: ⧖

Helene St S

Cyclists	Trucks	Cars	Totals
0	3	56	59

Cars	Trucks	Cyclists	Totals
2	0	0	2
45	2	0	47
2	0	0	2
49	2	0	

Port St E

N
W E
S

Cyclists	Trucks	Cars	Totals
0	0	5	5
0	0	46	46
0	0	3	3
0	0	54	

Port St E

Cars	Trucks	Cyclists	Totals
50	0	0	50

Helene St S

Peds Cross: ⧖
West Peds: 0
West Entering: 54
West Leg Total: 113

Cars	8
Trucks	0
Cyclists	0
Totals	8

Cars	7	3	3	13
Trucks	1	0	0	1
Cyclists	0	0	0	0
Totals	8	3	3	

Peds Cross: ⋈
South Peds: 0
South Entering: 14
South Leg Total: 22

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

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

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

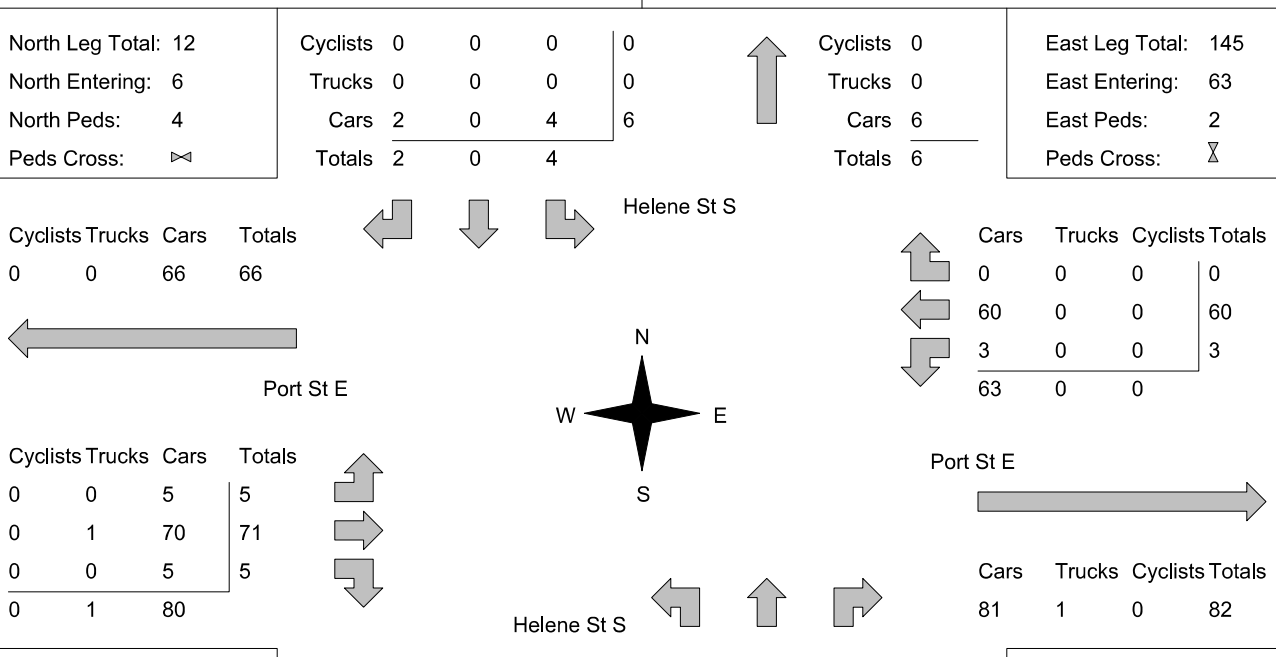
Municipality: Mississauga
Site #: 1804100003
Intersection: Port St E & Helene St S
TFR File #: 2
Count date: 25-Jan-18

Weather conditions:

Person(s) who counted:

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

Major Road: Port St E runs W/E



Comments

Ontario Traffic Inc.

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 1804100004
Intersection: Port St E & First driveway just east (
TFR File #: 13
Count date: 25-Jan-18

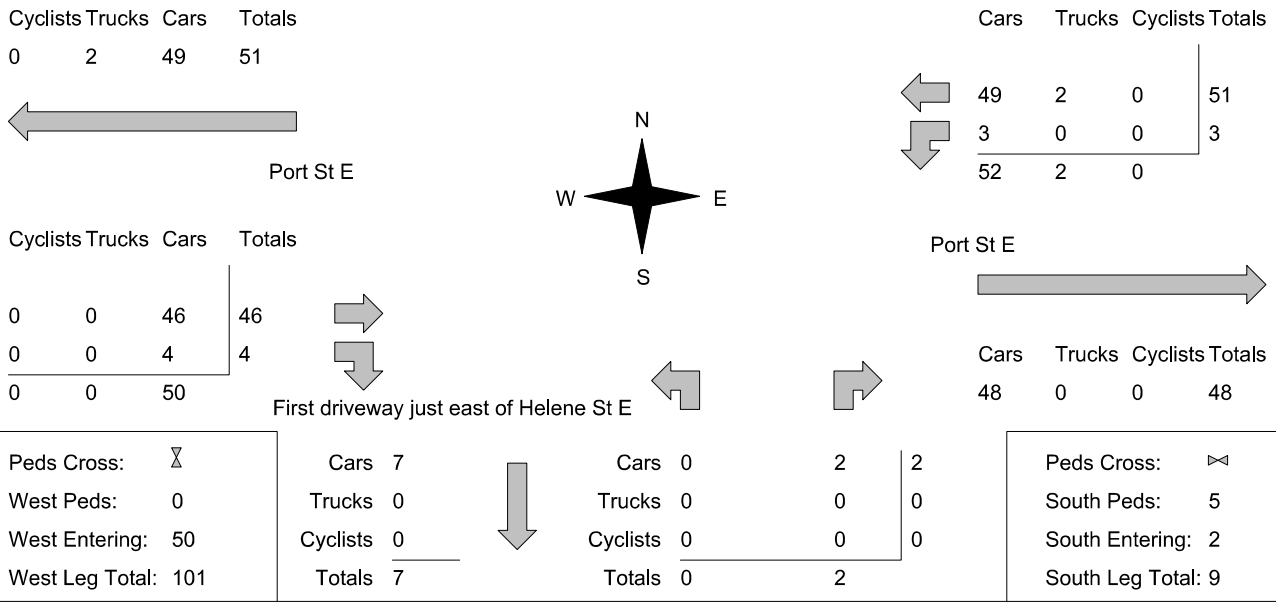
Weather conditions:

Person(s) who counted:

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

Major Road: Port St E runs W/E

East Leg Total: 102
East Entering: 54
East Peds: 2
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 50
West Leg Total: 101

Cars 7
Trucks 0
Cyclists 0
Totals 7

Cars 0 2 2
Trucks 0 0 0
Cyclists 0 0 0
Totals 0 2

Peds Cross: ⋈
South Peds: 5
South Entering: 2
South Leg Total: 9

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

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

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

Municipality: Mississauga
Site #: 1804100004
Intersection: Port St E & First driveway just east
TFR File #: 13
Count date: 25-Jan-18

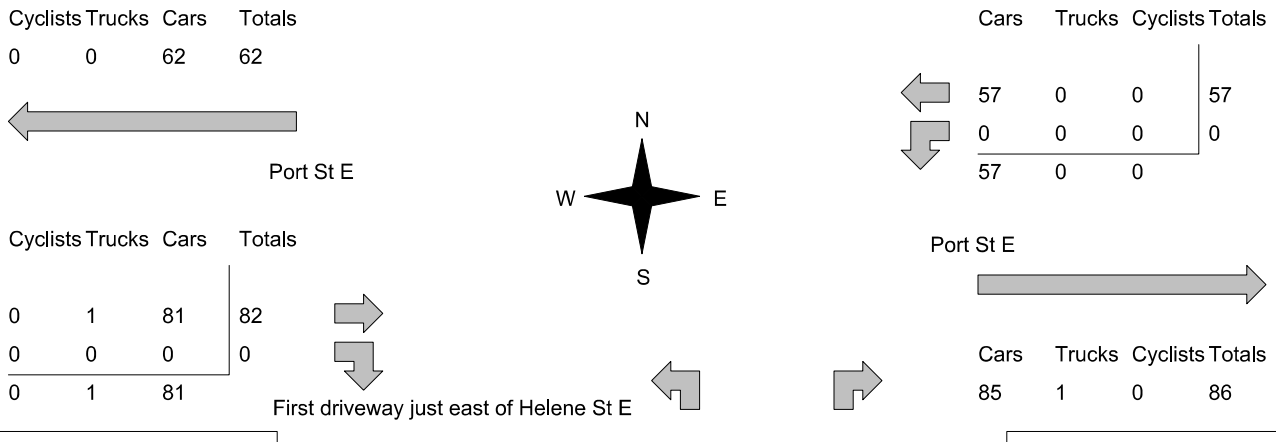
Weather conditions:

Person(s) who counted:

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

Major Road: Port St E runs W/E

East Leg Total: 143
East Entering: 57
East Peds: 5
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 82
West Leg Total: 144

Cars 0
Trucks 0
Cyclists 0
Totals 0

Cars 5 4 9
Trucks 0 0 0
Cyclists 0 0 0
Totals 5 4

Peds Cross: ⋈
South Peds: 5
South Entering: 9
South Leg Total: 9

Comments

Ontario Traffic Inc.

Morning Peak Diagram

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

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

Municipality: Mississauga
Site #: 1804100005
Intersection: Port St E & First driveway just west
TFR File #: 13
Count date: 25-Jan-18

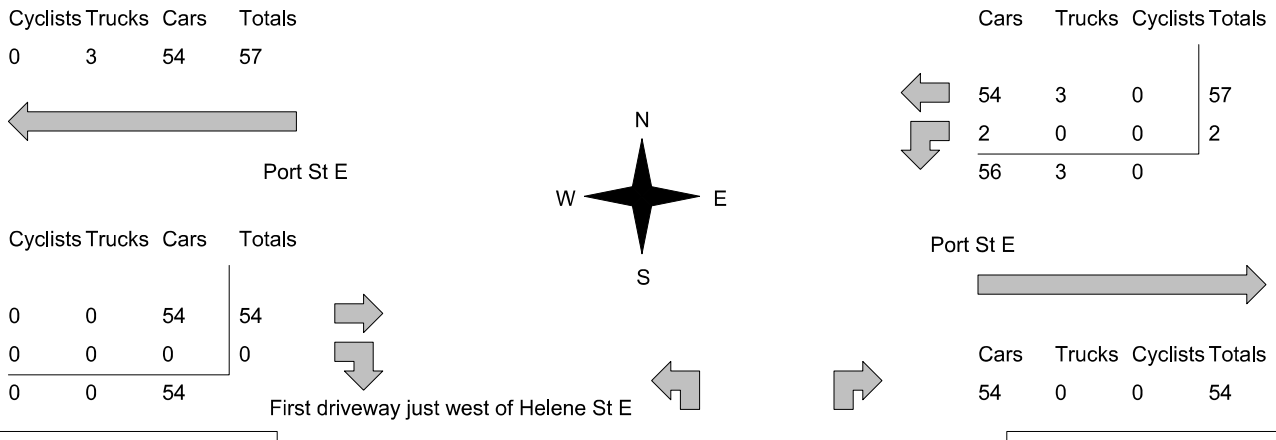
Weather conditions:

Person(s) who counted:

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

Major Road: Port St E runs W/E

East Leg Total: 113
East Entering: 59
East Peds: 0
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 3
West Entering: 54
West Leg Total: 111

Cars 2
Trucks 0
Cyclists 0
Totals 2

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

Peds Cross: ⋈
South Peds: 11
South Entering: 0
South Leg Total: 2

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

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

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

Municipality: Mississauga
Site #: 1804100005
Intersection: Port St E & First driveway just west
TFR File #: 13
Count date: 25-Jan-18

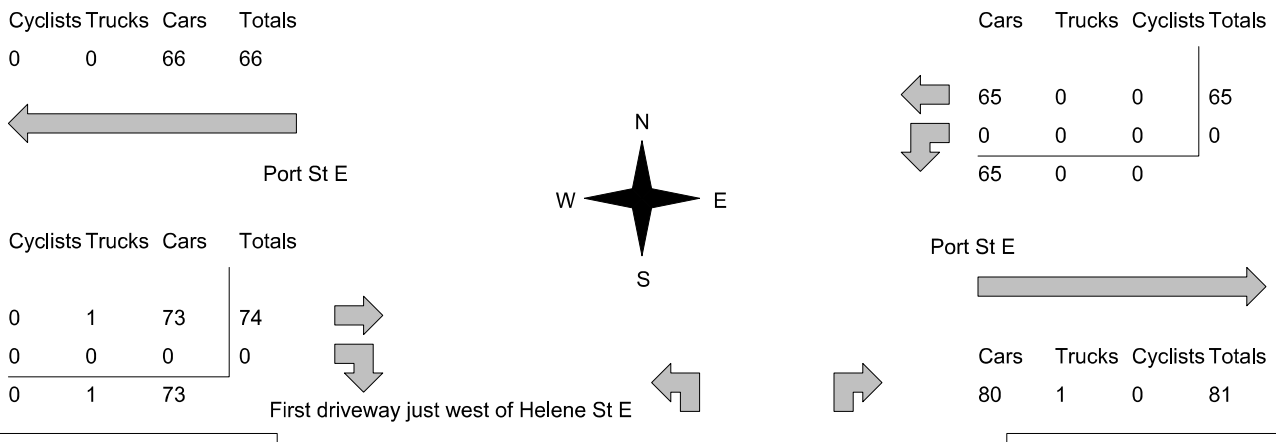
Weather conditions:

Person(s) who counted:

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

Major Road: Port St E runs W/E

East Leg Total: 146
East Entering: 65
East Peds: 0
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 2
West Entering: 74
West Leg Total: 140

Cars 0
Trucks 0
Cyclists 0
Totals 0

Cars 1 7 8
Trucks 0 0 0
Cyclists 0 0 0
Totals 1 7

Peds Cross: ⋈
South Peds: 10
South Entering: 8
South Leg Total: 8

Comments

Signal Timing Report

Runtime: 01/30/2018 11:53:14

Device: 0705

Region: Mississauga **Signal ID:** 0705 **Location:** LAKESHORE ROAD E at Hurontario Street

Phase	Units	1	2	3	4	5		7	8
Walk	Sec	0	12	0	12	0	12	0	12
Ped Clear	Sec	0	26	0	26	0	26	0	26
Min Green	Sec	0	8	0	8	5	8	0	8
Passage	Sec	0.0	4.0	0.0	4.0	3.0	4.0	0.0	4.0
Maximum 1	Sec	0	20	0	30	13	20	0	30
Maximum 2	Sec	0	20	0	30	13	20	0	30
Yellow Change	Sec	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
Red Clearance	Sec	0.0	2.0	0.0	3.0	0.0	2.0	0.0	3.0
Red Revert	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added Initial	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	Sec	0	0	0	0	0	0	0	0
Time Before	Sec	0	0	0	0	0	0	0	0
Cars Before	Veh	0	0	0	0	0	0	0	0
Time To Reduce	Sec	0	0	0	0	0	0	0	0
Reduce By	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min Gap	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dynamic Max Limit	Sec	0	0	0	0	0	0	0	0
Dynamic Max Step	Sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[P2] Start Up	Enum	other	redClear	other	phaseNotOn	phaseNotOn	redClear	other	phaseNotOn
[P2] Options	Bit	0	Enabled Non-Actuated 1 Max Veh Recall Ped Recall Dual Entry Act Rest In Walk	0	Enabled Non Lock Det Dual Entry	Enabled Non Lock Det	Enabled Non-Actuated 1 Max Veh Recall Ped Recall Dual Entry Act Rest In Walk	0	Enabled Non Lock Det Dual Entry

Coord Pattern	Units	1	2	3	4	5		7	8
Cycle Time	Sec	140	120	120	0	0	0	0	0
Offset	Sec	11	92	70	0	0	0	0	0
Split	Split	1	2	3	0	0	0	0	0
Sequence	Sequence	1	1	1	0	0	0	0	0

Coord Split	Units	1	2	3	4	5		7	8
Split 1 - Mode	Enum	none	none	none	pedRecall	none	none	none	pedRecall
Split 1 - Time	Sec	0	91	0	49	20	71	0	49
Split 1 - Coord	Enum	false	true	false	false	false	true	false	false
Split 2 - Mode	Enum	none	none	none	pedRecall	none	none	none	pedRecall
Split 2 - Time	Sec	0	72	0	48	17	55	0	48
Split 2 - Coord	Enum	false	true	false	false	false	true	false	false
Split 3 - Mode	Enum	none	none	none	pedRecall	none	none	none	pedRecall
Split 3 - Time	Sec	0	72	0	48	14	58	0	48
Split 3 - Coord	Enum	false	true	false	false	false	true	false	false

TB Schedule	Units	1	2	3	4	5		7	8
Month	Bit	JFMAMJJASOND	JFMAMJJASOND	JFMAMJJASOND	J----------	-F---------	J----------	-F---------	--M---------
Day of Week	Bit	-MTWTF-	S------	-----S	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS
Day of Month	Bit	12345678901234 56789012345678 901	12345678901234 56789012345678 901	123456789012345 678901234567890 1	-2---------- -----	----------0--- -----	1---------- -------	----------9----- -----	---------- ---0-
Day Plan	Number	1	3	2	3	3	3	3	3

TB Schedule	Units	9	10	11	12	13		15	16
Month	Bit	----M------	-----J-----	------A----	-------S---	--------O--	----------D	----------D	----------D
Day of Week	Bit	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS	SMTWTFS
Day of Month	Bit	----------1---- -----	-2---------- -----	----6---------- -----	--3---------- -----	------8---------- -----	---------- 5-----	---------- 6-----	----------4- -----
Day Plan	Number	3	3	3	3	3	3	3	3

TB Dayplan	Units	1	2	3	4	5		7	8
Plan 1 Hour	Hour	0	6	9	15	19	0	0	0
Plan 1 Minute	Min	0	0	30	0	30	0	0	0
Plan 1 Action	Number	8	1	2	3	2	0	0	0
Plan 2 Hour	Hour	0	7	0	0	0	0	0	0
Plan 2 Minute	Min	0	0	0	0	0	0	0	0
Plan 2 Action	Number	8	2	0	0	0	0	0	0
Plan 3 Hour	Hour	0	8	23	0	0	0	0	0
Plan 3 Minute	Min	0	0	0	0	0	0	0	0
Plan 3 Action	Number	8	2	8	0	0	0	0	0

TB Action	Units	1	2	3	4	5		7	8
Pattern	Enum	Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5	Pattern 6	Pattern 7	Free
Aux. Functions	Bit	0	0	0	0	0	0	0	0
Spec. Functions	Bit	0	0	0	0	0	0	0	0

TB Action	Units	9	10	11	12	13		15	16
Pattern	Enum	Pattern 9	Pattern 10	Interconnect	Interconnect	Interconnect	Interconnect	Interconnect	Interconnect
Aux. Functions	Bit	0	0	0	0	0	0	0	0
Spec. Functions	Bit	0	0	0	0	0	0	0	0

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Appendix B

Background Development Site Traffic Volumes

5. Site generated traffic

5.1 Site trip generation

The development proposal is for 66 condominium apartment units and 3 townhouse units for a total of 69 residential units. The weekday am and pm peak hour trip generation was based on Institute of Transportation Engineers (ITE), 8th Edition, data for Residential Condominiums/Townhouses (LUC # 230).

