



# Traffic Impact Study

**Derry Road and Regional Road 25  
Residential Development**

Milteron Developments Limited

August 21, 2023



## Executive Summary

GHD Limited (GHD) has prepared the following updated traffic study for the proposed residential development located in the southeast corner of Regional Road 25 at Derry Road West in the Town of Milton. The proposed stacked townhouse addition will replace a surface parking lot within a previously approved high-rise and townhouse development. Construction is currently ongoing for the approved development surrounding the subject site, which consists of 614 high-rise dwelling units and 34 townhouse units.

This report establishes the existing 2017 traffic volumes and operating conditions for the critical weekday a.m. and p.m. peak hour periods, assesses the future background 2022, 2027 and 2031 traffic growth (including traffic growth trend), estimates and assigns new site traffic volumes, and documents the expected site related impacts on the road network during the future horizon years.

The proposed site has 225 metres of frontage on Derry Road and 180 metres frontage on Regional Road 25 with no additional frontage on any other roadway as the proposed site is isolated from the adjacent residential neighbourhood by the Bronte Creek Tributary water course.

The site includes two proposed site accesses, consisting of an unsignalized right-in/right-out access on Regional Road 25 south of Derry Road West, and a signalized full moves access on Derry Road West east of the Regional Road 25 opposite an existing commercial access.

The proposed development consists of the approved 614 apartment and 34 townhouse units and the 27 proposed stacked townhouse units. Based on these assumptions and the proposed land use, it is estimated that the subject development will generate approximately 226 new two-way vehicle trips during the a.m. peak hour consisting of 54 inbound and 172 outbound trips. During the p.m. peak hour it is expected to generate 260 new two-way vehicle trips consisting of 159 inbound and 101 outbound trips.

The future 2022, 2027 and 2031 scenarios consider a general area growth rate. The increased travel demand on Derry Road and Regional Road 25 are related to background growth and is expected in advance of the widening of Derry road to six lanes. However, the proposed six lane widening will address all anticipated capacity deficiencies. As congestion increase in advance of the widening, travel patterns will likely adjust to use other routes.

The analysis suggest that in the ultimate 2031 the development can still be accommodated in the road network however it is anticipated that in the westbound direction a left dual left turn lane will ultimately be required in the six lane scenario. The Municipal Class Environmental Assessment Study for the future widening of Regional Road 25 and Derry Road will need to confirm the intersection requirements.

Queuing impacts have been assessed at the intersection of Regional Road 25 and Derry Road. The queues are a result of the future capacity constraints due to the adopted corridor growth to the 2031



horizon year. The addition of site trips from the subject development to the road network is expected to have a nominal impact, and is generally not expected to be identifiable from a driver's perspective.

Both Derry Road and Regional Road 25 have been identified as future transit priority corridors within the Town of Milton. In addition, the site is within close walking distance to many nearby amenities surrounding the site; as ranked on Walk Score, the site has a reported Walk Score of 74. This is considered to be a "Very Walkable" score, with most errands being able to be accomplished on foot. This, along with the TDM plan for the subject development that proposes a mix of hard and soft measures will help reduce vehicular demand and encourage passenger, transit, cycling, and walking. These measures include:

- Sidewalk connectivity
- 38 Short Term Bicycle Parking Spaces (Outdoor Weather Protected) and 366 Long Term Bicycle Parking Spaces (Bike Hangers)
- Bicycle Self Service Station
- Information Distribution and Community Board
- Unbundled Parking
- Subsidized transit passes for all occupants
- 1 Car Share Vehicles with Dedicated Parking

With respect to inbound traffic into the site access on Derry Road, the reported 95<sup>th</sup> percentile queue for westbound left-turning vehicles is less than one vehicle per the Synchro analysis, and approximately up to 3 vehicles per the SimTraffic analysis. Therefore a left-turn lane (3.0 metres wide lane) with a minimal storage (15-20 metres) should be sufficient. The existing raised median will require modification to accommodate the needed taper for the proposed auxiliary left-turn lane into the site. With an assumed design speed of 70 km/h, a taper length of 120 metres is recommended.

Respectfully submitted,

GHD



William Maria, P. Eng.  
Senior Project Manager



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# 1. Introduction

## 1.1 Retainer and Objective

GHD Limited (GHD) was retained to prepare a Traffic Impact and Parking Study for the proposed residential development located in the southeast corner of the intersection of Bronte Street South and Main Street East in the Town of Milton to determine the following:

- Establish the baseline (2017) traffic volumes and operating conditions for the critical weekday a.m. and p.m. peak hour periods;
- Conduct trip generation calculations in estimating for future site trips from the subject development and estimate appropriate trip distribution and assignments of the site trips to the study area road network;
- Establish the future background and total operating conditions for the study intersections at a future 2022, 2027 and 2031 planning horizon; and
- Conduct a parking assessment to evaluate the rationale for proposing a site-specific parking standard to reduce the number of parking spaces provided for the site.

This report is a resubmission based on the previously approved submission, dated July 2020.

## 1.2 Site Plan

The site is located in the southeast corner of the intersection of Derry Road West and Regional Road 25 in the Town of Milton, as shown in **Figure 1**. The site includes two proposed site accesses, consisting of an unsignalized right-in/right-out access on Regional Road 25 south of Derry Road West, and a signalized full moves access on Derry Road West east of Regional Road 25 opposite an existing commercial access.

Based on the proposed site plan, the proposed development consists of an additional 27 stacked townhouse units to the previously approved 614 high-rise dwelling units and 34 townhouse units. **Figure 2** shows the proposed site plan and access locations.

The Halton Region Transportation Master Plan (TMP) has identified Regional Road 25, Bronte Road, Ontario Street (Bronte GO Station to Steeles Avenue) and Derry Road (Tremaine Road to Highway 407) as future Transit Priority Corridors with transit vehicles operating on a 'semi-exclusive/exclusive right-of-way'. The Milton TMP's preferred alternative (2A) recommends converting two existing curbside lanes on Ontario Street into High Occupancy Vehicle (HOV) lanes in the future.

Given the residential high-density nature of the subject development and proposed parking supply, the proposed development is considered to be conducive in supporting transit.





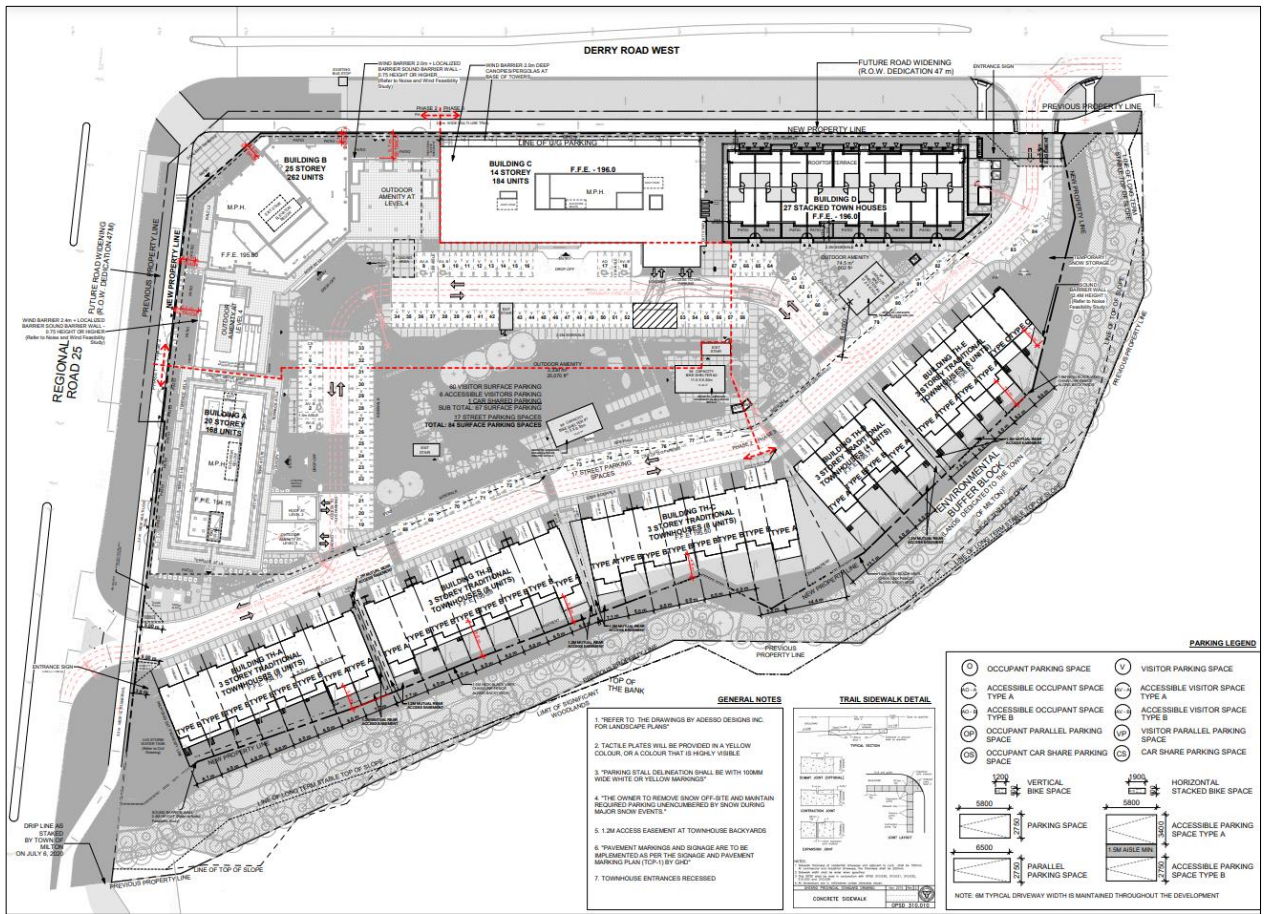
### **1.3 Study Team**

The GHD team involved in the preparation of the study are:

- William Maria, P. Eng., Senior Project Manager
- Ivan Drewnitski, Dipl. T., Transportation Planner
- Dhaval Harpal, Dipl. T., Transportation Planner



**Figure 1 Site Location**



**Figure 2 Site Plan**



## 2. Existing Conditions

### 2.1 Study Area Intersections

The study area includes the following intersections:

- Derry Road & 585 Ontario Street South Driveway
- Derry Road at Ontario Street South
- Ontario Street South at Laurier Avenue
- Derry Road at Holly Avenue
- Regional Highway 25 at Louis St. Laurent Avenue
- Proposed West Site Access (Right-In/Right-Out) at Regional Highway 25
- Proposed East Site Access at Derry Road West

### 2.2 Existing Road Network

**Derry Road** is an arterial road under the jurisdiction of the Town of Milton that runs east-west in the study area. It currently has a five-lane cross-section (two lanes per direction plus one centre lane) and a posted speed limit of 60 km/h. It has auxiliary left and right-turn lanes at its intersection with Ontario Street/Regional Road 25, and auxiliary left-turn lanes at its intersection at Holly Avenue. It has multi-use path on the north and south sides of the road.

**Ontario Street** is an arterial road under the jurisdiction of the Town of Milton that generally runs north-south in the study area north of Derry Road. It currently has a five-lane cross-section (two lanes per direction plus one centre lane) and a posted speed limit of 50 km/h. It has auxiliary left-turn lanes in its approach to Derry Road and in both approaches to Laurier Avenue, and sidewalk on both sides of the road; no bicycle facilities are currently provided.

**Regional Road 25** is an arterial road under the jurisdiction of Halton Region that generally runs north-south in the study area south of Derry Road. It currently has a four-lane cross-section (two lanes per direction) and a posted speed limit of 70 km/h south of the subject site, and 50 km/h fronting the subject site. It has auxiliary left and right-turn lanes in its approaches to Derry Road and Louis Saint Laurent Avenue. It has sidewalk on the east side south of Louis Saint Laurent Avenue, multi-use path on the east side between Derry Road and Louis Saint Laurent Avenue, and no pedestrian facilities on the west side; no further bicycle facilities are provided.

**Laurier Avenue** is a two-lane collector road that runs east-west in the study area with a posted speed limit of 50 km/h, and auxiliary left-turn lanes on both approaches to Ontario Street. There are sidewalks on both sides of the road, and no bicycle facilities.

**Holly Avenue** is a two-lane collector road that runs north-south in the study area with a posted speed limit of 50 km/h, and auxiliary left-turn lanes on both approaches to Derry Road. There are sidewalks on both sides of the road, and no bicycle facilities.



**Louis St. Laurent Avenue** is an arterial road under the jurisdiction of the Town of Milton that runs east-west in the study area. It currently has a four-lane cross-section and a posted speed limit of 60 km/h west of Regional Road 25 (two lanes per direction) and two-lane cross-section and a posted speed limit of 50 km/h east of Regional Road 25. It has auxiliary left-turn lanes in both approaches to Regional Road 25. It has multi-use path on both sides of the road west of Regional Road 25, and on the north side east of Regional Road 25, with no pedestrian facilities on the south side east of Regional Road 25.

### 2.3 Existing Transit Services

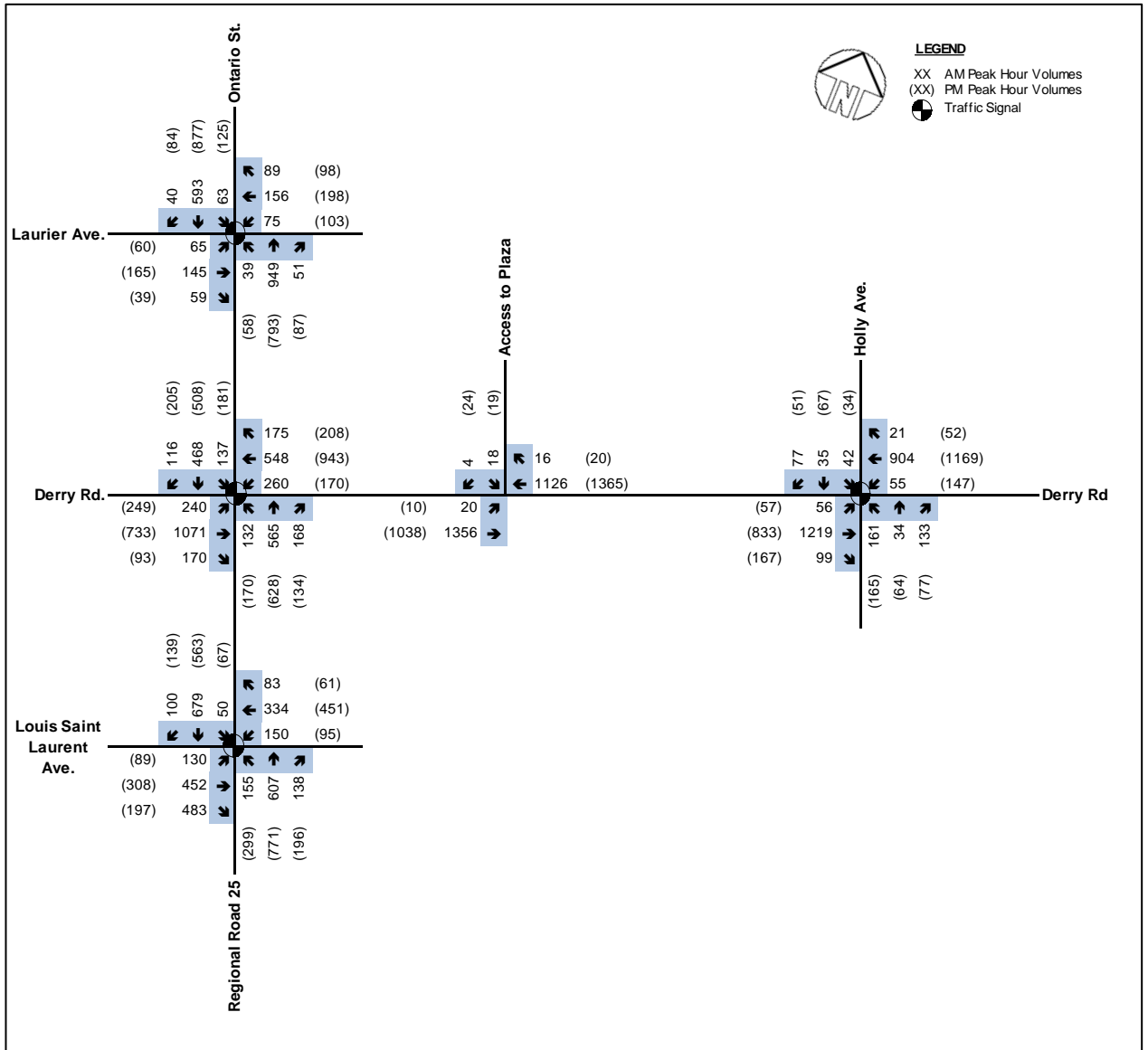
GO Transit currently provides bus services in the study area via Route 20 – Milton GO (northbound) and Route 20 – Oakville GO (southbound). There are two existing bus stops (northbound and southbound) along Regional Road 25. The northbound stop is located at the right-in/right-out access of the proposed site location, while the southbound stop is approximately 50 metres north on the opposite side of the road. Both the Milton and Oakville GO run 7 days a week, and average six stops per day.

Milton Transit currently provides bus services that run through the site location via Routes 7 (Harrison), 9 (Ontario South), and 8 (Willmott):

- The 7 – Runs through the residential area along Scott Boulevard around Dymott Avenue to Savoline Boulevard. After the residential loop it runs along Derry West and goes left on Ontario Street South. Takes a right on Main Street East and then ends at the GO Transit Terminal. This route operates Monday to Saturday.
- The 9 – Loops around Etheridge Avenue to Farmstead Drive and then runs north along Regional Road 25. Takes a left at Main Street East and then ends at the GO Transit Terminal. This route operates Monday to Saturday.
- The 8 – Runs through Bronte Street South and loops around from Louise St. Laurent to Santa Maria Boulevard. Runs along Derry West, past the site location, and makes a left on Thompson Road South into the GO Transit Terminal. This route operates Monday to Saturday.

### 2.4 Existing Traffic

Turning movement counts were conducted between 2016-2018 during the a.m. and p.m. peak hours at each study area intersection; turning movement counts are provided in **Appendix B. Figure 3** shows the adopted existing/baseline traffic volumes for weekday a.m. and p.m. peak hours at the study area intersections. Some balancing was applied along Derry Road to mitigate some imbalances in the traffic volumes between intersections where no mid-segment driveways that could account for the imbalances exist. The balancing was applied by nominal increases in through movements where required, and was conservative in that through volumes were only increased, never decreased.



**Figure 3 Existing (2017) Traffic Volumes**



## 3. Background Traffic

### 3.1 Study Horizon Year

Future traffic conditions were predicted for a five-year planning horizon of 2022, a ten-year planning horizon of 2027 and a fourteen-year planning horizon of 2031 (post road widening). The traffic impacts are assessed assuming the proposed development is fully occupied and growth in background traffic is consistent with assumptions provided by Halton Region and the Town of Milton.

### 3.2 Future Traffic/Corridor Growth

Based on the consultation with Regional and Town staff, the following compound annual growth rates were used to forecast future corridor growth:

- 3% growth eastbound and westbound on Derry Road West;
- 2% growth northbound on Ontario Street;
- 3% growth southbound on Ontario Street;
- 3% growth on Derry Road and Regional Road 25
- 2.45% growth eastbound and westbound on Louis Saint Laurent Avenue as consistent with the Boyne Road Needs Assessment (RNA); and
- 2% growth on Holly Avenue and Laurier Avenue.

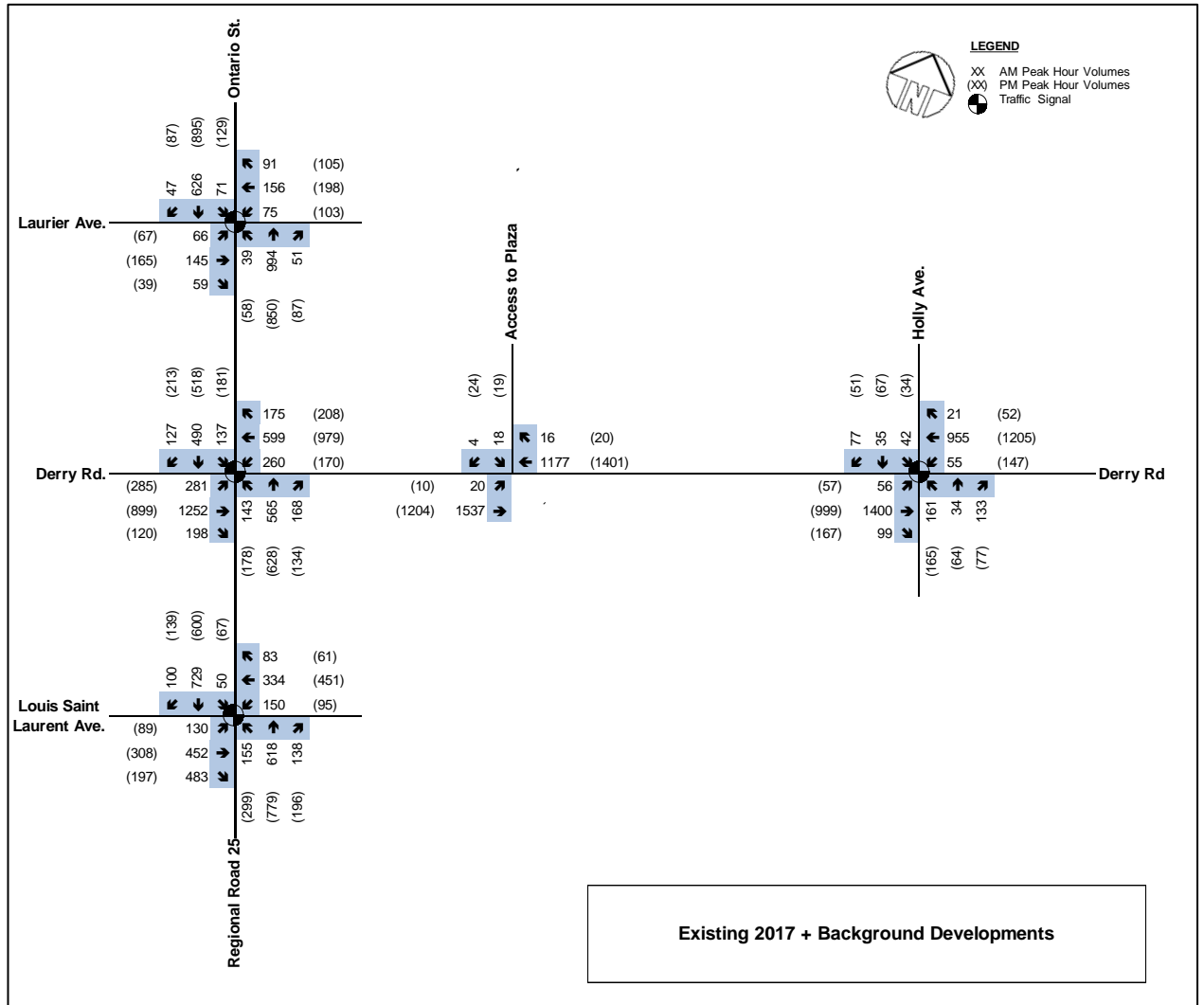
The above noted growth rates are considered to be conservative as some of the growth anticipated by the Region and Town includes background development traffic that has been accounted for through the site specific background developments included in section 3.3.

As directed by Town staff, corridor growth was generally only applied to through movements at Town intersections, as any future growth in turning movements is captured in considered site trips from future planned background developments.

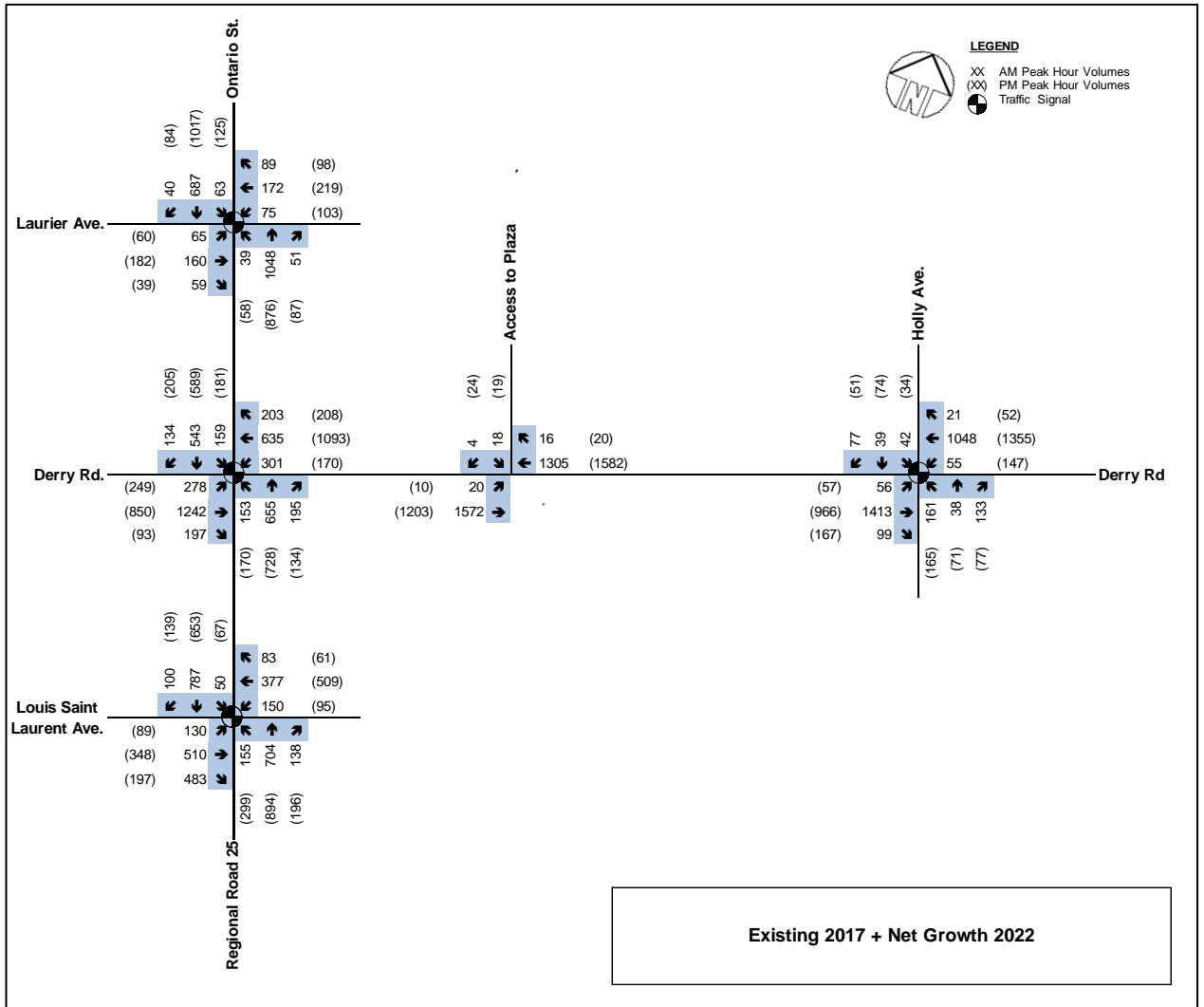
However as directed by Regional staff, growth rates were applied to turning movements that the regional intersection of Derry Road West at Regional Road 25 / Ontario Street.

Also, as directed by Region staff, a scenario was provided for 2022 future conditions with no corridor growth rates applied to traffic movements (only background development traffic added).

The 2022 (no corridor growth rate), 2022, 2027 and 2031 corridor growth traffic volumes are presented in **Figure 4**, **Figure 5**, **Figure 6** and **Figure 7** respectively.

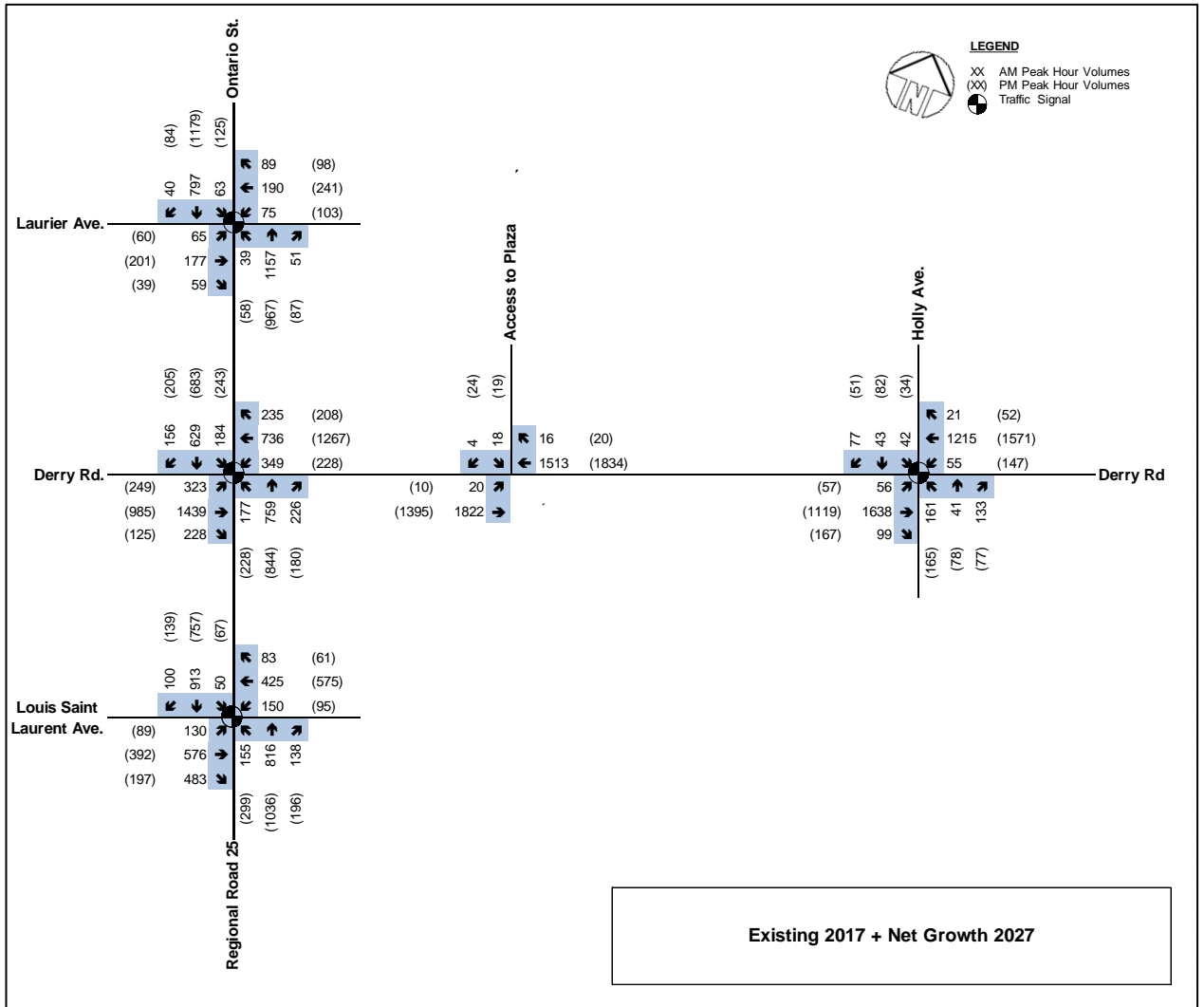


**Figure 4 2022 No Corridor Growth Traffic Volumes**

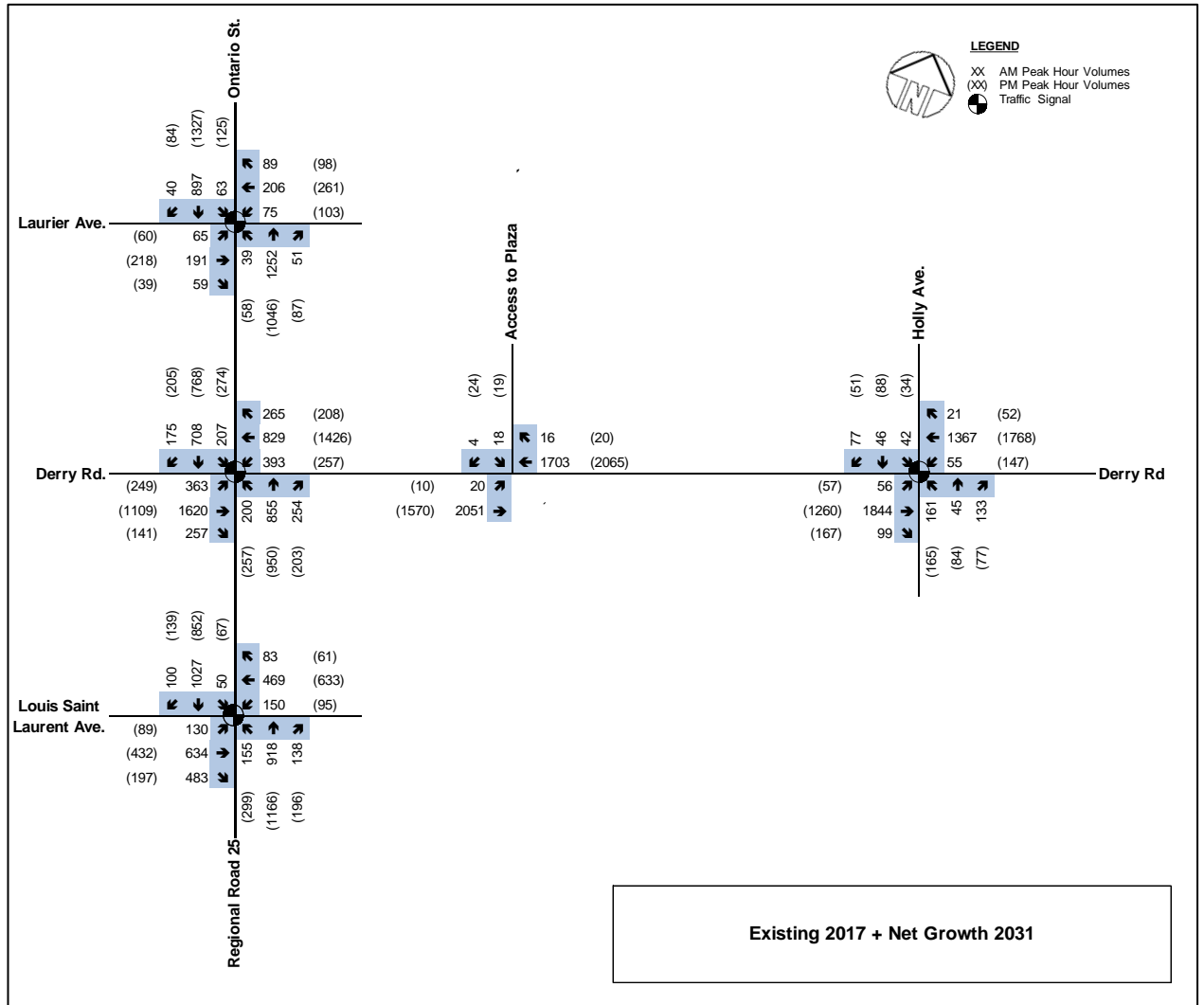


**Figure 5 2022 Corridor Growth Traffic Volumes**





**Figure 6 2027 Corridor Growth Traffic Volumes**



**Figure 7 2031 Corridor Growth Traffic Volumes**



### 3.3 Other Near-by Development Site Traffic

Site traffic generated by other nearby developments within the subject study area were also considered. The following developments were included in the study:

- 610 Farmstead Drive
  - Six storey, 170-condominium unit building
  - TIS completed by Paradigm in 2016
- Hallawest Development Site
  - Proposed 151 townhouse units
  - TIS completed by Paradigm in July 2013
- Milton District Hospital
  - In expansion to increase employee capacity from 280 to 565 by 2019
  - TIS completed by Stantec in 2013
- 7400 Derry Road
  - Commercial development at southwest corner of Santa Maria Boulevard at Derry Road
  - TIS completed by LEA Consulting Ltd in September 2017

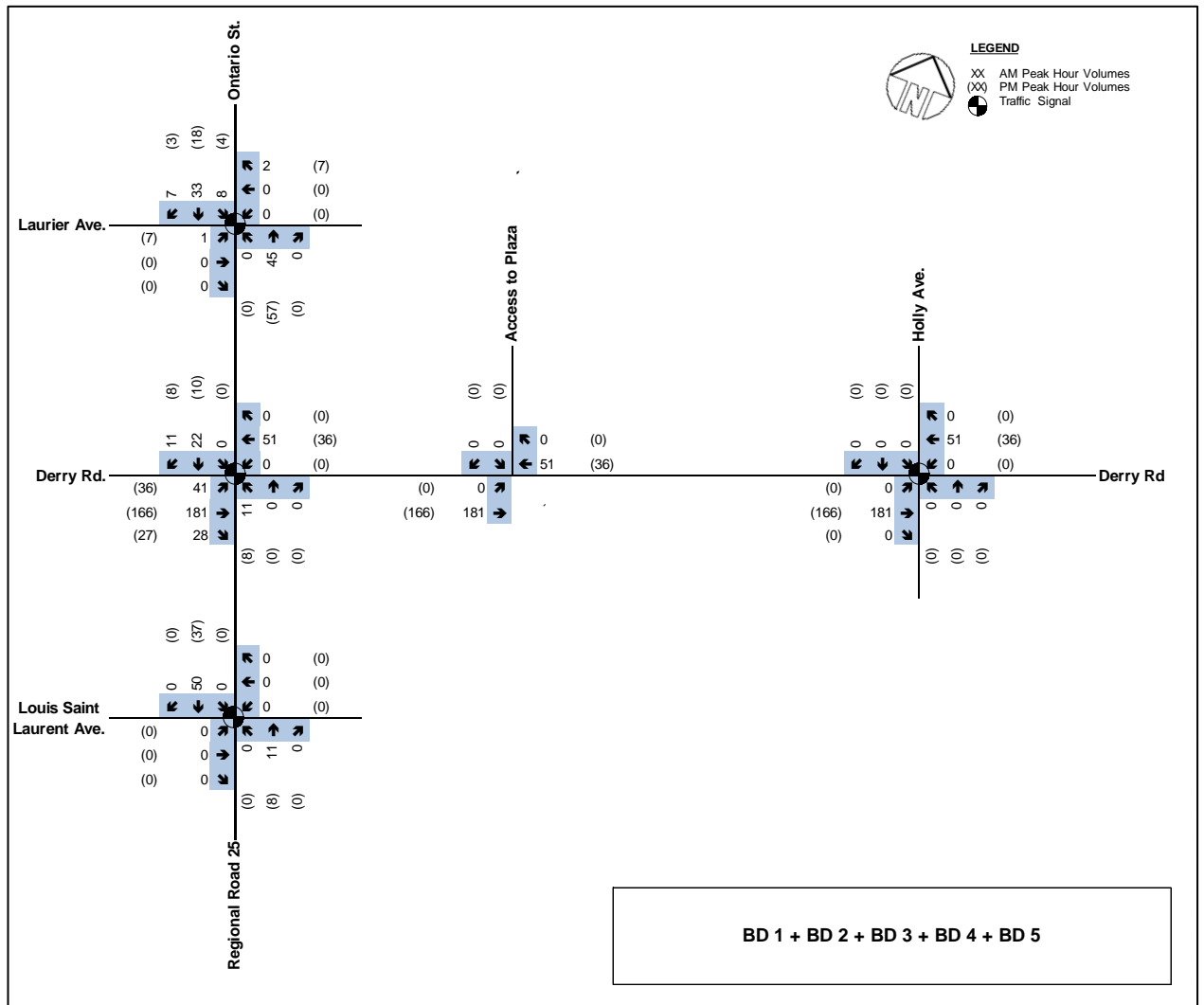
At the direction of Regional staff, site traffic generated by the Boyne Secondary Plan has been considered in the Regional growth rate assumptions provided in section 3.2.