The Hurontario / Main Street Corridor Master Plan projects a transit mode split of approximately 50% in 2031, compared to 24.1% in 2011 in the vicinity of the site. In this context of continued growth in transit use, and in consideration of the substantial transit improvements that are planned for implementation prior to 2021, the 25% transit mode split used in the analysis is considered conservative, but was nonetheless adopted in this report.

The future traffic analysis in 2019 did not include the Hurontario LRT into Port Credit, as the LRT service is not projected to be operational throughout the entire length of the Corridor until 2021 at the earliest (subject to funding).

The weekday am and pm peak hour estimated site trip rates for the combined apartment and townhouse residential units of the proposed development is summarized in **Table 3**:

Table 3 Site trip generation

Land Use Code	Units	Parameters	Peak Hour Trip Generation					
			Weekday AM			Weekday PM		
			In	Out	Total	In	Out	Total
Residential Condominium/ Townhouse (LUC 230)	69	Trip Rate	0.10	0.46	0.56	0.43	0.21	0.64
		Trip Ratio	17%	83%	-	67%	33%	-
		Gross Trips	7	31	38	30	14	44
		Transit Split (25%)	-2	-7	-9	-8	-3	-11
		Vehicle Trips	5	24	29	22	11	33

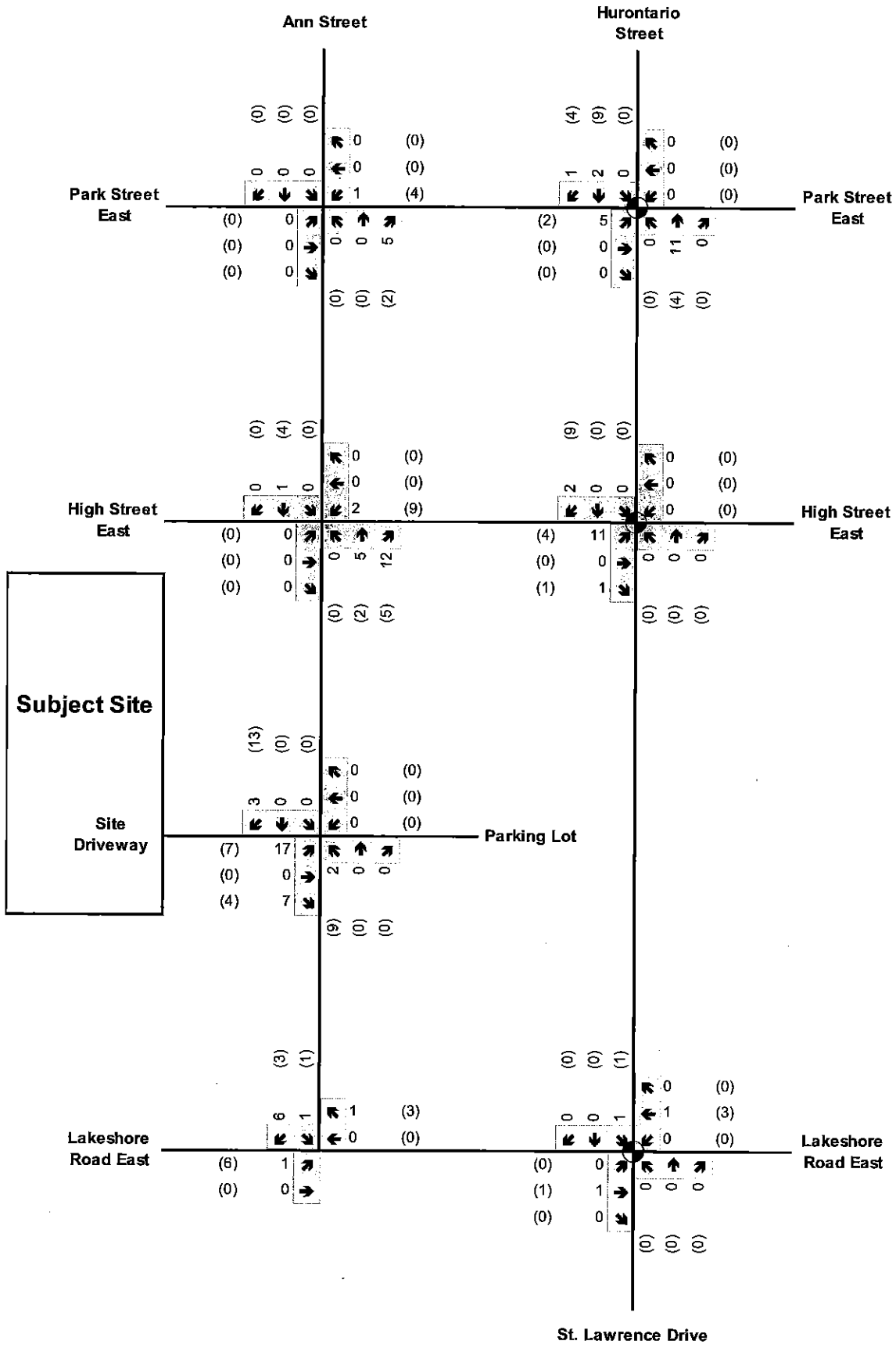
5.2 Site trip distribution and assignment

Distribution of new trips generated by the development was based on existing traffic patterns within the study area. The turning movement assignments to the various route options considered the overall directional orientations, traffic signal control of the intersections, and the existing traffic patterns.

The adopted directional distributions in each of the weekday peak hours were:

- AM peak hour: 65% north, 10% east and 25% west (negligible trips to the south)
- PM peak hour: 60% north, 15% east and 25% west (negligible trips to the south)

The total site traffic assigned to the study intersections in each of the weekday am and pm peak hours are shown in **Figure 6**.



Legend

XX AM Peak Hour Volumes
(XX) PM Peak Hour Volumes
Signalized Intersection

NOT TO SCALE

F.S. 6810 LP (c/o FRAM Group)
6, 8, 10 Ann Street Condominiums
Traffic Impact Study

Estimated Site Traffic

Job Number 88-11979
Revision A
Date Oct 2014

Figure 06

6705 Millcreek Drive, Unit 1, Mississauga Ontario L5N 5M4 T 1 416 213 7121 F 1 416 890 8499 E info@ghdcanada.com W www.ghd.com

Plot Date: 20 October 2014 - 1:16 PM Plotted by: Michael Dowdall Cad File No: X:\SernesTransTech\Projects\2014\Ann Street\Analysis\88-11979 Ann Street Figures.dwg

Conceptual Phasing

The phasing plan has been strategically divided into five phases that reflect a combination of environmental, market and civil/servicing considerations.

Phase

Phase One consists of townhouses along the western edge of the Site, and commercial/ mixed-use buildings along Lakeshore Road West. This phase also includes a portion of the mid-rise residential buildings south of the Lakeshore commercial area and along the Lake Ontario.

Phase Two moves to the centre of the site. It consists of a mix of townhouses and mid-rise buildings south of the Lakeshore commercial area.

Timing

- Construction to commence Q3 of 2019
- Construction to commence Q3 of 2021

Residential

- Total of approximately ± 810 new residential units.
- ± 210 Condominium townhouses with either one level underground parking or below grade parking at rear
- The first mid-rise buildings will also be a part of this first phase.

- Total of approximately ±390 new residential units.
- ±140 Condominium townhouses
- Includes Community Park along Mississauga Road South

Retail & Commercial

- Total of ±200,000 square feet of new commercial (both office and retail).

Public Space

- The Lakeside Park will be developed as part of the first phase.

Construction & Permanent Access

- Signalized access on Lakeshore Road West
- Unsignalized west access on Lakeshore Road West
- Unsignalized east access on Lakeshore Road West
- Unsignalized access on Mississauga Road South

- Signalized access on Lakeshore Road West
- Unsignalized west access on Lakeshore Road West
- Unsignalized east access on Lakeshore Road West
- Unsignalized access on Mississauga Road South

Trip generation forecasts for the proposed community/institutional use (9,118 m^2 GFA in size) are summarized in **Table 5**.

TABLE 3 RESIDENTIAL TRIP GENERATION SUMMARY

Vehicle Trip Generation Rate Source		AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
		Vehicle Trip Generation Rates per Residential Unit					
Legion Road Condominiums[1]		0.02	0.24	0.27	0.17	0.09	0.26
Manitoba Street Condominiums and Townhomes[2]		0.08	0.44	0.51	0.38	0.23	0.61
Port Credit Townhomes[3 4]		0.17	0.36	0.52	0.66	0.55	1.22
ITE Trip Generation Manual[5]		0.05	0.23	0.27	0.23	0.11	0.34
One Port Street Transportation Study[6]		0.07	0.27	0.34	0.28	0.12	0.40
Selected Vehicle Trip Generation Rate (Apartment Units)		**0.05**	**0.25**	**0.29**	**0.23**	**0.11**	**0.33**
Selected Vehicle Trip Generation Rate (Townhouse Units)		**0.08**	**0.44**	**0.51**	**0.38**	**0.23**	**0.61**
Travel Mode	**Split[7]**	**Total Future Trips by Travel Mode – 1,955 Condominium Apartment Units + 539 Townhouse Units**					
Driver Trips	**67%**	**131**	**718**	**849**	**647**	**329**	**976**
Auto Passenger Trips	12%	24	132	156	119	61	180
Transit Trips	19%	37	206	243	185	94	280
Cycling/Walking Trips	2%	4	19	23	17	9	26
Total Person Trips	**100%**	**196**	**1,075**	**1,271**	**968**	**494**	**1,462**

Notes:
1. Survey conducted by BA Group on Wednesday, April 26, 2017 at 155 Legion Road North. Proxy site contains approximately 930 residential condominium apartments units in total.
2. Survey conducted by BA Group on Wednesday, April 26, 2017 at 210 Manitoba Street. Proxy site contains approximately 32 townhouse units and 310 residential condominium apartments units in total.
3. Survey conducted by BA Group on Thursday, June 1, 2017 at townhouse development bordered by St. Lawrence Drive in Port Credit. Proxy site contains 185 townhouse units (include 8 live/work units) in total.
4. Weekday afternoon trip generation rates not utilized, as they were found to be unusually high.
5. Based on trip generation data for Land Use Code 230 (Residential Townhouse/Condominium) contained in the ITE Trip Generation Manual, 9th edition.
6. Based on transportation study associated with the One Port Street development in Port Credit conducted by BA Group in 2013. The One Port Street Master Plan contemplated 1,500 new residential units.
7. Mode split based on 2011 Transportation Tomorrow Survey (TTS) data for home-based trips made during the weekday peak periods in the Port Credit area.

TABLE 4 COMMERCIAL OFFICE TRIP GENERATION SUMMARY

Vehicle Trip Generation Rate Source		AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
		Vehicle Trip Generation Rates per 100 m^2 GFA					
Hatch Global Office Site[1 2]		1.30	0.15	1.45	0.11	1.27	1.38
ITE Trip Generation Manual[3]		1.56	0.21	1.77	0.28	1.37	1.65
Selected Vehicle Trip Generation Rate		**1.43**	**0.18**	**1.61**	**0.20**	**1.32**	**1.52**
Travel Mode	**Split[4]**	**Total Future Trips by Travel Mode – 13,627 m^2 Commercial GFA**					
Driver Trips	**85%**	**210**	**26**	**236**	**29**	**194**	**223**
Auto Passenger Trips	10%	24	3	27	3	22	25
Transit Trips	3%	9	1	10	1	8	9
Cycling/Walking Trips	2%	6	1	7	1	6	7
Total Person Trips	**100%**	**249**	**31**	**280**	**34**	**230**	**264**

Notes:
1. Survey conducted by BA Group on Tuesday, April 25, 2017 at 2800 Speakman Drive. Proxy site contains approximately 11,700 m^2 of office-related gross floor area.
2. Trip generation rates reduced by a decreasing rate factor of 98% in the AM peak hour and 96% in the PM peak hour to account for the size difference between the proxy site and the proposed amount of commercial office (11,700 m^2 versus 13,627 m^2). These factors were calculated based on a comparison of ITE Trip Generation Manual (9th Ed.) vehicle trip generation rates for a General Office Building (Land Use Code 710) 11,700 m^2 and 13,627 m^2 in size.
3. Based on trip generation data for Land Use Code 710 (General Office Building) contained in the ITE Trip Generation Manual, 9th edition.
4. Mode split based on 2011 Transportation Tomorrow Survey (TTS) data for work-based trips made during the weekday peak periods in the Port Credit area.

6.2.2.4 Retail Trips

Retail trip generation forecasts were based upon:

a) proxy trip generation surveys conducted at Loblaws retail plaza located directly north of the site at 220 Lakeshore Road West;
b) data from the ITE Trip Generation Manual for Land Use Code 820 – Shopping Centre; and
c) 2011 Transportation Tomorrow Survey (TTS) travel mode distribution data for market-based trips in the Port Credit area.

Trip generation forecasts for the proposed 13,819 m^2 GFA (12,437 m^2 Gross Leasable Area) of retail space are summarized in **Table 6**.

TABLE 6 RETAIL TRIP GENERATION SUMMARY

Vehicle Trip Generation Rate Source		AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
		Vehicle Trip Generation Rates per 100 m^2 GLA					
Loblaws Retail Site[1 2]		1.59	0.70	2.29	3.10	2.49	5.59
ITE Trip Generation Manual[3]		1.00	0.61	1.62	2.97	3.21	6.18
Selected Vehicle Trip Generation Rate		**1.30**	**0.66**	**1.95**	**3.03**	**2.85**	**5.88**
Travel Mode	**Split[4]**	**Total Future Trips by Travel Mode – 12,437 m^2 Retail GLA[5]**					
Driver Trips	**81%**	**149**	**76**	**225**	**358**	**336**	**694**
Primary Trips[6]		149	76	225	202	180	381
Pass-by Trips[6]		0	0	0	156	156	312
Auto Passenger Trips	15%	27	14	40	64	60	124
Transit Trips	1%	2	1	4	6	5	11
Cycling/Walking Trips	3%	5	2	7	12	12	24
Total Person Trips	**100%**	**184**	**93**	**277**	**439**	**413**	**852**

Notes:

1. Survey conducted by BA Group on Thursday, May 4, 2017 at the Loblaws retail plaza located at 240 Lakeshore Road West. Proxy site contains approximately 3,320 m^2 of retail gross leasable floor area. Vehicle trip rates exclude the Loblaws grocery store.
2. Trip generation rates reduced by a decreasing rate factor of 69% in the AM peak hour and 73% in the PM peak hour to account for the size difference between the proxy site and the proposed amount of retail space (3,320 m^2 versus 8,465 m^2). These factors were calculated based on a comparison of ITE Trip Generation Manual (9th Ed.) vehicle trip generation rates for a Shopping Centre (Land Use Code 820) 3,320 m^2 and 12,437 m^2 in size.
3. Based on trip generation data for Land Use Code 820 (Shopping Centre) contained in the ITE Trip Generation Manual, 9th edition.
4. Mode split based on 2011 Transportation Tomorrow Survey (TTS) data for market-based trips made during the weekday peak periods in the Port Credit area.
5. Gross Leasable Area (GLA) assumed to be 90 percent of Gross Floor Area (GFA).
6. A pass-by trip percentage of 45% was assumed in the PM peak hour based on pass-by trip data for Shopping Centres contained in the ITE Trip Generation Handbook, 3rd Edition. Pass-by trips are vehicle trips made to the site that are already on the road network on route to another destination. These trips are opposed to primary trips, which are trips made to the site where the site is the primary destination.

6.2.2.5 Total Site Trip Generation Forecasts

Total site trip generation was estimated by summing the trips generated by the individual proposed uses on-site – residential, office, community/institutional use, and retail uses – and applying an 'internalization' factor to account for a reduction in external home-based trips due to several common destination points being on-site.

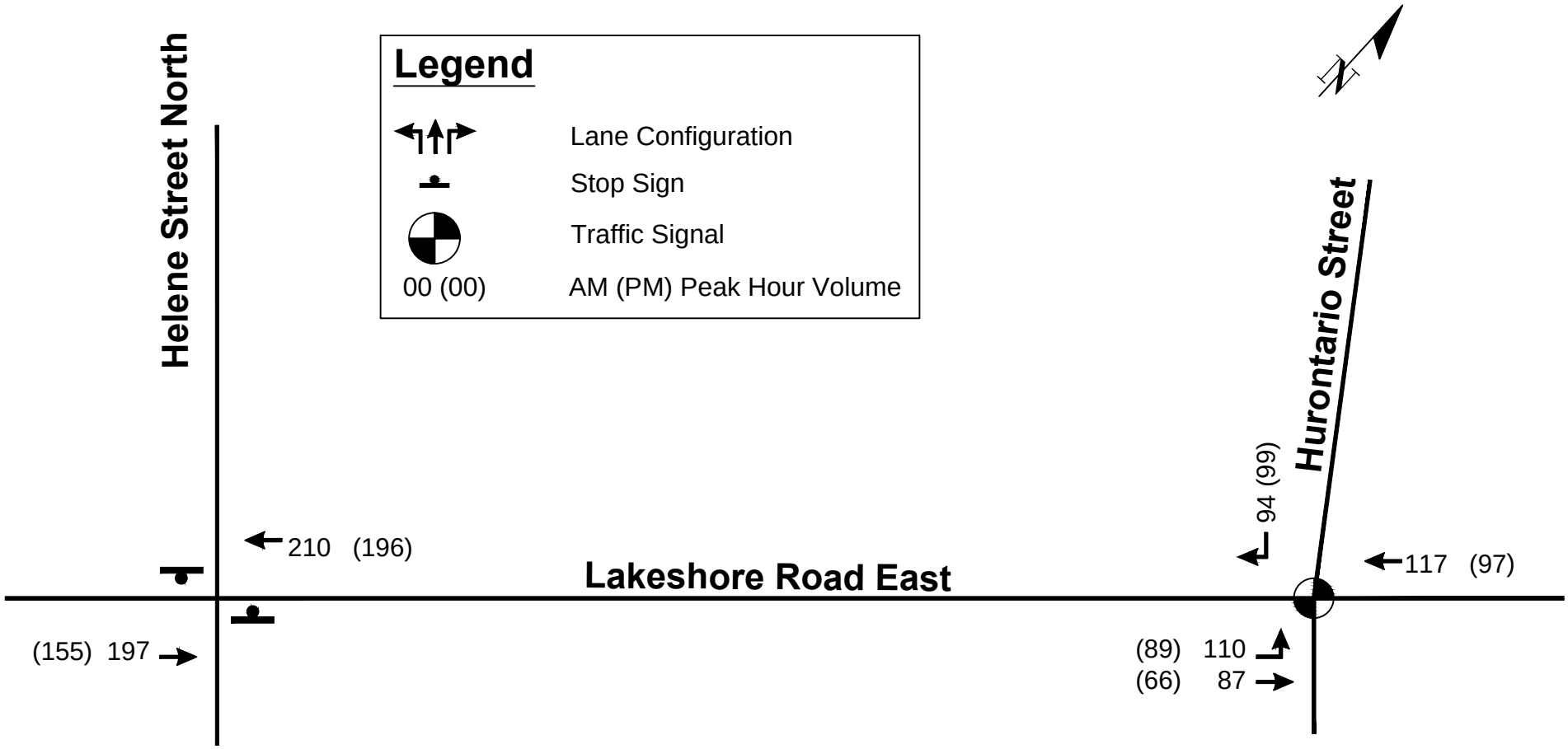
An internalization factor of 5% was applied to the total amount of forecast residential person trips during the peak hours. These internal trips represent persons who would normally make an external trip to either a place of work, retail store or recreational destination if they lived on a site containing no other uses but residential,

TABLE 21 SITE TRAFFIC DISTRIBUTION

To/From Route	Residential		Office		Retail Store		Community/Institutional	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
East on Lakeshore Road	15%	15%	10%	10%	30%	20%	30%	30%
West on Lakeshore Road	30%	20%	15%	15%	40%	45%	50%	50%
North on Mississauga Road	30%	40%	45%	45%	15%	20%	10%	10%
North on Hurontario Street	25%	25%	30%	30%	15%	15%	10%	10%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

10.3.4 Future Total Traffic Volumes

Future total traffic volumes are developed by adding traffic generated by the proposed Master Plan to future background traffic volumes. Future total traffic volumes for the base analysis scenario and 5% modal shift to transit scenario are illustrated in **Figure 20** and **Figure 21**, respectively. As noted previously, the assumption of a 5% modal shift was a result of direction from City staff and is not intended to reflect a longer term modal shift that may occur with introduction of rapid transit on Lakeshore Road. The Phase 2 transportation submission will look in more detail at the impacts of higher shifts in travel mode from automobile driver to transit.



70 Mississauga Road Site Traffic

BURNSIDE

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Appendix C

Removal of Existing 55 Port Street Traffic

Legend
Lane Configuration
Stop Sign
Traffic Signal
00 (00) AM (PM) Peak Hour Volume
Helene Street North
Helene Street South
Lakeshore Road East
Hurontario Street
St. Lawrence Drive
Port Street East
Remote Parking Lot Driveway
Site Driveway
65 Port Street Driveway
Site
0 (- 1)
-2 (0)
-1 (0)
-2 (-5)
0 (-5)
-2 (0)
-3 (0)
-5 (0)
(0) -4
(-7) - 4
(-7) 0
(0) - 4
(-11) -2
(-10) - 2
(-1) 0
(0) -2

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Appendix D

Existing Traffic Operations

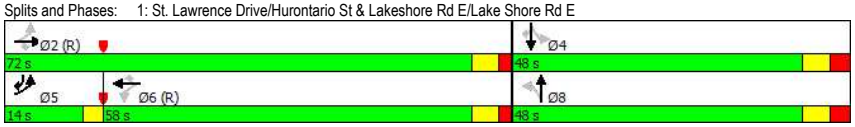
Lanes, Volumes, Timings
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	302	1328	4	32	639	135	11	69	18	305	64	279
Future Volume (vph)	302	1328	4	32	639	135	11	69	18	305	64	279
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		30.0	30.0		30.0	20.0		0.0	25.0		0.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	50.0			30.0			25.0			10.0		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		193.2			208.3			121.0			80.3	
Travel Time (s)		13.9			15.0			8.7			5.8	
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	6	6	6	8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	44.0	44.0	44.0	44.0	44.0	45.0	45.0		45.0	45.0	11.0
Total Split (s)	14.0	72.0	72.0	58.0	58.0	58.0	48.0	48.0		48.0	48.0	14.0
Total Split (%)	11.7%	60.0%	60.0%	48.3%	48.3%	48.3%	40.0%	40.0%		40.0%	40.0%	11.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						Yes
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E



HCM Signalized Intersection Capacity Analysis
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	302	1328	4	32	639	135	11	69	18	305	64	279
Future Volume (vph)	302	1328	4	32	639	135	11	69	18	305	64	279
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1820	3579	1578	1770	3544	1490	1764	1802		1739	1921	1428
Flt Permitted	0.28	1.00	1.00	0.11	1.00	1.00	0.71	1.00		0.69	1.00	1.00
Satd. Flow (perm)	534	3579	1578	197	3544	1490	1320	1802		1271	1921	1428
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	336	1476	4	36	710	150	12	77	20	339	71	310
RTOR Reduction (vph)	0	0	2	0	0	60	0	8	0	0	0	60
Lane Group Flow (vph)	336	1476	2	36	710	91	12	89	0	339	71	250
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	66.0	66.0	66.0	52.0	52.0	52.0	41.0	41.0		41.0	41.0	52.0
Effective Green, g (s)	66.0	66.0	66.0	52.0	52.0	52.0	41.0	41.0		41.0	41.0	52.0
Actuated g/C Ratio	0.55	0.55	0.55	0.43	0.43	0.43	0.34	0.34		0.34	0.34	0.43
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	411	1968	867	85	1535	645	451	615		434	656	618
v/s Ratio Prot	c0.07	0.41			0.20			0.05			0.04	0.04
v/s Ratio Perm	c0.37		0.00	0.18		0.06	0.01			c0.27		0.14
v/c Ratio	0.82	0.75	0.00	0.42	0.46	0.14	0.03	0.14		0.78	0.11	0.40
Uniform Delay, d1	17.9	20.7	12.2	23.6	24.1	20.5	26.2	27.4		35.5	27.0	23.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.9	2.7	0.0	14.7	1.0	0.5	0.1	0.5		13.1	0.3	0.4
Delay (s)	29.8	23.4	12.2	38.3	25.1	21.0	26.4	27.9		48.5	27.3	23.8
Level of Service	C	C	B	D	C	C	C	C		D	C	C
Approach Delay (s)		24.5			24.9			27.7			35.8	
Approach LOS		C			C			C			D	

Intersection Summary					
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.82				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	94.2%	ICU Level of Service	F		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	73	15	12	25	34	66
Future Volume (vph)	73	15	12	25	34	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (k/h)	50			20	50	
Link Distance (m)	133.5			57.9	121.0	
Travel Time (s)	9.6			10.4	8.7	
Confl. Peds. (#/hr)	4	2	4			4
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

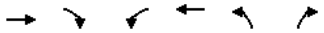
Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	73	15	12	25	34	66
Future Volume (vph)	73	15	12	25	34	66
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	103	21	17	35	48	93

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	124	52	141
Volume Left (vph)	103	17	0
Volume Right (vph)	21	0	93
Hadj (s)	0.06	0.07	-0.40
Departure Headway (s)	4.4	4.4	3.8
Degree Utilization, x	0.15	0.06	0.15
Capacity (veh/h)	790	784	904
Control Delay (s)	8.1	7.7	7.5
Approach Delay (s)	8.1	7.7	7.5
Approach LOS	A	A	A

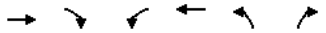
Intersection Summary			
Delay	7.8		
Level of Service	A		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	56	0	1	55	2	7
Future Volume (vph)	56	0	1	55	2	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (k/h)	50			50	50	
Link Distance (m)	33.5			133.5	36.5	
Travel Time (s)	2.4			9.6	2.6	
Confl. Peds. (#/hr)		7	7		4	3
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

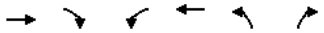
Control Type: Unsignalized



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	56	0	1	55	2	7
Future Volume (Veh/h)	56	0	1	55	2	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	79	0	1	77	3	10
Pedestrians	4			3	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			86		169	89
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			86		169	89
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1513		817	965

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	79	78	13
Volume Left	0	1	3
Volume Right	0	0	10
cSH	1700	1513	927
Volume to Capacity	0.05	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.0	0.1	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	0.1	8.9
Approach LOS			A

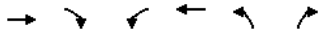
Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		16.4%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	54	4	3	54	0	2
Future Volume (vph)	54	4	3	54	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (k/h)	50			50	50	
Link Distance (m)	28.3			33.5	31.3	
Travel Time (s)	2.0			2.4	2.3	
Confl. Peds. (#/hr)		5	5			2
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	54	4	3	54	0	2
Future Volume (Veh/h)	54	4	3	54	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	71	5	4	71	0	3
Pedestrians				2	5	
Lane Width (m)				3.7	3.7	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			81		158	80
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			81		158	80
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1522		832	979

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	76	75	3
Volume Left	0	4	0
Volume Right	5	0	3
cSH	1700	1522	979
Volume to Capacity	0.04	0.00	0.00
Queue Length 95th (m)	0.0	0.1	0.1
Control Delay (s)	0.0	0.4	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.4	8.7
Approach LOS			A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Helene St S & Port St E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Future Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.0			28.3			76.4			121.3	
Travel Time (s)		3.8			2.0			5.5			8.7	
Confl. Peds. (#/hr)	5					5			3	3		
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	13%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
5: Helene St S & Port St E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Future Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	7	73	4	3	68	3	11	4	4	1	4	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	74	19	10
Volume Left (vph)	7	3	11	1
Volume Right (vph)	4	3	4	5
Hadj (s)	-0.01	0.05	0.12	-0.28
Departure Headway (s)	4.0	4.1	4.4	4.0
Degree Utilization, x	0.09	0.08	0.02	0.01
Capacity (veh/h)	880	867	787	865
Control Delay (s)	7.4	7.5	7.5	7.0
Approach Delay (s)	7.4	7.5	7.5	7.0
Approach LOS	A	A	A	A

Intersection Summary			
Delay		7.4	
Level of Service		A	
Intersection Capacity Utilization		16.0%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	1571	3	10	857	12	3	2	4	7	0	35
Future Volume (vph)	92	1571	3	10	857	12	3	2	4	7	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.5			193.2			121.3			129.9	
Travel Time (s)		7.6			13.9			8.7			9.4	
Confl. Peds. (#/hr)	21		9	9		21						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	10%	4%	0%	0%	0%	0%	14%	0%	3%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	1571	3	10	857	12	3	2	4	7	0	35
Future Volume (Veh/h)	92	1571	3	10	857	12	3	2	4	7	0	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	1708	3	11	932	13	3	2	4	8	0	38
Pedestrians								9			21	
Lane Width (m)								3.7			3.7	
Walking Speed (m/s)								1.1			1.1	
Percent Blockage								1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					193							
pX, platoon unblocked	0.87						0.87	0.87		0.87	0.87	0.87
vC, conflicting volume	966			1720			2444	2906	864	2040	2902	494
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	656			1720			2360	2892	864	1894	2886	112
tC, single (s)	4.1			4.3			7.5	6.5	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	88			97			78	83	99	66	100	95
cM capacity (veh/h)	800			328			14	12	299	23	12	780

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	954	857	477	479	9	46
Volume Left	100	0	11	0	3	8
Volume Right	0	3	0	13	4	38
cSH	800	1700	328	1700	22	118
Volume to Capacity	0.12	0.50	0.03	0.28	0.41	0.39
Queue Length 95th (m)	3.2	0.0	0.8	0.0	9.1	12.4
Control Delay (s)	3.3	0.0	1.1	0.0	252.3	54.0
Lane LOS	A		A		F	F
Approach Delay (s)	1.8		0.6		252.3	54.0
Approach LOS					F	F

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	83.9%	ICU Level of Service		E
Analysis Period (min)	15			

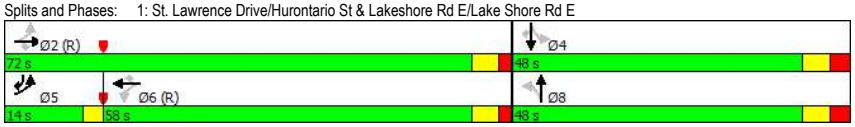
Lanes, Volumes, Timings
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	606	10	28	1076	109	10	99	16	242	74	377
Future Volume (vph)	219	606	10	28	1076	109	10	99	16	242	74	377
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		30.0	30.0		30.0	20.0		0.0	25.0		0.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	50.0			30.0			25.0			10.0		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		193.2			208.3			121.0			80.3	
Travel Time (s)		13.9			15.0			8.7			5.8	
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	6	6	6	8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	46.0	46.0	45.0	45.0	45.0	45.0	45.0		45.0	45.0	11.0
Total Split (s)	14.0	72.0	72.0	58.0	58.0	58.0	48.0	48.0		48.0	48.0	14.0
Total Split (%)	11.7%	60.0%	60.0%	48.3%	48.3%	48.3%	40.0%	40.0%		40.0%	40.0%	11.7%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						Yes
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E



HCM Signalized Intersection Capacity Analysis
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	606	10	28	1076	109	10	99	16	242	74	377
Future Volume (vph)	219	606	10	28	1076	109	10	99	16	242	74	377
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	0.97	1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1825	3579	1578	1762	3544	1490	1765	1828		1740	1921	1428
Flt Permitted	0.09	1.00	1.00	0.40	1.00	1.00	0.70	1.00		0.67	1.00	1.00
Satd. Flow (perm)	176	3579	1578	734	3544	1490	1307	1828		1236	1921	1428
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	243	673	11	31	1196	121	11	110	18	269	82	419
RTOR Reduction (vph)	0	0	5	0	0	36	0	5	0	0	0	15
Lane Group Flow (vph)	243	673	6	31	1196	85	11	123	0	269	82	404
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	66.0	66.0	66.0	52.0	52.0	52.0	41.0	41.0		41.0	41.0	52.0
Effective Green, g (s)	66.0	66.0	66.0	52.0	52.0	52.0	41.0	41.0		41.0	41.0	52.0
Actuated g/C Ratio	0.55	0.55	0.55	0.43	0.43	0.43	0.34	0.34		0.34	0.34	0.43
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	247	1968	867	318	1535	645	446	624		422	656	618
v/s Ratio Prot	c0.09	0.19			0.34			0.07			0.04	c0.06
v/s Ratio Perm	c0.45		0.00	0.04		0.06	0.01			0.22		0.22
v/c Ratio	0.98	0.34	0.01	0.10	0.78	0.13	0.02	0.20		0.64	0.12	0.65
Uniform Delay, d1	31.0	15.0	12.2	20.1	29.1	20.4	26.2	27.9		33.2	27.2	26.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	52.4	0.5	0.0	0.6	4.0	0.4	0.1	0.7		7.2	0.4	2.5
Delay (s)	83.4	15.4	12.2	20.7	33.1	20.9	26.3	28.6		40.4	27.6	29.4
Level of Service	F	B	B	C	C	C	C	C		D	C	C
Approach Delay (s)		33.2			31.7			28.4			33.0	
Approach LOS		C			C			C			C	

Intersection Summary					
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.87				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	89.6%	ICU Level of Service	E		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	107	14	11	18	21	91
Future Volume (vph)	107	14	11	18	21	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (k/h)	50			20	50	
Link Distance (m)	133.5			57.9	121.0	
Travel Time (s)	9.6			10.4	8.7	
Confl. Peds. (#/hr)	4	2	4			4
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

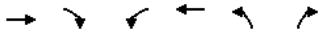
Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	107	14	11	18	21	91
Future Volume (vph)	107	14	11	18	21	91
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	151	20	15	25	30	128