The turning movement diagrams for the included background developments are provided in **Appendix C**.

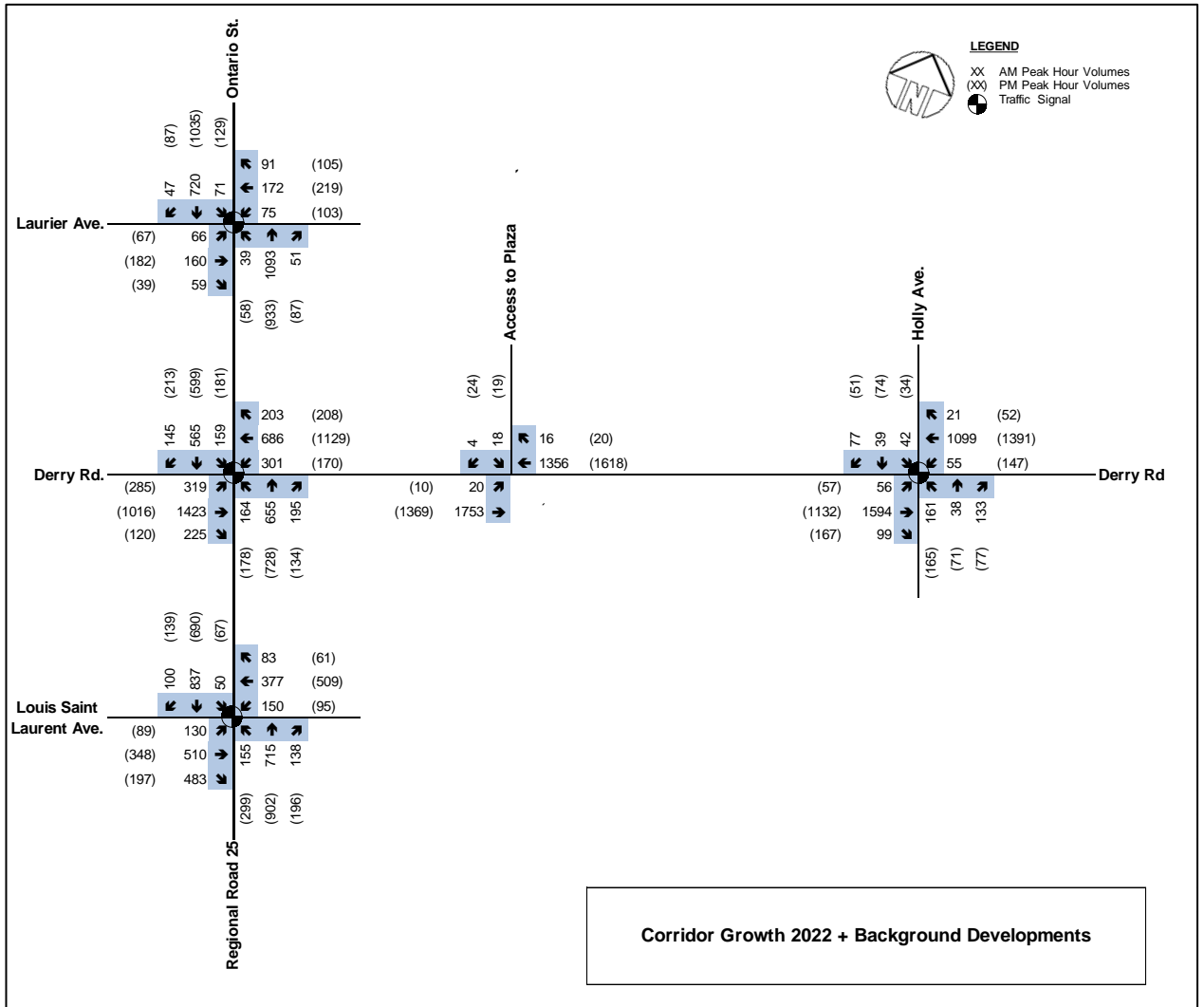
### 3.4 Background Traffic Volumes

The forecasted corridor growth and background development traffic were combined to produce the background weekday a.m. and p.m. peak hour traffic volumes for both five and ten-year planning horizons.

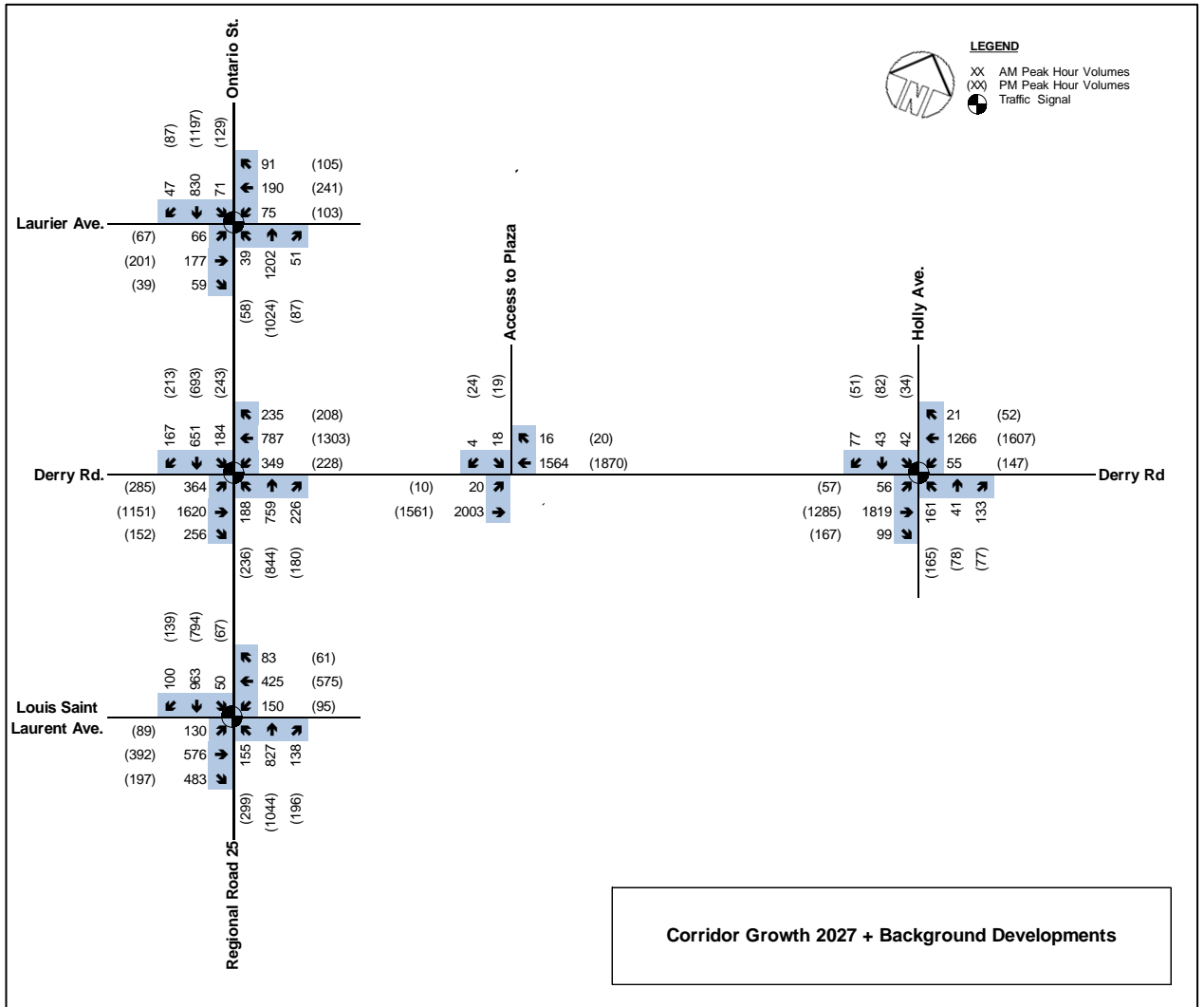
The 2022 (No corridor growth rate) 2022, 2027 and 2031 future background traffic volumes are presented in **Figure 8, Figure 9, Figure 10 and Figure 11** respectively.



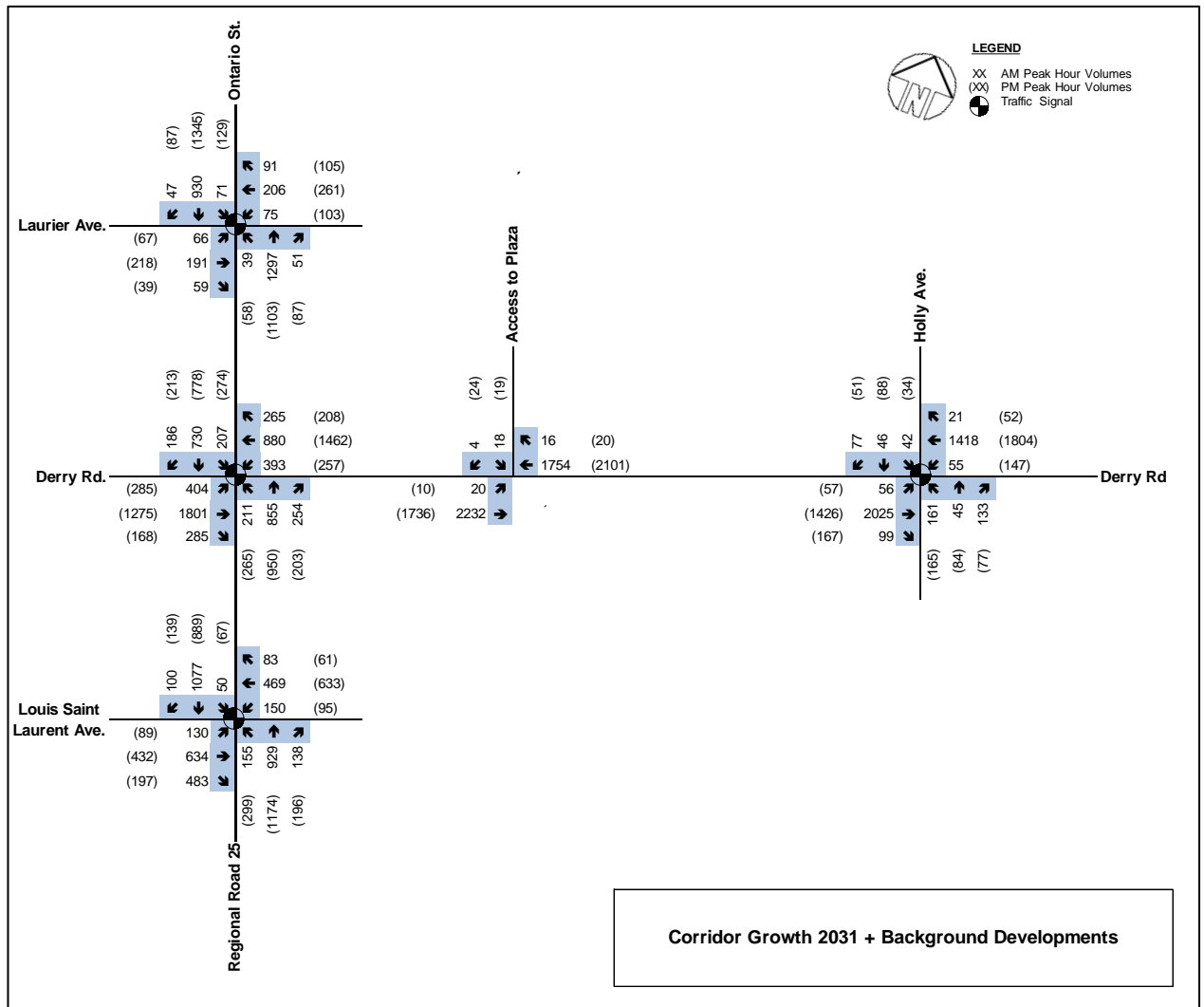
**Figure 8 2022 Future Background Traffic Volumes (No corridor growth)**



**Figure 9 2022 Future Background Traffic Volumes**



**Figure 10 2027 Future Background Volumes**



**Figure 11 2031 Future Background Traffic Volumes**

## 4. Proposed Development

### 4.1 Site Trip Generation

The proposed site plan consists of three high-rise residential condominium buildings with a total unit count of 614 condominium units, 34 3-storey townhouse units, and the proposed 27 stacked townhouse units.

The Institute of Transportation Engineer's (ITE) Trip Generation Manual (10th Edition) was utilized to develop the subject site trip estimates, using ITE Land Use Code #222 for multi-family high-rise housing, #221 for multi-family mid-rise housing and #220 for multi-family low-rise housing. Based on the previously approved study, the 10<sup>th</sup> Edition of the Trip Generation Manual was used for the trip generation of the 614 units of high-rise multi-use family housing and 34 units of mid-rise multi-use family housing. The 11<sup>th</sup> Edition of the Trip Generation Manual was used to generate trips for the 27



proposed stacked townhouse units. No transit modal split was assumed. For a conservative measure, the higher values between the average rate and the equation were used.

The resultant trip rates, entering and exiting proportions, and estimated total site trips are summarized in **Table 1** below.

**Table 1 Site Trip Generation**

Land Use	Parameter	AM			PM		
		In	Out	Total	In	Out	Total
614 units of Multi-Family Housing (High-Rise)	Gross Rate	0.07	0.24	0.31	0.22	0.14	0.36
	New Trips	44	139	183	129	83	212
34 units of Multi-Family Housing (Mid-Rise)	Gross Rate	0.09	0.26	0.35	0.29	0.18	0.47
	New Trips	3	9	12	10	6	16
27 units of Multi-Family Housing (Low-Rise)	Gross Rate	0.09	0.28	0.37	0.24	0.15	0.39
	New Trips	7	24	31	20	12	32
<b>Overall Site</b>	<b>Total New Trips</b>	<b>54</b>	<b>172</b>	<b>226</b>	<b>159</b>	<b>101</b>	<b>260</b>

## 4.2 Site Directional Distribution and Assignment

Trips generated by the proposed development were distributed to the roadway system based on 2016 Transportation Tomorrow Survey (TTS) data, which is provided in **Appendix D**. As requested, GHD has undertaken the analysis for two site access configurations on Derry Road: full moves and right-in/right-out.

The distribution of trips between the two accesses (Derry Road and Regional Road 25), and for both scenarios for the Derry Road access (full moves and right-in/right-out) are provided in **Table 3**.

**Table 2 Site Access Distribution**

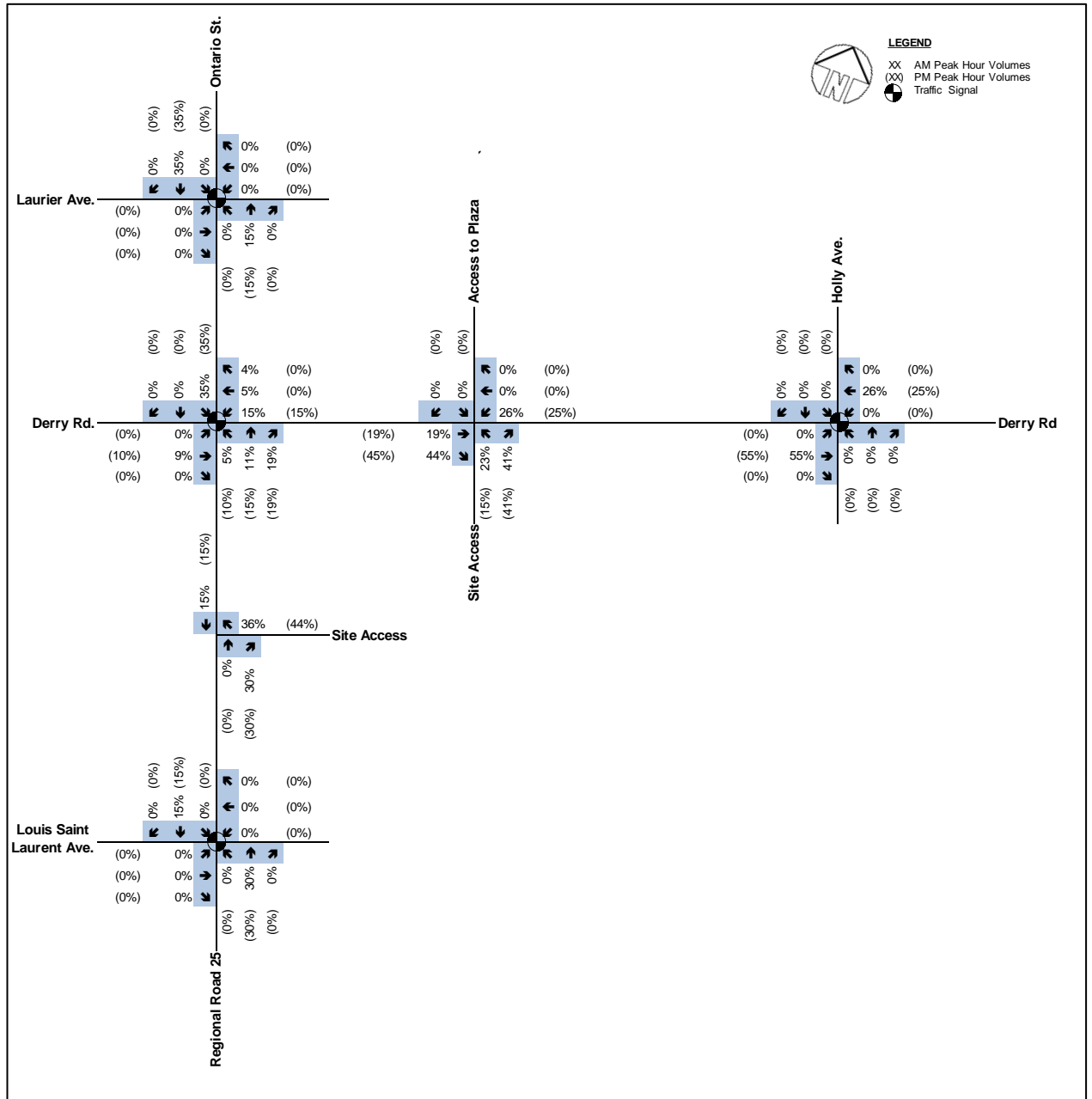
Access Configuration	Trip Orientation	Percent Distribution			
		AM Peak Hour		PM Peak Hour	
		In	Out	In	Out
Full Moves	<b>To / From the North</b> Via Ontario Street	35%	15%	35%	15%
	<b>To / From the South</b> Via Ontario Street	30%	20%	30%	20%
	<b>To / From the East</b> Via Derry Street	25%	55%	25%	55%
	<b>To / From the West</b> Via Derry Street	10%	10%	10%	10%
Right-in/Right-out	<b>To / From the North</b> Via Ontario Street	50%	15%	50%	15%
	<b>To / From the South</b> Via Ontario Street	41%	0%	40%	0%



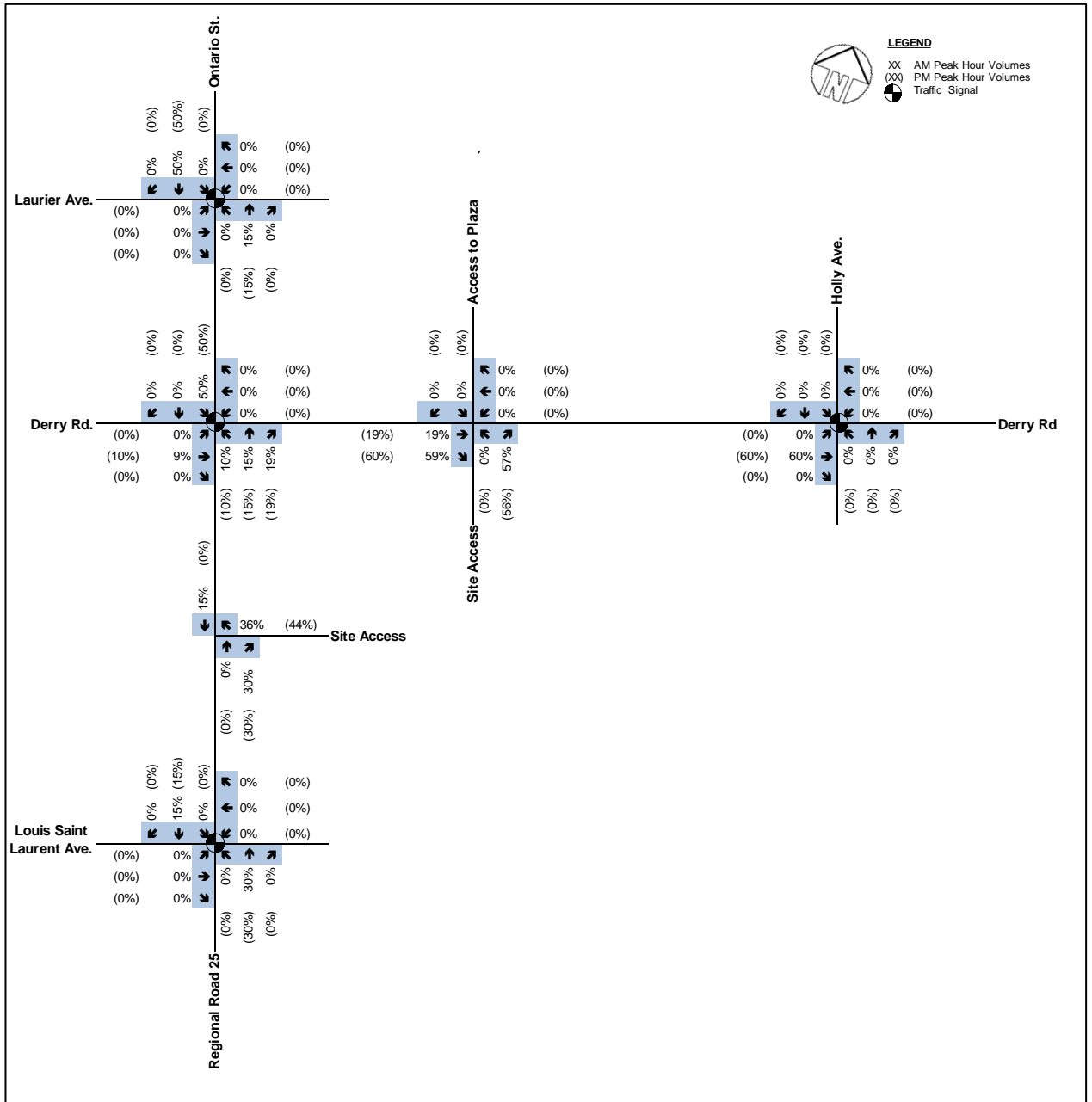


Access Configuration	Trip Orientation	Percent Distribution			
		AM Peak Hour		PM Peak Hour	
		In	Out	In	Out
	<b>To / From the East</b> Via Derry Street	0%	75%	0%	75%
	<b>To / From the West</b> Via Derry Street	9%	10%	10%	10%

The percentage of site trips assigned to each turning movement within the study area network, based on the trip distributions above, are presented in **Figure 12** and **Figure 13** for the full moves and right-in/right-out scenarios, respectively.



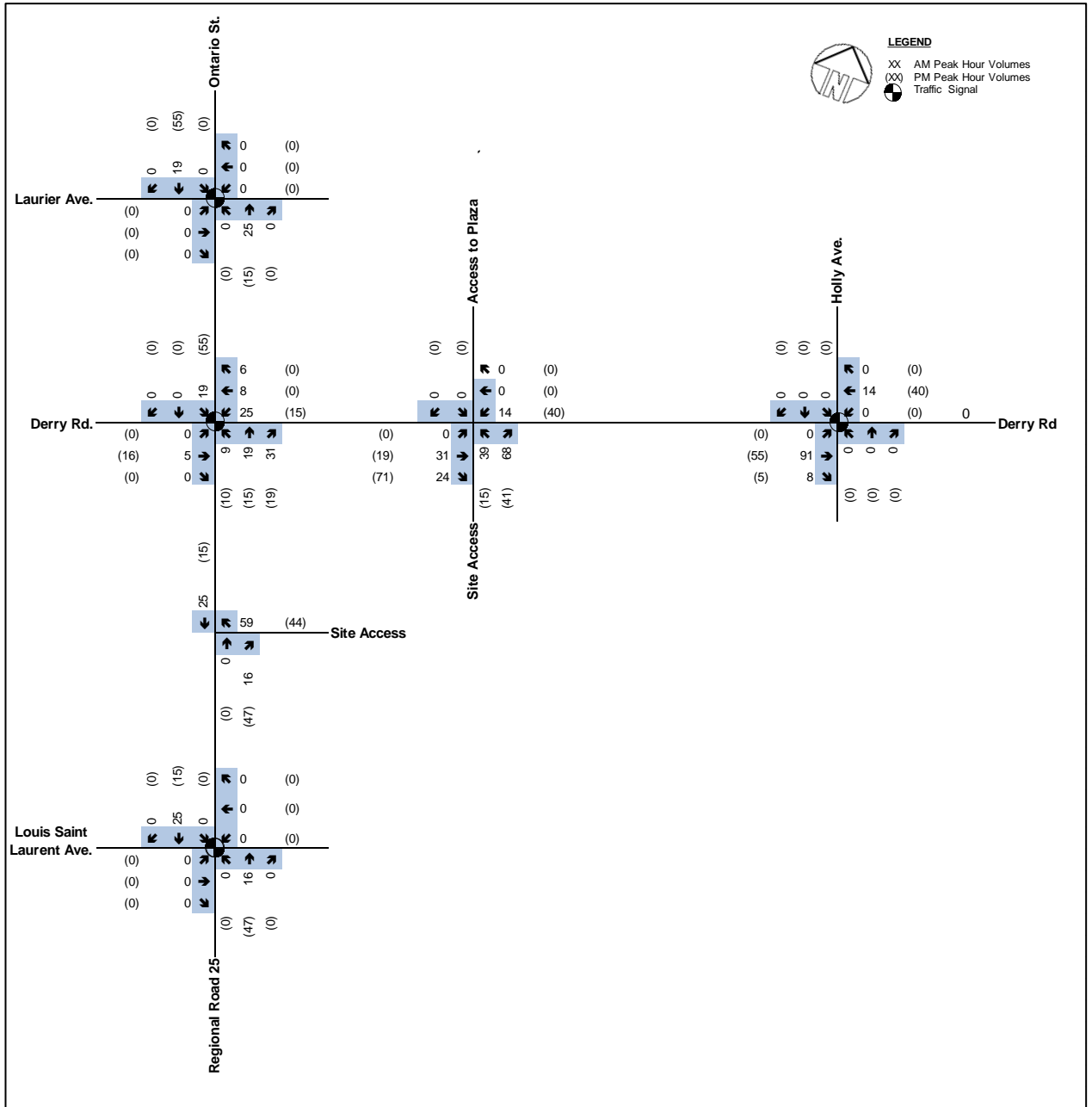
**Figure 12 Site Trip Assignment (Full Moves)**



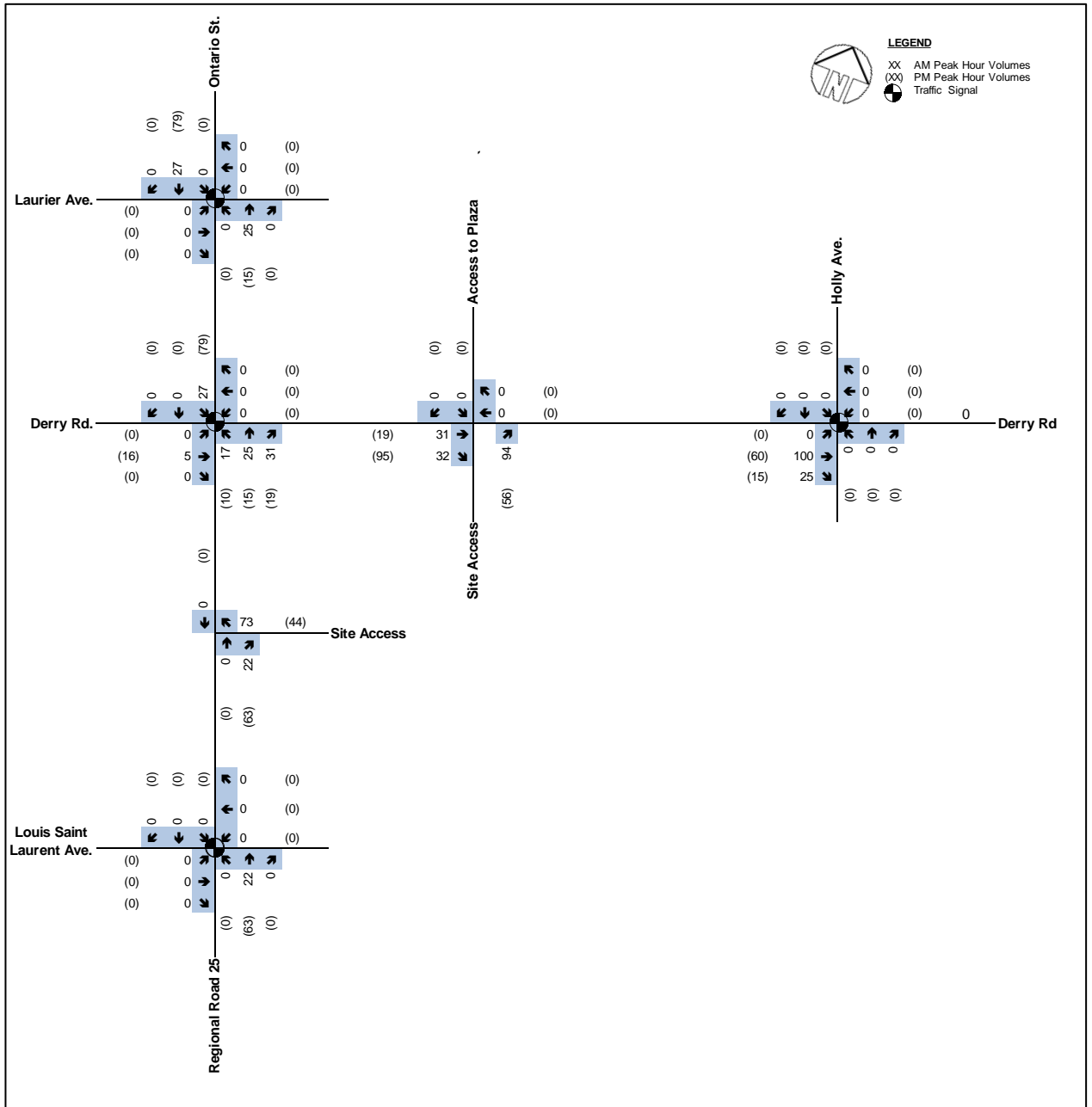
**Figure 13 Site Trip Assignment (Right-in/Right-out)**



The estimated total site trips generated by the proposed development as assigned to the nearby road network for the full moves and right-in/right-out access scenarios are illustrated in **Figure 14** and **Figure 15**, respectively.