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	171	40	158
Volume Left (vph)	151	15	0
Volume Right (vph)	20	0	128
Hadj (s)	0.11	0.08	-0.49
Departure Headway (s)	4.4	4.5	3.9
Degree Utilization, x	0.21	0.05	0.17
Capacity (veh/h)	773	750	891
Control Delay (s)	8.6	7.8	7.7
Approach Delay (s)	8.6	7.8	7.7
Approach LOS	A	A	A

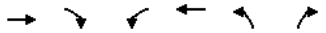
Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	85	1	1	88	1	2
Future Volume (vph)	85	1	1	88	1	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (k/h)	50			50	50	
Link Distance (m)	33.5			133.5	36.5	
Travel Time (s)	2.4			9.6	2.6	
Confl. Peds. (#/hr)		7	7		4	3
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

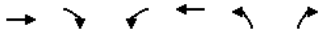
Control Type: Unsignalized



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	85	1	1	88	1	2
Future Volume (Veh/h)	85	1	1	88	1	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	120	1	1	124	1	3
Pedestrians	4			3	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			128		258	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			128		258	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1461		728	916

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	121	125	4
Volume Left	0	1	1
Volume Right	1	0	3
cSH	1700	1461	860
Volume to Capacity	0.07	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.1	9.2
Lane LOS		A	A
Approach Delay (s)	0.0	0.1	9.2
Approach LOS			A

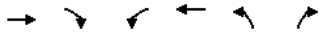
Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		17.3%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	82	0	0	89	5	4
Future Volume (vph)	82	0	0	89	5	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (k/h)	50			50	50	
Link Distance (m)	28.3			33.5	31.3	
Travel Time (s)	2.0			2.4	2.3	
Confl. Peds. (#/hr)		5	5			2
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	82	0	0	89	5	4
Future Volume (Veh/h)	82	0	0	89	5	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	108	0	0	117	7	5
Pedestrians				2	5	
Lane Width (m)				3.7	3.7	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			113		230	115
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			113		230	115
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1482		759	937

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	108	117	12
Volume Left	0	0	7
Volume Right	0	0	5
cSH	1700	1482	824
Volume to Capacity	0.06	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	9.4
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.4
Approach LOS			A

Intersection Summary				
Average Delay		0.5		
Intersection Capacity Utilization		16.3%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
5: Helene St S & Port St E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Future Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.0			28.3			76.4			121.3	
Travel Time (s)		3.8			2.0			5.5			8.7	
Confl. Peds. (#/hr)	5					5			3	3		
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	13%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
5: Helene St S & Port St E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Future Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	7	96	7	4	123	0	5	1	9	5	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	110	127	15	8
Volume Left (vph)	7	4	5	5
Volume Right (vph)	7	0	9	3
Hadj (s)	-0.03	0.07	-0.22	-0.10
Departure Headway (s)	4.0	4.1	4.2	4.3
Degree Utilization, x	0.12	0.15	0.02	0.01
Capacity (veh/h)	874	860	803	784
Control Delay (s)	7.6	7.8	7.3	7.4
Approach Delay (s)	7.6	7.8	7.3	7.4
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.7		
Level of Service		A		
Intersection Capacity Utilization		17.8%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	789	7	10	1348	41	0	0	8	7	0	43
Future Volume (vph)	20	789	7	10	1348	41	0	0	8	7	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.5			193.2			121.3			129.9	
Travel Time (s)		7.6			13.9			8.7			9.4	
Confl. Peds. (#/hr)	21		9	9		21						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	10%	4%	0%	0%	0%	0%	14%	0%	3%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	789	7	10	1348	41	0	0	8	7	0	43
Future Volume (Veh/h)	20	789	7	10	1348	41	0	0	8	7	0	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	858	8	11	1465	45	0	0	9	8	0	47
Pedestrians								9			21	
Lane Width (m)								3.7			3.7	
Walking Speed (m/s)								1.1			1.1	
Percent Blockage								1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					193							
pX, platoon unblocked	0.71						0.71	0.71		0.71	0.71	0.71
vC, conflicting volume	1531			875			1716	2468	442	2012	2450	776
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	936			875			1197	2253	442	1613	2227	0
tC, single (s)	4.1			4.3			7.5	6.5	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	96			98			100	100	98	80	100	94
cM capacity (veh/h)	516			712			89	27	564	40	28	754

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	451	437	744	778	9	55
Volume Left	22	0	11	0	0	8
Volume Right	0	8	0	45	9	47
cSH	516	1700	712	1700	564	208
Volume to Capacity	0.04	0.26	0.02	0.46	0.02	0.26
Queue Length 95th (m)	1.0	0.0	0.4	0.0	0.4	7.8
Control Delay (s)	1.3	0.0	0.4	0.0	11.5	28.5
Lane LOS	A		A		B	D
Approach Delay (s)	0.6		0.2		11.5	28.5
Approach LOS					B	D

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix E

2022 Background Traffic Operations

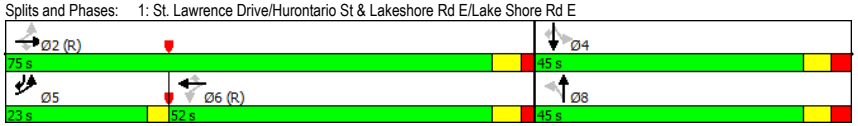
Lanes, Volumes, Timings
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/20/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	415	1429	4	32	803	145	11	69	18	325	68	393
Future Volume (vph)	415	1429	4	32	803	145	11	69	18	325	68	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	90.0		30.0	30.0		30.0	20.0		0.0	25.0		0.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	50.0			30.0			25.0			10.0		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		193.2			208.3			121.0			80.3	
Travel Time (s)		13.9			15.0			8.7			5.8	
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	6	6	6	8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	44.0	44.0	44.0	44.0	44.0	45.0	45.0		45.0	45.0	11.0
Total Split (s)	23.0	75.0	75.0	52.0	52.0	52.0	45.0	45.0		45.0	45.0	23.0
Total Split (%)	19.2%	62.5%	62.5%	43.3%	43.3%	43.3%	37.5%	37.5%		37.5%	37.5%	19.2%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						Yes
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E



HCM Signalized Intersection Capacity Analysis
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/20/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	415	1429	4	32	803	145	11	69	18	325	68	393
Future Volume (vph)	415	1429	4	32	803	145	11	69	18	325	68	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1823	3579	1578	1770	3544	1490	1764	1802		1739	1921	1437
Flt Permitted	0.19	1.00	1.00	0.11	1.00	1.00	0.71	1.00		0.69	1.00	1.00
Satd. Flow (perm)	365	3579	1578	196	3544	1490	1314	1802		1271	1921	1437
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	461	1588	4	36	892	161	12	77	20	361	76	437
RTOR Reduction (vph)	0	0	2	0	0	51	0	8	0	0	0	21
Lane Group Flow (vph)	461	1588	2	36	892	110	12	89	0	361	76	416
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	69.0	69.0	69.0	46.4	46.4	46.4	38.0	38.0		38.0	38.0	57.6
Effective Green, g (s)	72.0	69.0	69.0	46.4	46.4	46.4	38.0	38.0		38.0	38.0	57.6
Actuated g/C Ratio	0.60	0.58	0.58	0.39	0.39	0.39	0.32	0.32		0.32	0.32	0.48
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	493	2057	907	75	1370	576	416	570		402	608	689
v/s Ratio Prot	c0.18	c0.44			0.25			0.05			0.04	0.10
v/s Ratio Perm	0.38		0.00	0.18		0.07	0.01			c0.28		0.19
v/c Ratio	0.94	0.77	0.00	0.48	0.65	0.19	0.03	0.16		0.90	0.12	0.60
Uniform Delay, d1	23.9	19.5	10.9	27.7	30.2	24.4	28.3	29.5		39.1	29.2	22.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	25.1	2.9	0.0	20.4	2.4	0.7	0.1	0.6		25.4	0.4	1.5
Delay (s)	49.0	22.4	10.9	48.1	32.6	25.1	28.4	30.1		64.5	29.6	24.4
Level of Service	D	C	B	D	C	C	C	C		E	C	C
Approach Delay (s)		28.3			32.0			29.9			41.4	
Approach LOS		C			C			C			D	

Intersection Summary					
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.87				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	100.5%	ICU Level of Service	G		
Analysis Period (min)	15				

c Critical Lane Group

Lanes, Volumes, Timings
2: St. Lawrence Drive & Port Street E

02/16/2018

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	73	15	12	25	38	66
Future Volume (vph)	73	15	12	25	38	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)	0.0	0.0	0.0			0.0
Storage Lanes	1	0	0			0
Taper Length (m)	2.5		2.5			
Link Speed (k/h)	50			20	50	
Link Distance (m)	133.5			57.9	121.0	
Travel Time (s)	9.6			10.4	8.7	
Confl. Peds. (#/hr)	4	2	4			4
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
2: St. Lawrence Drive & Port Street E

02/16/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	73	15	12	25	38	66
Future Volume (vph)	73	15	12	25	38	66
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	103	21	17	35	54	93

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	124	52	147
Volume Left (vph)	103	17	0
Volume Right (vph)	21	0	93
Hadj (s)	0.06	0.07	-0.38
Departure Headway (s)	4.4	4.4	3.9
Degree Utilization, x	0.15	0.06	0.16
Capacity (veh/h)	787	783	900
Control Delay (s)	8.1	7.7	7.6
Approach Delay (s)	8.1	7.7	7.6
Approach LOS	A	A	A

Intersection Summary			
Delay	7.8		
Level of Service	A		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	56	0	1	55	2	7
Future Volume (vph)	56	0	1	55	2	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			2.5		2.5	
Link Speed (k/h)	50			50	50	
Link Distance (m)	33.5			133.5	36.5	
Travel Time (s)	2.4			9.6	2.6	
Confl. Peds. (#/hr)		7	7		4	3
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	56	0	1	55	2	7
Future Volume (Veh/h)	56	0	1	55	2	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	79	0	1	77	3	10
Pedestrians	4			3	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			86		169	89
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			86		169	89
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1513		817	965

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	79	78	13
Volume Left	0	1	3
Volume Right	0	0	10
cSH	1700	1513	927
Volume to Capacity	0.05	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.0	0.1	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	0.1	8.9
Approach LOS			A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	16.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	54	4	3	54	0	2
Future Volume (vph)	54	4	3	54	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			2.5		2.5	
Link Speed (k/h)	50			50	50	
Link Distance (m)	28.3			33.5	31.3	
Travel Time (s)	2.0			2.4	2.3	
Confl. Peds. (#/hr)		5	5			2
Confl. Bikes (#/hr)						
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	54	4	3	54	0	2
Future Volume (Veh/h)	54	4	3	54	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	71	5	4	71	0	3
Pedestrians				2	5	
Lane Width (m)				3.7	3.7	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			81		158	80
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			81		158	80
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1522		832	979

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	76	75	3
Volume Left	0	4	0
Volume Right	5	0	3
cSH	1700	1522	979
Volume to Capacity	0.04	0.00	0.00
Queue Length 95th (m)	0.0	0.1	0.1
Control Delay (s)	0.0	0.4	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.4	8.7
Approach LOS			A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Helene St S & Port St E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Future Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.0			28.3			76.4			121.3	
Travel Time (s)		3.8			2.0			5.5			8.7	
Confl. Peds. (#/hr)	5					5			3	3		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	13%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
5: Helene St S & Port St E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Future Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	7	73	4	3	68	3	11	4	4	1	4	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	74	19	10
Volume Left (vph)	7	3	11	1
Volume Right (vph)	4	3	4	5
Hadj (s)	-0.01	0.05	0.12	-0.28
Departure Headway (s)	4.0	4.1	4.4	4.0
Degree Utilization, x	0.09	0.08	0.02	0.01
Capacity (veh/h)	880	867	787	865
Control Delay (s)	7.4	7.5	7.5	7.0
Approach Delay (s)	7.4	7.5	7.5	7.0
Approach LOS	A	A	A	A

Intersection Summary			
Delay		7.4	
Level of Service		A	
Intersection Capacity Utilization		16.0%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	1785	3	10	1135	12	3	2	4	7	0	35
Future Volume (vph)	92	1785	3	10	1135	12	3	2	4	7	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.5			193.2			121.3			129.9	
Travel Time (s)		7.6			13.9			8.7			9.4	
Confl. Peds. (#/hr)	21		9	9		21						
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	10%	4%	0%	0%	0%	0%	14%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	1785	3	10	1135	12	3	2	4	7	0	35
Future Volume (Veh/h)	92	1785	3	10	1135	12	3	2	4	7	0	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	1940	3	11	1234	13	3	2	4	8	0	38
Pedestrians								9			21	
Lane Width (m)								3.7			3.7	
Walking Speed (m/s)								1.1			1.1	
Percent Blockage								1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					193							
pX, platoon unblocked	0.78						0.78	0.78		0.78	0.78	0.78
vC, conflicting volume	1268			1952			2828	3440	980	2458	3436	644
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	782			1952			2779	3564	980	2306	3558	0
tC, single (s)	4.1			4.3			7.5	6.5	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	85			96			47	44	98	0	100	95
cM capacity (veh/h)	647			264			6	4	250	6	4	828

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1070	973	628	630	9	46
Volume Left	100	0	11	0	3	8
Volume Right	0	3	0	13	4	38
cSH	647	1700	264	1700	8	35
Volume to Capacity	0.15	0.57	0.04	0.37	1.11	1.32
Queue Length 95th (m)	4.1	0.0	1.0	0.0	14.4	37.3
Control Delay (s)	4.9	0.0	1.6	0.0	942.1	439.2
Lane LOS	A		A		F	F
Approach Delay (s)	2.5		0.8		942.1	439.2
Approach LOS					F	F

Intersection Summary				
Average Delay	10.4			
Intersection Capacity Utilization	97.5%	ICU Level of Service		F
Analysis Period (min)	15			

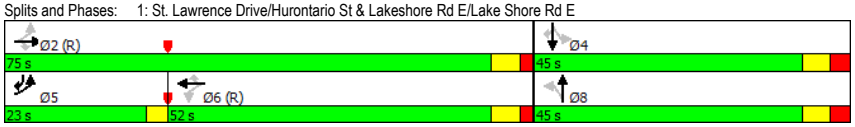
Timings
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/18/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	319	704	10	28	1198	111	10	99	253	77	491
Future Volume (vph)	319	704	10	28	1198	111	10	99	253	77	491
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA	pm+ov
Protected Phases	5	2			6			8		4	5
Permitted Phases	2		2	6		6	8		4		4
Detector Phase	5	2	2	6	6	6	8	8	4	4	5
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	46.0	46.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	11.0
Total Split (s)	23.0	75.0	75.0	52.0	52.0	52.0	45.0	45.0	45.0	45.0	23.0
Total Split (%)	19.2%	62.5%	62.5%	43.3%	43.3%	43.3%	37.5%	37.5%	37.5%	37.5%	19.2%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	0.0
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	3.0
Lead/Lag	Lead			Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes					Yes
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	None
Act Effct Green (s)	75.0	69.0	69.0	46.9	46.9	46.9	38.0	38.0	38.0	38.0	61.1
Actuated g/C Ratio	0.62	0.58	0.58	0.39	0.39	0.39	0.32	0.32	0.32	0.32	0.51
v/c Ratio	0.88	0.38	0.01	0.12	0.96	0.20	0.03	0.22	0.72	0.14	0.73
Control Delay	54.8	14.5	0.0	25.7	52.9	13.2	28.7	29.7	48.2	30.2	26.9
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	54.8	14.5	0.0	25.7	52.9	13.2	28.7	29.7	48.2	30.2	26.9
LOS	D	B	A	C	D	B	C	C	D	C	C
Approach Delay		26.8			49.0			29.6		33.8	
Approach LOS		C			D			C		C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 37.6		Intersection LOS: D	
Intersection Capacity Utilization 96.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E



HCM Signalized Intersection Capacity Analysis
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	704	10	28	1198	111	10	99	16	253	77	491
Future Volume (vph)	319	704	10	28	1198	111	10	99	16	253	77	491
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1825	3579	1578	1763	3544	1490	1765	1828		1740	1921	1437
Flt Permitted	0.08	1.00	1.00	0.36	1.00	1.00	0.70	1.00		0.67	1.00	1.00
Satd. Flow (perm)	154	3579	1578	660	3544	1490	1303	1828		1236	1921	1437
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	354	782	11	31	1331	123	11	110	18	281	86	546
RTOR Reduction (vph)	0	0	5	0	0	39	0	5	0	0	0	14
Lane Group Flow (vph)	354	782	6	31	1331	84	11	123	0	281	86	532
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	69.0	69.0	69.0	46.9	46.9	46.9	38.0	38.0		38.0	38.0	57.1
Effective Green, g (s)	72.0	69.0	69.0	46.9	46.9	46.9	38.0	38.0		38.0	38.0	57.1
Actuated g/C Ratio	0.60	0.58	0.58	0.39	0.39	0.39	0.32	0.32		0.32	0.32	0.48
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	400	2057	907	257	1385	582	412	578		391	608	683
v/s Ratio Prot	c0.16	0.22			c0.38			0.07			0.04	c0.12
v/s Ratio Perm	0.37		0.00	0.05		0.06	0.01			0.23		0.25
v/c Ratio	0.89	0.38	0.01	0.12	0.96	0.14	0.03	0.21		0.72	0.14	0.78
Uniform Delay, d1	36.2	13.9	10.9	23.4	35.7	23.6	28.3	30.0		36.3	29.3	26.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.1	0.5	0.0	1.0	16.5	0.5	0.1	0.8		10.8	0.5	5.6
Delay (s)	56.4	14.4	10.9	24.3	52.2	24.1	28.4	30.9		47.1	29.8	31.8
Level of Service	E	B	B	C	D	C	C	C		D	C	C
Approach Delay (s)		27.3			49.3			30.7			36.3	
Approach LOS		C			D			C			D	

Intersection Summary					
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.88				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	96.6%	ICU Level of Service	F		
Analysis Period (min)	15				

c Critical Lane Group

Lanes, Volumes, Timings
2: St. Lawrence Drive & Port Street E

02/16/2018

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	107	14	11	18	24	91
Future Volume (vph)	107	14	11	18	24	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)	0.0	0.0	0.0			0.0
Storage Lanes	1	0	0			0
Taper Length (m)	2.5		2.5			
Link Speed (k/h)	50			20	50	
Link Distance (m)	133.5			57.9	121.0	
Travel Time (s)	9.6			10.4	8.7	
Confl. Peds. (#/hr)	4	2	4			4
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
2: St. Lawrence Drive & Port Street E

02/16/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	107	14	11	18	24	91
Future Volume (vph)	107	14	11	18	24	91
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	151	20	15	25	34	128

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	171	40	162
Volume Left (vph)	151	15	0
Volume Right (vph)	20	0	128
Hadj (s)	0.11	0.08	-0.47
Departure Headway (s)	4.4	4.5	3.9
Degree Utilization, x	0.21	0.05	0.17
Capacity (veh/h)	771	749	888
Control Delay (s)	8.6	7.8	7.7
Approach Delay (s)	8.6	7.8	7.7
Approach LOS	A	A	A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: 65 Port Street Driveway & Port Street E

02/16/2018

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	85	1	1	88	1	2
Future Volume (vph)	85	1	1	88	1	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			2.5		2.5	
Link Speed (k/h)	50			50	50	
Link Distance (m)	33.5			133.5	36.5	
Travel Time (s)	2.4			9.6	2.6	
Confl. Peds. (#/hr)		7	7		4	3
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
3: 65 Port Street Driveway & Port Street E

02/16/2018

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	85	1	1	88	1	2
Future Volume (Veh/h)	85	1	1	88	1	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	120	1	1	124	1	3
Pedestrians	4			3	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			128		258	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			128		258	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1461		728	916

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	121	125	4
Volume Left	0	1	1
Volume Right	1	0	3
cSH	1700	1461	860
Volume to Capacity	0.07	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.1	9.2
Lane LOS		A	A
Approach Delay (s)	0.0	0.1	9.2
Approach LOS			A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	17.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	82	0	0	89	5	4
Future Volume (vph)	82	0	0	89	5	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			2.5		2.5	
Link Speed (k/h)	50			50	50	
Link Distance (m)	28.3			33.5	31.3	
Travel Time (s)	2.0			2.4	2.3	
Confl. Peds. (#/hr)		5	5			2
Confl. Bikes (#/hr)						
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	82	0	0	89	5	4
Future Volume (Veh/h)	82	0	0	89	5	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	108	0	0	117	7	5
Pedestrians				2	5	
Lane Width (m)				3.7	3.7	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			113		230	115
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			113		230	115
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1482		759	937

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	108	117	12
Volume Left	0	0	7
Volume Right	0	0	5
cSH	1700	1482	824
Volume to Capacity	0.06	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	9.4
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.4
Approach LOS			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	16.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Helene St S & Port St E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Future Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.0			28.3			76.4			121.3	
Travel Time (s)		3.8			2.0			5.5			8.7	
Confl. Peds. (#/hr)	5					5			3	3		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	13%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
5: Helene St S & Port St E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Future Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	7	96	7	4	123	0	5	1	9	5	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	110	127	15	8
Volume Left (vph)	7	4	5	5
Volume Right (vph)	7	0	9	3
Hadj (s)	-0.03	0.07	-0.22	-0.10
Departure Headway (s)	4.0	4.1	4.2	4.3
Degree Utilization, x	0.12	0.15	0.02	0.01
Capacity (veh/h)	874	860	803	784
Control Delay (s)	7.6	7.8	7.3	7.4
Approach Delay (s)	7.6	7.8	7.3	7.4
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.7		
Level of Service		A		
Intersection Capacity Utilization		17.8%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	990	7	10	1574	41	0	0	8	7	0	43
Future Volume (vph)	20	990	7	10	1574	41	0	0	8	7	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.5			193.2			121.3			129.9	
Travel Time (s)		7.6			13.9			8.7			9.4	
Confl. Peds. (#/hr)	21		9	9		21						
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	10%	4%	0%	0%	0%	0%	14%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	990	7	10	1574	41	0	0	8	7	0	43
Future Volume (Veh/h)	20	990	7	10	1574	41	0	0	8	7	0	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	1076	8	11	1711	45	0	0	9	8	0	47
Pedestrians								9			21	
Lane Width (m)								3.7			3.7	
Walking Speed (m/s)								1.1			1.1	
Percent Blockage								1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					193							
pX, platoon unblocked	0.64						0.64	0.64		0.64	0.64	0.64
vC, conflicting volume	1777			1093			2058	2932	551	2368	2914	899
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1084			1093			1523	2893	551	2009	2864	0
tC, single (s)	4.1			4.3			7.5	6.5	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	95			98			100	100	98	53	100	93
cM capacity (veh/h)	408			584			45	9	479	17	10	676

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	560	546	866	900	9	55
Volume Left	22	0	11	0	0	8
Volume Right	0	8	0	45	9	47
cSH	408	1700	584	1700	479	102
Volume to Capacity	0.05	0.32	0.02	0.53	0.02	0.54
Queue Length 95th (m)	1.3	0.0	0.4	0.0	0.4	18.7
Control Delay (s)	1.7	0.0	0.6	0.0	12.7	75.2
Lane LOS	A		A		B	F
Approach Delay (s)	0.8		0.3		12.7	75.2
Approach LOS					B	F

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	68.0%	ICU Level of Service	C	
Analysis Period (min)	15			

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix F

2027 Background Traffic Operations

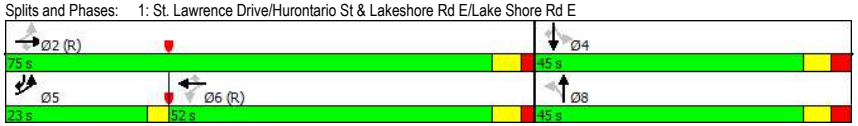
Lanes, Volumes, Timings
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	419	1446	4	32	865	158	11	69	18	342	71	420
Future Volume (vph)	419	1446	4	32	865	158	11	69	18	342	71	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	90.0		30.0	30.0		30.0	20.0		0.0	25.0		0.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	50.0			30.0			25.0			10.0		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		193.2			208.3			121.0			80.3	
Travel Time (s)		13.9			15.0			8.7			5.8	
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	6	6	6	8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	13.0	44.0	44.0	44.0	44.0	44.0	45.0	45.0		45.0	45.0	13.0
Total Split (s)	23.0	75.0	75.0	52.0	52.0	52.0	45.0	45.0		45.0	45.0	23.0
Total Split (%)	19.2%	62.5%	62.5%	43.3%	43.3%	43.3%	37.5%	37.5%		37.5%	37.5%	19.2%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						Yes
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E



HCM Signalized Intersection Capacity Analysis
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	419	1446	4	32	865	158	11	69	18	342	71	420
Future Volume (vph)	419	1446	4	32	865	158	11	69	18	342	71	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1823	3579	1578	1770	3544	1490	1765	1802		1739	1921	1438
Flt Permitted	0.16	1.00	1.00	0.10	1.00	1.00	0.71	1.00		0.69	1.00	1.00
Satd. Flow (perm)	304	3579	1578	188	3544	1490	1311	1802		1271	1921	1438
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	466	1607	4	36	961	176	12	77	20	380	79	467
RTOR Reduction (vph)	0	0	2	0	0	52	0	8	0	0	0	16
Lane Group Flow (vph)	466	1607	2	36	961	124	12	89	0	380	79	451
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	69.0	69.0	69.0	46.0	46.0	46.0	38.0	38.0		38.0	38.0	58.0
Effective Green, g (s)	72.0	69.0	69.0	46.0	46.0	46.0	38.0	38.0		38.0	38.0	58.0
Actuated g/C Ratio	0.60	0.58	0.58	0.38	0.38	0.38	0.32	0.32		0.32	0.32	0.48
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	473	2057	907	72	1358	571	415	570		402	608	695
v/s Ratio Prot	c0.19	c0.45			0.27			0.05			0.04	0.11
v/s Ratio Perm	0.40		0.00	0.19		0.08	0.01			c0.30		0.21
v/c Ratio	0.99	0.78	0.00	0.50	0.71	0.22	0.03	0.16		0.95	0.13	0.65
Uniform Delay, d1	29.0	19.7	10.9	28.2	31.3	24.9	28.3	29.5		40.0	29.2	23.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	37.2	3.0	0.0	22.7	3.1	0.9	0.1	0.6		33.0	0.4	2.1
Delay (s)	66.2	22.7	10.9	50.9	34.4	25.8	28.4	30.1		73.0	29.7	25.4
Level of Service	E	C	B	D	C	C	C	C		E	C	C
Approach Delay (s)		32.4			33.6			29.9			45.3	
Approach LOS		C			C			C			D	

Intersection Summary					
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	100.7%	ICU Level of Service	G		
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
2: St. Lawrence Drive & Port St E

02/16/2018

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	73	15	12	25	41	66
Future Volume (vph)	73	15	12	25	41	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)	0.0	0.0	0.0			0.0
Storage Lanes	1	0	0			0
Taper Length (m)	2.5		2.5			
Link Speed (k/h)	50			20	50	
Link Distance (m)	133.5			57.9	121.0	
Travel Time (s)	9.6			10.4	8.7	
Confl. Peds. (#/hr)	4	2	4			4
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
2: St. Lawrence Drive & Port St E

02/16/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	73	15	12	25	41	66
Future Volume (vph)	73	15	12	25	41	66
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	103	21	17	35	58	93

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	124	52	151
Volume Left (vph)	103	17	0
Volume Right (vph)	21	0	93
Hadj (s)	0.06	0.07	-0.37
Departure Headway (s)	4.4	4.4	3.9
Degree Utilization, x	0.15	0.06	0.16
Capacity (veh/h)	784	782	898
Control Delay (s)	8.2	7.7	7.6
Approach Delay (s)	8.2	7.7	7.6
Approach LOS	A	A	A

Intersection Summary			
Delay	7.8		
Level of Service	A		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: 65 Port Street Driveway & Port St E

02/16/2018

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	56	0	1	55	2	7
Future Volume (vph)	56	0	1	55	2	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			2.5		2.5	
Link Speed (k/h)	50			50	50	
Link Distance (m)	33.5			133.5	36.5	
Travel Time (s)	2.4			9.6	2.6	
Confl. Peds. (#/hr)		7	7		4	3
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
3: 65 Port Street Driveway & Port St E

02/16/2018

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	56	0	1	55	2	7
Future Volume (Veh/h)	56	0	1	55	2	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	79	0	1	77	3	10
Pedestrians	4			3	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			86		169	89
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			86		169	89
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1513		817	965

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	79	78	13
Volume Left	0	1	3
Volume Right	0	0	10
cSH	1700	1513	927
Volume to Capacity	0.05	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.0	0.1	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	0.1	8.9
Approach LOS			A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	16.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	54	4	3	54	0	2
Future Volume (vph)	54	4	3	54	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			2.5		2.5	
Link Speed (k/h)	50			50	50	
Link Distance (m)	28.3			33.5	31.3	
Travel Time (s)	2.0			2.4	2.3	
Confl. Peds. (#/hr)		5	5			2
Confl. Bikes (#/hr)						
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	54	4	3	54	0	2
Future Volume (Veh/h)	54	4	3	54	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	71	5	4	71	0	3
Pedestrians				2	5	
Lane Width (m)				3.7	3.7	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			81		158	80
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			81		158	80
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1522		832	979

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	76	75	3
Volume Left	0	4	0
Volume Right	5	0	3
cSH	1700	1522	979
Volume to Capacity	0.04	0.00	0.00
Queue Length 95th (m)	0.0	0.1	0.1
Control Delay (s)	0.0	0.4	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.4	8.7
Approach LOS			A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Helene St S & Port St E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Future Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.0			28.3			76.4			121.3	
Travel Time (s)		3.8			2.0			5.5			8.7	
Confl. Peds. (#/hr)	5					5			3	3		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	13%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
5: Helene St S & Port St E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Future Volume (vph)	5	54	3	2	50	2	8	3	3	1	3	4
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	7	73	4	3	68	3	11	4	4	1	4	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	74	19	10
Volume Left (vph)	7	3	11	1
Volume Right (vph)	4	3	4	5
Hadj (s)	-0.01	0.05	0.12	-0.28
Departure Headway (s)	4.0	4.1	4.4	4.0
Degree Utilization, x	0.09	0.08	0.02	0.01
Capacity (veh/h)	880	867	787	865
Control Delay (s)	7.4	7.5	7.5	7.0
Approach Delay (s)	7.4	7.5	7.5	7.0
Approach LOS	A	A	A	A

Intersection Summary			
Delay		7.4	
Level of Service		A	
Intersection Capacity Utilization		16.0%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	1805	3	10	1218	12	3	2	4	7	0	35
Future Volume (vph)	92	1805	3	10	1218	12	3	2	4	7	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.5			193.2			121.3			129.9	
Travel Time (s)		7.6			13.9			8.7			9.4	
Confl. Peds. (#/hr)	21		9	9		21						
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	10%	4%	0%	0%	0%	0%	14%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	1805	3	10	1218	12	3	2	4	7	0	35
Future Volume (Veh/h)	92	1805	3	10	1218	12	3	2	4	7	0	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	1962	3	11	1324	13	3	2	4	8	0	38
Pedestrians								9			21	
Lane Width (m)								3.7			3.7	
Walking Speed (m/s)								1.1			1.1	
Percent Blockage								1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					193							
pX, platoon unblocked	0.78						0.78	0.78		0.78	0.78	0.78
vC, conflicting volume	1358			1974			2894	3552	992	2560	3548	690
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	882			1974			2864	3713	992	2432	3706	20
tC, single (s)	4.1			4.3			7.5	6.5	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	83			96			37	28	98	0	100	95
cM capacity (veh/h)	589			258			5	3	246	4	3	798

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1081	984	673	675	9	46
Volume Left	100	0	11	0	3	8
Volume Right	0	3	0	13	4	38
cSH	589	1700	258	1700	7	21
Volume to Capacity	0.17	0.58	0.04	0.40	1.37	2.24
Queue Length 95th (m)	4.6	0.0	1.0	0.0	15.2	45.9
Control Delay (s)	5.6	0.0	1.7	0.0	1225.8	964.0
Lane LOS	A		A		F	F
Approach Delay (s)	3.0		0.8		1225.8	964.0
Approach LOS					F	F

Intersection Summary				
Average Delay	18.0			
Intersection Capacity Utilization	100.4%	ICU Level of Service	G	
Analysis Period (min)	15			

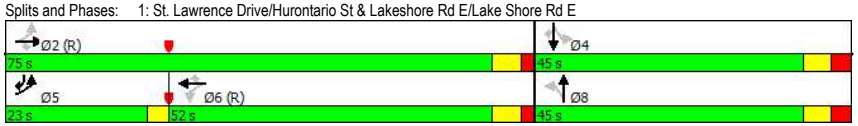
Lanes, Volumes, Timings
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	745	10	28	1226	114	10	99	16	259	79	501
Future Volume (vph)	334	745	10	28	1226	114	10	99	16	259	79	501
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	90.0		30.0	30.0		30.0	20.0		0.0	25.0		0.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	50.0			30.0			25.0			10.0		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		193.2			208.3			121.0			80.3	
Travel Time (s)		13.9			15.0			8.7			5.8	
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	6	6	6	8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	46.0	46.0	45.0	45.0	45.0	45.0	45.0		45.0	45.0	11.0
Total Split (s)	23.0	75.0	75.0	52.0	52.0	52.0	45.0	45.0		45.0	45.0	23.0
Total Split (%)	19.2%	62.5%	62.5%	43.3%	43.3%	43.3%	37.5%	37.5%		37.5%	37.5%	19.2%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						Yes
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E



HCM Signalized Intersection Capacity Analysis
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	745	10	28	1226	114	10	99	16	259	79	501
Future Volume (vph)	334	745	10	28	1226	114	10	99	16	259	79	501
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1825	3579	1578	1764	3544	1490	1765	1828		1740	1921	1437
Flt Permitted	0.08	1.00	1.00	0.34	1.00	1.00	0.70	1.00		0.67	1.00	1.00
Satd. Flow (perm)	155	3579	1578	631	3544	1490	1301	1828		1236	1921	1437
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	371	828	11	31	1362	127	11	110	18	288	88	557
RTOR Reduction (vph)	0	0	5	0	0	39	0	5	0	0	0	14
Lane Group Flow (vph)	371	828	6	31	1362	88	11	123	0	288	88	543
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	69.0	69.0	69.0	46.5	46.5	46.5	38.0	38.0		38.0	38.0	57.5
Effective Green, g (s)	72.0	69.0	69.0	46.5	46.5	46.5	38.0	38.0		38.0	38.0	57.5
Actuated g/C Ratio	0.60	0.58	0.58	0.39	0.39	0.39	0.32	0.32		0.32	0.32	0.48
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	406	2057	907	244	1373	577	411	578		391	608	688
v/s Ratio Prot	c0.17	0.23			c0.38			0.07			0.05	c0.13
v/s Ratio Perm	0.38		0.00	0.05		0.06	0.01			0.23		0.25
v/c Ratio	0.91	0.40	0.01	0.13	0.99	0.15	0.03	0.21		0.74	0.14	0.79
Uniform Delay, d1	37.0	14.1	10.9	23.7	36.6	23.9	28.3	30.0		36.5	29.4	26.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	24.6	0.6	0.0	1.1	22.5	0.6	0.1	0.8		11.7	0.5	6.0
Delay (s)	61.6	14.7	10.9	24.7	59.0	24.5	28.4	30.9		48.3	29.9	32.2
Level of Service	E	B	B	C	E	C	C	C		D	C	C
Approach Delay (s)		29.0			55.4			30.7			36.9	
Approach LOS		C			E			C			D	