**Figure 14 Estimated Site Trips (East access full movement)**



**Figure 15 Estimated Site Trips (East access Right-In/Right-Out)**



## 5. Future Total Traffic

The future total traffic conditions for the peak study hours was derived by combining the projected future background traffic with the corresponding estimate of the total site generated traffic.

Figures 16, Figure 17, Figure 18, Figure 19 and Figure 20 summarize the future total traffic volumes at the 2022 (No corridor growth rate), 2022, 2027, 2031 and 2031 (Right-In/Right-Out) planning horizons, respectively, during the weekday a.m. and p.m. peak hours.

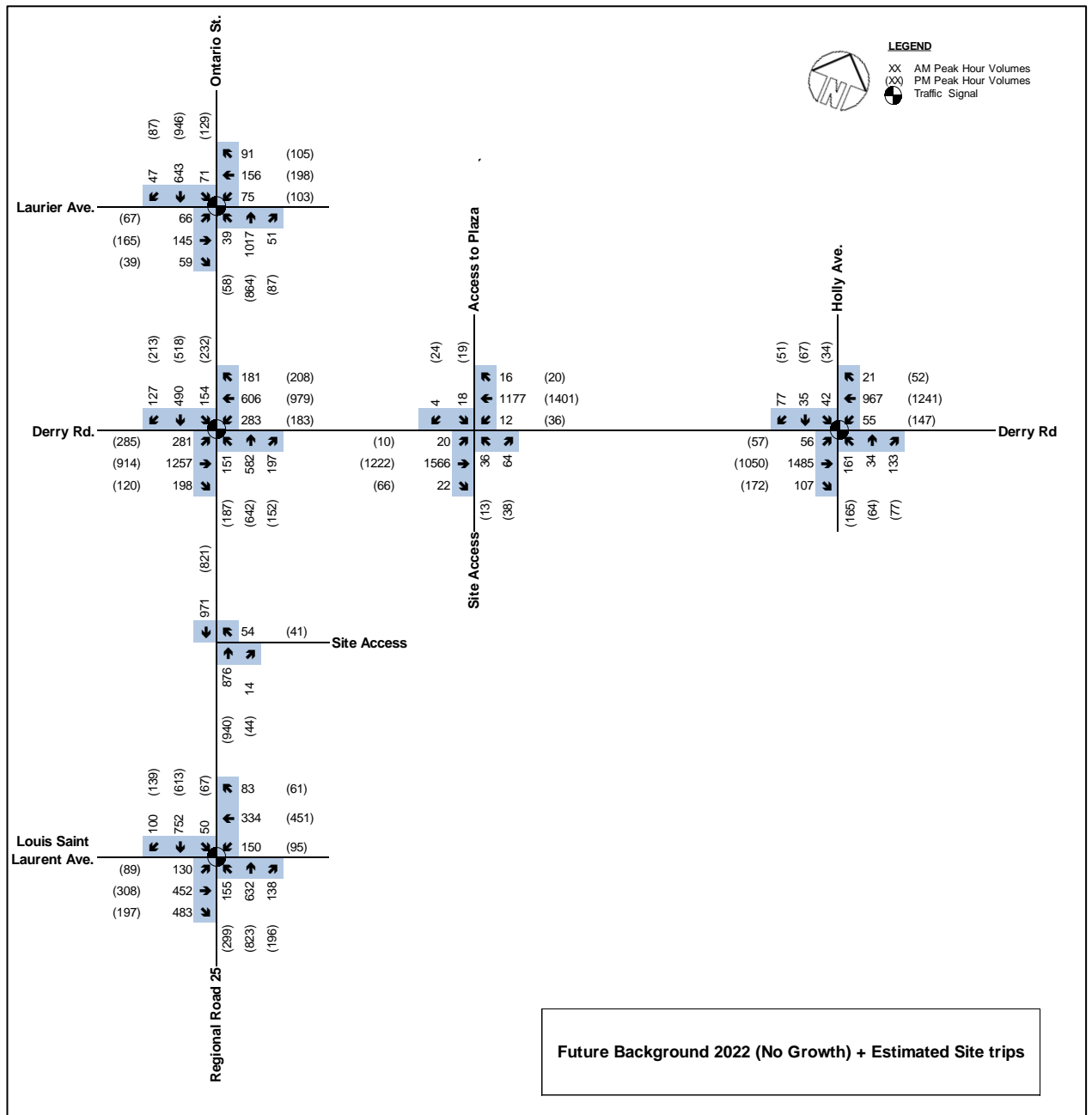
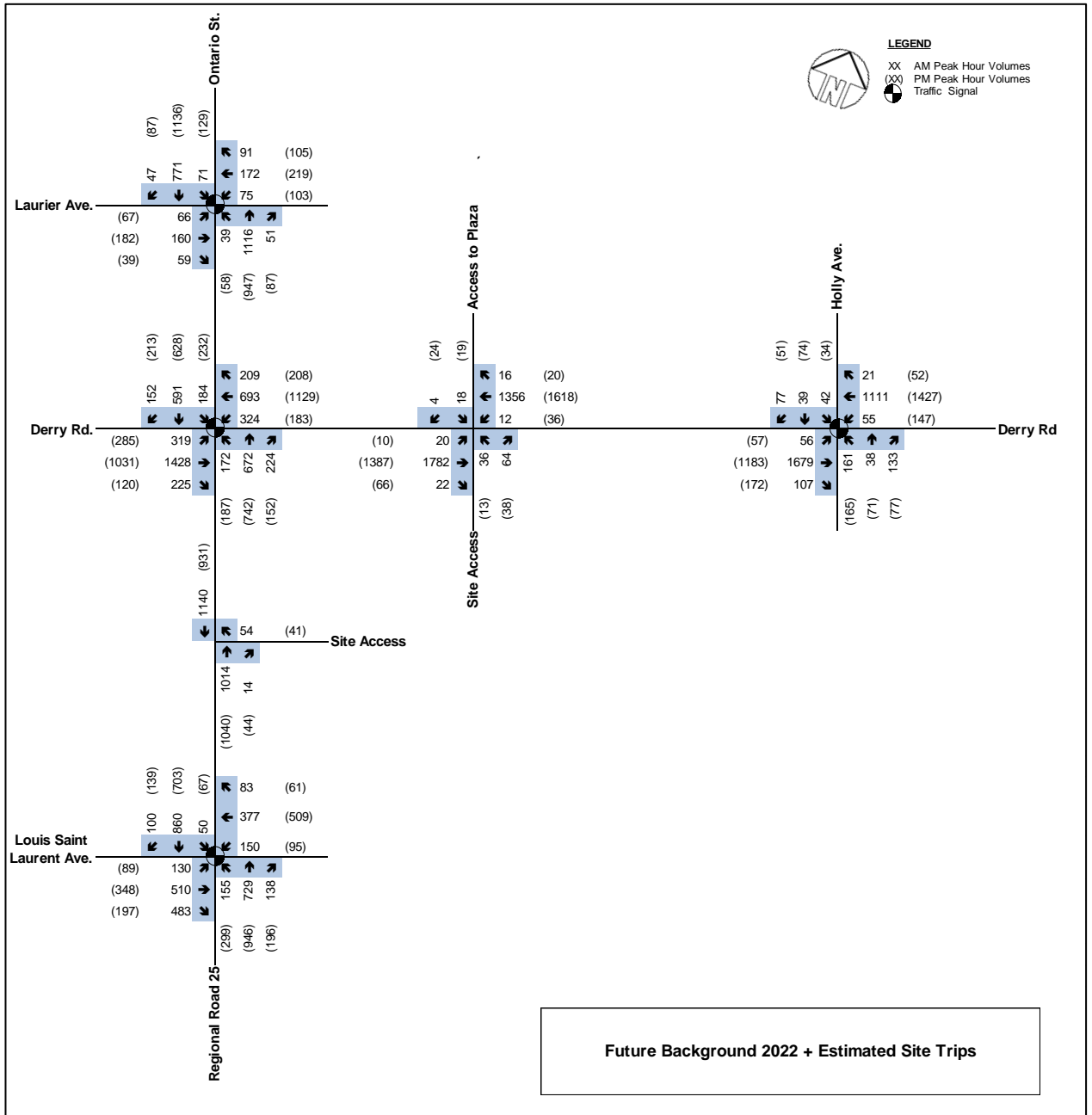
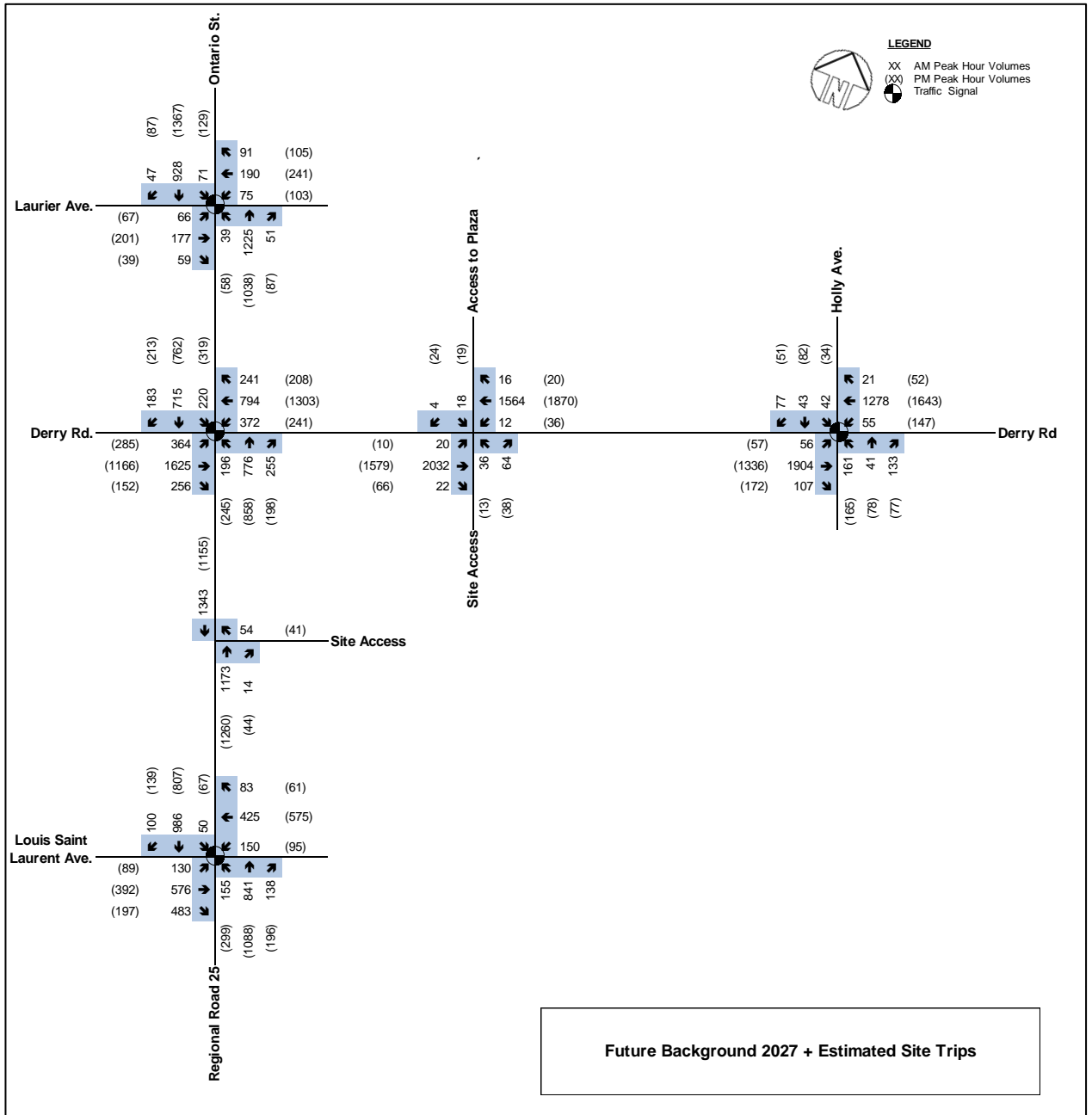


Figure 16 2022 Future Total Traffic (No corridor growth)

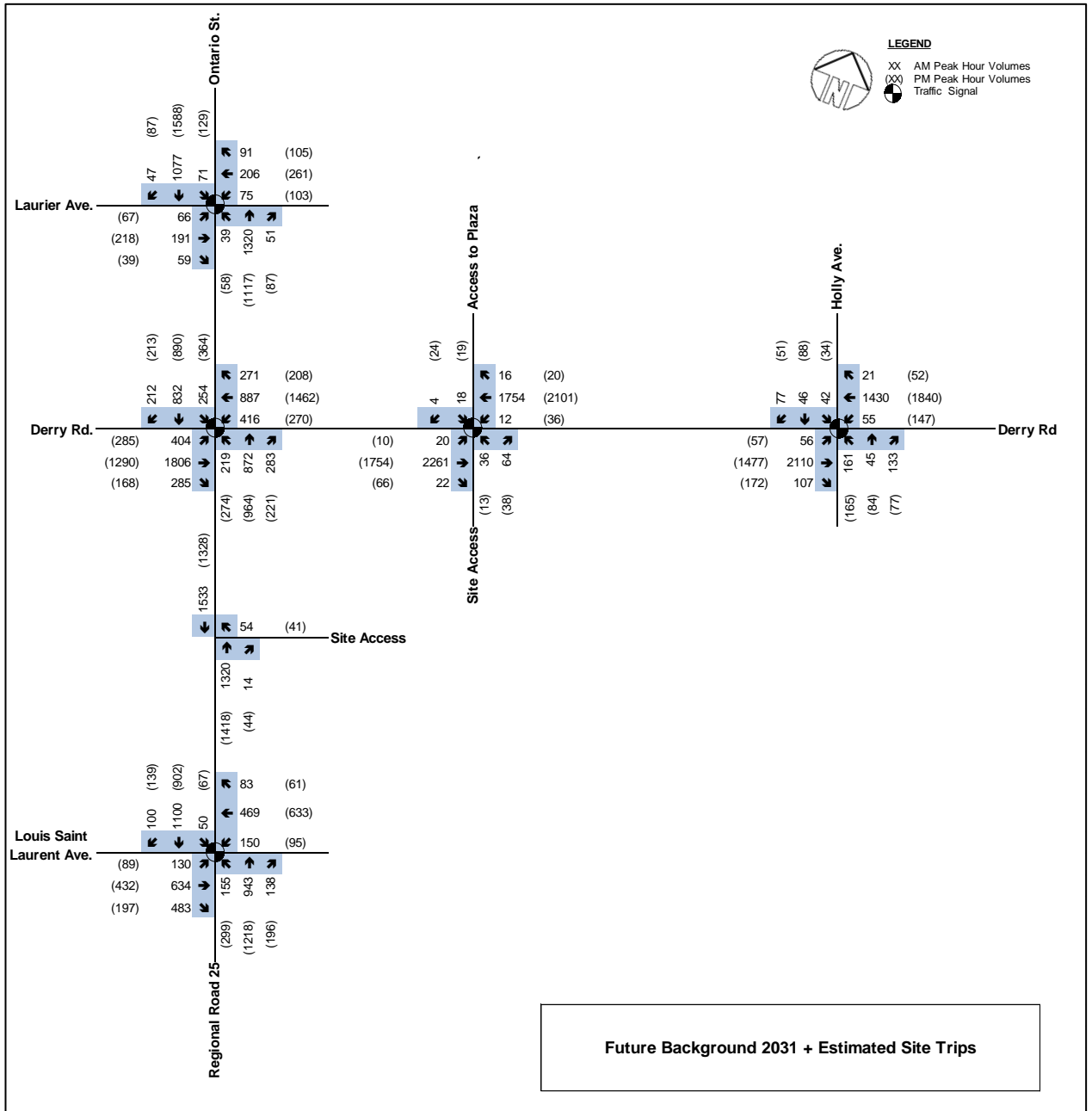


**Figure 17 2022 Future Total Traffic**

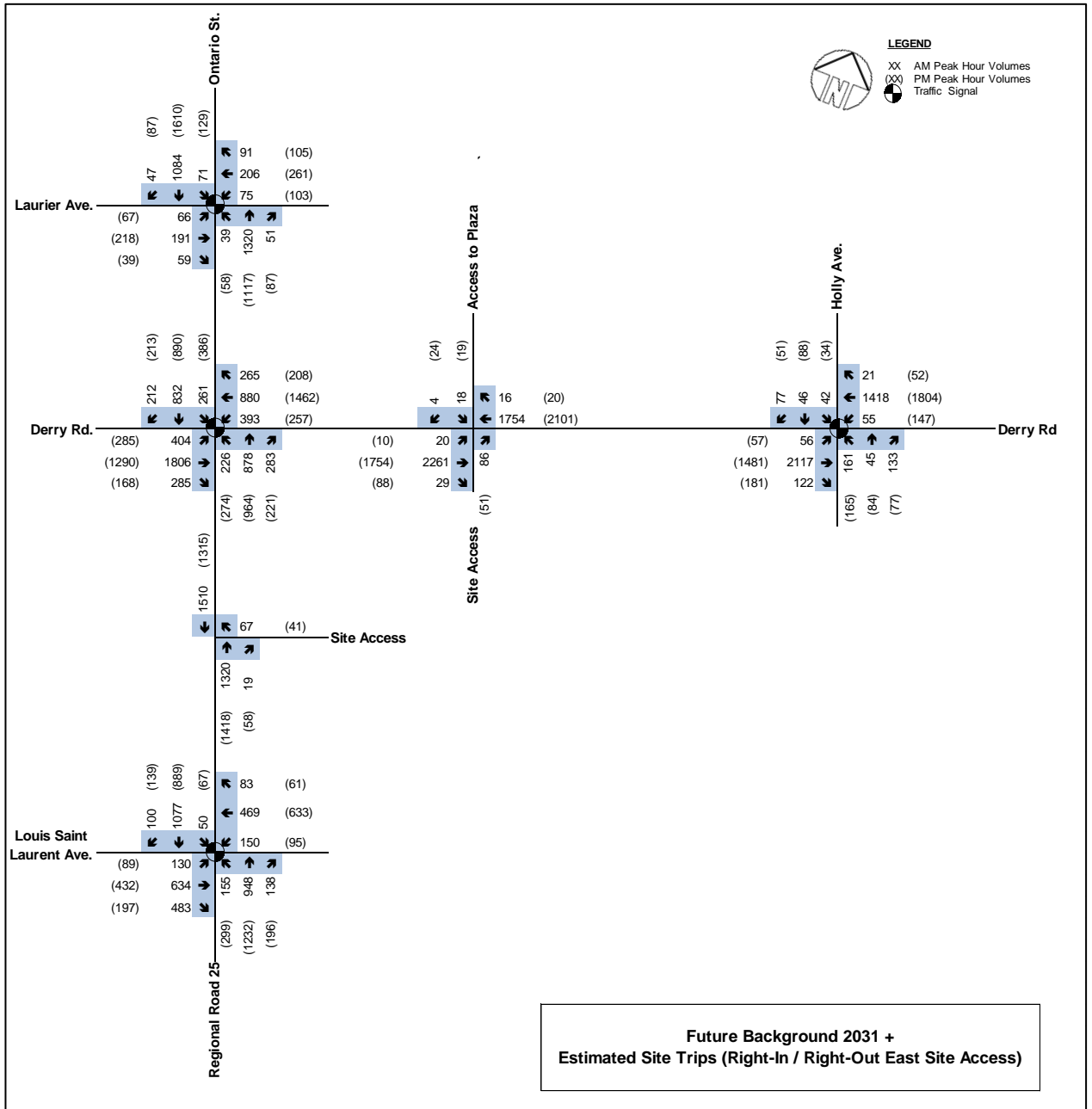


**Figure 18 2027 Future Total Traffic**





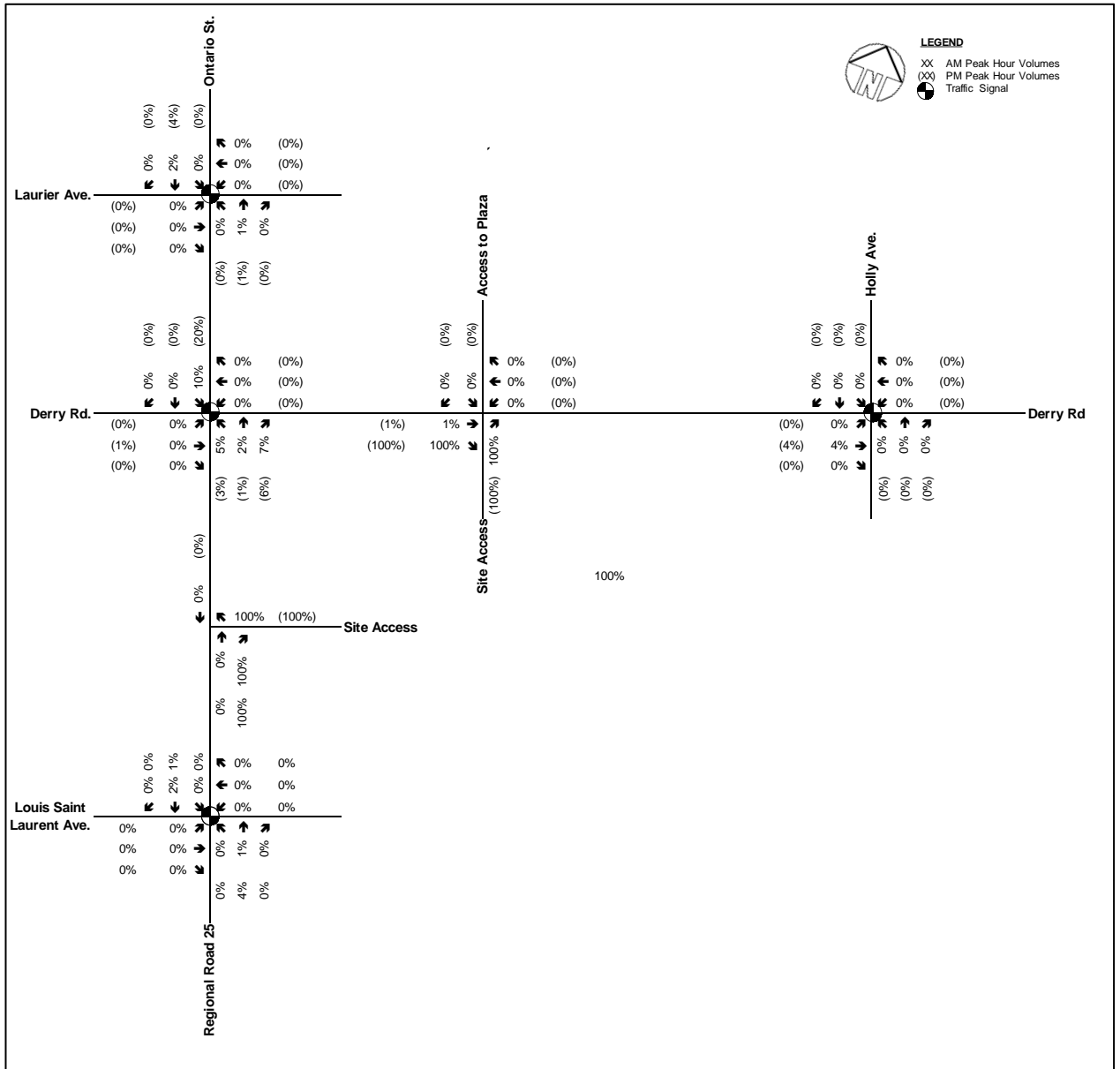
**Figure 19 2031 Future Total Traffic**



**Figure 20 2031 Future Total Traffic (Right-In/Right-Out)**



To communicate the impact, from a traffic volume perspective, that the subject site is expected to have on the surrounding study area intersections and specific turning movements, **Figure 21** illustrates the proportion of traffic that the site generated traffic assumes for each turning movement in the 2031 horizon year.



**Figure 21 Site Trip Proportion of 2031 Future Total Traffic**



## 6. Capacity Analysis

### 6.1 Methodology

The capacity analysis identifies how well the intersections and driveways are operating. The analysis contained within this report utilizes the Highway Capacity Manual (HCM) 2000 techniques within the Synchro Software package. The reported intersection volume-to-capacity ratios (v/c) are a measure of the saturation volume for each turning movement, while the levels-of-service (LOS) are a measure of the average delay for each turning movement. Queuing characteristics are reported as the predicted 95th percentile queue for each turning movement.

For analysis purposes, ‘critical’ intersection movements are defined as traffic movements where:

1. Volume to capacity (v/c) ratio of through movement or shared through/turning movement increased to 0.85 or above;
2. Volume to capacity (v/c) ratio of an exclusive turning movement increased to 0.95 or above; or
3. Queues for an individual movement are projected to exceed available turning lane storage.

Raw synchro report and incorporated signal timing plans are provided in **Appendix E**. Signal timings were optimized at each horizon year in response to the changing volumes, and are also provided in **Appendix E**.

### 6.2 Ontario Street at Laurier Avenue

**Table 3** presents the findings of the capacity analysis for the intersection of Ontario Street at Laurier Avenue.

**Table 3 Capacity Analysis for Ontario Street at Laurier Avenue**

Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que	
Existing 2017	<u>Overall = 0.49 (B)</u>		<u>Overall = 0.50 (B)</u>		
	EBL = 0.48 (C)	<b>EBL = 25 m</b>	EBL = 0.51 (D)	<b>EBL = 25 m</b>	EBL = 15 m
	EBTR = 0.53 (C)	EBTR = 50 m	EBTR = 0.49 (C)	EBTR = 50 m	EBTR = 80 m
	WBL = 0.46 (C)	WBL = 25 m	WBL = 0.53 (D)	WBL = 35 m	WBL = 35 m
	WBTR = 0.65 (D)	WBTR = 55 m	WBTR = 0.72 (D)	WBTR = 75 m	WBTR = 245 m
	NBL = 0.08 (A)	NBL = 10 m	NBL = 0.19 (A)	NBL = 15 m	NBL = 15 m
	NBTR = 0.44 (A)	NBTR = 65 m	NBTR = 0.39 (A)	NBTR = 60 m	NBTR = 180 m
	SBL = 0.22 (A)	SBL = 15 m	SBL = 0.37 (A)	SBL = 30 m	SBL = 40 m
	SBTR = 35 m	SBTR = 0.42 (A)	SBTR = 70 m	SBTR = 590 m	
Future Background 2022 – No corridor growth	<u>Overall = 0.51 (B)</u>		<u>Overall = 0.49 (B)</u>		
	EBL = 0.46 (C)	EBL = 25 m	EBL = 0.57 (D)	EBL = 25 m	EBL = 15 m
	EBTR = 0.51 (C)	EBTR = 45 m	EBTR = 0.48 (C)	EBTR = 50 m	EBTR = 80 m
	WBL = 0.43 (C)	WBL = 25 m	WBL = 0.52 (D)	WBL = 35 m	WBL = 35 m
	WBTR = 0.64 (D)	WBTR = 55 m	WBTR = 0.73 (D)	WBTR = 75 m	WBTR = 245 m
	NBL = 0.09 (A)	NBL = 10 m	NBL = 0.17 (A)	NBL = 10 m	NBL = 15 m
	NBTR = 0.51 (B)	NBTR = 90 m	NBTR = 0.39 (A)	NBTR = 60 m	NBTR = 180 m
					SBL = 40 m



Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que.	
	SBL = 0.18 (A) SBTR = 0.29 (A)	SBL = 10 m SBTR = 35 m	SBL = 0.37 (A) SBTR = 0.41 (A)	SBL = 25 m SBTR = 60 m	SBTR = 590 m
Future Total 2022 – No corridor growth	<u>Overall = 0.52 (B)</u> EBL = 0.46 (C) EBTR = 0.51 (C) WBL = 0.43 (C) WBTR = 0.64 (D) NBL = 0.09 (A) NBTR = 0.53 (B) SBL = 0.17 (A) SBTR = 0.29 (A)	<b>EBL = 25 m</b> EBTR = 45 m WBL = 25 m WBTR = 55 m NBL = 10 m NBTR = 90 m SBL = 10 m SBTR = 35 m	<u>Overall = 0.50 (B) 15</u> EBL = 0.57 (D) EBTR = 0.48 (C) WBL = 0.52 (D) WBTR = 0.73 (D) NBL = 0.18 (A) NBTR = 0.4 (A) SBL = 0.37 (A) SBTR = 0.43 (A)	<b>EBL = 25 m</b> EBTR = 50 m WBL = 35 m WBTR = 75 m NBL = 15 m NBTR = 60 m SBL = 25 m SBTR = 65 m	EBL = 15 m EBTR = 80 m WBL = 35 m WBTR = 245 m NBL = 15 m NBTR = 180 m SBL = 40 m SBTR = 590 m
Future Background 2022	<u>Overall = 0.56 (B)</u> EBL = 0.47 (C) EBTR = 0.54 (C) WBL = 0.44 (C) WBTR = 0.66 (D) NBL = 0.1 (A) NBTR = 0.57 (B) SBL = 0.19 (A) SBTR = 0.33 (A)	EBL = 25 m EBTR = 50 m WBL = 25 m WBTR = 60 m NBL = 10 m NBTR = 100 m SBL = 10 m SBTR = 45 m	<u>Overall = 0.54 (B)</u> EBL = 0.59 (D) EBTR = 0.5 (C) WBL = 0.52 (D) WBTR = 0.75 (D) NBL = 0.21 (A) NBTR = 0.43 (A) SBL = 0.42 (B) SBTR = 0.47 (A)	EBL = 25 m EBTR = 55 m WBL = 35 m WBTR = 80 m NBL = 15 m NBTR = 65 m SBL = 30 m SBTR = 75 m	EBL = 15 m EBTR = 80 m WBL = 35 m WBTR = 245 m NBL = 15 m NBTR = 180 m SBL = 40 m SBTR = 590 m
Future Total 2022	<u>Overall = 0.57 (B)</u> EBL = 0.46 (C) EBTR = 0.54 (C) WBL = 0.43 (C) WBTR = 0.66 (D) NBL = 0.1 (A) NBTR = 0.59 (B) SBL = 0.19 (A) SBTR = 0.34 (A)	<b>EBL = 25 m</b> EBTR = 50 m WBL = 25 m WBTR = 60 m NBL = 10 m NBTR = 105 m SBL = 10 m SBTR = 45 m	<u>Overall = 0.56 (B)</u> EBL = 0.6 (D) EBTR = 0.5 (C) WBL = 0.52 (D) WBTR = 0.75 (D) NBL = 0.23 (A) NBTR = 0.44 (A) SBL = 0.43 (B) SBTR = 0.5 (A)	<b>EBL = 25 m</b> EBTR = 55 m WBL = 35 m WBTR = 80 m NBL = 15 m NBTR = 65 m SBL = 30 m SBTR = 80 m	EBL = 15 m EBTR = 80 m WBL = 35 m WBTR = 245 m NBL = 15 m NBTR = 180 m SBL = 40 m SBTR = 590 m
Future Background 2027	<u>Overall = 0.61 (B)</u> EBL = 0.47 (C) EBTR = 0.56 (C) WBL = 0.43 (C) WBTR = 0.68 (D) NBL = 0.11 (A) NBTR = 0.63 (B) SBL = 0.22 (A) SBTR = 0.38 (A)	EBL = 20 m EBTR = 50 m WBL = 25 m WBTR = 60 m NBL = 10 m NBTR = 120 m SBL = 10 m SBTR = 55 m	<u>Overall = 0.61 (B)</u> EBL = 0.62 (D) EBTR = 0.53 (C) WBL = 0.53 (C) WBTR = 0.78 (D) NBL = 0.27 (B) NBTR = 0.48 (A) SBL = 0.48 (B) SBTR = 0.55 (A)	EBL = 30 m EBTR = 60 m WBL = 35 m WBTR = 90 m NBL = 15 m NBTR = 75 m SBL = 35 m SBTR = 90 m	EBL = 15 m EBTR = 80 m WBL = 35 m WBTR = 245 m NBL = 15 m NBTR = 180 m SBL = 40 m SBTR = 590 m
Future Total 2027	<u>Overall = 0.62 (B)</u> EBL = 0.47 (C) EBTR = 0.56 (C) WBL = 0.44 (C) WBTR = 0.68 (D) NBL = 0.11 (A)	<b>EBL = 20 m</b> EBTR = 50 m WBL = 25 m WBTR = 60 m NBL = 10 m	<u>Overall = 0.63 (B)</u> EBL = 0.62 (D) EBTR = 0.53 (C) WBL = 0.53 (C) WBTR = 0.77 (D) NBL = 0.3 (B)	<b>EBL = 30 m</b> EBTR = 60 m WBL = 35 m WBTR = 85 m NBL = 15 m	EBL = 15 m EBTR = 80 m WBL = 35 m WBTR = 245 m NBL = 15 m NBTR = 180 m



Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que.	
	NBTR = 0.65 (B) SBL = 0.22 (A) SBTR = 0.39 (A)	NBTR = 120 m SBL = 10 m SBTR = 55 m	NBTR = 0.48 (A) SBL = 0.49 (B) SBTR = 0.57 (B)	NBTR = 75 m SBL = 35 m SBTR = 95 m	SBL = 40 m SBTR = 590 m
Future Background 2031 (includes RR25 & Derry Road Widening)	<u>Overall: 0.66 (B)</u> EBL: 0.47 (C) EBTR: 0.57 (C) WBL: 0.43 (C) WBTR: 0.70 (D) NBL: 0.12 (B) NBTR: 0.69 (B) SBL: 0.25 (A) SBTR: 0.43 (A)	<b>EBL: 21 m</b> EBTR: 53 m WBL: 22 m WBTR: 63 m NBL: 10 m NBTR: 130 m SBL: 9 m SBTR: 62 m	<u>Overall: 0.67 (B)</u> EBL: 0.66 (D) EBTR: 0.55 (C) WBL: 0.54 (C) WBTR: 0.80 (D) NBL: 0.35 (B) NBTR: 0.51 (A) SBL: 0.55 (B) SBTR: 0.62 (B)	<b>EBL: 30 m</b> EBTR: 63 m WBL: 33 m WBTR: 92 m <b>NBL: 16 m</b> NBTR: 80 m SBL: 38 m SBTR: 107 m	EBL = 15 m EBTR = 80 m WBL = 35 m WBTR = 245 m NBL = 15 m NBTR = 180 m SBL = 40 m SBTR = 590 m
Future Total 2031 – Signalized East Site Access	<u>Overall = 0.66 (B)</u> EBL = 0.47 (C) EBTR = 0.57 (C) WBL = 0.43 (C) WBTR = 0.69 (D) NBL = 0.13 (B) NBTR = 0.7 (B) SBL = 0.25 (A) SBTR = 0.44 (A)	<b>EBL = 20 m</b> EBTR = 55 m WBL = 25 m WBTR = 65 m NBL = 10 m NBTR = 135 m SBL = 10 m SBTR = 65 m	<u>Overall = 0.68 (B)</u> EBL = 0.66 (D) EBTR = 0.55 (C) WBL = 0.54 (C) WBTR = 0.8 (D) NBL = 0.39 (B) NBTR = 0.52 (A) SBL = 0.57 (B) SBTR = 0.64 (B)	<b>EBL = 30 m</b> EBTR = 65 m WBL = 35 m WBTR = 95 m <b>NBL = 20 m</b> NBTR = 85 m SBL = 40 m SBTR = 115 m	EBL = 15 m EBTR = 80 m WBL = 35 m WBTR = 245 m NBL = 15 m NBTR = 180 m SBL = 40 m SBTR = 590 m
Future Total 2031 - Right-In / Right-Out East Site Access	<u>Overall = 0.66 (B)</u> EBL = 0.47 (C) EBTR = 0.57 (C) WBL = 0.43 (C) WBTR = 0.69 (D) NBL = 0.13 (B) NBTR = 0.7 (B) SBL = 0.25 (A) SBTR = 0.44 (A)	<b>EBL = 20 m</b> EBTR = 55 m WBL = 25 m WBTR = 65 m NBL = 10 m NBTR = 135 m SBL = 10 m SBTR = 65 m	<u>Overall = 0.69 (B)</u> EBL = 0.66 (D) EBTR = 0.55 (C) WBL = 0.54 (C) WBTR = 0.8 (D) NBL = 0.41 (B) NBTR = 0.52 (A) SBL = 0.57 (B) SBTR = 0.65 (B)	<b>EBL = 30 m</b> EBTR = 65 m WBL = 35 m WBTR = 95 m <b>NBL = 20 m</b> NBTR = 85 m SBL = 40 m SBTR = 120 m	EBL = 15 m EBTR = 80 m WBL = 35 m WBTR = 245 m NBL = 15 m NBTR = 180 m SBL = 40 m SBTR = 590 m

Under existing conditions all movements are currently operating well with substantial reserve capacity, acceptable levels of delay, and no critical queuing concerns other than the eastbound left-turn movement reporting a 95<sup>th</sup> percentile queues nominally above the storage length.