Intersection Summary					
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.91				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	98.2%	ICU Level of Service	F		
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
2: St. Lawrence Drive & Port St E

02/16/2018

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	107	14	11	18	26	91
Future Volume (vph)	107	14	11	18	26	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)	0.0	0.0	0.0			0.0
Storage Lanes	1	0	0			0
Taper Length (m)	2.5		2.5			
Link Speed (k/h)	50			20	50	
Link Distance (m)	133.5			57.9	121.0	
Travel Time (s)	9.6			10.4	8.7	
Confl. Peds. (#/hr)	4	2	4			4
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
2: St. Lawrence Drive & Port St E

02/16/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	107	14	11	18	26	91
Future Volume (vph)	107	14	11	18	26	91
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	151	20	15	25	37	128

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	171	40	165
Volume Left (vph)	151	15	0
Volume Right (vph)	20	0	128
Hadj (s)	0.11	0.08	-0.47
Departure Headway (s)	4.4	4.6	3.9
Degree Utilization, x	0.21	0.05	0.18
Capacity (veh/h)	778	748	886
Control Delay (s)	8.6	7.8	7.7
Approach Delay (s)	8.6	7.8	7.7
Approach LOS	A	A	A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	85	1	1	88	1	2
Future Volume (vph)	85	1	1	88	1	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			2.5		2.5	
Link Speed (k/h)	50			50	50	
Link Distance (m)	33.5			133.5	36.5	
Travel Time (s)	2.4			9.6	2.6	
Confl. Peds. (#/hr)		7	7		4	3
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	85	1	1	88	1	2
Future Volume (Veh/h)	85	1	1	88	1	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	120	1	1	124	1	3
Pedestrians	4			3	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			128		258	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			128		258	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1461		728	916

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	121	125	4
Volume Left	0	1	1
Volume Right	1	0	3
cSH	1700	1461	860
Volume to Capacity	0.07	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.1	9.2
Lane LOS		A	A
Approach Delay (s)	0.0	0.1	9.2
Approach LOS			A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	17.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	82	0	0	89	5	4
Future Volume (vph)	82	0	0	89	5	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			2.5		2.5	
Link Speed (k/h)	50			50	50	
Link Distance (m)	28.3			33.5	31.3	
Travel Time (s)	2.0			2.4	2.3	
Confl. Peds. (#/hr)		5	5			2
Confl. Bikes (#/hr)						
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	82	0	0	89	5	4
Future Volume (Veh/h)	82	0	0	89	5	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	108	0	0	117	7	5
Pedestrians				2	5	
Lane Width (m)				3.7	3.7	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			113		230	115
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			113		230	115
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1482		759	937

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	108	117	12
Volume Left	0	0	7
Volume Right	0	0	5
cSH	1700	1482	824
Volume to Capacity	0.06	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	9.4
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.4
Approach LOS			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	16.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Helene St S & Port St E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Future Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.0			28.3			76.4			121.3	
Travel Time (s)		3.8			2.0			5.5			8.7	
Confl. Peds. (#/hr)	5					5			3	3		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	13%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
5: Helene St S & Port St E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Future Volume (vph)	5	71	5	3	91	0	4	1	7	4	0	2
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	7	96	7	4	123	0	5	1	9	5	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	110	127	15	8
Volume Left (vph)	7	4	5	5
Volume Right (vph)	7	0	9	3
Hadj (s)	-0.03	0.07	-0.22	-0.10
Departure Headway (s)	4.0	4.1	4.2	4.3
Degree Utilization, x	0.12	0.15	0.02	0.01
Capacity (veh/h)	874	860	803	784
Control Delay (s)	7.6	7.8	7.3	7.4
Approach Delay (s)	7.6	7.8	7.3	7.4
Approach LOS	A	A	A	A

Intersection Summary					
Delay		7.7			
Level of Service		A			
Intersection Capacity Utilization		17.8%	ICU Level of Service		A
Analysis Period (min)		15			

Lanes, Volumes, Timings
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1043	7	10	1609	41	0	0	8	7	0	43
Future Volume (vph)	20	1043	7	10	1609	41	0	0	8	7	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.5			193.2			121.3			129.9	
Travel Time (s)		7.6			13.9			8.7			9.4	
Confl. Peds. (#/hr)	21		9	9		21						
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	10%	4%	0%	0%	0%	0%	14%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1043	7	10	1609	41	0	0	8	7	0	43
Future Volume (Veh/h)	20	1043	7	10	1609	41	0	0	8	7	0	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	1134	8	11	1749	45	0	0	9	8	0	47
Pedestrians								9			21	
Lane Width (m)								3.7			3.7	
Walking Speed (m/s)								1.1			1.1	
Percent Blockage								1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					193							
pX, platoon unblocked	0.63						0.63	0.63		0.63	0.63	0.63
vC, conflicting volume	1815			1151			2134	3028	580	2434	3010	918
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1119			1151			1626	3044	580	2102	3015	0
tC, single (s)	4.1			4.3			7.5	6.5	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	94			98			100	100	98	44	100	93
cM capacity (veh/h)	390			554			37	7	459	14	8	668

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	589	575	886	920	9	55
Volume Left	22	0	11	0	0	8
Volume Right	0	8	0	45	9	47
cSH	390	1700	554	1700	459	87
Volume to Capacity	0.06	0.34	0.02	0.54	0.02	0.63
Queue Length 95th (m)	1.4	0.0	0.5	0.0	0.5	22.6
Control Delay (s)	1.8	0.0	0.6	0.0	13.0	100.7
Lane LOS	A		A		B	F
Approach Delay (s)	0.9		0.3		13.0	100.7
Approach LOS					B	F

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	68.9%	ICU Level of Service	C	
Analysis Period (min)	15			

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix G

2022 Total Traffic Operations

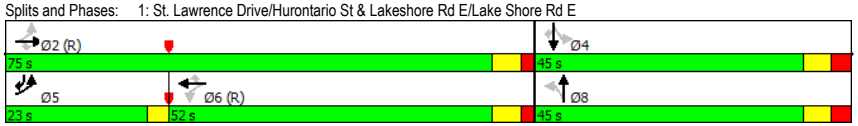
Lanes, Volumes, Timings
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/20/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	415	1429	4	32	803	145	11	78	22	325	69	393
Future Volume (vph)	415	1429	4	32	803	145	11	78	22	325	69	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	90.0		30.0	30.0		30.0	20.0		0.0	25.0		0.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	50.0			30.0			25.0			10.0		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		193.2			208.3			121.0			80.3	
Travel Time (s)		13.9			15.0			8.7			5.8	
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	6	6	6	8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	44.0	44.0	44.0	44.0	44.0	45.0	45.0		45.0	45.0	11.0
Total Split (s)	23.0	75.0	75.0	52.0	52.0	52.0	45.0	45.0		45.0	45.0	23.0
Total Split (%)	19.2%	62.5%	62.5%	43.3%	43.3%	43.3%	37.5%	37.5%		37.5%	37.5%	19.2%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						Yes
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E



HCM Signalized Intersection Capacity Analysis
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/20/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	415	1429	4	32	803	145	11	78	22	325	69	393
Future Volume (vph)	415	1429	4	32	803	145	11	78	22	325	69	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1823	3579	1578	1770	3544	1490	1764	1798		1739	1921	1437
Flt Permitted	0.19	1.00	1.00	0.11	1.00	1.00	0.71	1.00		0.69	1.00	1.00
Satd. Flow (perm)	365	3579	1578	196	3544	1490	1313	1798		1255	1921	1437
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	461	1588	4	36	892	161	12	87	24	361	77	437
RTOR Reduction (vph)	0	0	2	0	0	51	0	8	0	0	0	21
Lane Group Flow (vph)	461	1588	2	36	892	110	12	103	0	361	77	416
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	69.0	69.0	69.0	46.4	46.4	46.4	38.0	38.0		38.0	38.0	57.6
Effective Green, g (s)	72.0	69.0	69.0	46.4	46.4	46.4	38.0	38.0		38.0	38.0	57.6
Actuated g/C Ratio	0.60	0.58	0.58	0.39	0.39	0.39	0.32	0.32		0.32	0.32	0.48
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	493	2057	907	75	1370	576	415	569		397	608	689
v/s Ratio Prot	c0.18	c0.44			0.25			0.06			0.04	0.10
v/s Ratio Perm	0.38		0.00	0.18		0.07	0.01			c0.29		0.19
v/c Ratio	0.94	0.77	0.00	0.48	0.65	0.19	0.03	0.18		0.91	0.13	0.60
Uniform Delay, d1	23.9	19.5	10.9	27.7	30.2	24.4	28.3	29.7		39.3	29.2	22.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	25.1	2.9	0.0	20.4	2.4	0.7	0.1	0.7		27.3	0.4	1.5
Delay (s)	49.0	22.4	10.9	48.1	32.6	25.1	28.4	30.4		66.6	29.6	24.4
Level of Service	D	C	B	D	C	C	C	C		E	C	C
Approach Delay (s)		28.3			32.0			30.2			42.2	
Approach LOS		C			C			C			D	

Intersection Summary					
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.88				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	100.5%	ICU Level of Service	G		
Analysis Period (min)	15				
c Critical Lane Group					

Lanes, Volumes, Timings
2: St. Lawrence Drive & Port St E

02/16/2018

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	86	15	10	25	38	67
Future Volume (vph)	86	15	10	25	38	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)	0.0	0.0	0.0			0.0
Storage Lanes	1	0	0			0
Taper Length (m)	2.5		2.5			
Link Speed (k/h)	50			20	50	
Link Distance (m)	133.5			57.9	121.0	
Travel Time (s)	9.6			10.4	8.7	
Confl. Peds. (#/hr)	4	2	4			4
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
2: St. Lawrence Drive & Port St E

02/16/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	86	15	10	25	38	67
Future Volume (vph)	86	15	10	25	38	67
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	121	21	14	35	54	94

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	142	49	148
Volume Left (vph)	121	14	0
Volume Right (vph)	21	0	94
Hadj (s)	0.08	0.06	-0.38
Departure Headway (s)	4.4	4.4	3.9
Degree Utilization, x	0.17	0.06	0.16
Capacity (veh/h)	775	772	888
Control Delay (s)	8.3	7.7	7.7
Approach Delay (s)	8.3	7.7	7.7
Approach LOS	A	A	A

Intersection Summary			
Delay	7.9		
Level of Service	A		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	54	0	5	50	5	22
Future Volume (vph)	54	0	5	50	5	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			2.5		2.5	
Link Speed (k/h)	50			50	50	
Link Distance (m)	61.8			133.5	36.5	
Travel Time (s)	4.4			9.6	2.6	
Confl. Peds. (#/hr)		7	7		4	3
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	54	0	5	50	5	22
Future Volume (Veh/h)	54	0	5	50	5	22
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	76	0	7	70	7	31
Pedestrians	4			3	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			83		171	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			83		171	86
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	97
cM capacity (veh/h)			1517		812	969

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	76	77	38
Volume Left	0	7	7
Volume Right	0	0	31
cSH	1700	1517	936
Volume to Capacity	0.04	0.00	0.04
Queue Length 95th (m)	0.0	0.1	1.0
Control Delay (s)	0.0	0.7	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	0.7	9.0
Approach LOS			A

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	17.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Helene St S & Port St E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	50	3	2	51	2	8	3	3	1	3	4
Future Volume (vph)	5	50	3	2	51	2	8	3	3	1	3	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.0			61.8			76.4			121.3	
Travel Time (s)		3.8			4.4			5.5			8.7	
Confl. Peds. (#/hr)	5					5			3	3		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	13%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
5: Helene St S & Port St E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	50	3	2	51	2	8	3	3	1	3	4
Future Volume (vph)	5	50	3	2	51	2	8	3	3	1	3	4
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	7	68	4	3	69	3	11	4	4	1	4	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	79	75	19	10
Volume Left (vph)	7	3	11	1
Volume Right (vph)	4	3	4	5
Hadj (s)	-0.01	0.05	0.12	-0.28
Departure Headway (s)	4.0	4.1	4.4	4.0
Degree Utilization, x	0.09	0.09	0.02	0.01
Capacity (veh/h)	880	868	789	867
Control Delay (s)	7.4	7.5	7.5	7.0
Approach Delay (s)	7.4	7.5	7.5	7.0
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.4		
Level of Service		A		
Intersection Capacity Utilization		15.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	1785	3	10	1135	12	3	2	4	7	0	35
Future Volume (vph)	92	1785	3	10	1135	12	3	2	4	7	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.5			193.2			121.3			129.9	
Travel Time (s)		7.6			13.9			8.7			9.4	
Confl. Peds. (#/hr)	21		9	9		21						
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	10%	4%	0%	0%	0%	0%	14%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	1785	3	10	1135	12	3	2	4	7	0	35
Future Volume (Veh/h)	92	1785	3	10	1135	12	3	2	4	7	0	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	1940	3	11	1234	13	3	2	4	8	0	38
Pedestrians								9			21	
Lane Width (m)								3.7			3.7	
Walking Speed (m/s)								1.1			1.1	
Percent Blockage								1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					193							
pX, platoon unblocked	0.78						0.78	0.78		0.78	0.78	0.78
vC, conflicting volume	1268			1952			2828	3440	980	2458	3436	644
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	782			1952			2779	3564	980	2306	3558	0
tC, single (s)	4.1			4.3			7.5	6.5	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	85			96			47	44	98	0	100	95
cM capacity (veh/h)	647			264			6	4	250	6	4	828

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1070	973	628	630	9	46
Volume Left	100	0	11	0	3	8
Volume Right	0	3	0	13	4	38
cSH	647	1700	264	1700	8	35
Volume to Capacity	0.15	0.57	0.04	0.37	1.11	1.32
Queue Length 95th (m)	4.1	0.0	1.0	0.0	14.4	37.3
Control Delay (s)	4.9	0.0	1.6	0.0	942.1	439.2
Lane LOS	A		A		F	F
Approach Delay (s)	2.5		0.8		942.1	439.2
Approach LOS					F	F

Intersection Summary				
Average Delay	10.4			
Intersection Capacity Utilization	97.5%	ICU Level of Service	F	
Analysis Period (min)	15			

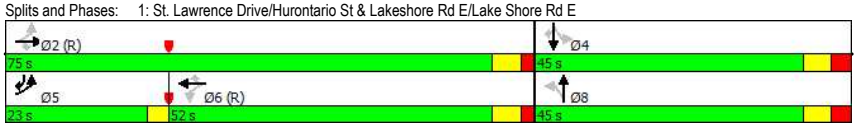
Lanes, Volumes, Timings
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	704	10	31	1198	111	9	96	17	253	88	491
Future Volume (vph)	319	704	10	31	1198	111	9	96	17	253	88	491
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	90.0		30.0	30.0		30.0	20.0		0.0	25.0		0.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	50.0			30.0			25.0			10.0		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		193.2			208.3			121.0			80.3	
Travel Time (s)		13.9			15.0			8.7			5.8	
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	6	6	6	8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	44.0	44.0	44.0	44.0	44.0	45.0	45.0		45.0	45.0	11.0
Total Split (s)	23.0	75.0	75.0	52.0	52.0	52.0	45.0	45.0		45.0	45.0	23.0
Total Split (%)	19.2%	62.5%	62.5%	43.3%	43.3%	43.3%	37.5%	37.5%		37.5%	37.5%	19.2%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						Yes
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E



HCM Signalized Intersection Capacity Analysis
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	704	10	31	1198	111	9	96	17	253	88	491
Future Volume (vph)	319	704	10	31	1198	111	9	96	17	253	88	491
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1825	3579	1578	1763	3544	1490	1766	1824		1740	1921	1437
Flt Permitted	0.08	1.00	1.00	0.36	1.00	1.00	0.69	1.00		0.68	1.00	1.00
Satd. Flow (perm)	154	3579	1578	660	3544	1490	1289	1824		1238	1921	1437
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	354	782	11	34	1331	123	10	107	19	281	98	546
RTOR Reduction (vph)	0	0	5	0	0	39	0	5	0	0	0	14
Lane Group Flow (vph)	354	782	6	34	1331	84	10	121	0	281	98	532
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	69.0	69.0	69.0	46.9	46.9	46.9	38.0	38.0		38.0	38.0	57.1
Effective Green, g (s)	72.0	69.0	69.0	46.9	46.9	46.9	38.0	38.0		38.0	38.0	57.1
Actuated g/C Ratio	0.60	0.58	0.58	0.39	0.39	0.39	0.32	0.32		0.32	0.32	0.48
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	400	2057	907	257	1385	582	408	577		392	608	683
v/s Ratio Prot	c0.16	0.22			c0.38			0.07			0.05	c0.12
v/s Ratio Perm	0.37		0.00	0.05		0.06	0.01			0.23		0.25
v/c Ratio	0.89	0.38	0.01	0.13	0.96	0.14	0.02	0.21		0.72	0.16	0.78
Uniform Delay, d1	36.2	13.9	10.9	23.5	35.7	23.6	28.2	30.0		36.2	29.5	26.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.1	0.5	0.0	1.1	16.5	0.5	0.1	0.8		10.7	0.6	5.6
Delay (s)	56.4	14.4	10.9	24.5	52.2	24.1	28.3	30.8		47.0	30.1	31.8
Level of Service	E	B	B	C	D	C	C	C		D	C	C
Approach Delay (s)		27.3			49.2			30.6			36.2	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
2: St. Lawrence Drive & Port St E

02/16/2018

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	104	13	11	18	24	105
Future Volume (vph)	104	13	11	18	24	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)	0.0	0.0	0.0			0.0
Storage Lanes	1	0	0			0
Taper Length (m)	2.5		2.5			
Link Speed (k/h)	50			20	50	
Link Distance (m)	133.5			57.9	121.0	
Travel Time (s)	9.6			10.4	8.7	
Confl. Peds. (#/hr)	4	2	4			4
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
2: St. Lawrence Drive & Port St E

02/16/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	104	13	11	18	24	105
Future Volume (vph)	104	13	11	18	24	105
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	146	18	15	25	34	148

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	164	40	182
Volume Left (vph)	146	15	0
Volume Right (vph)	18	0	148
Hadj (s)	0.11	0.08	-0.49
Departure Headway (s)	4.5	4.6	3.9
Degree Utilization, x	0.20	0.05	0.19
Capacity (veh/h)	760	748	896
Control Delay (s)	8.6	7.8	7.8
Approach Delay (s)	8.6	7.8	7.8
Approach LOS	A	A	A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	74	4	15	88	2	9
Future Volume (vph)	74	4	15	88	2	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			2.5		2.5	
Link Speed (k/h)	50			50	50	
Link Distance (m)	61.8			133.5	36.5	
Travel Time (s)	4.4			9.6	2.6	
Confl. Peds. (#/hr)		7	7		4	3
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	74	4	15	88	2	9
Future Volume (Veh/h)	74	4	15	88	2	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	104	6	21	124	3	13
Pedestrians	4			3	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			117		284	117
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			117		284	117
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1474		693	932

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	110	145	16
Volume Left	0	21	3
Volume Right	6	0	13
cSH	1700	1474	875
Volume to Capacity	0.06	0.01	0.02
Queue Length 95th (m)	0.0	0.3	0.4
Control Delay (s)	0.0	1.2	9.2
Lane LOS		A	A
Approach Delay (s)	0.0	1.2	9.2
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Helene St S & Port St E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	67	5	3	87	0	4	1	7	4	0	2
Future Volume (vph)	5	67	5	3	87	0	4	1	7	4	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.0			61.8			76.4			121.3	
Travel Time (s)		3.8			4.4			5.5			8.7	
Confl. Peds. (#/hr)	5					5			3	3		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	13%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
5: Helene St S & Port St E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	67	5	3	87	0	4	1	7	4	0	2
Future Volume (vph)	5	67	5	3	87	0	4	1	7	4	0	2
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	7	91	7	4	118	0	5	1	9	5	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	105	122	15	8
Volume Left (vph)	7	4	5	5
Volume Right (vph)	7	0	9	3
Hadj (s)	-0.03	0.07	-0.22	-0.10
Departure Headway (s)	4.0	4.1	4.2	4.3
Degree Utilization, x	0.12	0.14	0.02	0.01
Capacity (veh/h)	876	861	809	790
Control Delay (s)	7.6	7.8	7.3	7.3
Approach Delay (s)	7.6	7.8	7.3	7.3
Approach LOS	A	A	A	A

Intersection Summary					
Delay		7.7			
Level of Service		A			
Intersection Capacity Utilization		17.6%	ICU Level of Service		A
Analysis Period (min)		15			

Lanes, Volumes, Timings
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	990	7	10	1573	41	0	0	8	7	0	43
Future Volume (vph)	20	990	7	10	1573	41	0	0	8	7	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.5			193.2			121.3			129.9	
Travel Time (s)		7.6			13.9			8.7			9.4	
Confl. Peds. (#/hr)	21		9	9		21						
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	10%	4%	0%	0%	0%	0%	14%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	990	7	10	1573	41	0	0	8	7	0	43
Future Volume (Veh/h)	20	990	7	10	1573	41	0	0	8	7	0	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	1076	8	11	1710	45	0	0	9	8	0	47
Pedestrians								9			21	
Lane Width (m)								3.7			3.7	
Walking Speed (m/s)								1.1			1.1	
Percent Blockage								1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					193							
pX, platoon unblocked	0.64						0.64	0.64		0.64	0.64	0.64
vC, conflicting volume	1776			1093			2057	2931	551	2366	2912	898
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1077			1093			1518	2892	551	2005	2863	0
tC, single (s)	4.1			4.3			7.5	6.5	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	95			98			100	100	98	53	100	93
cM capacity (veh/h)	409			584			45	9	479	17	10	675

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	560	546	866	900	9	55
Volume Left	22	0	11	0	0	8
Volume Right	0	8	0	45	9	47
cSH	409	1700	584	1700	479	103
Volume to Capacity	0.05	0.32	0.02	0.53	0.02	0.54
Queue Length 95th (m)	1.3	0.0	0.4	0.0	0.4	18.6
Control Delay (s)	1.6	0.0	0.6	0.0	12.7	74.6
Lane LOS	A		A		B	F
Approach Delay (s)	0.8		0.3		12.7	74.6
Approach LOS					B	F

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	67.9%	ICU Level of Service	C	
Analysis Period (min)	15			

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix H

2027 Total Traffic Operations

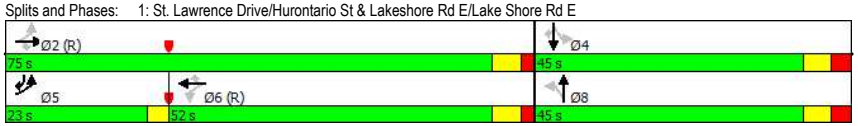
Lanes, Volumes, Timings
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	419	1446	4	32	865	158	11	78	22	342	72	420
Future Volume (vph)	419	1446	4	32	865	158	11	78	22	342	72	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	90.0		30.0	30.0		30.0	20.0		0.0	25.0		0.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	50.0			30.0			25.0			10.0		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		193.2			208.3			121.0			80.3	
Travel Time (s)		13.9			15.0			8.7			5.8	
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	6	6	6	8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	44.0	44.0	44.0	44.0	44.0	45.0	45.0		45.0	45.0	11.0
Total Split (s)	23.0	75.0	75.0	52.0	52.0	52.0	45.0	45.0		45.0	45.0	23.0
Total Split (%)	19.2%	62.5%	62.5%	43.3%	43.3%	43.3%	37.5%	37.5%		37.5%	37.5%	19.2%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						Yes
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E



HCM Signalized Intersection Capacity Analysis
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	419	1446	4	32	865	158	11	78	22	342	72	420
Future Volume (vph)	419	1446	4	32	865	158	11	78	22	342	72	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1823	3579	1578	1770	3544	1490	1765	1798		1739	1921	1438
Flt Permitted	0.16	1.00	1.00	0.10	1.00	1.00	0.70	1.00		0.69	1.00	1.00
Satd. Flow (perm)	304	3579	1578	188	3544	1490	1310	1798		1255	1921	1438
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	466	1607	4	36	961	176	12	87	24	380	80	467
RTOR Reduction (vph)	0	0	2	0	0	52	0	8	0	0	0	16
Lane Group Flow (vph)	466	1607	2	36	961	124	12	103	0	380	80	451
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	69.0	69.0	69.0	46.0	46.0	46.0	38.0	38.0		38.0	38.0	58.0
Effective Green, g (s)	72.0	69.0	69.0	46.0	46.0	46.0	38.0	38.0		38.0	38.0	58.0
Actuated g/C Ratio	0.60	0.58	0.58	0.38	0.38	0.38	0.32	0.32		0.32	0.32	0.48
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	473	2057	907	72	1358	571	414	569		397	608	695
v/s Ratio Prot	c0.19	c0.45			0.27			0.06			0.04	0.11
v/s Ratio Perm	0.40		0.00	0.19		0.08	0.01			c0.30		0.21
v/c Ratio	0.99	0.78	0.00	0.50	0.71	0.22	0.03	0.18		0.96	0.13	0.65
Uniform Delay, d1	29.0	19.7	10.9	28.2	31.3	24.9	28.3	29.7		40.2	29.2	23.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	37.2	3.0	0.0	22.7	3.1	0.9	0.1	0.7		35.6	0.4	2.1
Delay (s)	66.2	22.7	10.9	50.9	34.4	25.8	28.4	30.4		75.8	29.7	25.4
Level of Service	E	C	B	D	C	C	C	C		E	C	C
Approach Delay (s)		32.4			33.6			30.2			46.4	
Approach LOS		C			C			C			D	

Intersection Summary					
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.91				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	100.7%	ICU Level of Service	G		
Analysis Period (min)	15				

c Critical Lane Group

Lanes, Volumes, Timings
2: St. Lawrence Drive & Port St E

02/16/2018

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	86	15	10	25	41	67
Future Volume (vph)	86	15	10	25	41	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)	0.0	0.0	0.0			0.0
Storage Lanes	1	0	0			0
Taper Length (m)	2.5		2.5			
Link Speed (k/h)	50			20	50	
Link Distance (m)	133.5			57.9	121.0	
Travel Time (s)	9.6			10.4	8.7	
Confl. Peds. (#/hr)	4	2	4			4
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
2: St. Lawrence Drive & Port St E

02/16/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	86	15	10	25	41	67
Future Volume (vph)	86	15	10	25	41	67
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	121	21	14	35	58	94

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	142	49	152
Volume Left (vph)	121	14	0
Volume Right (vph)	21	0	94
Hadj (s)	0.08	0.06	-0.37
Departure Headway (s)	4.4	4.4	3.9
Degree Utilization, x	0.17	0.06	0.17
Capacity (veh/h)	783	771	886
Control Delay (s)	8.3	7.7	7.7
Approach Delay (s)	8.3	7.7	7.7
Approach LOS	A	A	A

Intersection Summary			
Delay	8.0		
Level of Service	A		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	54	0	5	50	5	22
Future Volume (vph)	54	0	5	50	5	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			2.5		2.5	
Link Speed (k/h)	50			50	50	
Link Distance (m)	61.8			133.5	36.5	
Travel Time (s)	4.4			9.6	2.6	
Confl. Peds. (#/hr)		7	7		4	3
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	54	0	5	50	5	22
Future Volume (Veh/h)	54	0	5	50	5	22
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	76	0	7	70	7	31
Pedestrians	4			3	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			83		171	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			83		171	86
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	97
cM capacity (veh/h)			1517		812	969

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	76	77	38
Volume Left	0	7	7
Volume Right	0	0	31
cSH	1700	1517	936
Volume to Capacity	0.04	0.00	0.04
Queue Length 95th (m)	0.0	0.1	1.0
Control Delay (s)	0.0	0.7	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	0.7	9.0
Approach LOS			A

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	17.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Helene St S & Port St E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	50	3	2	51	2	8	3	3	1	3	4
Future Volume (vph)	5	50	3	2	51	2	8	3	3	1	3	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.0			61.8			76.4			121.3	
Travel Time (s)		3.8			4.4			5.5			8.7	
Confl. Peds. (#/hr)	5					5			3	3		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	13%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
5: Helene St S & Port St E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	50	3	2	51	2	8	3	3	1	3	4
Future Volume (vph)	5	50	3	2	51	2	8	3	3	1	3	4
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	7	68	4	3	69	3	11	4	4	1	4	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	79	75	19	10
Volume Left (vph)	7	3	11	1
Volume Right (vph)	4	3	4	5
Hadj (s)	-0.01	0.05	0.12	-0.28
Departure Headway (s)	4.0	4.1	4.4	4.0
Degree Utilization, x	0.09	0.09	0.02	0.01
Capacity (veh/h)	880	868	789	867
Control Delay (s)	7.4	7.5	7.5	7.0
Approach Delay (s)	7.4	7.5	7.5	7.0
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.4		
Level of Service		A		
Intersection Capacity Utilization		15.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	1805	3	10	1218	12	3	2	4	7	0	35
Future Volume (vph)	92	1805	3	10	1218	12	3	2	4	7	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.5			193.2			121.3			129.9	
Travel Time (s)		7.6			13.9			8.7			9.4	
Confl. Peds. (#/hr)	21		9	9		21						
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	10%	4%	0%	0%	0%	0%	14%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	1805	3	10	1218	12	3	2	4	7	0	35
Future Volume (Veh/h)	92	1805	3	10	1218	12	3	2	4	7	0	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	1962	3	11	1324	13	3	2	4	8	0	38
Pedestrians								9			21	
Lane Width (m)								3.7			3.7	
Walking Speed (m/s)								1.1			1.1	
Percent Blockage								1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					193							
pX, platoon unblocked	0.78						0.78	0.78		0.78	0.78	0.78
vC, conflicting volume	1358			1974			2894	3552	992	2560	3548	690
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	882			1974			2864	3713	992	2432	3706	20
tC, single (s)	4.1			4.3			7.5	6.5	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	83			96			37	28	98	0	100	95
cM capacity (veh/h)	589			258			5	3	246	4	3	798

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1081	984	673	675	9	46
Volume Left	100	0	11	0	3	8
Volume Right	0	3	0	13	4	38
cSH	589	1700	258	1700	7	21
Volume to Capacity	0.17	0.58	0.04	0.40	1.37	2.24
Queue Length 95th (m)	4.6	0.0	1.0	0.0	15.2	45.9
Control Delay (s)	5.6	0.0	1.7	0.0	1225.8	964.0
Lane LOS	A		A		F	F
Approach Delay (s)	3.0		0.8		1225.8	964.0
Approach LOS					F	F

Intersection Summary				
Average Delay	18.0			
Intersection Capacity Utilization	100.4%	ICU Level of Service	G	
Analysis Period (min)	15			

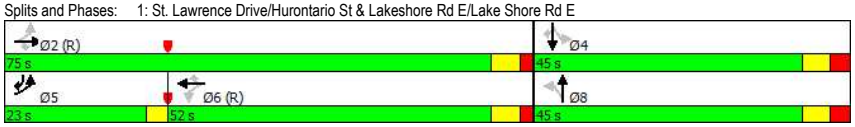
Lanes, Volumes, Timings
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	745	10	31	1226	114	9	96	17	259	90	501
Future Volume (vph)	334	745	10	31	1226	114	9	96	17	259	90	501
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		30.0	30.0		30.0	20.0		0.0	25.0		0.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	50.0			30.0			25.0			10.0		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		193.2			208.3			121.0			80.3	
Travel Time (s)		13.9			15.0			8.7			5.8	
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	6	6	6	8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	44.0	44.0	44.0	44.0	44.0	45.0	45.0		45.0	45.0	11.0
Total Split (s)	23.0	75.0	75.0	52.0	52.0	52.0	45.0	45.0		45.0	45.0	23.0
Total Split (%)	19.2%	62.5%	62.5%	43.3%	43.3%	43.3%	37.5%	37.5%		37.5%	37.5%	19.2%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	3.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lead/Lag	Lead			Lag	Lag	Lag						Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						Yes
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		Max	Max	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 20 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E



HCM Signalized Intersection Capacity Analysis
1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	745	10	31	1226	114	9	96	17	259	90	501
Future Volume (vph)	334	745	10	31	1226	114	9	96	17	259	90	501
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	0.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1825	3579	1578	1764	3544	1490	1766	1824		1740	1921	1437
Flt Permitted	0.08	1.00	1.00	0.34	1.00	1.00	0.69	1.00		0.68	1.00	1.00
Satd. Flow (perm)	155	3579	1578	631	3544	1490	1287	1824		1238	1921	1437
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	371	828	11	34	1362	127	10	107	19	288	100	557
RTOR Reduction (vph)	0	0	5	0	0	39	0	5	0	0	0	14
Lane Group Flow (vph)	371	828	6	34	1362	88	10	121	0	288	100	543
Confl. Peds. (#/hr)	26		9	9		26	39		11	11		39
Heavy Vehicles (%)	0%	2%	0%	3%	3%	3%	0%	2%	6%	4%	0%	10%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	69.0	69.0	69.0	46.5	46.5	46.5	38.0	38.0		38.0	38.0	57.5
Effective Green, g (s)	72.0	69.0	69.0	46.5	46.5	46.5	38.0	38.0		38.0	38.0	57.5
Actuated g/C Ratio	0.60	0.58	0.58	0.39	0.39	0.39	0.32	0.32		0.32	0.32	0.48
Clearance Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	7.0	7.0		7.0	7.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	406	2057	907	244	1373	577	407	577		392	608	688
v/s Ratio Prot	c0.17	0.23			c0.38			0.07			0.05	c0.13
v/s Ratio Perm	0.38		0.00	0.05		0.06	0.01			0.23		0.25
v/c Ratio	0.91	0.40	0.01	0.14	0.99	0.15	0.02	0.21		0.73	0.16	0.79
Uniform Delay, d1	37.0	14.1	10.9	23.8	36.6	23.9	28.2	30.0		36.5	29.6	26.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	24.6	0.6	0.0	1.2	22.5	0.6	0.1	0.8		11.6	0.6	6.0
Delay (s)	61.6	14.7	10.9	25.0	59.0	24.5	28.3	30.8		48.1	30.1	32.2
Level of Service	E	B	B	C	E	C	C	C		D	C	C
Approach Delay (s)		29.0			55.4			30.6			36.8	
Approach LOS		C			E			C			D	

Intersection Summary					
HCM 2000 Control Delay	41.5	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.91				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	98.2%	ICU Level of Service	F		
Analysis Period (min)	15				

c Critical Lane Group

Lanes, Volumes, Timings
2: St. Lawrence Drive & Port St E 02/16/2018

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	104	13	11	18	26	105
Future Volume (vph)	104	13	11	18	26	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (k/h)	50			20	50	
Link Distance (m)	133.5			57.9	121.0	
Travel Time (s)	9.6			10.4	8.7	
Confl. Peds. (#/hr)	4	2	4			4
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
2: St. Lawrence Drive & Port St E 02/16/2018

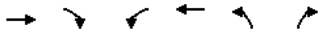
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	104	13	11	18	26	105
Future Volume (vph)	104	13	11	18	26	105
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	146	18	15	25	37	148