Under 2022 future background conditions, with and without corridor growth, and added traffic from background developments, the intersections is still expected to operating generally well. With added site traffic under the 2022 future total conditions, the expected change in operations is nominal, with any change not expected to be identifiable from the driver’s perspective.

Under 2027 future background conditions with further corridor growth, the expected change in operations is nominal, with any change not expected to be identifiable from the driver’s perspective. However with added site traffic under the 2027 future total conditions, the expected change in operations is nominal, with any change not expected to be identifiable from the driver’s perspective.



Given the land constraints of the immediate area, geometric improvements resulting in additional intersection capacity are not recommended at this time. However, it is recommended the Town continue to monitor this intersection to assess when, and if, this intersection nears capacity. The utilized growth rates as instructed by the Town may not occur consistently over the entire fourteen year horizon, given future changes in travel patterns due to planned future changes in the surrounding road network, changes in transit modal splits, as well as changes to the wider GTHA area impacting corridor growth rates through the Town of Milton.

Therefore, at this time there is no justification for significant geometric improvements at this intersection based on the results of this Traffic Impact Study, beyond signal timing optimization as necessary. The noted queueing concerns are considered nominal, and the noted future capacity concern for the northbound approach should be monitored.

### 6.3 Ontario Street/Regional Road 25 at Derry Road

**Table 4** presents the findings of the capacity analysis for the intersection of Ontario Street/Regional Road 25 at Derry Road.

**Table 4 Capacity Analysis of Ontario Street/Regional Road 25 at Derry Road**

Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que	
Existing 2017	<u>Overall = 0.74 (D)</u>		<u>Overall = 0.74 (C)</u>		
	EBL = 0.48 (B)	EBL = 50 m	EBL = 0.79 (D)	EBL = 85 m	EBL = 30 m
	EBT = 0.82 (D)	EBT = 155 m	EBT = 0.52 (C)	EBT = 95 m	EBT = 460 m
	EBR = 0.19 (C)	EBR = 30 m	EBR = 0.06 (C)	EBR = 10 m	EBR = 35 m
	WBL = 0.78 (D)	WBL = 110 m	WBL = 0.49 (B)	WBL = 20 m	WBL = 35 m
	WBT = 0.4 (C)	WBT = 80 m	WBT = 0.76 (C)	WBT = 145 m	WBT = 670 m
	WBR = 0.12 (D)	WBR = 25 m	WBR = 0.23 (B)	WBR = 30 m	WBR = 45 m
	NBL = 0.48 (C)	NBL = 35 m	NBL = 0.67 (C)	NBL = 40 m	NBL = 70 m
	NBT = 0.69 (D)	NBT = 80 m	NBT = 0.7 (D)	NBT = 95 m	NBT = 1500 m
	NBR = 0.11 (C)	NBR = 15 m	NBR = 0.1 (C)	NBR = 15 m	NBR = 70 m
	SBL = 0.51 (C)	SBL = 35 m	SBL = 0.63 (C)	SBL = 45 m	SBL = 30 m
	SBTR = 0.74 (D)	SBTR = 80 m	SBTR = 0.78 (D)	SBTR = 105 m	SBTR = 180 m
Future Background 2022 – No corridor growth	<u>Overall = 0.77 (D)</u>		<u>Overall = 0.73 (C)</u>		
	EBL = 0.54 (B)	EBL = 50 m	EBL = 0.78 (D)	EBL = 110 m	EBL = 30 m
	EBT = <b>0.87</b> (D)	EBT = 200 m	EBT = 0.63 (C)	EBT = 125 m	EBT = 460 m
	EBR = 0.22 (C)	EBR = 35 m	EBR = 0.08 (C)	EBR = 10 m	EBR = 35 m
	WBL = 0.78 (D)	WBL = 90 m	WBL = 0.49 (B)	WBL = 20 m	WBL = 35 m
	WBT = 0.4 (C)	WBT = 85 m	WBT = 0.79 (D)	WBT = 140 m	WBT = 670 m
	WBR = 0.11 (D)	WBR = 25 m	WBR = 0.21 (B)	WBR = 20 m	WBR = 45 m
	NBL = 0.55 (C)	NBL = 35 m	NBL = 0.6 (C)	NBL = 40 m	NBL = 70 m
	NBT = 0.64 (D)	NBT = 75 m	NBT = 0.57 (D)	NBT = 75 m	NBT = 1500 m
	NBR = 0.11 (C)	NBR = 15 m	NBR = 0.09 (C)	NBR = 15 m	NBR = 70 m
	SBL = 0.53 (C)	SBL = 35 m	SBL = 0.6 (C)	SBL = 40 m	SBL = 30 m
	SBTR = 0.75 (D)	SBTR = 85 m	SBTR = 0.75 (D)	SBTR = 95 m	SBTR = 180 m



Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que	
Future Total 2022 – No corridor growth	<u>Overall = 0.80 (D)</u>		<u>Overall = 0.75 (D)</u>		
	EBL = 0.55 (B)	EBL = 55 m	EBL = 0.78 (D)	EBL = 110 m	EBL = 30 m
	EBT = <b>0.94</b> (D)	EBT = 210 m	EBT = 0.65 (C)	EBT = 130 m	EBT = 460 m
	EBR = 0.22 (C)	EBR = 35 m	EBR = 0.09 (C)	EBR = 15 m	EBR = 35 m
	WBL = 0.81 (D)	WBL = 100 m	WBL = 0.53 (B)	WBL = 35 m	WBL = 35 m
	WBT = 0.43 (C)	WBT = 85 m	WBT = 0.8 (D)	WBT = 140 m	WBT = 670 m
	WBR = 0.12 (D)	WBR = 25 m	WBR = 0.23 (C)	WBR = 40 m	WBR = 45 m
	NBL = 0.53 (C)	NBL = 35 m	NBL = 0.63 (C)	NBL = 40 m	NBL = 70 m
	NBT = 0.62 (D)	NBT = 80 m	NBT = 0.64 (D)	NBT = 85 m	NBT = 1500 m
	NBR = 0.13 (C)	NBR = 20 m	NBR = 0.1 (C)	NBR = 15 m	NBR = 70 m
	SBL = 0.6 (C)	SBL = 40 m	SBL = 0.74 (D)	SBL = 50 m	SBL = 30 m
SBTR = 0.75 (D)	SBTR = 85 m	SBTR = 0.74 (D)	SBTR = 95 m	SBTR = 180 m	
Future Background 2022	<u>Overall = <b>0.89</b> (D)</u>		<u>Overall = 0.81 (D)</u>		
	EBL = 0.68 (C)	EBL = 60 m	EBL = 0.84 (D)	EBL = 120 m	EBL = 30 m
	EBT = <b>1.06</b> (E)	EBT = 240 m	EBT = 0.77 (D)	EBT = 160 m	EBT = 460 m
	EBR = 0.27 (C)	EBR = 40 m	EBR = 0.09 (C)	EBR = 15 m	EBR = 35 m
	WBL = 0.9 (D)	WBL = 120 m	WBL = 0.59 (C)	WBL = 35 m	WBL = 35 m
	WBT = 0.51 (C)	WBT = 95 m	WBT = <b>0.96</b> (D)	WBT = 185 m	WBT = 670 m
	WBR = 0.16 (D)	WBR = 30 m	WBR = 0.26 (C)	WBR = 25 m	WBR = 45 m
	NBL = 0.66 (C)	NBL = 40 m	NBL = 0.61 (C)	NBL = 35 m	NBL = 70 m
	NBT = 0.68 (D)	NBT = 90 m	NBT = 0.63 (C)	NBT = 90 m	NBT = 1500 m
	NBR = 0.13 (C)	NBR = 20 m	NBR = 0.09 (C)	NBR = 15 m	NBR = 70 m
	SBL = 0.64 (C)	SBL = 40 m	SBL = 0.61 (C)	SBL = 35 m	SBL = 30 m
SBTR = 0.79 (D)	SBTR = 100 m	SBTR = 0.77 (D)	SBTR = 100 m	SBTR = 180 m	
Future Total 2022	<u>Overall = <b>0.91</b> (D)</u>		<u>Overall = 0.82 (D)</u>		
	EBL = 0.68 (C)	EBL = 60 m	EBL = 0.87 (E)	EBL = 120 m	EBL = 30 m
	EBT = <b>1.08</b> (F)	EBT = 240 m	EBT = 0.77 (D)	EBT = 160 m	EBT = 460 m
	EBR = 0.27 (C)	EBR = 40 m	EBR = 0.09 (C)	EBR = 15 m	EBR = 35 m
	WBL = <b>0.96</b> (E)	WBL = 130 m	WBL = 0.62 (C)	WBL = 40 m	WBL = 35 m
	WBT = 0.52 (C)	WBT = 100 m	WBT = <b>0.91</b> (D)	WBT = 175 m	WBT = 670 m
	WBR = 0.16 (D)	WBR = 30 m	WBR = 0.24 (C)	WBR = 35 m	WBR = 45 m
	NBL = 0.67 (C)	NBL = 40 m	NBL = 0.67 (C)	NBL = 40 m	NBL = 70 m
	NBT = 0.69 (D)	NBT = 95 m	NBT = 0.68 (D)	NBT = 95 m	NBT = 1500 m
	NBR = 0.15 (C)	NBR = 20 m	NBR = 0.1 (C)	NBR = 15 m	NBR = 70 m
	SBL = 0.74 (D)	SBL = 45 m	SBL = 0.8 (D)	SBL = 55 m	SBL = 30 m
SBTR = 0.8 (D)	SBTR = 100 m	SBTR = 0.77 (D)	SBTR = 105 m	SBTR = 180 m	
Future Background 2027	<u>Overall = <b>1.03</b> (E)</u>		<u>Overall = <b>0.95</b> (D)</u>		
	EBL = 0.88 (D)	EBL = 100 m	EBL = <b>1.08</b> (F)	EBL = 130 m	EBL = 30 m
	EBT = <b>1.23</b> (F)	EBT = 290 m	EBT = <b>0.94</b> (D)	EBT = 190 m	EBT = 460 m
	EBR = 0.33 (C)	EBR = 50 m	EBR = 0.15 (C)	EBR = 25 m	EBR = 35 m
	WBL = <b>1.15</b> (F)	WBL = 145 m	WBL = 0.79 (D)	WBL = 80 m	WBL = 35 m
	WBT = 0.63 (D)	WBT = 115 m	WBT = <b>1.03</b> (E)	WBT = 220 m	WBT = 670 m
	WBR = 0.22 (D)	WBR = 40 m	WBR = 0.25 (B)	WBR = 20 m	WBR = 45 m
NBL = 0.77 (D)	NBL = 55 m	NBL = 0.86 (D)	NBL = 75 m	NBL = 70 m	





Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que.	
	NBT = 0.72 (D) NBR = 0.15 (C) SBL = 0.79 (D) SBTR = <b>0.86</b> (D)	NBT = 105 m NBR = 20 m SBL = 45 m SBTR = 120 m	NBT = 0.71 (D) NBR = 0.12 (C) SBL = 0.86 (D) SBTR = 0.8 (D)	NBT = 110 m NBR = 15 m SBL = 65 m SBTR = 120 m	NBT = 1500 m NBR = 70 m SBL = 30 m SBTR = 180 m
Future Total 2027	<u>Overall = <b>1.06</b> (E)</u> EBL = 0.9 (D) EBT = <b>1.21</b> (F) EBR = 0.32 (C) WBL = 1.25 (F) WBT = 0.61 (C) WBR = 0.22 (D) NBL = 0.82 (D) NBT = 0.75 (D) NBR = 0.18 (C) SBL = 0.9 (E) SBTR = <b>0.87</b> (D)	EBL = 95 m EBT = 290 m EBR = 50 m WBL = 160 m WBT = 110 m WBR = 40 m NBL = 60 m NBT = 110 m NBR = 20 m SBL = 60 m SBTR = 120 m	<u>Overall = <b>1.09</b> (D)</u> EBL = <b>1.11</b> (F) EBT = <b>0.96</b> (E) EBR = 0.11 (C) WBL = 0.81 (D) WBT = <b>1.01</b> (E) WBR = 0.24 (B) NBL = 0.91 (E) NBT = 0.73 (D) NBR = 0.15 (C) SBL = <b>1.1</b> (F) SBTR = 0.81 (D)	EBL = 130 m EBT = 195 m EBR = 20 m WBL = 85 m WBT = 215 m WBR = 30 m NBL = 80 m NBT = 110 m NBR = 20 m SBL = 100 m SBTR = 120 m	EBL = 30 m EBT = 460 m EBR = 35 m WBL = 35 m WBT = 670 m WBR = 45 m NBL = 70 m NBT = 1500 m NBR = 70 m SBL = 30 m SBTR = 180 m
Future Background 2031 (includes RR25 & Derry Road Widening)	<u>Overall: 0.95 (D)</u> EBL: 0.87 (C) EBT: <b>0.95</b> (D) EBR: 0.37 (C) WBL: <b>1.14</b> (F) WBT: 0.49 (C) WBR: 0.28 (D) NBL: 0.84 (D) NBT: 0.62 (D) NBR: 0.16 (C) SBL: 0.89 (D) SBTR: 0.72 (D)	EBL: 113 m EBT: 182 m EBR: 53 m WBL: 169 m WBT: 80 m WBR: 47 m NBL: 59 m NBT: 74 m NBR: 18 m SBL: 61 m SBTR: 79 m	<u>Overall: 0.89 (D)</u> EBL: 0.82 (F) EBT: 0.70 (F) EBR: 0.18 (C) WBL: 0.72 (D) WBT: 0.80 (F) WBR: 0.23 (B) NBL: <b>0.95</b> (F) NBT: 0.64 (D) NBR: 0.19 (C) SBL: <b>1.00</b> (F) SBTR: 0.69 (D)	EBL: 121 m EBT: 117 m EBR: 27 m WBL: 81 m WBT: 135 m WBR: 19 m NBL: 84 m NBT: 77 m NBR: 21 m SBL: 83 m SBTR: 80 m	EBL = 30 m EBT = 460 m EBR = 35 m WBL = 35 m WBT = 670 m WBR = 45 m NBL = 70 m NBT = 1500 m NBR = 70 m SBL = 30 m SBTR = 180 m
Future Total 2031 – Signalized East Site Access	<u>Overall = <b>0.99</b> (D)</u> EBL = 0.87 (C) EBT = <b>0.98</b> (D) EBR = 0.38 (C) WBL = <b>1.15</b> (F) WBT = 0.49 (C) WBR = 0.27 (D) NBL = 0.82 (D) NBT = 0.63 (D) NBR = 0.18 (C) SBL = <b>0.99</b> (F) SBTR = 0.76 (D)	EBL = 100 m EBT = 190 m EBR = 55 m WBL = 170 m WBT = 80 m WBR = 45 m NBL = 70 m NBT = 80 m NBR = 20 m SBL = 70 m SBTR = 85 m	<u>Overall = <b>0.88</b> (D)</u> EBL = 0.87 (D) EBT = 0.78 (D) EBR = 0.19 (C) WBL = 0.83 (D) WBT = <b>0.89</b> (D) WBR = 0.25 (C) NBL = 0.88 (D) NBT = 0.68 (D) NBR = 0.15 (C) SBL = 0.92 (E) SBTR = 0.61 (D)	EBL = 105 m EBT = 125 m EBR = 30 m WBL = 95 m WBT = 155 m WBR = 30 m NBL = 75 m NBT = 85 m NBR = 20 m SBL = 100 m SBTR = 80 m	EBL = 30 m EBT = 460 m EBR = 35 m WBL = 35 m WBT = 670 m WBR = 45 m NBL = 70 m NBT = 1500 m NBR = 70 m SBL = 30 m SBTR = 180 m



Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que	
Future Total 2031 - Right-In / Right-Out East Site Access	<u>Overall = 1.00 (D)</u>		<u>Overall = 0.89 (D)</u>		
	EBL = 0.87 (C)	EBL = 100 m	EBL = 0.87 (D)	EBL = 105 m	EBL = 30 m
	EBT = 0.98 (D)	EBT = 190 m	EBT = 0.77 (D)	EBT = 125 m	EBT = 460 m
	EBR = 0.38 (C)	EBR = 55 m	EBR = 0.18 (C)	EBR = 30 m	EBR = 35 m
	WBL = 1.08 (F)	WBL = 155 m	WBL = 0.81 (D)	WBL = 85 m	WBL = 35 m
	WBT = 0.48 (C)	WBT = 80 m	WBT = 0.89 (D)	WBT = 155 m	WBT = 670 m
	WBR = 0.26 (D)	WBR = 45 m	WBR = 0.25 (C)	WBR = 30 m	WBR = 45 m
	NBL = 0.85 (D)	NBL = 70 m	NBL = 0.88 (D)	NBL = 75 m	NBL = 70 m
	NBT = 0.63 (D)	NBT = 80 m	NBT = 0.68 (D)	NBT = 85 m	NBT = 1500 m
	NBR = 0.18 (C)	NBR = 20 m	NBR = 0.15 (C)	NBR = 20 m	NBR = 70 m
	SBL = 1.03 (F)	SBL = 75 m	SBL = 0.99 (E)	SBL = 115 m	SBL = 30 m
SBTR = 0.76 (D)	SBTR = 85 m	SBTR = 0.61 (D)	SBTR = 80 m	SBTR = 180 m	
Recommended Future Total 2031- Signalized East Site Access (RR25 & Derry Road Widening) - Dual WB Left Turn Lanes	<u>Overall: 0.84 (D)</u>		<u>Overall: 0.87 (D)</u>		
	EBL: 0.83 (C)	EBL: 89 m	EBL: 0.86 (D)	EBL: 106 m	EBL = 30 m
	EBT: 0.89 (D)	EBT: 190 m	EBT: 0.70 (D)	EBT: 122 m	EBT = 460 m
	EBR: 0.35 (C)	EBR: 55 m	EBR: 0.17 (C)	EBR: 28 m	EBR = 35 m
	WBL: 0.67 (C)	WBL: 56 m	WBL: 0.51 (C)	WBL: 19 m	WBL = 35 m
	WBT: 0.49 (D)	WBT: 84 m	WBT: 0.90 (D)	WBT: 155 m	WBT = 670 m
	WBR: 0.23 (E)	WBR: 46 m	WBR: 0.25 (D)	WBR: 47 m	WBR = 45 m
	NBL: 0.91 (E)	NBL: 72 m	NBL: 0.88 (D)	NBL: 75 m	NBL = 70 m
	NBT: 0.72 (D)	NBT: 83 m	NBT: 0.68 (D)	NBT: 85 m	NBT = 1500 m
	NBR: 0.18 (D)	NBR: 21 m	NBR: 0.15 (C)	NBR: 17 m	NBR = 70 m
	SBL: 0.91 (E)	SBL: 74 m	SBL: 0.91 (D)	SBL: 97 m	SBL = 30 m
SBTR: 0.75 (D)	SBTR: 84 m	SBTR: 0.61 (D)	SBTR: 79 m	SBTR = 180 m	

Under existing conditions all movements are currently operating generally well with reserve capacity and acceptable levels of delay. Some queueing concerns are identified however, with the eastbound and southbound left-turn movements reporting 95<sup>th</sup> percentile queues above the storage length during both peak hours, and a more noticeable queueing concern for the westbound left-turn movement during the a.m. peak hour.

By 2022 future background conditions, with no corridor growth, the intersection is expected to operating generally well. With added site traffic under the 2022 future total conditions, the eastbound through movement is nearing capacity during the a.m. peak hour. This is shown with a reported v/c ratio of 0.87 which increases with the addition of site traffic to a reported v/c ratio of 0.93.

Under 2022 future total condition, with additional corridor growth and site traffic from the subject development added to the intersection for all future scenarios, the operational impact of the added site traffic is expected to have a nominal impact, although operations for the eastbound through and westbound left-turn movements will continue to worsen with the added site traffic. This is shown with a reported v/c ratio of 1.06 (EBT) and 0.90 (WBL) increased to a reported v/c ratio of 1.08 (EBR) and 0.96 (WBL).



However it is important to note that the operational impact of the added site traffic from the subject development is not expected to have a significant operational impact on the intersection, as evident in comparing 2022 and 2027 future background conditions to 2022 and 2027 future total conditions. Although the increase in v/c ratios is noticeable, though still nominal, this is primarily a result of the respective movements operating at-capacity under the future background conditions (even small increases in volume to an at-capacity movement can noticeably increase the reported v/c ratio). This is evident with a small addition of 25 (a.m.) and 15 (p.m.) site trips being added into the road network for the westbound left-turning movement.

Capacity analysis of the future 2027 background and total traffic conditions shows significant delays in the eastbound and westbound through movements as a result of the higher through volumes. While the eastbound and westbound left turns are also showing at capacity conditions, GHD does not recommend any intersection improvements ahead of the widening of Derry Road. As identified in the future 2031 background traffic analysis, it is expected that with Derry Road at six lanes, changes to the signal timings will be sufficient to mitigate the capacity issues with the left turns.

Under 2031 future background conditions, including the widening of Derry Road to six lanes, the intersection is generally expected to be operating overall with acceptable v/c ratios and delays with the exception of the westbound left turn in the a.m. peak hour and southbound left in the p.m. peak hour.

With site traffic added under future total 2031 traffic conditions, comparison of two different scenarios (east access as a full signalized scenario and right-in/right-out scenarios) to the future background 2031 shows an increase in the a.m. peak hour v/c ratios from 0.95 to 0.99 and 1.00 (signalized and right-in/right-out) and the p.m. peak hour v/c ratio reduced to 0.89 or remaining at 0.89. Most notably, an increase of v/c ratios are experienced by the westbound left-turn movement and southbound left turn movement during the a.m. peak hour and by the southbound left turn movement during the p.m. peak hour. The remainder movements are largely mitigated, but are still nearing or at capacity for several movements in all directions.

The intersection capacity under the 2031 future total traffic scenario can be mitigated by introducing dual left turn lanes for the westbound left turn on Derry Road. Under the 2031 future total volumes conditions, the capacity results with this improvement indicates a noticeable improvement in operations with all movement operating with v/c ratios less than 1.0. The overall intersection v/c ratio is reduced during the a.m. and p.m. peak hour from 1.00 and 0.89, respectively; to a v/c ratio of 0.84 and 0.87.

## **6.4 Regional Road 25 at Louis Saint Laurent Avenue**

**Table 5** presents the findings of the capacity analysis for the intersection of Regional Road 25 at Louis Saint Laurent Avenue.



**Table 5 Capacity Analyses for Regional Road 25 at Louis Saint Laurent Avenue**

Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que.	
Existing 2017	<u>Overall = 0.70 (C)</u> EBL = 0.52 (C) EBTR = 0.73 (D) WBL = <b>0.97 (F)</b> WBTR = 0.34 (C) NBL = 0.52 (C) NBT = 0.34 (B) NBR = 0.1 (B) SBL = 0.14 (B) SBT = 0.38 (B) SBR = 0.07 (B)	EBL = 50 m EBTR = 120 m <b>WBL = 85 m</b> WBTR = 55 m NBL = 50 m NBT = 60 m NBR = 10 m SBL = 15 m SBT = 70 m SBR = 10 m	<u>Overall = 0.66 (C)</u> EBL = 0.78 (E) EBTR = 0.54 (D) WBL = 0.81 (E) WBTR = 0.62 (D) NBL = 0.61 (B) NBT = 0.35 (A) NBR = 0.13 (A) SBL = 0.18 (A) SBT = 0.26 (A) SBR = 0.09 (A)	EBL = 40 m EBTR = 55 m <b>WBL = 45 m</b> WBTR = 70 m <b>NBL = 90 m</b> NBT = 65 m NBR = 10 m SBL = 15 m SBT = 45 m SBR = 10 m	EBL = 50 m EBTR = 700 m WBL = 20 m WBTR = 500 m NBL = 60 m NBT = 1500 m NBR = 60 m SBL = 50 m SBT = 1500 m SBR = 50 m
Future Background 2022 – No corridor growth	<u>Overall = 0.61 (C)</u> EBL = 0.34 (C) EBTR = <b>0.85 (D)</b> WBL = 0.54 (C) WBTR = 0.49 (D) NBL = 0.39 (B) NBT = 0.41 (C) NBR = 0.09 (B) SBL = 0.12 (B) SBT = 0.55 (C) SBR = 0.07 (C)	EBL = 30 m EBTR = 105 m WBL = 35 m WBTR = 55 m NBL = 35 m NBT = 75 m NBR = 15 m SBL = 15 m SBT = 105 m SBR = 5 m	<u>Overall = 0.51 (C)</u> EBL = 0.31 (C) EBTR = 0.59 (D) WBL = 0.31 (C) WBTR = 0.62 (D) NBL = 0.52 (B) NBT = 0.47 (B) NBR = 0.14 (B) SBL = 0.16 (B) SBT = 0.45 (C) SBR = 0.09 (C)	EBL = 25 m EBTR = 60 m WBL = 25 m WBTR = 70 m NBL = 50 m NBT = 85 m NBR = 20 m SBL = 15 m SBT = 75 m SBR = 15 m	EBL = 50 m EBTR = 700 m WBL = 20 m WBTR = 500 m NBL = 60 m NBT = 1500 m NBR = 60 m SBL = 50 m SBT = 1500 m SBR = 50 m
Future Total 2022 – No corridor growth	<u>Overall = 0.63 (C)</u> EBL = 0.33 (C) EBTR = <b>0.86 (D)</b> WBL = 0.57 (C) WBTR = 0.44 (C) NBL = 0.41 (B) NBT = 0.44 (C) NBR = 0.09 (C) SBL = 0.13 (B) SBT = 0.59 (C) SBR = 0.07 (C)	EBL = 30 m EBTR = 110 m <b>WBL = 35 m</b> WBTR = 55 m NBL = 35 m NBT = 85 m NBR = 15 m SBL = 15 m SBT = 110 m SBR = 5 m	<u>Overall = 0.52 (C)</u> EBL = 0.32 (C) EBTR = 0.61 (D) WBL = 0.32 (C) WBTR = 0.63 (D) NBL = 0.53 (B) NBT = 0.48 (B) NBR = 0.14 (B) SBL = 0.17 (B) SBT = 0.43 (C) SBR = 0.09 (B)	EBL = 25 m EBTR = 60 m WBL = 25 m WBTR = 75 m NBL = 50 m NBT = 90 m NBR = 20 m SBL = 15 m SBT = 75 m SBR = 15 m	EBL = 50 m EBTR = 700 m WBL = 20 m WBTR = 500 m NBL = 60 m NBT = 1500 m NBR = 60 m SBL = 50 m SBT = 1500 m SBR = 50 m
Future Background 2022	<u>Overall = 0.66 (C)</u> EBL = 0.35 (C) EBTR = <b>0.87 (D)</b> WBL = 0.57 (C) WBTR = 0.51 (D) NBL = 0.44 (B) NBT = 0.47 (C) NBR = 0.09 (B)	EBL = 30 m EBTR = 115 m WBL = 35 m WBTR = 65 m NBL = 35 m NBT = 90 m NBR = 15 m	<u>Overall = 0.56 (C)</u> EBL = 0.35 (C) EBTR = 0.65 (D) WBL = 0.33 (C) WBTR = 0.66 (D) NBL = 0.55 (B) 14 NBT = 0.52 (C) 20 NBR = 0.16 (B) 16	EBL = 25 m EBTR = 70 m WBL = 25 m WBTR = 80 m NBL = 50 m NBT = 105 m NBR = 20 m	EBL = 50 m EBTR = 700 m WBL = 20 m WBTR = 500 m NBL = 60 m NBT = 1500 m NBR = 60 m



Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que.	
	SBL = 0.14 (B) SBT = 0.63 (C) SBR = 0.07 (C)	SBL = 15 m SBT = 125 m SBR = 5 m	SBL = 0.18 (B) 16 SBT = 0.51 (C) 27 SBR = 0.1 (C) 22	SBL = 15 m SBT = 90 m SBR = 20 m	SBL = 50 m SBT = 1500 m SBR = 50 m
Future Total 2022	<u>Overall = 0.70 (C)</u> EBL = 0.34 (C) EBTR = <b>0.88</b> (D) WBL = 0.62 (C) WBTR = 0.46 (D) NBL = 0.47 (B) NBT = 0.5 (C) NBR = 0.09 (C) SBL = 0.14 (B) SBT = 0.67 (C) SBR = 0.07 (C)	EBL = 30 m EBTR = 125 m <b>WBL = 40 m</b> WBTR = 65 m NBL = 35 m NBT = 100 m NBR = 15 m SBL = 15 m SBT = 135 m SBR = 0 m	<u>Overall = 0.58 (C)</u> EBL = 0.34 (C) EBTR = 0.65 (D) WBL = 0.33 (C) WBTR = 0.66 (D) NBL = 0.58 (B) NBT = 0.56 (C) NBR = 0.16 (B) SBL = 0.19 (B) SBT = 0.51 (C) SBR = 0.11 (C)	EBL = 25 m EBTR = 70 m <b>WBL = 25 m</b> WBTR = 80 m NBL = 50 m NBT = 115 m NBR = 25 m SBL = 15 m SBT = 90 m SBR = 20 m	EBL = 50 m EBTR = 700 m WBL = 20 m WBTR = 500 m NBL = 60 m NBT = 1500 m NBR = 60 m SBL = 50 m SBT = 1500 m SBR = 50 m
Future Background 2027	<u>Overall = 0.73 (C)</u> EBL = 0.37 (C) EBTR = <b>0.89</b> (D) WBL = 0.59 (C) WBTR = 0.53 (D) NBL = 0.51 (B) NBT = 0.55 (C) NBR = 0.09 (B) SBL = 0.16 (B) SBT = 0.73 (C) SBR = 0.07 (C)	EBL = 30 m EBTR = 135 m WBL = 35 m WBTR = 70 m NBL = 35 m NBT = 110 m NBR = 15 m SBL = 15 m SBT = 150 m SBR = 0 m	<u>Overall = 0.63 (C)</u> EBL = 0.36 (C) EBTR = 0.68 (D) WBL = 0.35 (C) WBTR = 0.72 (D) NBL = 0.63 (B) NBT = 0.61 (C) NBR = 0.17 (B) SBL = 0.22 (B) SBT = 0.57 (C) SBR = 0.11 (C)	EBL = 25 m EBTR = 80 m WBL = 25 m WBTR = 90 m NBL = 55 m NBT = 135 m NBR = 25 m SBL = 15 m SBT = 105 m SBR = 20 m	EBL = 50 m EBTR = 700 m WBL = 20 m WBTR = 500 m NBL = 60 m NBT = 1500 m NBR = 60 m SBL = 50 m SBT = 1500 m SBR = 50 m
Future Total 2027	<u>Overall = 0.77 (D)</u> EBL = 0.36 (C) EBTR = <b>0.91</b> (D) WBL = 0.69 (D) WBTR = 0.5 (D) NBL = 0.54 (C) NBT = 0.57 (C) NBR = 0.09 (C) SBL = 0.17 (B) SBT = 0.77 (D) SBR = 0.07 (C)	EBL = 30 m EBTR = 140 m <b>WBL = 50 m</b> WBTR = 70 m NBL = 35 m NBT = 115 m NBR = 15 m SBL = 15 m SBT = 155 m SBR = 0 m	<u>Overall = 0.64 (C)</u> EBL = 0.38 (C) EBTR = 0.68 (D) WBL = 0.35 (C) WBTR = 0.69 (D) NBL = 0.65 (B) NBT = 0.64 (C) NBR = 0.17 (B) SBL = 0.23 (B) SBT = 0.57 (C) SBR = 0.11 (C)	EBL = 25 m EBTR = 80 m <b>WBL = 25 m</b> WBTR = 90 m NBL = 55 m NBT = 145 m NBR = 25 m SBL = 15 m SBT = 110 m SBR = 20 m	EBL = 50 m EBTR = 700 m WBL = 20 m WBTR = 500 m NBL = 60 m NBT = 1500 m NBR = 60 m SBL = 50 m SBT = 1500 m SBR = 50 m
Future Background 2031 (includes RR25 & Derry Road Widening)	<u>Overall: 0.62 (D)</u> EBL: 0.37 (C) EBTR: <b>0.89</b> (D) WBL: 0.59 (C) WBTR: 0.53 (D) NBL: 0.44 (C) NBT: 0.38 (C) NBR: 0.09 (B)	EBL: 31 m EBTR: 134 m <b>WBL: 35 m</b> WBTR: 70 m NBL: 34 m NBT: 68 m NBR: 13 m	<u>Overall: 0.58 (C)</u> EBL: 0.37 (C) EBTR: 0.68 (D) WBL: 0.35 (C) WBTR: 0.74 (D) NBL: 0.65 (B) NBT: 0.49 (C) NBR: 0.14 (B)	EBL: 24 m EBTR: 84 m <b>WBL: 25 m</b> WBTR: 98 m NBL: 57 m NBT: 96 m NBR: 18 m	EBL = 50 m EBTR = 700 m WBL = 20 m WBTR = 500 m NBL = 60 m NBT = 1500 m NBR = 60 m



Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que.	
	SBL: 0.14 (B) SBT: 0.49 (D) SBR: 0.07 (C)	SBL: 13 m SBT: 86 m SBR: <1 veh	SBL: 0.22 (B) SBT: 0.45 (C) SBR: 0.09 (C)	SBL: 14 m SBT: 77 m SBR: 14 m	SBL = 50 m SBT = 1500 m SBR = 50 m
Future Total 2031 – Signalized East Site Access	<u>Overall = 0.70 (C)</u>		<u>Overall = 0.60 (C)</u>		
	EBL = 0.35 (B)	EBL = 30 m	EBL = 0.39 (C)	EBL = 25 m	EBL = 50 m
	EBTR = <b>0.88</b> (D)	EBTR = 125 m	EBTR = 0.66 (D)	EBTR = 75 m	EBTR = 700 m
	WBL = 0.73 (D)	<b>WBL = 45 m</b>	WBL = 0.35 (C)	<b>WBL = 25 m</b>	WBL = 20 m
	WBTR = 0.52 (C)	WBTR = 70 m	WBTR = 0.69 (D)	WBTR = 90 m	WBTR = 500 m
	NBL = 0.55 (C)	NBL = 35 m	NBL = 0.64 (B)	NBL = 55 m	NBL = 60 m
	NBT = 0.49 (C)	NBT = 85 m	NBT = 0.53 (C)	NBT = 100 m	NBT = 1500 m
	NBR = 0.09 (C)	NBR = 15 m	NBR = 0.16 (B)	NBR = 25 m	NBR = 60 m
	SBL = 0.17 (B)	SBL = 15 m	SBL = 0.23 (B)	SBL = 15 m	SBL = 50 m
	SBT = 0.63 (C)	SBT = 105 m	SBT = 0.49 (C)	SBT = 75 m	SBT = 1500 m
SBR = 0.07 (C)	SBR = 10 m	SBR = 0.1 (C)	SBR = 15 m	SBR = 50 m	
Future Total 2031 - Right-In / Right-Out East Site Access	<u>Overall = 0.70 (C)</u>		<u>Overall = 0.60 (C)</u>		
	EBL = 0.35 (B)	EBL = 30 m	EBL = 0.38 (C)	EBL = 25 m	EBL = 50 m
	EBTR = <b>0.88</b> (D)	EBTR = 125 m	EBTR = 0.66 (D)	EBTR = 75 m	EBTR = 700 m
	WBL = 0.72 (D)	<b>WBL = 45 m</b>	WBL = 0.35 (C)	<b>WBL = 25 m</b>	WBL = 20 m
	WBTR = 0.52 (C)	WBTR = 70 m	WBTR = 0.69 (D)	WBTR = 90 m	WBTR = 500 m
	NBL = 0.54 (B)	NBL = 35 m	NBL = 0.63 (B)	NBL = 55 m	NBL = 60 m
	NBT = 0.5 (C)	NBT = 85 m	NBT = 0.54 (C)	NBT = 100 m	NBT = 1500 m
	NBR = 0.09 (C)	NBR = 15 m	NBR = 0.16 (B)	NBR = 25 m	NBR = 60 m
	SBL = 0.17 (B)	SBL = 15 m	SBL = 0.23 (B)	SBL = 15 m	SBL = 50 m
	SBT = 0.62 (C)	SBT = 100 m	SBT = 0.48 (C)	SBT = 75 m	SBT = 1500 m
SBR = 0.07 (C)	SBR = 10 m	SBR = 0.1 (C)	SBR = 15 m	SBR = 50 m	

Under existing conditions, the westbound left-turn movement is expected to have reached capacity during the a.m. peak hour, with notable delay during the p.m. peak hour. All remaining movements are expected to be operating generally well.

By 2022 future background conditions, with no corridor growth, the intersection is expected to operating generally well. With added site traffic under the 2022 future total conditions, the eastbound through-right movement is nearing capacity during the a.m. peak hour, 0.85 v/c ratio increased to a reported v/c ratio of 0.86. Queueing concerns are identified, with the westbound left-turn movement reported 95<sup>th</sup> percentile queues above the storage length during the a.m. peak hour.

Under 2022, with additional corridor growth and/or site traffic from the subject development added to the intersection for all future scenarios, the operational impact of the added site traffic is expected to have a nominal impact. The eastbound through-right movement is nearing capacity during the a.m. peak hour, with a reported v/c ratio of 0.87 during future background conditions, with the addition of the anticipated site traffic an increased v/c ratio of 0.88 is reported.



A comparison of the impacts of the full moves scenario to the right-in/right-out scenario under 2031 future total conditions shows no significant difference in operations.

The utilized growth rates as instructed by the Town/Region may not occur consistently over the entire fourteen-year horizon, given future changes in travel patterns due to planned future changes in the surrounding road network, changes in transit modal splits, as well as changes to the wider GTHA area impacting corridor growth rates through the Town of Milton.

Therefore, at this time there is no justification for significant geometric improvements at this intersection based on the results of this Traffic Impact Study alone.

## 6.5 Derry Road at Holly Avenue

Table 6 presents the findings of the capacity analysis for the intersection of Derry Road at Holly Avenue.

**Table 6 Capacity Analyses for Derry Road at Holly Avenue**

Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que	
Existing 2017	<u>Overall = 0.59 (B)</u> EBL = 0.18 (A) EBTR = 0.56 (A) WBL = 0.3 (A) WBTR = 0.4 (A) NBL = 0.72 (E) NBTR = 0.46 (D) SBL = 0.25 (D) SBTR = 0.16 (D)	EBL = 5 m EBTR = 25 m WBL = 15 m WBTR = 70 m <b>NBL = 60 m</b> NBTR = 45 m SBL = 20 m SBTR = 20 m	<u>Overall = 0.54 (B)</u> EBL = 0.24 (A) EBTR = 0.41 (B) WBL = 0.46 (A) WBTR = 0.49 (A) NBL = 0.72 (E) NBTR = 0.31 (D) SBL = 0.16 (D) SBTR = 0.27 (D)	EBL = 25 m EBTR = 120 m <b>WBL = 40 m</b> WBTR = 100 m <b>NBL = 60 m</b> NBTR = 35 m SBL = 15 m SBTR = 35 m	EBL = 30 m EBTR = 670 m WBL = 30 m WBTR = 645 m NBL = 20 m NBTR = 125 m SBL = 20 m SBTR = 170 m
Future Background 2022 – No corridor growth	<u>Overall = 0.61 (B)</u> EBL = 0.17 (A) EBTR = 0.59 (A) WBL = 0.31 (A) WBTR = 0.39 (A) NBL = 0.7 (D) NBTR = 0.4 (D) SBL = 0.24 (D) SBTR = 0.16 (D)	EBL = 5 m EBTR = 15 m WBL = 15 m WBTR = 70 m NBL = 55 m NBTR = 40 m SBL = 20 m SBTR = 20 m	<u>Overall = 0.55 (B)</u> EBL = 0.22 (A) EBTR = 0.46 (B) WBL = 0.51 (A) WBTR = 0.48 (A) NBL = 0.71 (D) NBTR = 0.3 (D) SBL = 0.16 (D) SBTR = 0.27 (D)	EBL = 20 m EBTR = 145 m WBL = 45 m WBTR = 95 m NBL = 55 m NBTR = 35 m SBL = 15 m SBTR = 35 m	EBL = 30 m EBTR = 670 m WBL = 30 m WBTR = 645 m NBL = 20 m NBTR = 125 m SBL = 20 m SBTR = 170 m
Future Total 2022 – No corridor growth	<u>Overall = 0.64 (B)</u> EBL = 0.17 (A) EBTR = 0.63 (A) WBL = 0.37 (A) WBTR = 0.4 (A) NBL = 0.7 (D) NBTR = 0.43 (D) SBL = 0.24 (D) SBTR = 0.16 (D)	EBL = 5 m EBTR = 25 m WBL = 20 m WBTR = 70 m <b>NBL = 55 m</b> NBTR = 45 m SBL = 20 m SBTR = 20 m	<u>Overall = 0.58 (B)</u> EBL = 0.24 (A) EBTR = 0.48 (A) WBL = 0.55 (A) WBTR = 0.5 (A) NBL = 0.71 (D) NBTR = 0.3 (D) SBL = 0.16 (D) SBTR = 0.27 (D)	EBL = 5 m EBTR = 15 m <b>WBL = 50 m</b> WBTR = 100 m <b>NBL = 55 m</b> NBTR = 35 m SBL = 15 m SBTR = 35 m	EBL = 30 m EBTR = 670 m WBL = 30 m WBTR = 645 m NBL = 20 m NBTR = 125 m SBL = 20 m SBTR = 170 m



Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que	
Future Background 2022	<u>Overall = 0.67 (B)</u> EBL = 0.2 (A) EBTR = 0.66 (A) WBL = 0.43 (A) WBTR = 0.45 (A) NBL = 0.7 (D) NBTR = 0.47 (D) SBL = 0.24 (D) SBTR = 0.17 (D)	EBL = 5 m EBTR = 15 m WBL = 25 m WBTR = 85 m NBL = 55 m NBTR = 45 m SBL = 20 m SBTR = 25 m	<u>Overall = 0.63 (B)</u> EBL = 0.29 (A) EBTR = 0.51 (B) WBL = 0.61 (B) WBTR = 0.56 (A) NBL = 0.72 (E) NBTR = 0.33 (D) SBL = 0.16 (D) SBTR = 0.29 (D)	EBL = 20 m EBTR = 175 m WBL = 60 m WBTR = 120 m NBL = 55 m NBTR = 40 m SBL = 15 m SBTR = 35 m	EBL = 30 m EBTR = 670 m WBL = 30 m WBTR = 645 m NBL = 20 m NBTR = 125 m SBL = 20 m SBTR = 170 m
Future Total 2022	<u>Overall = 0.70 (B)</u> EBL = 0.21 (A) EBTR = 0.7 (A) WBL = 0.51 (A) WBTR = 0.46 (A) NBL = 0.7 (D) NBTR = 0.48 (D) SBL = 0.24 (D) SBTR = 0.17 (D)	EBL = 5 m EBTR = 20 m WBL = 30 m WBTR = 85 m <b>NBL = 55 m</b> NBTR = 50 m SBL = 20 m SBTR = 25 m	<u>Overall = 0.68 (B)</u> EBL = 0.31 (A) EBTR = 0.53 (A) WBL = 0.67 (B) WBTR = 0.57 (A) NBL = 0.72 (E) NBTR = 0.33 (D) SBL = 0.16 (D) SBTR = 0.29 (D)	EBL = 5 m EBTR = 20 m <b>WBL = 65 m</b> WBTR = 125 m <b>NBL = 55 m</b> NBTR = 40 m SBL = 15 m SBTR = 35 m	EBL = 30 m EBTR = 670 m WBL = 30 m WBTR = 645 m NBL = 20 m NBTR = 125 m SBL = 20 m SBTR = 170 m
Future Background 2027	<u>Overall = 0.74 (B)</u> EBL = 0.25 (A) EBTR = 0.75 (A) WBL = 0.65 (C) WBTR = 0.52 (A) NBL = 0.71 (E) NBTR = 0.52 (D) SBL = 0.24 (D) SBTR = 0.19 (D)	EBL = 5 m EBTR = 15 m WBL = 35 m WBTR = 100 m NBL = 55 m NBTR = 50 m SBL = 20 m SBTR = 25 m	<u>Overall = 0.75 (B)</u> EBL = 0.41 (B) EBTR = 0.57 (B) WBL = 0.76 (C) WBTR = 0.64 (A) NBL = 0.74 (E) NBTR = 0.36 (D) SBL = 0.16 (D) SBTR = 0.32 (D)	EBL = 15 m EBTR = 190 m WBL = 70 m WBTR = 150 m NBL = 60 m NBTR = 40 m SBL = 15 m SBTR = 40 m	EBL = 30 m EBTR = 670 m WBL = 30 m WBTR = 645 m NBL = 20 m NBTR = 125 m SBL = 20 m SBTR = 170 m
Future Total 2027	<u>Overall = 0.79 (B)</u> EBL = 0.26 (A) EBTR = 0.79 (A) WBL = 0.81 (E) WBTR = 0.52 (A) NBL = 0.71 (D) NBTR = 0.53 (D) SBL = 0.24 (D) SBTR = 0.19 (D)	EBL = 5 m EBTR = 20 m WBL = 25 m WBTR = 105 m <b>NBL = 55 m</b> NBTR = 50 m SBL = 20 m SBTR = 25 m	<u>Overall = 0.81 (B)</u> EBL = 0.44 (A) EBTR = 0.59 (A) WBL = 0.84 (D) WBTR = 0.66 (A) NBL = 0.74 (E) NBTR = 0.36 (D) SBL = 0.16 (D) SBTR = 0.32 (D)	EBL = 5 m EBTR = 20 m <b>WBL = 75 m</b> WBTR = 155 m <b>NBL = 60 m</b> NBTR = 40 m SBL = 15 m SBTR = 40 m	EBL = 30 m EBTR = 670 m WBL = 30 m WBTR = 645 m NBL = 20 m NBTR = 125 m SBL = 20 m SBTR = 170 m
Future Background 2031 (includes RR25 & Derry Road Widening)	<u>Overall: 0.62 (D)</u> EBL: 0.37 (C) EBTR: <b>0.89 (D)</b> WBL: 0.59 (C) WBTR: 0.53 (D) NBL: 0.44 (C) NBT: 0.38 (C) NBR: 0.09 (B)	<b>EBL: 31 m</b> EBTR: 134 m <b>WBL: 35 m</b> WBTR: 70 m <b>NBL: 34 m</b> NBT: 68 m NBR: 13 m	<u>Overall: 0.58 (C)</u> EBL: 0.37 (C) EBTR: 0.68 (D) WBL: 0.35 (C) WBTR: 0.74 (D) NBL: 0.65 (B) NBT: 0.49 (C) NBR: 0.14 (B)	EBL: 24 m EBTR: 84 m WBL: 25 m WBTR: 98 m <b>NBL: 57 m</b> NBT: 96 m NBR: 18 m	EBL = 30 m EBTR = 670 m WBL = 30 m WBTR = 645 m NBL = 20 m NBTR = 125 m SBL = 20 m





Scenario	AM Peak Hour		PM Peak Hour		Storage Length
	V/C (LOS)	95 <sup>th</sup> % Que.	V/C (LOS)	95 <sup>th</sup> % Que	
	SBL: 0.14 (B) SBT: 0.49 (D) SBR: 0.07 (C)	SBL: 13 m SBT: 86 m SBR: <1 veh	SBL: 0.22 (B) SBT: 0.45 (C) SBR: 0.09 (C)	SBL: 14 m SBT: 77 m SBR: 14 m	SBTR = 170 m
Future Total 2031 – Signalized East Site Access	<u>Overall = 0.75 (A)</u> EBL = 0.29 (A) EBTR = 0.61 (A) WBL = 0.76 (D) WBTR = 0.41 (A) NBL = 0.71 (E) NBTR = 0.55 (D) SBL = 0.24 (D) SBTR = 0.24 (D)	EBL = 5 m EBTR = 20 m WBL = 25 m WBTR = 70 m <b>NBL = 55 m</b> NBTR = 55 m SBL = 20 m SBTR = 30 m	<u>Overall = 0.87 (B)</u> EBL = 0.48 (B) EBTR = 0.45 (A) WBL = 0.91 (E) WBTR = 0.51 (A) NBL = 0.74 (E) NBTR = 0.38 (D) SBL = 0.17 (D) SBTR = 0.34 (D)	EBL = 15 m EBTR = 130 m <b>WBL = 45 m</b> WBTR = 95 m <b>NBL = 60 m</b> NBTR = 45 m SBL = 15 m SBTR = 40 m	EBL = 30 m EBTR = 670 m WBL = 30 m WBTR = 645 m NBL = 20 m NBTR = 125 m SBL = 20 m SBTR = 170 m
Future Total 2031 - Right-In / Right-Out East Site Access	<u>Overall = 0.77 (A)</u> EBL = 0.29 (A) EBTR = 0.62 (A) WBL = 0.79 (D) WBTR = 0.4 (A) NBL = 0.71 (E) NBTR = 0.55 (D) SBL = 0.24 (D) SBTR = 0.24 (D)	EBL = 5 m EBTR = 20 m WBL = 25 m WBTR = 70 m <b>NBL = 55 m</b> NBTR = 55 m SBL = 20 m SBTR = 30 m	<u>Overall = 0.88 (B)</u> EBL = 0.46 (B) EBTR = 0.46 (A) WBL = 0.92 (E) WBTR = 0.5 (A) NBL = 0.74 (E) NBTR = 0.38 (D) SBL = 0.17 (D) SBTR = 0.34 (D)	EBL = 10 m EBTR = 130 m <b>WBL = 45 m</b> WBTR = 95 m <b>NBL = 60 m</b> NBTR = 45 m SBL = 15 m SBTR = 40 m	EBL = 30 m EBTR = 670 m WBL = 30 m WBTR = 645 m NBL = 20 m NBTR = 125 m SBL = 20 m SBTR = 170 m

Under existing and all future conditions all movements are currently operating generally well with reserve capacity and acceptable levels of delay. Some queueing concerns are identified however, with the westbound (p.m. only) and northbound left-turn movements reporting 95<sup>th</sup> percentile queues above the storage length during both peak hours.

However overall the operational impact of the added site traffic from the subject development is not expected to have a significant operational impact on the intersection, as evident in comparing 2022 and 2027 future background conditions to 2022 and 2027 future total conditions.

The utilized growth rates as instructed by the Town/Region may not occur consistently over the entire ten-year horizon to 2027, and fourteen-year horizon to 2031, given future changes in travel patterns due to planned future changes in the surrounding road network, changes in transit modal splits, as well as changes to the wider GTHA area impacting corridor growth rates through the Town of Milton.

## 6.6 Regional Road 25 at West Site Access

**Table 7** presents the findings of the capacity analysis for the intersection of Regional Road 25 at the West Site Access.



**Table 7 Capacity Analyses for Regional Road 25 at West Site Access**

Scenario	Movement v/c (LOS) 95th Percentile Queue	
	AM Peak Hour	PM Peak Hour
Future Total 2022 – No corridor growth	WBR: 0.11 (B) <1 veh	WBR: 0.08 (B) <1 veh
Future Total 2022	WBR: 0.12 (B) 1 veh	WBR: 0.09 (B) <1 veh
Future Total 2027	WBR: 0.14 (B) 1 veh	WBR: 0.11 (B) <1 veh
Future Total 2031 – Signalized East Site Access	WBR: 0.11 (B) <1 veh	WBR: 0.08 (B) <1 veh
Future Total 2031 - Right-In / Right-Out East Site Access	WBR: 0.14 (B) 1 veh	WBR: 0.09 (B) <1 veh

Under future total traffic conditions this access intersection is expected to operate well with substantial reserve capacity, low levels of delay, and negligible queueing. There are not expected to be any operational concerns at this proposed driveway location, with no expected operational impact on Ontario Street.

## 6.7 Derry Road at East Site Access

Table 8 presents the findings of the capacity analysis for the intersection of Derry Road at the East Site Access.

**Table 8 Capacity Analysis for East Site Access**

Scenario	Movement v/c (LOS) 95th Percentile Queue	
	AM Peak Hour	PM Peak Hour
Existing 2017	EBL: 0.04 (B) <1 veh SBLR: 0.12 (C) <1 veh	EBL: 0.03 (B) <1 veh SBLR: 0.21 (D) <1 veh
Future Background 2022 – No corridor growth	EBL: 0.03 (B) <1 veh SBLR: 0.09 (C) <1 veh	EBL: 0.02 (B) <1 veh SBLR: 0.17 (C) <1 veh
Future Total 2022 – No corridor growth	<u>Overall = 0.63 (B)</u> EBL: 0.03 (B) <1 veh EBT: 0.62 (A) <1 veh EBTR: 0.32 (A) <1 veh WBL: 0.03 (B) <1 veh WBT: 0.46 (A) <1 veh WBTR: 0.24 (A) <1 veh NBTR: 0.33 (C) 11 m SBTR: 0.12 (D) <1 veh	<u>Overall = 0.50 (A)</u> EBL: 0.02 (B) <1 veh EBT: 0.48 (A) <1 veh EBTR: 0.28 (A) <1 veh WBL: 0.06 (B) <1 veh WBT: 0.55 (A) <1 veh WBTR: 0.29 (A) <1 veh NBTR: 0.13 (B) <1 veh SBTR: 0.22 (D) 6 m
Future Background 2022	EBL: 0.04 (B) <1 veh SBLR: 0.15 (D) <1 veh	EBL: 0.06 (B) <1 veh SBLR: 0.29 (E) 1 veh
Future Total 2022	<u>Overall = 0.69 (C)</u> EBL: 0.04 (B) <1 veh EBT: 0.70 (A) <1 veh	<u>Overall = 0.56 (B)</u> EBL: 0.02 (B) <1 veh EBT: 0.54 (A) <1 veh



Scenario	Movement v/c (LOS) 95th Percentile Queue	
	AM Peak Hour	PM Peak Hour
	EBTR: 0.36 (A) <1 veh WBL: 0.04 (B) <1 veh WBT: 0.53 (A) <1 veh WBTR: 0.28 (A) <1 veh NBTR: 0.45 (D) 16 m SBTR: 0.15 (D) 4 m	EBTR: 0.31 (A) <1 veh WBL: 0.07 (B) <1 veh WBT: 0.63 (A) <1 veh WBTR: 0.33 (A) <1 veh NBTR: 0.15 (C) 4 m SBTR: 0.29 (E) 9 m
Future Background 2027	EBL: 0.05 (C) <1 veh SBLR: 0.14 (D) <1 veh	EBL: 0.07 (C) <1 veh SBLR: 0.27 (E) 8 m
Future Total 2027	<u>Overall = 0.77 (D)</u> EBL: 0.05 (B) <1 veh EBT: 0.80 (A) <1 veh EBTR: 0.41 (A) <1 veh WBL: 0.05 (C) <1 veh WBT: 0.61 (A) <1 veh WBTR: 0.32 (A) <1 veh NBTR: 0.69 (F) 31 m SBTR: 0.20 (E) 46 m	<u>Overall = 0.63 (B)</u> EBL: 0.03 (C) <1 veh EBT: 0.62 (A) <1 veh EBTR: 0.35 (A) <1 veh WBL: 0.09 (B) <1 veh WBT: 0.73 (A) <1 veh WBTR: 0.38 (A) <1 veh NBTR: 0.18 (C) 5 m SBTR: 0.41 (F) 13 m
Future Background 2031 (includes RR25 & Derry Road Widening)	EBL: 0.06 (C) <1 veh SBLR: 0.17 (E) <1 veh	EBL: 0.04 (C) <1 veh SBLR: 0.31 (E) 11 m
Future Total 2031 – Signalized East Site Access	<u>Overall = 0.63 (B)</u> EBL: 0.06 (C) <1 veh EBT: 0.53 (A) <1 veh EBT: 0.53 (A) <1 veh EBTR: 0.28 (A) <1 veh WBL: 0.04 (B) <1 veh WBT: 0.41 (A) <1 veh WBT: 0.41 (A) <1 veh WBTR: 0.22 (A) <1 veh NBR: 0.44 (D) 16 m SBLTR: 0.25 (F) 7 m	<u>Overall = 0.52 (A)</u> EBL: 0.04 (C) <1 veh EBT: 0.41 (A) <1 veh EBT: 0.41 (A) <1 veh EBTR: 0.25 (A) <1 veh WBL: 0.08 (B) <1 veh WBT: 0.49 (A) <1 veh WBT: 0.49 (A) <1 veh WBTR: 0.26 (A) <1 veh NBR: 0.15 (C) 4 m SBLTR: 0.51 (F) 17 m
Future Total 2031 - Right-In / Right-Out East Site Access	<u>Overall = 0.69 (C)</u> EBL: 0.06 (C) <1 veh EBT: 0.53 (A) <1 veh EBT: 0.53 (A) <1 veh EBTR: 0.29 (A) <1 veh WBT: 0.41 (A) <1 veh WBT: 0.41 (A) <1 veh WBTR: 0.22 (A) <1 veh NBR: 0.13 (B) 4 m SBLTR: 0.23 (F) 6 m	<u>Overall = 0.53 (A)</u> EBL: 0.04 (C) <1 veh EBT: 0.41 (A) <1 veh EBT: 0.41 (A) <1 veh EBTR: 0.26 (A) <1 veh WBT: 0.49 (A) <1 veh WBT: 0.49 (A) <1 veh WBTR: 0.26 (A) <1 veh NBR: 0.07 (A) <1 veh SBLTR: 0.43 (F) 14 m

Under existing and future conditions this access signalized intersection is expected to operate well with substantial reserve capacity, acceptable levels of delay, and negligible queuing.



A comparison of the full moves scenario to the right-in/right-out scenario under 2031 future total conditions shows no significant difference in operations.

Please see Appendix K for additional rationale supporting the signalized access to Derry Road.

## 7. SimTraffic Analysis

The capacity analysis measures the full impact of queueing and blocking data. SimTraffic is utilized in order to simulate a real-world queueing condition, which is considered to be a higher measure of effectiveness compared to the Synchro simulation. Through the analysis, each vehicle in the traffic system is individually tracked through the model and comprehensive operational measures of effectiveness are collected on every vehicle during each 0.1 second of simulation.

Raw SimTraffic reports are provided in **Appendix F**.

**Table 9** presents the findings of the queueing analysis for the intersections in the study area based on the full moves configuration of the site access on Derry Road.

**Table 9 SimTraffic Queue Results for 2031 Future Total Scenario (Full Moves Access)**

Intersections	Movement v/c (LOS) 95th Percentile Queue		Storage Length
	AM Peak Hour	PM Peak Hour	
Ontario Street at Laurier Avenue	<b>EBL: 28 m</b> <b>EBTR: 172 m</b> <b>WBL: 48 m</b> WBTR: 154 m <b>NBL: 19 m</b> NBT: 113 m NBTR: 120 m <b>SBL: 64 m</b> SBT: 400 m SBTR: 401 m	<b>EBL: 28 m</b> <b>EBTR: 176 m</b> <b>WBL: 54 m</b> WBTR: 236 m <b>NBL: 25 m</b> NBT: 111 m NBTR: 118 m <b>SBL: 65 m</b> SBT: 390 m SBTR: 389 m	15 m 80 m 35 m 245 m 15 m 180 m 180 m 40 m 590 m 590 m
Ontario Street/Regional Road 25 at Derry Road	<b>EBL: 38 m</b> <b>EBT: 649 m</b> <b>EBT: 650 m</b> <b>EBT: 664 m</b> <b>EBR: 57 m</b> <b>WBL: 43 m</b> WBT: 205 m WBT: 115 m WBT: 104 m <b>WBR: 68 m</b> <b>NBL: 93 m</b> NBT: 234 m NBT: 214 m NBT: 203 m <b>NBR: 86 m</b> <b>SBL: 38 m</b> SBT: 124 m SBT: 121 m SBTR: 120 m	<b>EBL: 38 m</b> <b>EBT: 720 m</b> <b>EBT: 719 m</b> <b>EBT: 710 m</b> <b>EBR: 57 m</b> <b>WBL: 46 m</b> WBT: 205 m WBT: 208 m WBT: 207 m <b>WBR: 72 m</b> <b>NBL: 78 m</b> NBT: 209 m NBT: 221 m NBT: 229 m <b>NBR: 103 m</b> <b>SBL: 38 m</b> SBT: 112 m SBT: 96 m SBTR: 89 m	30 m 460 m 460 m 460 m 35 m 35 m 670 m 670 m 670 m 45 m 70 m 1,500 m 1,500 m 1,500 m 70 m 30 m 180 m 180 m 180 m



Intersections	Movement v/c (LOS) 95th Percentile Queue		Storage Length
	AM Peak Hour	PM Peak Hour	
Regional Road 25 at Louis Saint Laurent Avenue	<b>EBL: 72 m</b> EBT: 221 m EBTR: 235 m <b>WBL: 32 m</b> WBT: 86 m WBTR: 87 m <b>NBL: 61 m</b> NBT: 82 m NBT: 77 m NBT: 57 m NBR: 17 m SBL: 30 m SBT: 72 m SBT: 75 m SBT: 74 m <b>SBR: 43 m</b>	<b>EBL: 51 m</b> EBT: 77 m EBTR: 80 m <b>WBL: 33 m</b> WBT: 84 m WBTR: 87 m <b>NBL: 76 m</b> NBT: 106 m NBT: 96 m NBT: 76 m NBR: 36 m SBL: 23 m SBT: 57 m SBT: 63 m SBT: 67 m SBR: 15 m	50 m 700 m 700 m 20 m 500 m 500 m 60 m 1,500 m 1,500 m 1,500 m 60 m 50 m 1,500 m 1,500 m 1,500 m 50 m
Derry Road at Holly Avenue	EBL: 28 m EBT: 27 m EBT: 32 m EBTR: 37 m <b>WBL: 46 m</b> WBT: 444 m WBT: 431 m WBTR: 382 m <b>NBL: 30 m</b> NBTR: 90 m <b>SBL: 27 m</b> SBTR: 188 m	EBL: 25 m EBT: 32 m EBT: 37 m EBTR: 44 m <b>WBL: 47 m</b> WBT: 433 m WBT: 425 m WBTR: 410 m <b>NBL: 30 m</b> NBTR: 91 m SBL: 26 m SBTR: 92 m	30 m 670 m 670 m 670 m 30 m 645 m 645 m 645 m 20 m 125 m 20 m 170 m
Regional Road 25 at West Site Access	WBR: 75 m	WBR: 118 m	
East Site Access	EBL: 10 m WBL: 17 m NBLTR: 127 m SBLTR: 38 m	EBL: 9 m WBL: 23 m NBLTR: 126 m SBLTR: 98 m	

The results of the SimTraffic analysis illustrate significant queueing on the Derry Road and Regional Road 25 / Ontario Street corridors.

The utilized growth rates as instructed by the Town/Region may not occur consistently over the entire fourteen-year horizon, given future changes in travel patterns due to planned future changes in the surrounding road network, changes in transit modal splits, as well as changes to the wider GTHA area impacting corridor growth rates through the Town of Milton.

**Table 10** presents the findings of the queueing analysis for the intersections in the study area based on the right-in/right-out configuration of the site access on Derry Road.



**Table 10 SimTraffic Queue Results for 2031 Future Total Scenario (Right-In/Right-Out Access)**

Intersections	Movement v/c (LOS) 95th Percentile Queue		Storage Length
	AM Peak Hour	PM Peak Hour	
Ontario Street at Laurier Avenue	<b>EBL: 27 m</b> <b>EBTR: 143 m</b> <b>WBL: 50 m</b> WBTR: 171 m <b>NBL: 21 m</b> NBT: 111 m NBTR: 116 m <b>SBL: 64 m</b> SBT: 386 m SBTR: 388 m	<b>EBL: 28 m</b> <b>EBTR: 239 m</b> <b>WBL: 55 m</b> WBTR: 228 m <b>NBL: 25 m</b> NBT: 108 m NBTR: 116 m <b>SBL: 64 m</b> SBT: 401 m SBTR: 401 m	15 m 80 m 35 m 245 m 15 m 180 m 180 m 40 m 590 m 590 m
Ontario Street/Regional Road 25 at Derry Road	<b>EBL: 41 m</b> <b>EBT: 628 m</b> <b>EBT: 628 m</b> <b>EBT: 639 m</b> <b>EBR: 57 m</b> <b>WBL: 43 m</b> WBT: 198 m WBT: 106 m WBT: 100 m <b>WBR: 68 m</b> <b>NBL: 90 m</b> NBT: 235 m NBT: 227 m NBT: 205 m <b>NBR: 85 m</b> <b>SBL: 38 m</b> SBT: 123 m SBT: 122 m SBTR: 122 m	<b>EBL: 39 m</b> <b>EBT: 710 m</b> <b>EBT: 710 m</b> <b>EBT: 711 m</b> <b>EBR: 55 m</b> <b>WBL: 47 m</b> WBT: 209 m WBT: 212 m WBT: 208 m <b>WBR: 72 m</b> <b>NBL: 78 m</b> NBT: 199 m NBT: 233 m NBT: 236 m <b>NBR: 103 m</b> <b>SBL: 38 m</b> SBT: 112 m SBT: 92 m SBTR: 90 m	30 m 460 m 460 m 460 m 35 m 35 m 670 m 670 m 670 m 45 m 70 m 1,500 m 1,500 m 1,500 m 70 m 30 m 180 m 180 m 180 m
Regional Road 25 at Louis Saint Laurent Avenue	<b>EBL: 73 m</b> EBT: 257 m EBTR: 267 m <b>WBL: 31 m</b> WBT: 91 m WBTR: 83 m NBL: 58 m NBT: 81 m NBT: 77 m NBT: 63 m NBR: 19 m SBL: 20 m SBT: 65 m SBT: 66 m SBT: 67 m SBR: 36 m	EBL: 39 m EBT: 68 m EBTR: 75 m <b>WBL: 33 m</b> WBT: 84 m WBTR: 87 m <b>NBL: 72 m</b> NBT: 95 m NBT: 87 m NBT: 71 m NBR: 35 m SBL: 25 m SBT: 55 m SBT: 61 m SBT: 66 m SBR: 44 m	50 m 700 m 700 m 20 m 500 m 500 m 60 m 1,500 m 1,500 m 1,500 m 60 m 50 m 1,500 m 1,500 m 1,500 m 50 m
Derry Road at Holly Avenue	EBL: 24 m EBT: 24 m EBT: 36 m EBTR: 38 m <b>WBL: 43 m</b> WBT: 304 m WBT: 291 m WBTR: 246 m <b>NBL: 30 m</b>	EBL: 27 m EBT: 33 m EBT: 39 m EBTR: 43 m <b>WBL: 47 m</b> WBT: 313 m WBT: 302 m WBTR: 276 m <b>NBL: 30 m</b>	30 m 670 m 670 m 670 m 30 m 645 m 645 m 645 m 20 m



Intersections	Movement v/c (LOS) 95th Percentile Queue		Storage Length
	AM Peak Hour	PM Peak Hour	
	NBTR: 89 m SBL: 23 m SBTR: 50 m	NBTR: 89 m SBL: 25 m SBTR: 62 m	125 m 20 m 170 m
Regional Road 25 at West Site Access	WBR: 130 m	WBR: 139 m	
East Site Access	EBL: 9 m NBR: 24 m SBLTR: 17 m	EBL: 10 m NBR: 18 m SBLTR: 94 m	

Similar to the results of the capacity analysis, a comparison of the full moves scenario to the right-in/right-out scenario under 2031 future total conditions shows no significant difference in operations.

## 8. Site Access Design

### 8.1 Proposed Access on Regional Road 25

Based on the results of the capacity analysis, the proposed right-in/right-out site access on Regional Road 25 is expected to operate satisfactorily for the future horizon years.

A sightline review at the proposed access location found that the existing vertical and horizontal alignment of the road is sufficient to permit adequate sightlines.

This proposed right-in/right-out access is expected to be situated approximately 143 m south of Derry Road (conservatively measured from start of corner radius to start of corner radius), and given its right-in/right-out operation and the results of the capacity analysis, is not expected to pose an operational and/or safety concerns.

Although this spacing is within the recommend minimum access spacing of 200 metres as per Halton Region's Access Guidelines, the proposed locations is as far south as feasibly possible given the site constraints.

Furthermore, GHD strongly believes that there is not expected to be any issues related to traffic infiltration through the site in order to bypass the intersection of Regional Road 25 at Derry Road. As per the results of the capacity analysis, the northbound right-turn movement at the signalized intersection is expected to operate very well with minimal delay, presenting no significant justification for infiltration through the site.