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	164	40	185
Volume Left (vph)	146	15	0
Volume Right (vph)	18	0	148
Hadj (s)	0.11	0.08	-0.48
Departure Headway (s)	4.5	4.6	3.9
Degree Utilization, x	0.20	0.05	0.20
Capacity (veh/h)	759	748	895
Control Delay (s)	8.6	7.8	7.8
Approach Delay (s)	8.6	7.8	7.8
Approach LOS	A	A	A

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: 65 Port Street Driveway & Port St E

02/16/2018



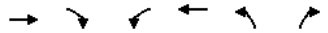
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	74	4	15	88	2	9
Future Volume (vph)	74	4	15	88	2	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (k/h)	50			50	50	
Link Distance (m)	61.8			133.5	36.5	
Travel Time (s)	4.4			9.6	2.6	
Confl. Peds. (#/hr)		7	7		4	3
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
3: 65 Port Street Driveway & Port St E

02/16/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	74	4	15	88	2	9
Future Volume (Veh/h)	74	4	15	88	2	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	104	6	21	124	3	13
Pedestrians	4			3	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			117		284	117
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			117		284	117
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1474		693	932

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	110	145	16
Volume Left	0	21	3
Volume Right	6	0	13
cSH	1700	1474	875
Volume to Capacity	0.06	0.01	0.02
Queue Length 95th (m)	0.0	0.3	0.4
Control Delay (s)	0.0	1.2	9.2
Lane LOS		A	A
Approach Delay (s)	0.0	1.2	9.2
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Helene St S & Port St E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	67	5	3	87	0	4	1	7	4	0	2
Future Volume (vph)	5	67	5	3	87	0	4	1	7	4	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.0			61.8			76.4			121.3	
Travel Time (s)		3.8			4.4			5.5			8.7	
Confl. Peds. (#/hr)	5					5			3	3		
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	13%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM Unsignalized Intersection Capacity Analysis
5: Helene St S & Port St E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	67	5	3	87	0	4	1	7	4	0	2
Future Volume (vph)	5	67	5	3	87	0	4	1	7	4	0	2
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	7	91	7	4	118	0	5	1	9	5	0	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	105	122	15	8
Volume Left (vph)	7	4	5	5
Volume Right (vph)	7	0	9	3
Hadj (s)	-0.03	0.07	-0.22	-0.10
Departure Headway (s)	4.0	4.1	4.2	4.3
Degree Utilization, x	0.12	0.14	0.02	0.01
Capacity (veh/h)	876	861	809	790
Control Delay (s)	7.6	7.8	7.3	7.3
Approach Delay (s)	7.6	7.8	7.3	7.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.7		
Level of Service		A		
Intersection Capacity Utilization		17.6%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1043	7	10	1608	41	0	0	8	7	0	43
Future Volume (vph)	20	1043	7	10	1608	41	0	0	8	7	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		105.5			193.2			121.3			129.9	
Travel Time (s)		7.6			13.9			8.7			9.4	
Confl. Peds. (#/hr)	21		9	9		21						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	10%	4%	0%	0%	0%	0%	14%	0%	3%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
6: Helene St S/Helene St N & Lakeshore Rd E

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1043	7	10	1608	41	0	0	8	7	0	43
Future Volume (Veh/h)	20	1043	7	10	1608	41	0	0	8	7	0	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	1134	8	11	1748	45	0	0	9	8	0	47
Pedestrians								9			21	
Lane Width (m)								3.7			3.7	
Walking Speed (m/s)								1.1			1.1	
Percent Blockage								1			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					193							
pX, platoon unblocked	0.63						0.63	0.63		0.63	0.63	0.63
vC, conflicting volume	1814			1151			2134	3027	580	2434	3008	918
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1117			1151			1625	3043	580	2101	3013	0
tC, single (s)	4.1			4.3			7.5	6.5	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	94			98			100	100	98	44	100	93
cM capacity (veh/h)	391			554			37	7	459	14	8	668

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	589	575	885	919	9	55
Volume Left	22	0	11	0	0	8
Volume Right	0	8	0	45	9	47
cSH	391	1700	554	1700	459	87
Volume to Capacity	0.06	0.34	0.02	0.54	0.02	0.63
Queue Length 95th (m)	1.4	0.0	0.5	0.0	0.5	22.5
Control Delay (s)	1.8	0.0	0.6	0.0	13.0	100.2
Lane LOS	A		A		B	F
Approach Delay (s)	0.9		0.3		13.0	100.2
Approach LOS					B	F

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	68.9%	ICU Level of Service	C	
Analysis Period (min)	15			

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix I

Queue Analysis

Queues

1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E 02/23/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	336	1476	4	36	710	150	12	97	339	71	310
v/c Ratio	0.80	0.75	0.00	0.42	0.46	0.21	0.03	0.16	0.78	0.11	0.43
Control Delay	30.0	23.7	0.0	42.3	25.3	8.0	26.6	24.8	49.8	27.7	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	23.7	0.0	42.3	25.3	8.0	26.6	24.8	49.8	27.7	14.4
Queue Length 50th (m)	39.2	134.2	0.0	5.8	61.2	6.1	1.9	13.8	71.2	11.4	28.3
Queue Length 95th (m)	#65.3	161.5	0.0	18.0	77.6	18.5	6.2	26.2	#116.6	21.9	49.4
Internal Link Dist (m)		169.2			184.3			97.0		56.3	
Turn Bay Length (m)	90.0		30.0	30.0		30.0	20.0		25.0		
Base Capacity (vph)	422	1968	884	85	1535	705	451	623	433	656	722
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	0.80	0.75	0.00	0.42	0.46	0.21	0.03	0.16	0.78	0.11	0.43

Intersection Summary

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

Queues

1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E 02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	243	673	11	31	1196	121	11	128	269	82	419
v/c Ratio	0.96	0.34	0.01	0.10	0.78	0.18	0.02	0.20	0.64	0.12	0.62
Control Delay	74.4	15.6	0.0	21.3	33.5	11.0	26.6	27.5	41.4	27.9	25.1
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	74.4	15.6	0.0	21.3	33.5	11.0	26.6	27.5	41.4	27.9	25.1
Queue Length 50th (m)	36.1	44.2	0.0	4.2	124.4	7.8	1.7	20.0	53.0	13.2	63.0
Queue Length 95th (m)	#86.4	56.4	0.1	10.6	151.4	19.3	5.9	34.7	83.0	24.7	94.0
Internal Link Dist (m)		169.2			184.3			97.0		56.3	
Turn Bay Length (m)	90.0		30.0	30.0		30.0	20.0		25.0		
Base Capacity (vph)	252	1968	884	318	1535	681	446	629	422	656	680
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	0.96	0.34	0.01	0.10	0.78	0.18	0.02	0.20	0.64	0.13	0.62

Intersection Summary

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

Queues

1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E 02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	461	1588	4	36	961	161	12	97	361	76	437
v/c Ratio	0.96	0.77	0.00	0.48	0.71	0.26	0.03	0.17	0.90	0.12	0.58
Control Delay	57.0	22.8	0.0	53.1	34.8	14.3	28.7	27.1	65.5	29.9	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	22.8	0.0	53.1	34.8	14.3	28.7	27.1	65.5	29.9	20.4
Queue Length 50th (m)	74.0	142.8	0.0	6.3	99.6	12.8	1.9	14.5	80.9	12.7	59.0
Queue Length 95th (m)	#138.4	171.7	0.0	#21.2	123.2	28.3	6.5	27.5	#136.2	24.2	88.1
Internal Link Dist (m)		169.2			184.3			97.0		56.3	
Turn Bay Length (m)	90.0		30.0	30.0		30.0	20.0		25.0		
Base Capacity (vph)	481	2057	922	75	1358	618	416	578	402	608	756
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	0.96	0.77	0.00	0.48	0.71	0.26	0.03	0.17	0.90	0.13	0.58

Intersection Summary

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

Queues

1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	354	782	11	31	1331	123	11	128	281	86	546
v/c Ratio	0.89	0.39	0.01	0.12	0.99	0.20	0.03	0.21	0.68	0.13	0.72
Control Delay	58.5	15.9	0.0	27.1	60.5	14.3	28.0	28.8	45.3	29.4	25.7
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	58.5	15.9	0.0	27.1	60.5	14.3	28.0	28.8	45.3	29.4	25.7
Queue Length 50th (m)	66.2	53.3	0.0	4.9	~169.3	9.6	1.8	20.8	58.4	14.5	84.4
Queue Length 95th (m)	#117.2	66.8	0.2	12.3	#218.8	23.0	6.1	35.9	90.4	26.5	123.8
Internal Link Dist (m)		169.2			184.3			97.0		56.3	
Turn Bay Length (m)	90.0		30.0	30.0		30.0	20.0		25.0		
Base Capacity (vph)	406	2007	900	251	1345	603	433	614	412	640	770
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	0.87	0.39	0.01	0.12	0.99	0.20	0.03	0.21	0.68	0.13	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Queues

1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E 02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	466	1607	4	36	961	176	12	97	380	79	467
v/c Ratio	0.97	0.78	0.00	0.50	0.71	0.28	0.03	0.17	0.95	0.13	0.62
Control Delay	59.4	23.1	0.0	56.1	34.8	14.4	28.7	27.1	73.9	30.0	21.7
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	59.4	23.1	0.0	56.1	34.8	14.4	28.7	27.1	73.9	30.0	21.7
Queue Length 50th (m)	75.5	145.7	0.0	6.4	99.6	14.1	1.9	14.5	87.1	13.2	65.3
Queue Length 95th (m)	#140.9	175.4	0.0	#22.0	123.2	30.6	6.5	27.5	#146.5	24.8	97.0
Internal Link Dist (m)		169.2			184.3			97.0		56.3	
Turn Bay Length (m)	90.0		30.0	30.0		30.0	20.0		25.0		
Base Capacity (vph)	481	2057	922	72	1358	622	415	578	402	608	756
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.78	0.00	0.50	0.71	0.28	0.03	0.17	0.95	0.13	0.62

Intersection Summary

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

Queues

1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E 02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	371	828	11	31	1362	127	11	128	288	88	557
v/c Ratio	0.90	0.40	0.01	0.13	0.99	0.21	0.03	0.22	0.74	0.14	0.74
Control Delay	59.0	14.8	0.0	25.9	59.5	13.6	28.7	29.7	49.4	30.2	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	14.8	0.0	25.9	59.5	13.6	28.7	29.7	49.4	30.2	27.4
Queue Length 50th (m)	68.0	53.8	0.0	4.7	~168.0	9.5	1.8	20.8	60.3	14.8	87.3
Queue Length 95th (m)	#121.8	67.3	0.1	11.8	#218.3	22.7	6.1	36.1	#95.8	27.3	128.8
Internal Link Dist (m)		169.2			184.3			97.0		56.3	
Turn Bay Length (m)	90.0		30.0	30.0		30.0	20.0		25.0		
Base Capacity (vph)	417	2057	922	244	1373	616	411	583	391	608	754
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	0.89	0.40	0.01	0.13	0.99	0.21	0.03	0.22	0.74	0.14	0.74

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Queues

1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E 02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	461	1588	4	36	961	161	12	111	361	77	437
v/c Ratio	0.96	0.77	0.00	0.48	0.71	0.26	0.03	0.19	0.91	0.13	0.58
Control Delay	57.0	22.8	0.0	53.1	34.8	14.3	28.7	27.6	67.6	30.0	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	22.8	0.0	53.1	34.8	14.3	28.7	27.6	67.6	30.0	20.4
Queue Length 50th (m)	74.0	142.8	0.0	6.3	99.6	12.8	1.9	16.8	81.4	12.9	59.0
Queue Length 95th (m)	#138.4	171.7	0.0	#21.2	123.2	28.3	6.5	30.8	#137.4	24.2	88.1
Internal Link Dist (m)		169.2			184.3			97.0		56.3	
Turn Bay Length (m)	90.0		30.0	30.0		30.0	20.0		25.0		
Base Capacity (vph)	481	2057	922	75	1358	618	415	577	397	608	756
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	0.96	0.77	0.00	0.48	0.71	0.26	0.03	0.19	0.91	0.13	0.58

Intersection Summary

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

Queues

1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	354	782	11	34	1331	123	10	126	281	98	546
v/c Ratio	0.88	0.38	0.01	0.13	0.96	0.20	0.02	0.22	0.72	0.16	0.73
Control Delay	54.8	14.5	0.0	25.9	52.9	13.2	28.7	29.3	48.1	30.5	26.9
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	54.8	14.5	0.0	25.9	52.9	13.2	28.7	29.3	48.1	30.5	26.9
Queue Length 50th (m)	63.4	50.0	0.0	5.2	161.1	8.8	1.6	20.3	58.4	16.6	84.4
Queue Length 95th (m)	#112.8	62.9	0.1	12.7	#210.1	21.8	5.6	35.3	91.0	29.5	124.6
Internal Link Dist (m)		169.2			184.3			97.0		56.3	
Turn Bay Length (m)	90.0		30.0	30.0		30.0	20.0		25.0		
Base Capacity (vph)	416	2057	922	258	1384	620	408	582	392	608	754
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	0.38	0.01	0.13	0.96	0.20	0.02	0.22	0.72	0.16	0.72

Intersection Summary

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

1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E

02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	466	1607	4	36	961	176	12	111	380	80	467
v/c Ratio	0.97	0.78	0.00	0.50	0.71	0.28	0.03	0.19	0.96	0.13	0.62
Control Delay	59.4	23.1	0.0	56.1	34.8	14.4	28.7	27.6	76.7	30.0	21.7
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	59.4	23.1	0.0	56.1	34.8	14.4	28.7	27.6	76.7	30.0	21.7
Queue Length 50th (m)	75.5	145.7	0.0	6.4	99.6	14.1	1.9	16.8	87.5	13.4	65.3
Queue Length 95th (m)	#140.9	175.4	0.0	#22.0	123.2	30.6	6.5	30.8	#147.7	25.2	97.0
Internal Link Dist (m)		169.2			184.3			97.0		56.3	
Turn Bay Length (m)	90.0		30.0	30.0		30.0	20.0		25.0		
Base Capacity (vph)	481	2057	922	72	1358	622	414	577	397	608	756
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.78	0.00	0.50	0.71	0.28	0.03	0.19	0.96	0.13	0.62

Intersection Summary

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

1: St. Lawrence Drive/Hurontario St & Lakeshore Rd E/Lake Shore Rd E 02/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	371	828	11	34	1362	127	10	126	288	100	557
v/c Ratio	0.90	0.40	0.01	0.14	0.99	0.21	0.02	0.22	0.73	0.16	0.74
Control Delay	59.0	14.8	0.0	26.2	59.5	13.6	28.7	29.3	49.2	30.5	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	14.8	0.0	26.2	59.5	13.6	28.7	29.3	49.2	30.5	27.4
Queue Length 50th (m)	68.0	53.8	0.0	5.2	~168.0	9.5	1.6	20.3	60.2	17.0	87.3
Queue Length 95th (m)	#121.8	67.3	0.1	12.8	#218.3	22.7	5.6	35.3	#95.6	30.1	128.8
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Base Capacity (vph)	417	2057	922	244	1373	616	407	582	392	608	754
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	0.89	0.40	0.01	0.14	0.99	0.21	0.02	0.22	0.73	0.16	0.74

Intersection Summary

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

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix J

Auto Turn Analysis

Helene Street North

Port Street East

Public Parking Lot

65 Port Street East

LOBBY
195.6927 sm

UNIT 1
160.4188 sm

LOADING

BIKE STOR.

MI

WASTE
78.3823 sm

UNIT 2
134.9108 sm

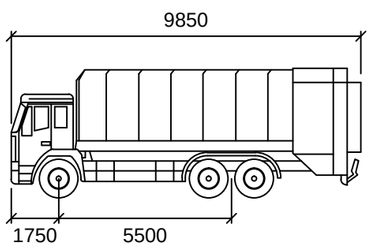
LOUNGE
54.5344 sm

UNIT 3
97.0921 sm

UNIT 4
116.7597 sm

AMENITY
142.6318 sm

OUTDOOR AMENITY



Peel Region Refuse Truck

	mm
Width	: 2770
Track	: 2770
Lock to Lock Time	: 6.0
Steering Angle	: 28.5

LEGEND

PROPERTY LINE

VEHICLE BODY PATH

VEHICLE TIRE PATH

BURNSIDE

55 PORT STREET EAST

MISSISSAUGA, ONTARIO

LOADING ANALYSIS
PEEL REGION REFUSE TRUCK
FORWARD ENTRY PATH

R.J Burnside & Asoociates Limited
BW / DWA
FEBRUARY 15, 2018

Scale 1:500

Helene Street North

Port Street East

65 Port Street East

Public Parking Lot

LOBBY
195.6927 sm

UNIT 1
160.4188 sm

LOADING

MI

BIKE STOR.

WASTE
78.3823 sm

UNIT 2
134.9108 sm

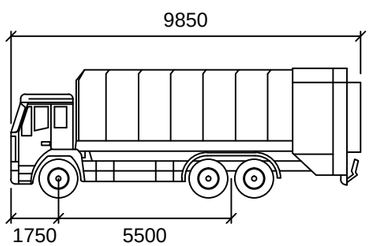
LOUNGE
54.5344 sm

UNIT 3
97.0921 sm

UNIT 4
116.7597 sm

AMENITY
142.6318 sm

OUTDOOR AMENITY



Peel Region Refuse Truck

	mm
Width	: 2770
Track	: 2770
Lock to Lock Time	: 6.0
Steering Angle	: 28.5

LEGEND

PROPERTY LINE

VEHICLE BODY PATH

VEHICLE TIRE PATH

BURNSIDE

55 PORT STREET EAST

MISSISSAUGA, ONTARIO

LOADING ANALYSIS
PEEL REGION REFUSE TRUCK
REVERSE EXIT PATH

R.J Burnside & Asoociates Limited
BW / DWA
FEBRUARY 15, 2018

Scale 1:500

R.J. Burnside & Associates Limited