The proposed access is to be situated at the southern extent of the right-turn lane, and therefore during times of peak queueing for the northbound through movement, if vehicles are able to access the proposed site access they will also be able to access the existing northbound right-turn lane.

Moreover, the site plan is proposed to include two raised pedestrian crosswalks on the site's private road connecting Regional Road 25 and Derry Road, fronting the site's proposed internal park. This



form a vertical deflection is an accepted traffic calming tool, which will help discourage any potential cut-through traffic through the site.

## 8.2 Proposed Access on Derry Road

The proposed full moves signalized access on Derry Road, with a single shared left/through/right-turn outbound lane is expected to operate satisfactorily for the future horizon years.

A sightline review at the proposed access location found that the existing vertical and horizontal alignment of the road is sufficient to permit adequate sightlines.

Access spacing from the intersection of Derry Road at Ontario Street is not expected to be an issue as this access is proposed opposite an existing full moves access, and furthermore this proposed access will be situated at the furthest eastern extent of the site.

## 9. Site Circulation Review

The internal road network, accesses, and loading area were subject to a site plan/circulation review using AutoTURN software. Based on the analysis, the internal road network is considered sufficient to accommodate circulation requirements of the design vehicles (garbage truck, delivery truck and passenger vehicle).

The figures illustrating the design vehicles used in the review and their pathways through the site are provided in **Appendix G**. The proposed site plan has been found acceptable in terms of vehicular flow and parking space accessibility, and therefore conclude that the current site plan can accommodate the intended design vehicles.

## 10. Parking Evaluation

### 10.1 Site Plan Layout

The site plan dated April 2023, consists of the approved three condominium buildings, 3-storey townhouses with garages, and the proposed 27 unit stacked townhouse addition with the following expected uses, and bedroom units:

- Building A – 20-storey residential;
  - 1-bedroom units: 66 units
  - 2-bedroom units: 102 units
- Building B – 25-storey residential;
  - 1-bedroom units: 153 units
  - 2-bedroom units: 109 units
- Building C – 16-storey residential; and
  - 1-bedroom units: 130 units





- 2-bedroom units: 54 units
- Townhouse Building – 3-storey residential.
  - Townhouse units: 34 units
- Townhouse Building – Stacked
  - Townhouse units: 27 units

## 10.2 Town of Milton Parking By-Law

The subject site is governed by the site specific zoning By-law 063-2019, with the minimum parking requirement for the site as follows. The calculation of the parking spaces also includes the approved developments that share the site with the proposed stacked townhouse development. The approved development consists of 614 high-rise dwelling units and 34 townhouse units with garages.

### Condominium unit parking requirement

- 1 bedroom resident parking: 349 units \* 1.03 spaces per unit = 360 parking spaces required
  - 2-bedroom resident parking: 265 units \* 1.15 spaces per unit: 305 parking spaces required
  - Residential visitor parking: 614 units \* 0.25 spaces per unit: 154 parking spaces required
- Townhouse unit with garage parking requirement
  - Resident parking: 34 units \* 2.0 spaces per unit: 68 parking spaces required
  - Residential visitor parking: 34 units \* 0.25 spaces per unit: 9 parking space required
- Stacked Townhouse unit parking requirement
  - Resident parking 27 units \* 1.15 spaces per unit = 32 parking spaces required
  - Residential visitor parking: 27 units \* 0.25 spaces per unit: 7 parking space required
- Car Share space
  - 1 car share vehicle and dedicated parking space
- Accessible parking requirement:
  - The barrier free parking requirement is also subject to the Town of Milton's zoning By-law 016-2014, with the minimum accessible parking requirement found in Section 5.9, Table 5H and is based on the number of required parking spaces. The minimum By-law requirements are found below, with the requirement applied to the subject site underlined.
  - 1-12 spaces required: 1 Type A
  - 13-100 spaces required: 4% of the required spaces
  - 101-200 spaces required: 1 accessible parking space plus 3% of the required spaces
  - 201-1,000 spaces required: 2 accessible parking space plus 2% of the required spaces



- o More than 1,000 spaces required: 11 accessible parking space plus 1% of the required spaces

An equal number of Type A and Type B spaces are required. If an odd number of barrier free spaces are required, an even number of Type A and Type B spaces should be provided and the additional space may be a Type B space.

With a total requirement of 765 resident spaces, the subject site is required to provide a minimum of 17 barrier free spaces for residents (8 Type A and 9 Type B). With a requirement of 170 visitor spaces, a minimum of 6 spaces are required to be barrier free spaces (3 Type A and 3 Type B).

### 10.3 Proposed Site Parking Rates

The following table summarizes the minimum By-law requirements and the proposed parking/loading supply for the subject site.

**Table 11 Parking Requirements and Provisions**

Type	Unit Count/GFA	By-Law Requirement	Required	Provided
Vehicle Parking Condominium – Residents	614 condominium units, 34 townhouse units, and 27 stacked dwelling units	Minimum 1.03 parking spaces per unit, 1-bedroom Minimum 1.15 parking spaces per unit, all other bedroom units	Minimum of 665 vehicle spaces, residents	876 parking spaces (735 resident spaces at 1.0 per unit for apartments and stacked towns and 2.0 per unit for towns, 140 visitor spaces at 0.20 per unit, and 1 car-share space)
Vehicle Parking Townhouse – Residents		Minimum 2 parking spaces per unit	Minimum of 68 vehicle spaces, residents	
Vehicle Parking Stacked Townhouse – Residents		Minimum 1.15 parking spaces per unit	Minimum of 32 vehicle spaces, residents	
Car Share Space		Minimum of 1 car share space	Minimum of 1 car share space	
Vehicle Parking – Visitors		Minimum 0.25 parking space per unit	Minimum of 170 vehicle spaces, visitors	
Barrier Free Parking		Minimum of 2 spaces, plus 2% of total vehicle parking spaces required (residents) Minimum of 1 space, plus 3% of total vehicle parking spaces required (visitors)	Minimum of 23 barrier free spaces	



The subject site proposes to provide a total of 876 vehicle parking spaces, a shortfall of 60 spaces from the By-law requirement of 936 spaces.

The subject site is seeking relief from the site-specific by-law requirement to reduce the resident parking requirement for the condominium and stacked townhouse units to 1.0 parking spaces per unit for residents and to reduce the visitor parking requirement for all uses to 0.20 spaces per unit. The revised parking rates result in a parking requirement as follows:

- Condominium and Stacked Townhouses:
  - 1.0 parking spaces per unit, for residents
  - 0.20 parking spaces per unit, for visitor
- Townhouse with Garage:
  - 2.0 parking spaces per unit, for residents
  - 0.20 parking spaces per unit, for visitor
- Car share space
  - 1 car share space

Based on the above rates, the subject site's revised parking requirements are as follows:

- Condominium and Stacked Townhouses:
  - 1.0 parking spaces per unit x 641 units = 641 spaces, for residents
  - 0.20 parking spaces per unit x 641 units = 129 spaces, for visitor
- Townhouse with garage
  - 2.0 parking spaces per unit x 34 units = 68 spaces, for residents
  - 0.20 parking spaces per unit x 34 units = 7 spaces, for visitor
- Car share space
  - 1 car share space

Under the revised parking rates, the subject site would require 846 parking spaces, consisting of 709 resident spaces, 136 visitor spaces, and 1 car-share space.

The subject site proposes to provide 876 parking spaces, consisting of 779 parking spaces for the condominium and stacked townhouse development (647 resident, 131 visitor spaces, and 1 car share space) and 97 spaces for the townhouse development (88 resident and 9 visitor spaces).

The proposed resident parking supply of the site for the condominium and stacked townhouse units is 647 parking spaces which represents a reduction of 50 spaces from the currently approved rates (697 spaces).

The proposed parking supply for residents is an overall rate of 1.00 spaces per unit for the condominium and stacked townhouse units as opposed to an overall rate of 1.09 spaces per unit as required based on the currently approved parking rates.



## **10.4 Parking Assessment**

### **10.4.1 Sales Data**

As of April 13, 2023, a total of 402 units have been sold (93%, 167 out of the 168 units in Building A and 235 of the 262 units in Building B) resulting in a total of 28 units remaining unsold. Each unit is offered the opportunity to purchase one spot with the option to purchase an additional space if available.

Of the 402 units that have been sold, 402 parking spaces have been sold with each unit being sold with one parking space, representing a rate of 1.00 parking space per dwelling unit.

Currently, there are no buyers on a waiting list that have requested an additional parking space.

### **10.4.2 Resident Parking Assessment**

The existing demand for residential parking spaces for the subject site based on up-to-date sales data is 1.00 space per unit. With only 239 units remaining for sale (28 units in Buildings A and B, all 184 units in Building C, and the 27 proposed stacked townhouse developments), parking can be provided at the time of purchase for these unsold units at a rate of 1.03 spaces per unit (245 remaining parking spaces, 239 units remaining), which exceeds both the existing demand of 1.00 spaces per unit based on the current demand for parking spaces at time of sale.

With the expectation that the parking demand continues at the current rate of 1.00 spaces per unit for the remaining unsold units, the parking demand will be approximately 641 parking spaces for all condominium and stacked townhouse units, resulting in a surplus of 6 parking spaces.

Consequently, there is an expectation that the parking demand for the site will remain considerably less than the proposed parking provision and as a result, no negative impact on the site is expected including the potential for illegal parking activities and overflow parking within the adjacent neighbourhood.

The proposed site specific TDM measures for the proposed site which include a reduction in the parking supply from the currently approved parking aims to increase the use of transit in order to increase the sustainability of the transportation system and help maximize the use of existing transportation infrastructure.

It is clear from the current sales demand of 1.00 space per unit that current purchasers of units are already anticipating the demand for parking spaces in the area. It is our opinion that the sales data summarized above provides a more accurate understanding of the expected parking demand for the site than can ever be provided by completing a proxy survey of another site.

### **10.4.3 Visitor Parking Assessment**

To support the proposed reduction visitor parking supply, GHD has over time undertaken proxy surveys at multiple existing multi-unit residential developments in the Greater Toronto Area (GTA) for the purpose of collecting parking demand data for both residents and visitors. The completed parking surveys allows GHD to support a reduced parking supply for both residents and visitors depending



on the type of development proposed and the supporting transportation demand management initiatives recommended for a site.

In general, parking utilization guidelines require surveying on at least two days over two normal weeks, and within time periods that capture the peak parking demand of the site. GHD therefore generally adopted the following schedule when completed parking demand surveys at each of the proxy sites:

- Parking accumulation on two weekdays on two separate weeks, typically 5:30 – 5:45 a.m., 12:30 – 12:45 p.m. (noon) and 10:30 – 10:45 p.m. time intervals to identify the peak resident demand.
- Parking accumulation on two Fridays and two Saturdays, typically between 8:00 p.m. and 11:00 p.m. at 15 minute intervals to capture the peak visitor demand and verify the peak resident demand.

Surveyors are generally not permitted to undertake parking surveys unless permission has been granted by the property owner. Permission is typically not granted unless the site being surveyed is in fact the subject site of the parking study or traffic impact study. This limits GHD's ability to gather proxy survey data for sites considered comparable in size and type to the subject development. Therefore, GHD, as similar to other consulting agencies, generally utilize previously collected proxy survey data from previously undertaken projects when such data is required in support of a Parking Justification Study.

The following list provides a sample of surveyed resident and/or visitor parking demand from parking studies and surveys for sites with similar development content that is proposed for this site:

- The Courtyards on Main – Phase 1, Milton (apartment building with 260 units)
  - Visitors: 0.14 spaces per unit
- 297 Queens Avenue, Oakville (apartment building with 78 residential units)
  - Visitors: 0.13 spaces per unit
- 2051-2067 Prospect Street, Burlington (apartment buildings with 144 residential units)
  - Visitors: 0.11 spaces per unit
- Alton Village Phase 3 (Condo building with 288 residential units)
  - Visitors: 0.20 spaces per unit

The highest observed visitor parking rate was recorded at 0.20 spaces per unit and the average rate being 0.15 spaces per unit, this includes the Courtyards on Main located in Milton. The proxy survey results indicate that a proposed visitor parking rate of 0.20 spaces per unit can be supported to sufficiently accommodate the expected visitor parking demand.

Detailed information pertaining to the undertaken surveys are provided in Error! Reference source not found..



#### **10.4.4 Conclusion**

Based on the information and data provided in **Section 10.4**, it is our opinion that the proposed parking supply for resident and visitor parking is appropriate and expected to satisfy the resident and visitor parking demand.

## **11. Travel Demand Management (TDM)**

### **11.1 Travel Demand Management**

Travel Demand Management (TDM) refers to a variety of strategies to reduce congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system. TDM strategies have multiple benefits including the following:

- Reduced auto-related emissions to improve air quality;
- Decreased traffic congestion to reduce travel time;
- Increased travel options for businesses and commuters;
- Reduced personal transportation costs and energy consumptions; and
- Support Provincial smart growth objectives.

The combined benefits listed above will assist in creating a more active and livable community through improvements to overall active transportation standards for the local businesses and surrounding community.

### **11.2 Existing TDM Opportunities**

#### **11.2.1 Walking**

Sidewalks and multi-use paths are currently provided throughout the study area along at least one side of Derry Road West, Ontario Street, and Regional Road 25. Signalized pedestrian crosswalks are currently provided on all four legs of the intersection of Derry Road West and Ontario Street/Regional Road 25 providing access to the west side of Ontario Street/Regional Road 25 and the north side of Derry Road West to access all transit stops and amenities within a short distance of the subject site.

#### **11.2.2 Transit**

The subject site is serviced by three Milton Transit Routes. All three transit routes, route 7, 8, and 9, begin at the Milton GO Station and end at the intersection of Derry Road West and Savoline Boulevard, the intersection of Bronte Street South and Louis St. Laurent Avenue, and the intersection of Britannia Road West and Regional Road 25, respectively. All three routes operate with a 30-minute headway during the morning and afternoon rush hour period.



### 11.3 Recommended TDM Measures

The table below summarizes the recommended TDM strategies for the subject site which includes Buildings A, B, C and the stacked townhouses (Building D).

**Table 12 Recommended TDM Strategies**

TDM Measure	Responsibility	Cost	Note
<b>Hard Measures</b>			
Pedestrian connections	Applicant	Integrated into the overall development cost	Site plan includes a walkway system providing a connection to the municipal sidewalks.
Public Transit Access	Applicant	Integrated into the overall development cost	The subject site is located within walking distance of transit stops located along Ontario Street and Derry Road West
Cycling Connections	Applicant	Integrated into the overall development cost	The subject site has frontage along Derry Road West and Regional Road West and their respective multi-use trails
<b>Soft Measures</b>			
Transit incentives (i.e. PRESTO cards)	Applicant	The developer will subsidize the cost of transit passes for all occupants for a minimum of two years.	To be provided with the purchase of each unit.
Information packages (Milton Transit map and schedules, cycling maps)	Applicant	To be determined.	Distributed at the sales office with Purchase and Sales Agreement
Real Time Transit Information	Applicant	To be determined	Developer to provide screens in the main lobby that will display real-time data for the local bus routes, in addition to wayfinding signage



Communication strategy and physical location to deliver information packages	Applicant	To be determined.	At 50% occupancy, the applicant is responsible for assisting with distribution of information flyers to residents;
Car Share Vehicle	Applicant	To be determined	The developer will provide one car share vehicle, with dedicated parking space in a priority location that is publicly accessible
Unbundled vehicle parking sales	Applicant	Integrated into the overall development cost	Proposed to unbundle the sales of the parking space and unit to provide residents with the true cost of the parking space.
Reduced parking supply	Applicant	Integrated into the overall development cost	Proposed to provide less parking than the By-law requirement.

## 12. Functional Design

GHD has prepared a functional design for both vehicular accesses, in accordance with the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, 2017 edition. The completed functional design is provided in **Appendix I**.

The west access on Regional Road 25 will operate as an unsignalized right-in/right-out intersection, with an opposing 75 metre long raised centre median within the existing painted centre median. With 30 metres and 45 metres of median north and south of the access, respectively, this configuration is expected to both:

- Restrict inbound and outbound left-turn movements; and
- Permit full moves access at the existing driveway for the proposed immediately opposite the subject site on Regional Road 25.

The east access on Derry Road will operate as a signalized intersection, with auxiliary left-turn lanes for both directions on Derry Road. The design includes the following design features:

- The geometry and alignment of the existing general purpose lanes on Derry Road will not be impacted;
- The existing eastbound left-turn lane will remain as per existing conditions, however with the existing adjacent raised centre median extended eastwards;
- The existing eastbound left-turn lane has a storage length of 51.4 metres, which is sufficient to accommodate the expected future 95<sup>th</sup> percentile queuing as per the results of the capacity analysis;





A proposed westbound left-turn lane will be introduced within the existing wide raised centre median;

- The proposed westbound left-turn lane will have a storage length of 25 metres, which is sufficient to accommodate the expected future 95<sup>th</sup> percentile queuing as per the results of the capacity analysis;
- The proposed westbound left-turn lane will have a taper length of 56 metres, which meeting the guidelines of TAC given the left-turn lane width and 70 km/h design speed;
- The overall length of the proposed left-turn facility (storage + taper) is 81 metres, which is sufficient to accommodate the recommended deceleration length as per TAC (56 metre deceleration distance + 25 metres vehicle storage);
- Both left-turn lanes will have standard 3.0 metre widths;
- As per the results of the capacity analysis, 95<sup>th</sup> percentile queuing for both driveway approaches is expected to be nominal.

## **13. Conclusions and Recommendations**

Based on these assumptions and the proposed land use, it is estimated that the subject development will generate approximately 195 new two-way vehicle trips during the a.m. peak hour consisting of 47 inbound and 148 outbound trips. During the p.m. peak hour it is expected to generate 228 new two-way vehicle trips consisting of 139 inbound and 89 outbound trips.

Under future 2022, 2027, and 2031 conditions, the incremental impact of the site generated traffic is expected to be nominal, with no recommended geometric improvements to the study area intersections in response to the subject development. While geometric intersections improvements have been identified and several intersections and specific movements are expected to operate with reduced capacity and some operational concerns, these issues are a result of background corridor growth and background development traffic and not solely triggered by the subject development.

Under 2031 future total traffic conditions, the intersection of Regional Road 25 and Derry Road may operate at full capacity under the planned intersection configuration which includes the widening of Derry Road and Regional Road 25 south of Derry Road. In particular, the westbound left turn lane movement is expected to exhibit v/c ratios over 1.0 and high delays. Implementing a dual left turn lane for the westbound left turn on Derry Road at Regional Road 25 would alleviate the capacity issues identified under the 2031 horizon year bringing the overall intersection v/c ratio below 1.0 during the a.m. and p.m. peak hours.

What the analysis makes clear is the planned background developments and the proposed subject development do not contribute significantly to the capacity issues along the regional roads. It is the assumed background corridor growth that will significantly add traffic to the arterial roads. It is worth noting that corridor growth was applied in a linear form from existing to future planning horizons. In reality, the Region is investing in network improvements along parallel routes that will add capacity on a screen line basis to the east/west and north/south directions. However, the proposed six lane



widening of Derry Road will address all anticipated capacity deficiencies. In the interim, as congestion increases in advance of the widening, travel patterns will likely adjust to use other routes.

The proposed high-density development will generate a volume of site traffic that is best served by providing at a minimum one full moves driveway to the regional road network. Without it, the site will be serviced by two right-in/out driveways which will result in significant u-turns at adjacent signalized intersections and traffic infiltration through the adjacent residential neighbourhoods. The proposed development will also bring additional pedestrians to the area with the commercial plaza located on the north side of Derry Road. An additional signalized crossing of Derry Road at the proposed site driveway will facilitate pedestrian crossing of Derry Road as traffic along Derry Road is forced to stop. As an added benefit, the traffic signal will control the access on the north side at no cost to the Region.

Queuing impacts have been assessed at the intersection of Regional Road 25 and Derry Road. The queues are a result of the future capacity constraints due to the adopted corridor growth to the 2031 horizon year. The addition of site trips from the subject development to the road network is expected to have a nominal impact, and is generally not expected to be identifiable from a driver's perspective.

Both Derry Road and Regional Road 25 have been identified as future transit priority corridors within the Town of Milton. In addition, the site is within close walking distance to many nearby amenities surrounding the site; as ranked on Walk Score, the site has a reported Walk Score of 74. This is considered to be a "Very Walkable" score, with most errands being able to be accomplished on foot. This, along with the TDM plan for the subject development that proposes a mix of hard and soft measures will help reduce vehicular demand and encourage passenger, transit, cycling, and walking. These measures include:

- Sidewalk connectivity
- 38 Short Term Bicycle Parking Spaces (Outdoor Weather Protected) and 366 Long Term Bicycle Parking Spaces (Bike Hangers)
- Bicycle Self Service Station
- Information Distribution and Community Board
- Unbundled Parking
- Subsidized transit passes for all occupants
- 1 Car Share Vehicles with Dedicated Parking

With respect to inbound traffic into the site access on Derry Road, the reported 95<sup>th</sup> percentile queue for westbound left-turning vehicles is less than one vehicle per the Synchro analysis, and approximately up to 3 vehicles per the SimTraffic analysis. Therefore a left-turn lane (3.0 metres wide lane) with a minimal storage (15-20 metres) should be sufficient. The existing raised median will require modification to accommodate the needed taper for the proposed auxiliary left-turn lane into the site. With an assumed design speed of 70 km/h, a taper length of 120 metres is recommended.

## **Appendices**

**Appendix A**  
**Town & Region Comment's**



January 27, 2020

Our ref: 111/48645/800

**Patrick Monaghan**

Transportation Planning Coordinator  
Halton Region  
2316 South Service Road West  
Oakville, Ontario  
L6L 5M9

**Michael Turco**

Transportation Planning Technologist  
Town of Milton  
150 Mary Street  
Milton, Ontario  
L9T 6Z5

Attention: Michael Turco; Patrick Monaghan.

**Proposed Residential Development, Derry Road at Regional Road 25  
Traffic Impact Study - Response to Regional Comments**

GHD was retained by Briarwood (Milton Green Fields) Ltd. to prepare a Traffic Impact Study (TIS) for a proposed residential development located on the southeast corner of Derry Road and Regional Road 25 in the Town of Milton. The TIS report, dated May 2019, has been reviewed by the staff of Halton Region and Town of Milton, with resulting comments provided to GHD.

This letter presents the Region's and Town's comments and GHD's respective responses, with the expectation that a meeting will be held to permit further discussion between Regional/ Town staff and GHD.

***Response to Regional Comments***

**Comment #1**

**Region:** As previously noted in through the LOPA/Zoning submission "the applicant will be required to demonstrate through their submission that the parking structure will not limit the construction of future infrastructure within the Regional right-of-way." The Site Plan submission does not consider any means for the Region to confirm if the ultimate intersection design can be accommodated at this intersection within the ultimate right of way. An engineering drawing showing the functional intersection design is required, which assumes/includes:

- Regional Road 25 and Derry Road as a 6 lane cross section through the intersection (the sixth lane is carried through Derry Road and narrows to 4 lanes on the north side of Derry Road).
- Dual left turn and single right turn lanes are required in each direction.
- Confirmation where the existing utilities will be located within the Regional right-of-way and their ultimate proximity to the proposed structure.
- Lanes widths are required to conform to Halton Region right-of way guidelines (Cross Section C4) available on the Halton Region website.
- Infrastructure as identified in the Halton Region Active Transportation Master Plan. Additional information related to the Active Transportation Master Plan is located on the Halton Region website.
- The extent of the required Regional right-of-way dedication will be confirmed once the detailed design of the intersection noted above is provided by the applicant.

**GHD:** A preliminary design has been prepared by GHD for the widening of Derry Road. The cross sections on the engineering drawings now show the limits of the future widening to better illustrate the coordination with the site development.

### **Comment #2**

**Region:** The proposed signalized access to Derry Road does not conform to the Halton Region access spacing requirements. The proposed signalized access to Derry Road is subject to the approval of a Deviation Memo as noted in the June 5th 2019, response to the LOPA and ZBA. A qualified transportation consultant or engineer is required to draft and complete a Deviation Memo to the Region's satisfaction, to confirm the reduced spacing will not negatively impact the operation of the Regional Road Network. Please see the attached memo template. The finalized memo is to be attached to the final Transportation Impact Study.

**GHD:** Noted. Deviation memo has been attached to the TIS report.

### **Comment #3**

**Region:** An updated Conclusions and Recommendation section is required to provide more context to explain how the interim capacity deficiencies may be considered in advance or the ultimate widening scenario which may include a discussion of the broader transportation network.

**GHD:** TIS report has been revised.

### **Comment #4**

**Region:** Sections 6.3 Ontario Street/Regional Road 25 at Derry Road, 12 Conclusion and Recommendation and the Executive Summary, contain references to the need for the Region to consider advancing capital improvements in the study area. The need and timing of these improvements was identified through the Region's Transportation Master Plan to 2031. The Transportation Impact Study analysis does not consider comparable scope or study area and as such this recommendation should be removed. The Region's Road Capital Program forecast also identifies the widening of Derry Road from Tremaine Road to Highway 407 with a start of construction in 2031.

In addition, it should also be noted that these sections indicate that the Derry Road corridor will operate "over capacity", however in reality the corridor can only operate "at" capacity. In an over capacity scenario, vehicle trips will divert to adjacent roads. Please update the report to reflect the above note.

**GHD:** Text has been revised.

**Comment #5**

**Region:** The report has scenarios that are referenced to as the "no growth scenario" (for example, each capacity table and supporting text). However, the impacts of other nearby development traffic as noticed in Section 3.3 has been considered in these scenarios. Please update the report to correct this.

**GHD:** Text has been revised.

**Comment #6**

**Region:** Table 4 Capacity Analysis of Ontario Street/Regional Road 25 at Derry Road notes in the last row that the "Future Total 2031 right-in right-out East Site Access" volume scenario was used to evaluate the need for westbound dual left turn improvement. This should be corrected to consider the recommended "Future Total 2031 Signalized East Site Access" scenario.

**GHD:** Table text has been revised.

**Comment #7**

**Region:** The second last paragraph of Sections 6.3 Ontario Street/Regional Road 25 at Derry Road is confusing, please consider revisiting the text to separate out the points.

**GHD:** Text has been revised.

**Comment #8**

**Region:** Auto-Turn drawings need to be updated to demonstrate that both proposed accesses to the Regional Road network can accommodate the ingress and egress of each design vehicle at the same time.

**GHD:** Noted, new AutoTurn drawings have been attached in appendices.

**Comment #9**

**Region:** The drawings provided with the addendum suggest that the proposed full movement access to Derry Road will operate under a stop control condition. A stop controlled full movement access to Derry Road will not be considered before, after or during construction of the proposed development. Please revise the report and drawings accordingly. Similarly, it should be noted that the proposed right-in right-out access to Region Road 25 will not be considered until the access is physically restricted to right-in right-out to the Region's satisfaction.

**GHD:** Drawing has been revised.

**Comment #10**

**Region:** The drawings should also illustrate the lane markings on Regional Road 25 and Derry Road.

**GHD:** Noted, drawing has been revised.

## ***Response to Towns Comments***

### **Comment #1**

**Region:** Correct the typos in Section 10.2 (3rd bullet point incorrect number of units noted), Appendix C (BD 2 incorrectly referred to as Boyne Secondary School rather than Boyne Secondary Plan), & Table 5 – Existing 2017 LOS for PM peak (should be LOS C instead of LOS V).

**GHD:** Noted. TIS report has been revised accordingly.

### **Comment #2**

**Region:** Concerns with the swept-path analysis include:

- Unrealistically showing the vehicles maneuvering directly against a concrete wall on the ramps. Motorists tend to avoid driving close to walls or barriers as they are concerned about damaging their vehicle. Further to this, the results indicate overtracking into opposing travel lanes and the fact that the current ramp width cannot safely accommodate two-way traffic flow. Minimum curved ramp width should be 9.1m.
- It is not reasonable to require drivers to have to reverse into their parking spaces and/or to have to complete several manoeuvres to get into their parking space. Please also analyze the vehicles entering the spaces in a forward motion and exiting in a backward motion. End of aisle parking spaces are to be wider (e.g. minimum 3.3m wide) or have a hammerhead with a minimum depth of 1.2m to 2.4m.

**GHD:** AutoTurn drawing have been revised accordingly.

### **Comment #3**

**Region:** Please use the correct Town of Milton “Fire Access Route” sign spec (attached). The signs must be spaced 40-45 metres apart as per By-Law No. 48-82. Remove redundant signs that are placed too close together, as this unnecessarily creates sign pollution. Mounting the signs on light standards is preferable, where applicable, to limit the number of sign posts.

**GHD:** ‘Fire Access Route’ sign has been revised accordingly.

### **Comment #4**

**Region:** Indicate all raised crosswalks on the plan. Add ladder crosswalk and arrow pavement markings on all raised crosswalks. Add applicable signage.

**GHD:** Drawing has been revised accordingly.

### **Comment #5**

**Region:** Indicate all speed humps/tables on the plan. Add applicable signage and pavement markings.

**GHD:** Drawing has been revised accordingly.



**Comment #6**

**Region:** It is the Town's understanding that the Derry Road site access is to operate under Traffic Signal Control. As such, please remove the Ra-1 "Stop" sign from this access. Please confirm other pavement marking/signage requirements (e.g. ladder crosswalk) at this access with the Region.

**GHD:** Drawing has been revised accordingly.

**Comment #8**

**Region:** Add a note stating "Parking stall delineation shall be with 100mm wide white or yellow markings".

**GHD:** Noted, drawings have been revised.

**Comment #7**

**Region:** The drop-off area should be signed with custom "pick up and drop off only no parking" signs.

**GHD:** Drawing has been revised accordingly.

**Comment #8**

**Region:** Add a Ra-1 Stops signs at the top of the parking ramps for outbound vehicles.

**GHD:** Drawing has been revised accordingly.

**Comment #9**

**Region:** Indicate barrier-free parking symbols and accessible aisle hatched markings as per the HTA.

**GHD:** Drawing has been revised accordingly.

**Comment #10**

**Region:** One (1) dedicated parking space must be clearly identified (signed), demarcated (with pavement markings) and reserved for the car share vehicle program.

**GHD:** Drawing has been revised accordingly.

**Comment #11**

**Region:** Underground parking should have appropriate directional signing/markings, etc.

**GHD:** An underground parking is only designated for residents and will be assigned spaces for each unit. Therefore, directional signing/ marking would not provide a benefits for resident who uses the same space every day.

Should you have any further questions, please do not hesitate to contact the undersigned. We look forward to a meeting with you to discuss the comments and results of the revised analysis.

Respectfully submitted,

GHD

A handwritten signature in blue ink that reads "William Maria". The signature is written in a cursive, flowing style.

William Maria, P. Eng.

**Transportation Engineer**

**From:** [Ivan Drewnitski](mailto:Ivan.Drewnitski)  
**To:** [Ivan Drewnitski](mailto:Ivan.Drewnitski)  
**Subject:** FW: Z-12/17 & LOPA-06/17 - Briarwood (Milton Towers) REVISED TIS & Noise Rpts.  
**Date:** Monday, May 06, 2019 12:49:00 PM  
**Attachments:** [image007.png](#)

---

**From:** [Aaron.Raymond@milton.ca](mailto:Aaron.Raymond@milton.ca) <[Aaron.Raymond@milton.ca](mailto:Aaron.Raymond@milton.ca)>  
**Sent:** Monday, April 29, 2019 2:00 PM  
**To:** Jacob Kaven <[jacob@korsiak.com](mailto:jacob@korsiak.com)>; 'annettegilgan@me.com' <[annettegilgan@me.com](mailto:annettegilgan@me.com)>  
**Subject:** FW: Z-12/17 & LOPA-06/17 - Briarwood (Milton Towers) REVISED TIS & Noise Rpts.

Hello Jacob, Annette,

Please see below for Regional comments as they pertain to the TIS



**Aaron Raymond**, MCIP, RPP  
Senior Planner, Development Review  
150 Mary Street, Milton ON, L9T 6Z5  
905-878-7252 x2313  
[www.milton.ca](http://www.milton.ca)

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**From:** Hudson, Brian [<mailto:Brian.Hudson@halton.ca>]  
**Sent:** Monday, April 29, 2019 12:15 PM  
**To:** Aaron Raymond <[Aaron.Raymond@milton.ca](mailto:Aaron.Raymond@milton.ca)>  
**Subject:** FW: Z-12/17 & LOPA-06/17 - Briarwood (Milton Towers) REVISED TIS & Noise Rpts.

Hello-for expediency, Patrick gave me his comments on the revised Briarwood TIS and Noise Report via e-mail-see below:

### Noise Requirement

Transportation Planning has reviewed the Noise Feasibility Study titled "Proposed Development at Derry Road and Highway 25" dated March 14, 2019-it is deemed satisfactory.

### Transportation Impact Study Requirement

Transportation Planning has reviewed the Transportation Impact Study dated March 2019 and offers the following comments. These comments need to be considered in an updated final version of the report:

#### Section 3.2 Future Traffic/Corridor Growth

The previous direction from the Region noted the following:

“Add a 3% compounded annually on both Derry Road and Regional Road 25.”

Section 3.2 notes that a 4% growth rate was utilized at for the southbound movement at Ontario Street (the north leg of the Derry Road and Regional Road 25 intersection). It is understood that the Town has not advised that a 4% growth rate should be used for the southbound movement at Regional Road 25 and Derry Road. Please revise this assumption to 3% and update the report accordingly.

### **Section 3.3 Other Nearby Development Site Traffic**

As previously discussed, the direction previously provided was intended to remove the “double count” of the Boyne Secondary Plan traffic-not remove its impact from the analysis. The Boyne Secondary Plan Traffic has been considered in background growth rate assumptions. Please update the report text with this understanding and remove the second last sentence:

~~“As directed by Regional Staff, site traffic generated from the Boyne Secondary Plan Survey Area was not included in the analysis for future considerations”~~

### **Section 6. Capacity Analysis**

The report currently only has a Total 2031 traffic scenario, please complete an ultimate 2031 background scenario. This will help illustrate the impact of the site on the ultimate road network.

### **Section 12 Conclusions and Recommendations**

- The results of the analysis indicate that there are capacity constraints in the study area, in particular at Regional Road 25 and Derry Road. The Conclusion states “Any recommended improvements are in response to the background traffic demands.” It is acknowledged other area developments contribute to the growth; however the report needs to demonstrate that the road network can ultimately (with the future road widening projects) accommodate the development. For example the analysis results indicate that critical movements are identified in the future but does not consider recommending dual left turn lanes at the Regional Road 25 and Derry Road intersection to mitigate these concerns. Please update the report to with specific feasible recommendations that could be implemented to confirm the development can be accommodated in the ultimate scenario. If physical road network improvements cannot address the capacity deficiencies please recommend other means of accommodating the development density.
- The conclusion is to be updated to provide more context to explain how the capacity deficiencies may be accommodated in advance of the ultimate widening scenario which may include a discussion of the broader transportation network.
- A discussion is required in the conclusion related to the potential queuing impacts of this development. The discussion should provide a reference to the future 2022 –No Growth scenario (existing traffic + Site Traffic ), the interim traffic scenario (Traffic conditions in advance of the widening) and ultimate 2031 scenarios (ultimate traffic scenario). It is important to provide the reader with an understanding of anticipated queuing conditions especially at Regional Road 25 and Derry Road. Please demonstrate how the site impacts queuing in the study area and identify if anything can be done to mitigate these concerns.

**Patrick Monaghan**

**Transportation Planning Coordinator**

Infrastructure Planning & Policy

Public Works

**Halton Region**

905-825-6000, ext. 7213 | 1-866-442-5866



**Brian Hudson**

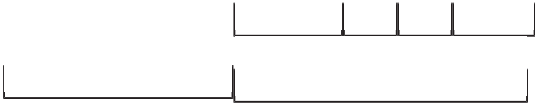
**Senior Planner**

Planning Services

Legislative & Planning Services

**Halton Region**

905-825-6000, ext. 7209 | 1-866-442-5866



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April 6, 2019

Our ref: 111/48645/800

Brian Hudson  
Senior Planner  
Infrastructure Planning & Policy  
Public Works  
Halton Region  
1151 Bronte Road,  
Oakville, Ontario, L6M 3L1

Dear Mr. Brian Hudson

### **Proposed Residential Development, Derry Road at Regional Road 25 Traffic Impact Study - Response to Regional Comments**

GHD was retained by Briarwood (Milton Green Fields) Ltd. to prepare a Traffic Impact Study (TIS) for a proposed residential development located on the southeast corner of Derry Road and Regional Road 25 in the Town of Milton. The TIS report, dated March, 2019, has been reviewed by Halton Region staff, with resulting Regional comments provided to GHD, dated April 2019.

This letter presents the Region's comments and GHD's respective responses, with the expectation that a meeting will be held to permit further discussion between Regional staff and GHD.

#### ***Response to Regional Comments***

**The Region** provided the following comments:

- Remove the anticipated 4% growth rate for the southbound movement at Ontario Street;
- Revised the report text relating the Boyne Secondary Plan;
- Complete an ultimate 2031 background scenario;
- Revise the conclusions and recommendations based on capacity constraints, lane improvements and queueing.

**GHD** as requested by the Region has:

- Removed the 4% growth rate and revised the assumption to a 3% growth rate;
- Removed the text relating to the Boyne Secondary Plan being included in the background development sit traffic;
- Added a 2031 future background scenario in the capacity analysis section;
- Revised the conclusion to reflect the new conclusion based on the comments provided.

Should you have any further questions, please do not hesitate to contact the undersigned. We look forward to a meeting with you to discuss the comments and results of the revised analysis.

Respectfully submitted,

GHD



William Maria, P. Eng.

**Transportation Engineer**



Adam Mildenerger, B.A., C.E.T.

**Transportation Planner**



## Town of Milton

### Memo

**To:** Aaron Raymond, Senior Planner  
**From:** Michael Turco, Transportation Planning Technologist  
**Date:** 4/29/2019  
**Subject:** Briarwood Milton Towers & Green Fields - Z 12-17 & LOPA 06-17

---

Further to the Traffic Impact and Parking Study dated March 2019, please be advised that the Traffic section has the following comments:

#### Traffic Impact and Parking Study

- The growth rate for southbound traffic on Ontario Street appears to be excessive when compared to the other growth rates being used in the report. Please confirm a suitable growth rate with Halton Region staff.
- The Town does not support reducing visitor parking requirements. Visitor parking must be provided at a rate of 0.25 spaces per unit. Please revise the report accordingly including, but not limited to, Section 10.3, p. 46, which refers to visitor parking being provided at a rate 0.20 spaces per unit.
- Section 3.3 states that the Boyne Secondary Plan Survey Area was included in the study as a background development. Further down in Section 3.3 the report states "...site traffic generated from the Boyne Secondary Plan Survey Area was not included in the analysis of future conditions". It is the Town's understanding that the Boyne area traffic is included in the growth rates provided by the Region and, therefore, the text referring to the Boyne traffic not being included should be removed.
- Essentially all of the traffic volume figures in the report are missing a "legend". Please update the figures accordingly.
- The report includes a Future Total 2031 (post widening) scenario. In order to properly determine the impacts of the additional site generated traffic, a Future



Background 2031 scenario should also be provided. The intent of presenting the future background scenario is to have a baseline for evaluating the incremental impact of the proposed development.

- As per the findings of the study, several critical movements have been identified at study area intersections with considerable capacity constraints and queuing. The report has not adequately justified that the adjacent road network can accommodate the proposed development. The following should be explained in the report:
  - The growth rates used in the report are conservative considering the inclusion of the other nearby background developments which technically would capture at least some of the growth anticipated by the Region and Town
  - A summary comparison of the future background and future total scenario results should be provided to indicate the nominal increases to v/c ratios and intersection delays
  - The location of the subject site being within walking distance of many nearby amenities which should somewhat reduce vehicular traffic trips generated by the site
  - The potential impact of Regional Road 25/Ontario Street and Derry Road being future transit priority corridors on reducing the site generated traffic volumes
  - The potential impact of the proposed TDM measures and reduced parking supply on reducing the site generated traffic volumes
- Please submit a revised report with the aforementioned changes in both PDF and hardcopy format.

Should you have any questions, please feel free to contact me at 905-878-7252 ext. 2363

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



April 6, 2019

Our ref: 111/48645/800

Michael Turco  
Transportation Planning Technologist  
Town of Milton  
150 Mary Street  
Milton, Ontario

Dear Mr. Michael Turco

### **Proposed Residential Development, Derry Road at Regional Road 25 Traffic Impact Study - Response to Regional Comments**

GHD was retained by Briarwood (Milton Green Fields) Ltd. to prepare a Traffic Impact Study (TIS) for a proposed residential development located on the southeast corner of Derry Road and Regional Road 25 in the Town of Milton. The TIS report, dated March, 2019, has been reviewed by Town of Milton staff, with resulting Town comments provided to GHD, dated April 2019.

This letter presents the Town's comments and GHD's respective responses, with the expectation that a meeting will be held to permit further discussion between Town staff and GHD.

#### ***Response to Town Comments***

##### **Comment #1**

**Town:** The growth rate for southbound traffic on Ontario Street appears to be excessive when compared to the other growth rates being used in the report. Please confirm a suitable growth rate with Halton Region staff.

**GHD:** Has revised the growth rate based on discussions with Halton Region staff.

##### **Comment #2**

**Town:** The Town does not support reducing visitor parking requirements. Visitor parking must be provided at a rate of 0.25 spaces per unit. Please revise the report accordingly including, but not limited to, Section 10.3, p. 46, which refers to visitor parking being provided at a rate 0.20 spaces per unit.

**GHD:** Updated accordingly.

##### **Comment #3**

**Town:** Section 3.3 states that the Boyne Secondary Plan Survey Area was included in the study as a background development. Further down in Section 3.3 the report states "...site traffic generated from the Boyne Secondary Plan Survey Area was not included in the analysis of future conditions". It is the Town's understanding that the Boyne area traffic is included in the growth rates provided by the Region and, therefore, the text referring to the Boyne traffic not being included should be removed.

**GHD:** Updated accordingly.

Comment #4

**Town:** Essentially all of the traffic volume figures in the report are missing a “legend”. Please update the figures accordingly.

**GHD:** Updated accordingly.

Comment #5

**Town:** The report includes a Future Total 2031 (post widening) scenario. In order to properly determine the impacts of the additional site generated traffic, a Future Background 2031 scenario should also be provided. The intent of presenting the future background scenario is to have a baseline for evaluating the incremental impact of the proposed development.

**GHD:** A future background 2031 scenario has been included in the capacity analysis section.

Comment #6

**Town:** As per the findings of the study, several critical movements have been identified at study area intersections with considerable capacity constraints and queuing. The report has not adequately justified that the adjacent road network can accommodate the proposed development.

**GHD:** Updated accordingly, based on the comments provided.

Should you have any further questions, please do not hesitate to contact the undersigned. We look forward to a meeting with you to discuss the comments and results of the revised analysis.

Respectfully submitted,

GHD



William Maria, P. Eng.

**Transportation Engineer**



Adam Mildenerger, B.A., C.E.T.

**Transportation Planner**

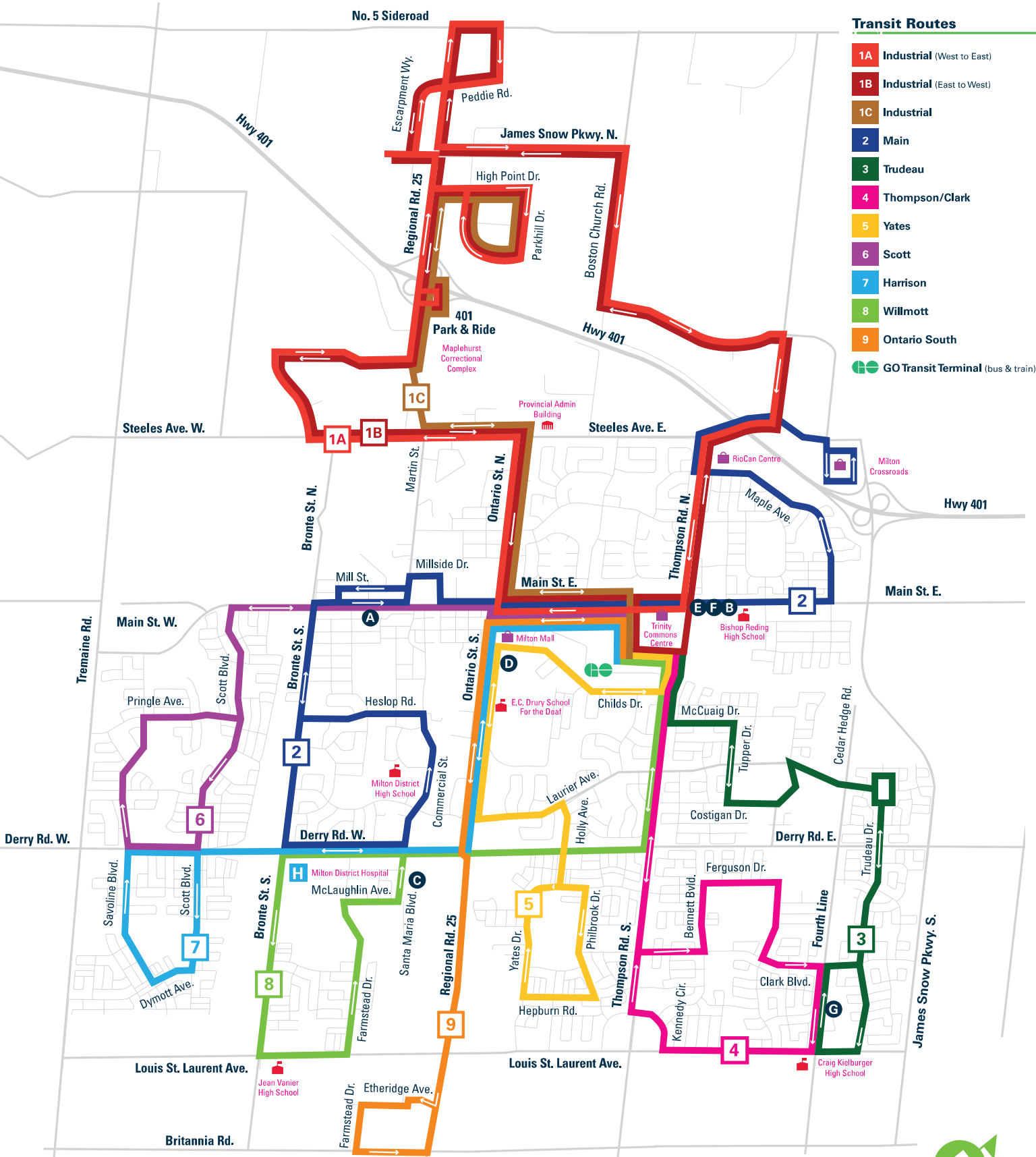
## **Appendix B Traffic Data**

No. 5 Sideroad

**Transit Routes**

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

**GO Transit Terminal** (bus & train)



# Regional Rd 25 @ Louis St Laurent Ave

## Morning Peak Diagram

### Specified Period

**From:** 7:00:00

**To:** 9:00:00

### One Hour Peak

**From:** 7:30:00

**To:** 8:30:00

**Municipality:** Halton Region  
**Site #:** 0000002977  
**Intersection:** Regional Rd 25 & Louis St Laurent /  
**TFR File #:** 1  
**Count date:** 6-Dec-2016

**Weather conditions:**  
 Cloudy/Dry  
**Person(s) who counted:**  
 Matt  
 Linda

**\*\* Signalized Intersection \*\***

**Major Road:** Regional Rd 25 runs N/S

North Leg Total: 1649  
 North Entering: 829  
 North Peds: 6  
 Peds Cross:  $\times$

Heavys	10	48	0	58
Trucks	1	7	2	10
Cars	89	624	48	761
Totals	100	679	50	



Heavys	46
Trucks	15
Cars	759
Totals	820

East Leg Total: 1207  
 East Entering: 567  
 East Peds: 2  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
26	10	553	589

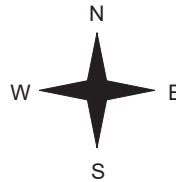


Regional Rd 25

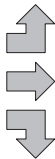
Cars	Trucks	Heavys	Totals
80	1	2	83
323	4	7	334
141	3	6	150
544	8	15	



Louis St Laurent Ave



Heavys	Trucks	Cars	Totals
11	2	117	130
4	4	444	452
15	4	464	483
30	10	1025	



Louis St Laurent Ave



Cars	Trucks	Heavys	Totals
622	11	7	640

Peds Cross:  $\times$   
 West Peds: 0  
 West Entering: 1065  
 West Leg Total: 1654

Cars	1229	Cars	141	562	130	833
Trucks	14	Trucks	5	12	5	22
Heavys	69	Heavys	9	33	3	45
Totals	1312	Totals	155	607	138	



Peds Cross:  $\times$   
 South Peds: 0  
 South Entering: 900  
 South Leg Total: 2212

## Comments

# Regional Rd 25 @ Louis St Laurent Ave

## Mid-day Peak Diagram

### Specified Period

**From:** 11:00:00

**To:** 14:00:00

### One Hour Peak

**From:** 13:00:00

**To:** 14:00:00

**Municipality:** Halton Region  
**Site #:** 0000002977  
**Intersection:** Regional Rd 25 & Louis St Laurent /  
**TFR File #:** 1  
**Count date:** 6-Dec-2016

**Weather conditions:**  
 Cloudy/Dry  
**Person(s) who counted:**  
 Matt  
 Linda

**\*\* Signalized Intersection \*\***

**Major Road:** Regional Rd 25 runs N/S

North Leg Total: 1124  
 North Entering: 558  
 North Peds: 4  
 Peds Cross:  $\times$

Heavys	8	42	0	50
Trucks	2	13	1	16
Cars	77	372	43	492
<b>Totals</b>	<b>87</b>	<b>427</b>	<b>44</b>	



Heavys	56
Trucks	24
Cars	486
<b>Totals</b>	<b>566</b>

East Leg Total: 499  
 East Entering: 236  
 East Peds: 0  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
14	10	345	369

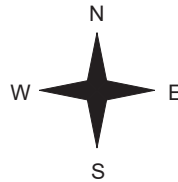


Regional Rd 25

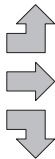
Cars	Trucks	Heavys	Totals
29	0	0	29
144	4	2	150
57	0	0	57
<b>230</b>	<b>4</b>	<b>2</b>	



Louis St Laurent Ave



Heavys	Trucks	Cars	Totals
9	2	47	58
1	6	136	143
6	5	140	151
<b>16</b>	<b>13</b>	<b>323</b>	



Louis St Laurent Ave



Cars	Trucks	Heavys	Totals
252	9	2	263

Peds Cross:  $\times$   
 West Peds: 1  
 West Entering: 352  
 West Leg Total: 721

Cars	569	Cars	124	410	73	607
Trucks	18	Trucks	4	22	2	28
Heavys	48	Heavys	4	47	1	52
<b>Totals</b>	<b>635</b>	<b>Totals</b>	<b>132</b>	<b>479</b>	<b>76</b>	



Peds Cross:  $\times$   
 South Peds: 0  
 South Entering: 687  
 South Leg Total: 1322

## Comments

# Regional Rd 25 @ Louis St Laurent Ave

## Afternoon Peak Diagram

### Specified Period

**From:** 15:00:00  
**To:** 18:00:00

### One Hour Peak

**From:** 16:30:00  
**To:** 17:30:00

**Municipality:** Halton Region  
**Site #:** 0000002977  
**Intersection:** Regional Rd 25 & Louis St Laurent /  
**TFR File #:** 1  
**Count date:** 6-Dec-2016

**Weather conditions:**  
Cloudy/Dry  
**Person(s) who counted:**  
Matt  
Linda

**\*\* Signalized Intersection \*\***

**Major Road:** Regional Rd 25 runs N/S

North Leg Total: 1690  
North Entering: 769  
North Peds: 1  
Peds Cross:  $\bowtie$

Heavys	0	19	0	19
Trucks	0	7	0	7
Cars	139	537	67	743
Totals	139	563	67	



Heavys	24
Trucks	15
Cars	882
Totals	921

East Leg Total: 1178  
East Entering: 607  
East Peds: 1  
Peds Cross:  $\bowtie$

Heavys	4
Trucks	6
Cars	879
Totals	889

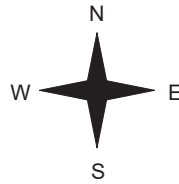


Regional Rd 25

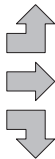
Cars	61	0	0	61
Trucks	448	1	2	451
Heavys	92	2	1	95
Totals	601	3	3	



Louis St Laurent Ave



Heavys	3
Trucks	0
Cars	86
Totals	89
Heavys	2
Trucks	0
Cars	306
Totals	308
Heavys	2
Trucks	2
Cars	193
Totals	197
Heavys	7
Trucks	2
Cars	585
Totals	



Louis St Laurent Ave



Cars	562	6	3	571
Trucks				
Heavys				
Totals				

Peds Cross:  $\bowtie$   
West Peds: 0  
West Entering: 594  
West Leg Total: 1483

Cars	822	292	735	189	1216
Trucks	11	5	15	6	26
Heavys	22	2	21	1	24
Totals	855	299	771	196	



Regional Rd 25

Peds Cross:  $\bowtie$   
South Peds: 0  
South Entering: 1266  
South Leg Total: 2121

## Comments



# Regional Rd 25 @ Louis St Laurent Ave

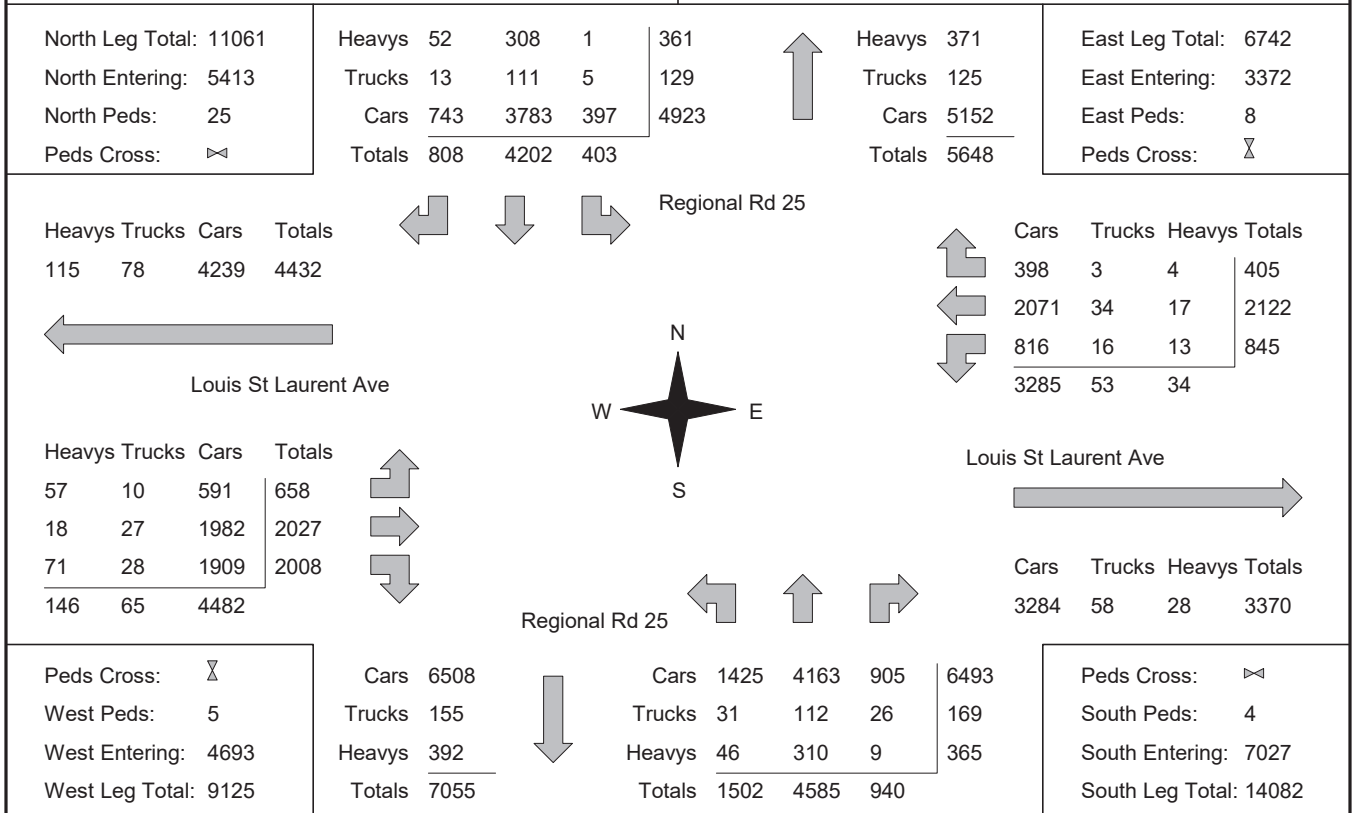
## Total Count Diagram

**Municipality:** Halton Region  
**Site #:** 0000002977  
**Intersection:** Regional Rd 25 & Louis St Laurent /  
**TFR File #:** 1  
**Count date:** 6-Dec-2016

**Weather conditions:**  
 Cloudy/Dry  
**Person(s) who counted:**  
 Matt  
 Linda

**\*\* Signalized Intersection \*\***

**Major Road:** Regional Rd 25 runs N/S



### 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:** Milton  
**Site #:** 1721200001  
**Intersection:** Derry Rd & 585 Ontario St S Driveway  
**TFR File #:** 25  
**Count date:** 19-Jul-17

**Weather conditions:**  
**Person(s) who counted:**

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

**Major Road:** Derry Rd runs W/E

North Leg Total: 58

North Entering: 22

North Peds: 8

Peds Cross:  $\times$

Heavys	0	0	0
Trucks	0	1	1
Cars	4	17	21
<b>Totals</b>	<b>4</b>	<b>18</b>	



Heavys 0

Trucks 0

Cars 36

Totals 36

East Leg Total: 2370

East Entering: 1142

East Peds: 0

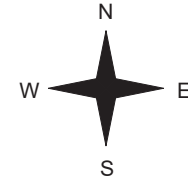
Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
0	63	1067	1130



Derry Rd

Heavys	Trucks	Cars	Totals
0	0	20	20
0	34	1176	1210
<b>0</b>	<b>34</b>	<b>1196</b>	



585 Ontario St S Driveway

Cars	Trucks	Heavys	Totals
16	0	0	16
1063	63	0	1126
<b>1079</b>	<b>63</b>	<b>0</b>	



Derry Rd



Cars	Trucks	Heavys	Totals
1193	35	0	1228

Peds Cross:  $\times$   
 West Peds: 0  
 West Entering: 1230  
 West Leg Total: 2360

## 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:** Milton  
**Site #:** 1721200001  
**Intersection:** Derry Rd & 585 Ontario St S Driveway  
**TFR File #:** 25  
**Count date:** 19-Jul-17

**Weather conditions:**  
**Person(s) who counted:**

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

**Major Road:** Derry Rd runs W/E

North Leg Total: 73  
North Entering: 43  
North Peds: 2  
Peds Cross:  $\times$

Heavys	0	0	0
Trucks	0	0	0
Cars	24	19	43
<b>Totals</b>	<b>24</b>	<b>19</b>	



Heavys	0
Trucks	0
Cars	30
<b>Totals</b>	<b>30</b>

East Leg Total: 2090  
East Entering: 1232  
East Peds: 0  
Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
0	13	1223	1236



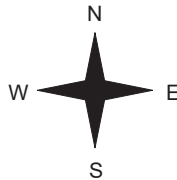
585 Ontario St S Driveway



Cars	Trucks	Heavys	Totals
20	0	0	20
1199	13	0	1212
<b>1219</b>	<b>13</b>	<b>0</b>	



Derry Rd



Heavys	Trucks	Cars	Totals
0	0	10	10
0	34	805	839
<b>0</b>	<b>34</b>	<b>815</b>	



Derry Rd



Cars	Trucks	Heavys	Totals
824	34	0	858

Peds Cross:  $\times$   
West Peds: 0  
West Entering: 849  
West Leg Total: 2085

## Comments

# Ontario Traffic Inc.

## Total Count Diagram

**Municipality:** Milton  
**Site #:** 1721200001  
**Intersection:** Derry Rd & 585 Ontario St S Driveway  
**TFR File #:** 25  
**Count date:** 19-Jul-17

**Weather conditions:**  
**Person(s) who counted:**

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

**Major Road:** Derry Rd runs W/E

North Leg Total: 223  
 North Entering: 111  
 North Peds: 24  
 Peds Cross:  $\times$

Heavys	0	0	0
Trucks	2	2	4
Cars	37	70	107
<b>Totals</b>	<b>39</b>	<b>72</b>	



Heavys	0
Trucks	1
Cars	111
<b>Totals</b>	<b>112</b>

East Leg Total: 7699  
 East Entering: 3765  
 East Peds: 0  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
0	172	3581	3753



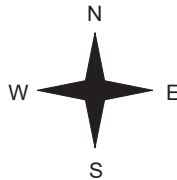
585 Ontario St S Driveway



Cars	Trucks	Heavys	Totals
51	0	0	51
3544	170	0	3714
<b>3595</b>	<b>170</b>	<b>0</b>	



Derry Rd



Heavys	Trucks	Cars	Totals
0	1	60	61
0	167	3695	3862
<b>0</b>	<b>168</b>	<b>3755</b>	



Derry Rd



Cars	Trucks	Heavys	Totals
3765	169	0	3934

Peds Cross:  $\times$   
 West Peds: 0  
 West Entering: 3923  
 West Leg Total: 7676

### Comments

# Ontario Traffic Inc. Traffic Count Summary

Intersection: Derry Rd & 585 Ontario St S Drive    Count Date: 19-Jul-17    Municipality: Milton

<b>North Approach Totals</b>						North/South Total Approaches	<b>South Approach Totals</b>						
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total		
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0	
8:00:00	14	0	2	16	10	16	8:00:00	0	0	0	0	4	
9:00:00	18	0	4	22	8	22	9:00:00	0	0	0	0	6	
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0	
17:00:00	21	0	9	30	4	30	17:00:00	0	0	0	0	5	
18:00:00	19	0	24	43	2	43	18:00:00	0	0	0	0	1	
<b>Totals:</b>						111							16
<b>East Approach Totals</b>						East/West Total Approaches	<b>West Approach Totals</b>						
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds	
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total		
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0	
8:00:00	0	765	6	771	0	1788	8:00:00	8	1009	0	1017	0	
9:00:00	0	1126	16	1142	0	2372	9:00:00	20	1210	0	1230	0	
16:00:00	0	1	0	1	0	1	16:00:00	0	0	0	0	0	
17:00:00	0	610	9	619	0	1446	17:00:00	23	804	0	827	0	
18:00:00	0	1212	20	1232	0	2081	18:00:00	10	839	0	849	0	
<b>Totals:</b>						7688							0
<b>Calculated Values for Traffic Crossing Major Street</b>													
Hours Ending:	0:00	0:00	7:00	8:00				9:00	16:00	17:00	18:00		
Crossing Values:	0	0	0	14				18	0	21	19		

# Ontario Traffic Inc.

Count Date: 19-Jul-17 Site #: 1721200001

Interval Time	Passenger Cars - North Approach				Trucks - North Approach				Heavys - North Approach				Pedestrians	
	Left		Right		Left		Right		Left		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	2	2	0	0	0	0	0	0	0	0	0	0	2	2
7:30:00	9	7	0	0	0	0	0	0	0	0	0	0	5	3
7:45:00	10	1	0	1	0	0	0	0	0	0	0	0	7	2
8:00:00	13	3	0	2	1	1	0	0	0	0	0	0	10	3
8:15:00	15	2	0	2	1	0	0	0	0	0	0	0	12	2
8:30:00	19	4	0	4	1	0	0	0	0	0	0	0	13	1
8:45:00	24	5	0	6	2	1	0	0	0	0	0	0	14	1
9:00:00	30	6	0	6	2	0	0	0	0	0	0	0	18	4
9:00:53	30	0	0	6	0	0	0	0	0	0	0	0	18	0
16:00:00	30	0	0	6	0	0	0	0	0	0	0	0	18	0
16:15:00	36	6	0	8	2	0	0	0	0	0	0	0	19	1
16:30:00	40	4	0	9	1	2	0	0	2	2	0	0	21	2
16:45:00	46	6	0	12	3	2	0	0	2	0	0	0	22	1
17:00:00	51	5	0	13	1	2	0	0	2	0	0	0	22	0
17:15:00	57	6	0	20	7	2	0	0	2	0	0	0	22	0
17:30:00	60	3	0	28	8	2	0	0	2	0	0	0	22	0
17:45:00	62	2	0	31	3	2	0	0	2	0	0	0	24	2
18:00:00	70	8	0	37	6	2	0	0	2	0	0	0	24	0
18:05:40	70	0	0	37	0	2	0	0	2	0	0	0	24	0
18:15:00	70	0	0	37	0	2	0	0	2	0	0	0	24	0
18:15:15	70	0	0	37	0	2	0	0	2	0	0	0	24	0









# Derry Rd @ Ontario St S

## Morning Peak Diagram

### Specified Period

**From:** 6:00:00  
**To:** 10:00:00

### One Hour Peak

**From:** 8:00:00  
**To:** 9:00:00

**Municipality:** Halton Region  
**Site #:** 0000002743  
**Intersection:** Derry Rd & Ontario St S  
**TFR File #:** 5  
**Count date:** 20-Apr-2017

### Weather conditions:

Rain

### Person(s) who counted:

Cam

### \*\* Signalized Intersection \*\*

**Major Road:** Derry Rd runs W/E

North Leg Total: 1701  
North Entering: 721  
North Peds: 6  
Peds Cross:  $\times$

Heavys	10	44	9	63
Trucks	3	10	2	15
Cars	103	414	126	643
<b>Totals</b>	<b>116</b>	<b>468</b>	<b>137</b>	



Heavys	52
Trucks	10
Cars	918
<b>Totals</b>	<b>980</b>

East Leg Total: 2355  
East Entering: 983  
East Peds: 4  
Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
31	10	755	796

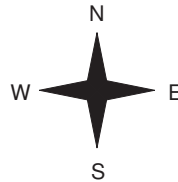


Ontario St S

Cars	Trucks	Heavys	Totals
166	2	7	175
523	5	20	548
240	4	16	260
<b>929</b>	<b>11</b>	<b>43</b>	



Derry Rd



Heavys	Trucks	Cars	Totals
9	1	230	240
19	6	1042	1067
4	3	163	170
<b>32</b>	<b>10</b>	<b>1435</b>	



Derry Rd



Peds Cross:  $\times$   
West Peds: 2  
West Entering: 1477  
West Leg Total: 2273

Cars	817
Trucks	17
Heavys	64
<b>Totals</b>	<b>898</b>



Ontario St S

Cars	129	522	161	812
Trucks	2	7	3	12
Heavys	1	36	4	41
<b>Totals</b>	<b>132</b>	<b>565</b>	<b>168</b>	



Cars	Trucks	Heavys	Totals
1329	11	32	1372

Peds Cross:  $\times$   
South Peds: 1  
South Entering: 865  
South Leg Total: 1763

## Comments

# Derry Rd @ Ontario St S

## Mid-day Peak Diagram

### Specified Period

**From:** 12:00:00

**To:** 14:00:00

### One Hour Peak

**From:** 12:15:00

**To:** 13:15:00

**Municipality:** Halton Region  
**Site #:** 0000002743  
**Intersection:** Derry Rd & Ontario St S  
**TFR File #:** 5  
**Count date:** 20-Apr-2017

### Weather conditions:

Rain

### Person(s) who counted:

Cam

### \*\* Signalized Intersection \*\*

**Major Road:** Derry Rd runs W/E

North Leg Total: 1248

North Entering: 601

North Peds: 4

Peds Cross:  $\times$

Heavys	2	32	3	37
Trucks	3	7	4	14
Cars	149	297	104	550
<b>Totals</b>	<b>154</b>	<b>336</b>	<b>111</b>	



Heavys 29

Trucks 12

Cars 606

Totals 647

East Leg Total: 1349

East Entering: 675

East Peds: 3

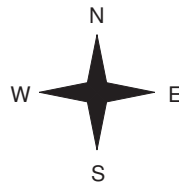
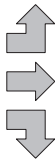
Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
6	11	665	682



Derry Rd

Heavys	Trucks	Cars	Totals
3	2	190	195
10	4	467	481
1	0	93	94
<b>14</b>	<b>6</b>	<b>750</b>	



Ontario St S

Cars	Trucks	Heavys	Totals
116	2	2	120
420	6	3	429
115	1	10	126
<b>651</b>	<b>9</b>	<b>15</b>	

Derry Rd



Cars	Trucks	Heavys	Totals
641	13	20	674

Peds Cross:  $\times$

West Peds: 0

West Entering: 770

West Leg Total: 1452

Cars	505	Cars	96	300	70	466
Trucks	8	Trucks	2	8	5	15
Heavys	43	Heavys	1	24	7	32
<b>Totals</b>	<b>556</b>	<b>Totals</b>	<b>99</b>	<b>332</b>	<b>82</b>	



Peds Cross:  $\times$

South Peds: 2

South Entering: 513

South Leg Total: 1069

## Comments

# Derry Rd @ Ontario St S

## Afternoon Peak Diagram

### Specified Period

**From:** 15:00:00

**To:** 22:00:00

### One Hour Peak

**From:** 16:30:00

**To:** 17:30:00

**Municipality:** Halton Region  
**Site #:** 0000002743  
**Intersection:** Derry Rd & Ontario St S  
**TFR File #:** 5  
**Count date:** 20-Apr-2017

### Weather conditions:

Rain

### Person(s) who counted:

Cam

### \*\* Signalized Intersection \*\*

**Major Road:** Derry Rd runs W/E

North Leg Total: 1979  
 North Entering: 894  
 North Peds: 1  
 Peds Cross:  $\times$

Heavys	5	19	2	26
Trucks	0	5	0	5
Cars	200	484	179	863
<b>Totals</b>	<b>205</b>	<b>508</b>	<b>181</b>	



Heavys	33
Trucks	5
Cars	1047
<b>Totals</b>	<b>1085</b>

East Leg Total: 2336  
 East Entering: 1321  
 East Peds: 1  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
12	2	1304	1318

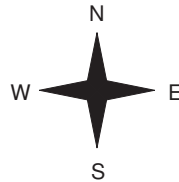


Ontario St S

Cars	Trucks	Heavys	Totals
207	0	1	208
937	1	5	943
169	0	1	170
<b>1313</b>	<b>1</b>	<b>7</b>	



Derry Rd



Heavys	Trucks	Cars	Totals
6	1	242	249
3	3	694	700
0	1	92	93
<b>9</b>	<b>5</b>	<b>1028</b>	



Derry Rd



Peds Cross:  $\times$   
 West Peds: 1  
 West Entering: 1042  
 West Leg Total: 2360

Cars	745	Cars	167	598	122	887
Trucks	6	Trucks	1	4	3	8
Heavys	20	Heavys	2	26	9	37
<b>Totals</b>	<b>771</b>	<b>Totals</b>	<b>170</b>	<b>628</b>	<b>134</b>	



Ontario St S



Cars	Trucks	Heavys	Totals
995	6	14	1015

Peds Cross:  $\times$   
 South Peds: 2  
 South Entering: 932  
 South Leg Total: 1703

## Comments

# Derry Rd @ Ontario St S

## Total Count Diagram

**Municipality:** Halton Region  
**Site #:** 0000002743  
**Intersection:** Derry Rd & Ontario St S  
**TFR File #:** 5  
**Count date:** 20-Apr-2017

**Weather conditions:**  
 Rain  
**Person(s) who counted:**  
 Cam

**\*\* Signalized Intersection \*\***

**Major Road:** Derry Rd runs W/E

North Leg Total: 17692  
 North Entering: 8158  
 North Peds: 34  
 Peds Cross:  $\times$

Heavys	58	285	35	378
Trucks	15	63	13	91
Cars	1839	4236	1614	7689
<b>Totals</b>	<b>1912</b>	<b>4584</b>	<b>1662</b>	



Heavys	394
Trucks	89
Cars	9051
<b>Totals</b>	<b>9534</b>

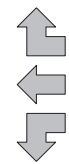
East Leg Total: 22989  
 East Entering: 11428  
 East Peds: 24  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
183	67	10812	11062

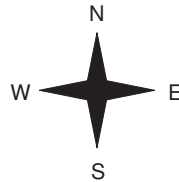


Ontario St S

Cars	Trucks	Heavys	Totals
1719	13	32	1764
7562	41	104	7707
1870	19	68	1957
<b>11151</b>	<b>73</b>	<b>204</b>	



Derry Rd



Heavys	Trucks	Cars	Totals
73	14	2626	2713
103	61	8275	8439
24	12	1201	1237
<b>200</b>	<b>87</b>	<b>12102</b>	



Derry Rd



Peds Cross:  $\times$   
 West Peds: 10  
 West Entering: 12389  
 West Leg Total: 23451

Cars	7307
Trucks	94
Heavys	377
<b>Totals</b>	<b>7778</b>



Ontario St S

Cars	1411	4706	1360	7477
Trucks	11	62	29	102
Heavys	21	289	71	381
<b>Totals</b>	<b>1443</b>	<b>5057</b>	<b>1460</b>	

Peds Cross:  $\times$   
 South Peds: 21  
 South Entering: 7960  
 South Leg Total: 15738

### Comments

# Derry Rd @ Holly Ave

## Morning Peak Diagram

### Specified Period

**From:** 6:00:00  
**To:** 10:00:00

### One Hour Peak

**From:** 8:00:00  
**To:** 9:00:00

**Municipality:** Halton Region  
**Site #:** 0000002744  
**Intersection:** Derry Rd & Holly Ave  
**TFR File #:** 6  
**Count date:** 20-Apr-2017

**Weather conditions:**  
Rain  
**Person(s) who counted:**  
Cam

**\*\* Signalized Intersection \*\***

**Major Road:** Derry Rd runs W/E

North Leg Total: 265  
North Entering: 154  
North Peds: 2  
Peds Cross:  $\times$

Heavys	1	4	2	7
Trucks	0	0	0	0
Cars	76	31	40	147
Totals	77	35	42	



Heavys	10
Trucks	3
Cars	98
Totals	111

East Leg Total: 2246  
East Entering: 852  
East Peds: 6  
Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
39	10	965	1014

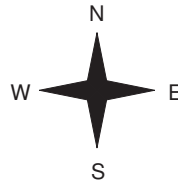


Holly Ave

Cars	Trucks	Heavys	Totals
20	0	1	21
729	10	37	776
52	0	3	55
801	10	41	



Derry Rd



Heavys	Trucks	Cars	Totals
3	3	50	56
28	8	1183	1219
2	0	97	99
33	11	1330	



Derry Rd



Cars	Trucks	Heavys	Totals
1350	8	36	1394

Peds Cross:  $\times$   
West Peds: 2  
West Entering: 1374  
West Leg Total: 2388

Cars	180
Trucks	0
Heavys	9
Totals	189



Cars	160	28	127	315
Trucks	0	0	0	0
Heavys	1	6	6	13
Totals	161	34	133	

Peds Cross:  $\times$   
South Peds: 1  
South Entering: 328  
South Leg Total: 517

## Comments

# Derry Rd @ Holly Ave

## Mid-day Peak Diagram

### Specified Period

**From:** 12:00:00  
**To:** 14:00:00

### One Hour Peak

**From:** 12:00:00  
**To:** 13:00:00

**Municipality:** Halton Region  
**Site #:** 0000002744  
**Intersection:** Derry Rd & Holly Ave  
**TFR File #:** 6  
**Count date:** 20-Apr-2017

**Weather conditions:**  
Rain  
**Person(s) who counted:**  
Cam

**\*\* Signalized Intersection \*\***

**Major Road:** Derry Rd runs W/E

North Leg Total: 151  
North Entering: 73  
North Peds: 0  
Peds Cross:  $\times$

Heavys	0	1	0	1
Trucks	1	0	0	1
Cars	28	18	25	71
<b>Totals</b>	<b>29</b>	<b>19</b>	<b>25</b>	



Heavys 1  
Trucks 0  
Cars 77  
Totals 78

East Leg Total: 1424  
East Entering: 665  
East Peds: 1  
Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
18	6	662	686

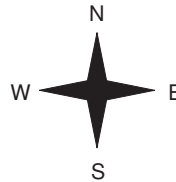


Holly Ave

Cars	Trucks	Heavys	Totals
30	0	0	30
560	4	18	582
52	1	0	53
<b>642</b>	<b>5</b>	<b>18</b>	



Derry Rd



Heavys	Trucks	Cars	Totals
0	0	28	28
22	13	636	671
0	0	81	81
<b>22</b>	<b>13</b>	<b>745</b>	



Derry Rd



Cars	Trucks	Heavys	Totals
724	13	22	759

Peds Cross:  $\times$   
West Peds: 1  
West Entering: 780  
West Leg Total: 1466

Cars	151	Cars	74	19	63	156
Trucks	1	Trucks	1	0	0	1
Heavys	1	Heavys	0	1	0	1
<b>Totals</b>	<b>153</b>	<b>Totals</b>	<b>75</b>	<b>20</b>	<b>63</b>	



Holly Ave



Peds Cross:  $\times$   
South Peds: 1  
South Entering: 158  
South Leg Total: 311

## Comments

# Derry Rd @ Holly Ave

## Afternoon Peak Diagram

### Specified Period

**From:** 15:00:00

**To:** 22:00:00

### One Hour Peak

**From:** 17:45:00

**To:** 18:45:00

**Municipality:** Halton Region  
**Site #:** 0000002744  
**Intersection:** Derry Rd & Holly Ave  
**TFR File #:** 6  
**Count date:** 20-Apr-2017

### Weather conditions:

Rain

### Person(s) who counted:

Cam

### \*\* Signalized Intersection \*\*

**Major Road:** Derry Rd runs W/E

North Leg Total: 325  
 North Entering: 152  
 North Peds: 0  
 Peds Cross:  $\times$

Heavys	0	2	0	2
Trucks	0	0	0	0
Cars	51	65	34	150
<b>Totals</b>	<b>51</b>	<b>67</b>	<b>34</b>	



Heavys	3
Trucks	0
Cars	170
<b>Totals</b>	<b>173</b>

East Leg Total: 2312  
 East Entering: 1368  
 East Peds: 1  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
8	4	1373	1385

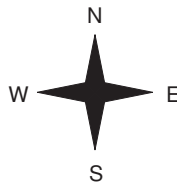


Holly Ave

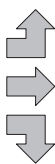
Cars	Trucks	Heavys	Totals
52	0	0	52
1159	3	7	1169
147	0	0	147
<b>1358</b>	<b>3</b>	<b>7</b>	



Derry Rd



Heavys	Trucks	Cars	Totals
0	0	57	57
8	5	820	833
0	0	167	167
<b>8</b>	<b>5</b>	<b>1044</b>	

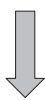


Derry Rd



Peds Cross:  $\times$   
 West Peds: 0  
 West Entering: 1057  
 West Leg Total: 2442

Cars	379	Cars	163	61	77	301
Trucks	0	Trucks	1	0	0	1
Heavys	2	Heavys	1	3	0	4
<b>Totals</b>	<b>381</b>	<b>Totals</b>	<b>165</b>	<b>64</b>	<b>77</b>	



Holly Ave



Peds Cross:  $\times$   
 South Peds: 2  
 South Entering: 306  
 South Leg Total: 687

## Comments



# Derry Rd @ Holly Ave

## Total Count Diagram

**Municipality:** Halton Region  
**Site #:** 0000002744  
**Intersection:** Derry Rd & Holly Ave  
**TFR File #:** 6  
**Count date:** 20-Apr-2017

**Weather conditions:**  
 Rain  
**Person(s) who counted:**  
 Cam

**\*\* Signalized Intersection \*\***

**Major Road:** Derry Rd runs W/E

North Leg Total: 2488  
 North Entering: 1320  
 North Peds: 24  
 Peds Cross:  $\times$

Heavys	4	22	7	33
Trucks	2	2	1	5
Cars	519	395	368	1282
Totals	525	419	376	



Heavys	35
Trucks	9
Cars	1124
Totals	1168

East Leg Total: 22708  
 East Entering: 10988  
 East Peds: 29  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
207	67	11282	11556

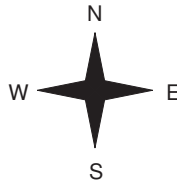


Holly Ave

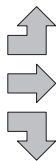
Cars	Trucks	Heavys	Totals
367	4	3	374
9369	61	193	9623
981	3	7	991
10717	68	203	



Derry Rd



Heavys	Trucks	Cars	Totals
4	5	418	427
228	89	9979	10296
6	1	1338	1345
238	95	11735	



Derry Rd



Peds Cross:  $\times$   
 West Peds: 16  
 West Entering: 12068  
 West Leg Total: 23624

Cars	2714
Trucks	6
Heavys	35
Totals	2755



Cars	1394	339	1038	2771
Trucks	4	0	1	5
Heavys	10	28	9	47
Totals	1408	367	1048	

Holly Ave



Cars	Trucks	Heavys	Totals
11385	91	244	11720

Peds Cross:  $\times$   
 South Peds: 25  
 South Entering: 2823  
 South Leg Total: 5578

### Comments

# Ontario Traffic Inc.

## Morning Peak Diagram

### Specified Period

**From:** 6:00:00  
**To:** 9:00:00

### One Hour Peak

**From:** 8:00:00  
**To:** 9:00:00

**Municipality:** Milton  
**Site #:** 1806700001  
**Intersection:** Ontario St S & Laurier Ave  
**TFR File #:** 1  
**Count date:** 15-Feb-18

**Weather conditions:**  
**Person(s) who counted:**

**\*\* Signalized Intersection \*\***

**Major Road:** Ontario St S runs N/S

North Leg Total: 1799  
North Entering: 696  
North Peds: 4  
Peds Cross:  $\bowtie$

Heavys	0	0	0	0
Trucks	0	41	3	44
Cars	40	552	60	652
<b>Totals</b>	<b>40</b>	<b>593</b>	<b>63</b>	



Heavys 0  
Trucks 43  
Cars 1060  
Totals 1103

East Leg Total: 579  
East Entering: 320  
East Peds: 2  
Peds Cross:  $\bowtie$

Heavys	0	Trucks	5	Cars	230	Totals	235
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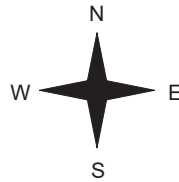


Ontario St S

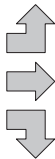
Cars	84	Trucks	5	Heavys	0	Totals	89
Cars	151	Trucks	5	Heavys	0	Totals	156
Cars	71	Trucks	4	Heavys	0	Totals	75
<b>Totals</b>	<b>306</b>	<b>14</b>	<b>0</b>				



Laurier Ave



Heavys	0	Trucks	1	Cars	64	Totals	65
Heavys	0	Trucks	2	Cars	143	Totals	145
Heavys	0	Trucks	0	Cars	59	Totals	59
<b>Totals</b>	<b>0</b>	<b>3</b>	<b>266</b>				



Ontario St S

Laurier Ave



Cars	251	Trucks	8	Heavys	0	Totals	259
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Peds Cross:  $\bowtie$   
West Peds: 0  
West Entering: 269  
West Leg Total: 504

Cars	682	Cars	39	912	48	999
Trucks	45	Trucks	0	37	3	40
Heavys	0	Heavys	0	0	0	0
<b>Totals</b>	<b>727</b>	<b>Totals</b>	<b>39</b>	<b>949</b>	<b>51</b>	



Peds Cross:  $\bowtie$   
South Peds: 3  
South Entering: 1039  
South Leg Total: 1766

## Comments

# Ontario Traffic Inc.

## Afternoon Peak Diagram

### Specified Period

**From:** 16:00:00  
**To:** 19:00:00

### One Hour Peak

**From:** 17:00:00  
**To:** 18:00:00

**Municipality:** Milton  
**Site #:** 1806700001  
**Intersection:** Ontario St S & Laurier Ave  
**TFR File #:** 1  
**Count date:** 15-Feb-18

**Weather conditions:**  
**Person(s) who counted:**

**\*\* Signalized Intersection \*\***

**Major Road:** Ontario St S runs N/S

North Leg Total: 2037  
North Entering: 1086  
North Peds: 9  
Peds Cross:  $\times$

Heavys	0	0	0	0
Trucks	2	25	2	29
Cars	82	852	123	1057
Totals	84	877	125	



Heavys	0
Trucks	29
Cars	922
Totals	951

East Leg Total: 776  
East Entering: 399  
East Peds: 3  
Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
0	3	337	340

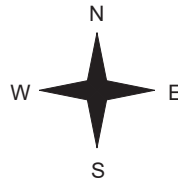


Ontario St S

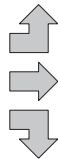
Cars	Trucks	Heavys	Totals
95	3	0	98
197	1	0	198
102	1	0	103
394	5	0	



Laurier Ave



Heavys	Trucks	Cars	Totals
0	1	59	60
0	0	165	165
0	0	39	39
0	1	263	



Laurier Ave



Peds Cross:  $\times$   
West Peds: 3  
West Entering: 264  
West Leg Total: 604

Cars	993	Cars	58	768	87	913
Trucks	26	Trucks	0	25	0	25
Heavys	0	Heavys	0	0	0	0
Totals	1019	Totals	58	793	87	



Ontario St S



Cars	Trucks	Heavys	Totals
375	2	0	377

Peds Cross:  $\times$   
South Peds: 5  
South Entering: 938  
South Leg Total: 1957

## Comments

# Ontario Traffic Inc.

## Total Count Diagram

**Municipality:** Milton  
**Site #:** 1806700001  
**Intersection:** Ontario St S & Laurier Ave  
**TFR File #:** 1  
**Count date:** 15-Feb-18

**Weather conditions:**  
**Person(s) who counted:**

**\*\* Signalized Intersection \*\***

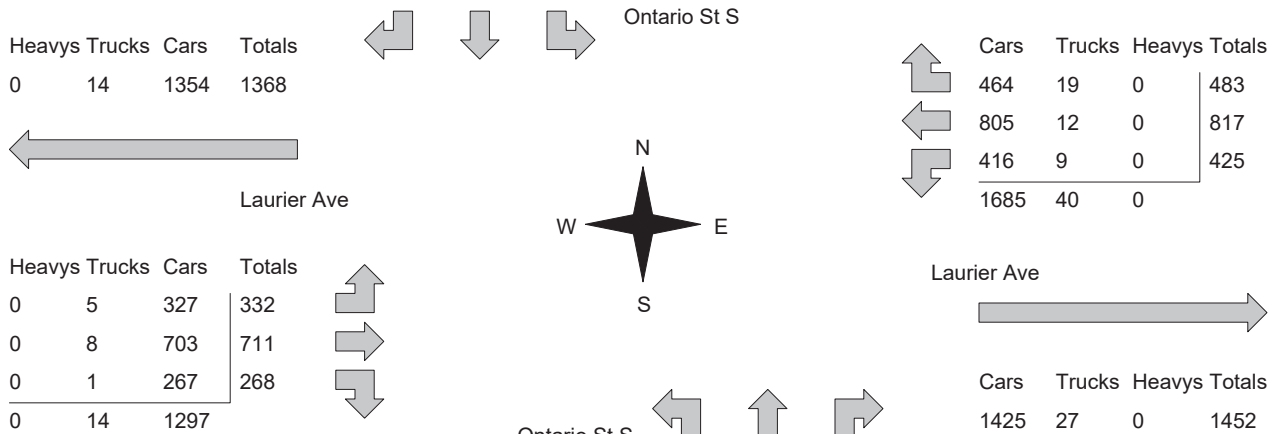
**Major Road:** Ontario St S runs N/S

North Leg Total: 9682  
 North Entering: 4462  
 North Peds: 25  
 Peds Cross:  $\times$

Heavys	0	0	0	0
Trucks	2	199	14	215
Cars	304	3536	407	4247
Totals	306	3735	421	

Heavys 0  
 Trucks 200  
 Cars 5020  
 Totals 5220

East Leg Total: 3177  
 East Entering: 1725  
 East Peds: 16  
 Peds Cross:  $\times$



Peds Cross:  $\times$   
 West Peds: 13  
 West Entering: 1311  
 West Leg Total: 2679

Cars	4219	Cars	245	4229	315	4789
Trucks	209	Trucks	0	176	5	181
Heavys	0	Heavys	0	0	0	0
Totals	4428	Totals	245	4405	320	

Peds Cross:  $\times$   
 South Peds: 24  
 South Entering: 4970  
 South Leg Total: 9398

### Comments

# Ontario Traffic Inc. Traffic Count Summary

Intersection: Ontario St S & Laurier Ave

Count Date: 15-Feb-18

Municipality: Milton

<b>North Approach Totals</b>						North/South Total Approaches	<b>South Approach Totals</b>					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
6:00:00	0	0	0	0	0	0	6:00:00	0	0	0	0	0
7:00:00	10	269	3	282	2	740	7:00:00	9	439	10	458	0
8:00:00	21	478	17	516	3	1365	8:00:00	22	802	25	849	1
9:00:00	63	593	40	696	4	1735	9:00:00	39	949	51	1039	3
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	105	794	85	984	7	1917	17:00:00	62	784	87	933	12
18:00:00	125	877	84	1086	9	2024	18:00:00	58	793	87	938	5
19:00:00	97	724	77	898	0	1651	19:00:00	55	638	60	753	3
<b>Totals:</b>	421	3735	306	4462	25	9432		245	4405	320	4970	24
<b>East Approach Totals</b>						East/West Total Approaches	<b>West Approach Totals</b>					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
6:00:00	0	0	0	0	0	0	6:00:00	0	0	0	0	0
7:00:00	20	22	31	73	1	157	7:00:00	16	23	45	84	0
8:00:00	68	88	67	223	0	413	8:00:00	73	66	51	190	1
9:00:00	75	156	89	320	2	589	9:00:00	65	145	59	269	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	73	190	106	369	3	624	17:00:00	56	164	35	255	9
18:00:00	103	198	98	399	3	663	18:00:00	60	165	39	264	3
19:00:00	86	162	92	340	7	589	19:00:00	62	148	39	249	0
<b>Totals:</b>	425	816	483	1724	16	3035		332	711	268	1311	13
<b>Calculated Values for Traffic Crossing Major Street</b>												
Hours Ending:	6:00	7:00	8:00	9:00			16:00	17:00	18:00	19:00		
Crossing Values:	0	61	233	303			0	338	375	313		





# Ontario Traffic Inc.

Count Date: 15-Feb-18 Site #: 1806700001

Interval Time	Passenger Cars - South Approach				Trucks - South Approach				Heavys - South Approach				Pedestrians	
	Left		Right		Left		Right		Left		Right		South	Cross
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	4	4	92	92	0	0	4	4	0	0	0	0	0	0
6:30:00	6	2	154	62	0	0	5	1	0	0	0	0	0	0
6:45:00	7	1	277	123	0	0	16	11	0	0	0	0	0	0
7:00:00	9	2	420	143	0	0	19	3	0	0	0	0	0	0
7:15:00	11	2	578	158	0	0	29	10	0	0	0	0	0	0
7:30:00	19	8	777	199	0	0	34	5	0	0	0	0	0	0
7:45:00	24	5	975	198	0	0	48	14	1	0	0	0	0	0
8:00:00	31	7	1180	205	0	0	61	13	1	0	0	0	1	1
8:15:00	43	12	1418	238	0	0	68	7	1	0	0	0	1	0
8:30:00	49	6	1667	249	0	0	74	6	1	0	0	0	1	0
8:45:00	56	7	1896	229	0	0	85	11	1	0	0	0	2	1
9:00:00	70	14	2092	196	0	0	98	13	4	3	0	0	4	2
9:00:03	70	0	2092	0	0	0	98	0	4	0	0	0	4	0
16:00:00	70	0	2092	0	0	0	98	0	4	0	0	0	4	0
16:15:00	87	17	2272	180	0	0	108	10	4	0	0	0	5	1
16:30:00	103	16	2480	208	0	0	117	9	4	0	0	0	8	3
16:45:00	115	12	2662	182	0	0	129	12	4	0	0	0	12	4
17:00:00	132	17	2839	177	0	0	135	6	4	0	0	0	16	4
17:15:00	142	10	3036	197	0	0	142	7	4	0	0	0	17	1
17:30:00	156	14	3223	187	0	0	150	8	4	0	0	0	17	0
17:45:00	173	17	3415	192	0	0	156	6	4	0	0	0	18	1
18:00:00	190	17	3607	192	0	0	160	4	4	0	0	0	21	3
18:15:00	213	23	3779	172	0	0	166	6	4	0	0	0	23	2
18:30:00	222	9	3930	151	0	0	169	3	4	0	0	0	23	0
18:45:00	233	11	4089	159	0	0	173	4	5	1	0	0	23	0
19:00:00	245	12	4229	140	0	0	176	3	5	0	0	0	24	1
19:00:12	245	0	4229	0	0	0	176	0	5	0	0	0	24	0







# Turning Movements Report - Full Study

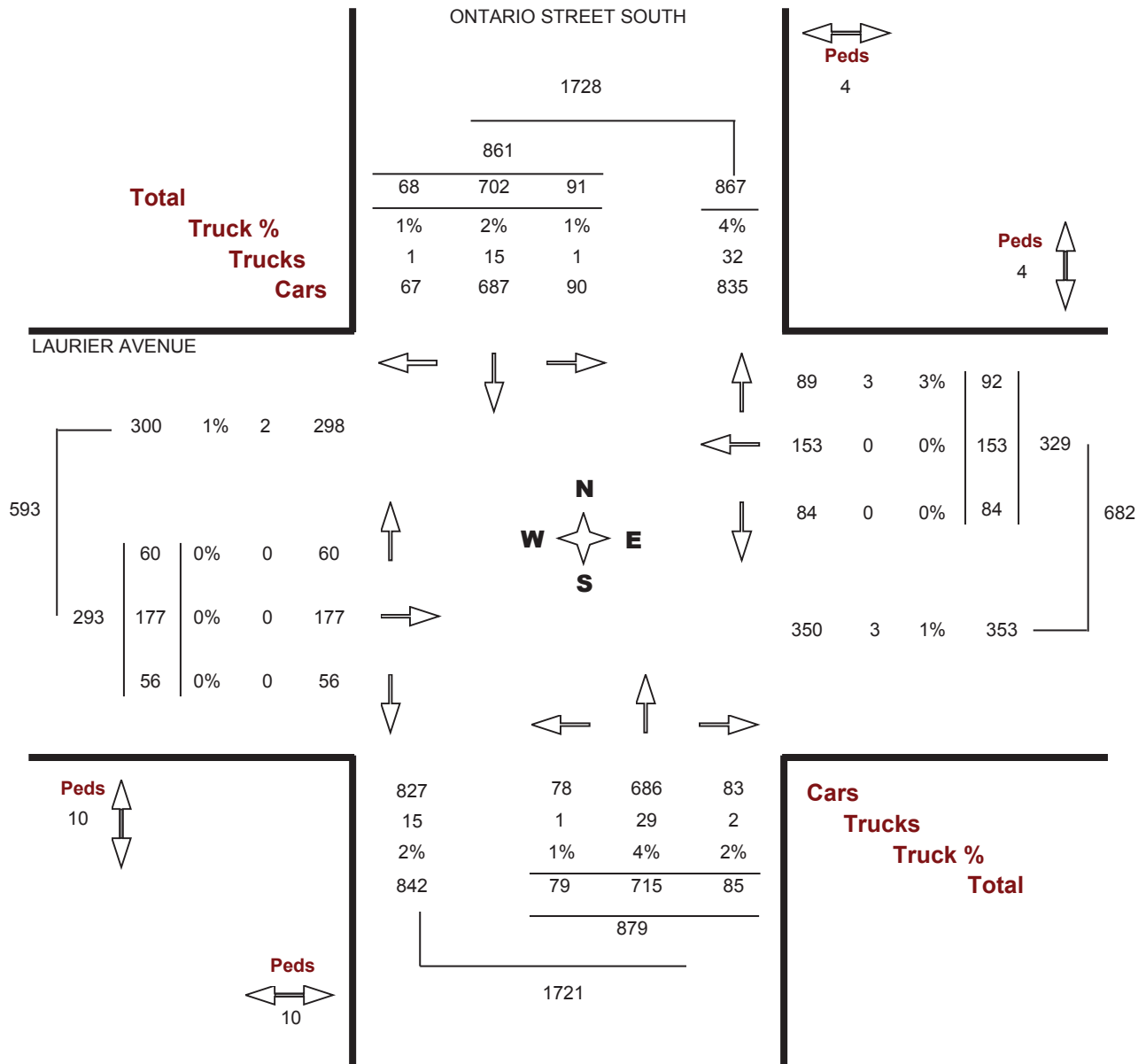
**Location.....** ONTARIO STREET SOUTH @ LAURIER AVENUE

**Municipality.....** MILTON

**GeoID.....** 50278201

**Count Date.....** Tuesday, 07 February, 2012

**Peak Hour.....** 05:00 PM — 06:00 PM





# Turning Movements Report - AM Period

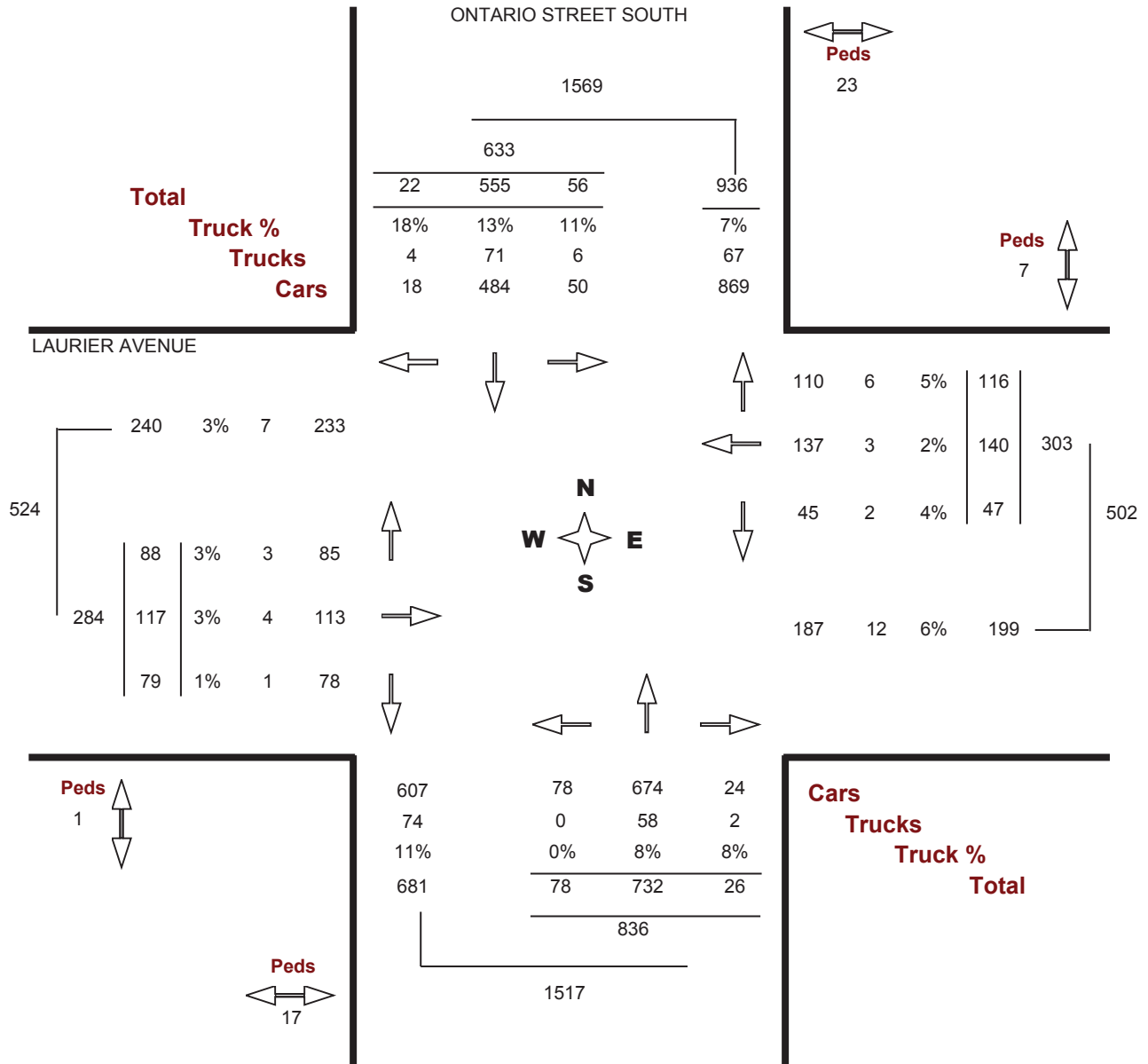
**Location.....** ONTARIO STREET SOUTH @ LAURIER AVENUE

**Municipality.....** MILTON

**GeoID.....** 50278201

**Count Date.....** Tuesday, 07 February, 2012

**Peak Hour.....** 07:45 AM — 08:45 AM





# Turning Movements Report - MD Period

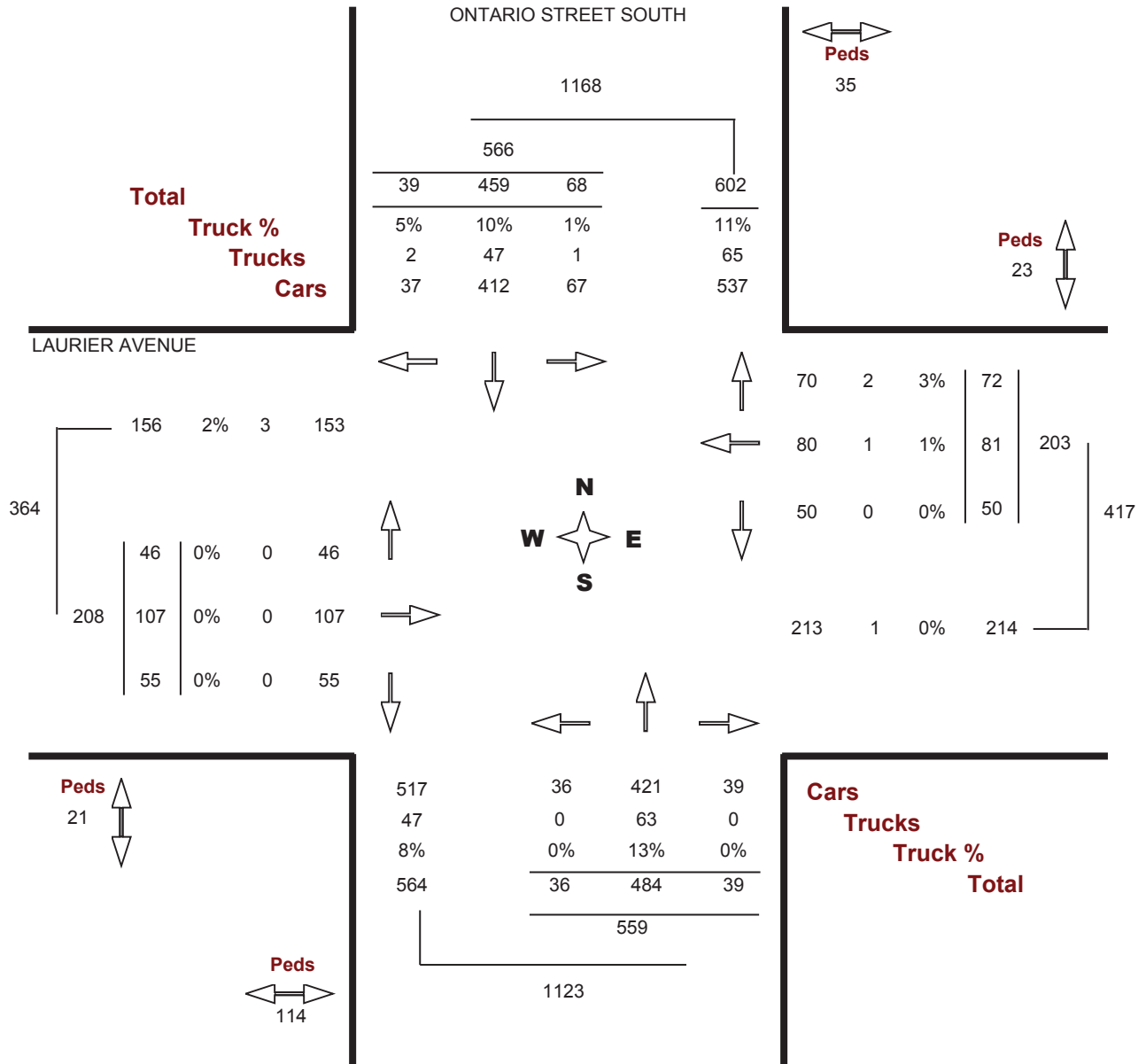
**Location.....** ONTARIO STREET SOUTH @ LAURIER AVENUE

**Municipality.....** MILTON

**GeoID.....** 50278201

**Count Date.....** Tuesday, 07 February, 2012

**Peak Hour.....** 12:00 PM — 01:00 PM





# Turning Movements Report - PM Period

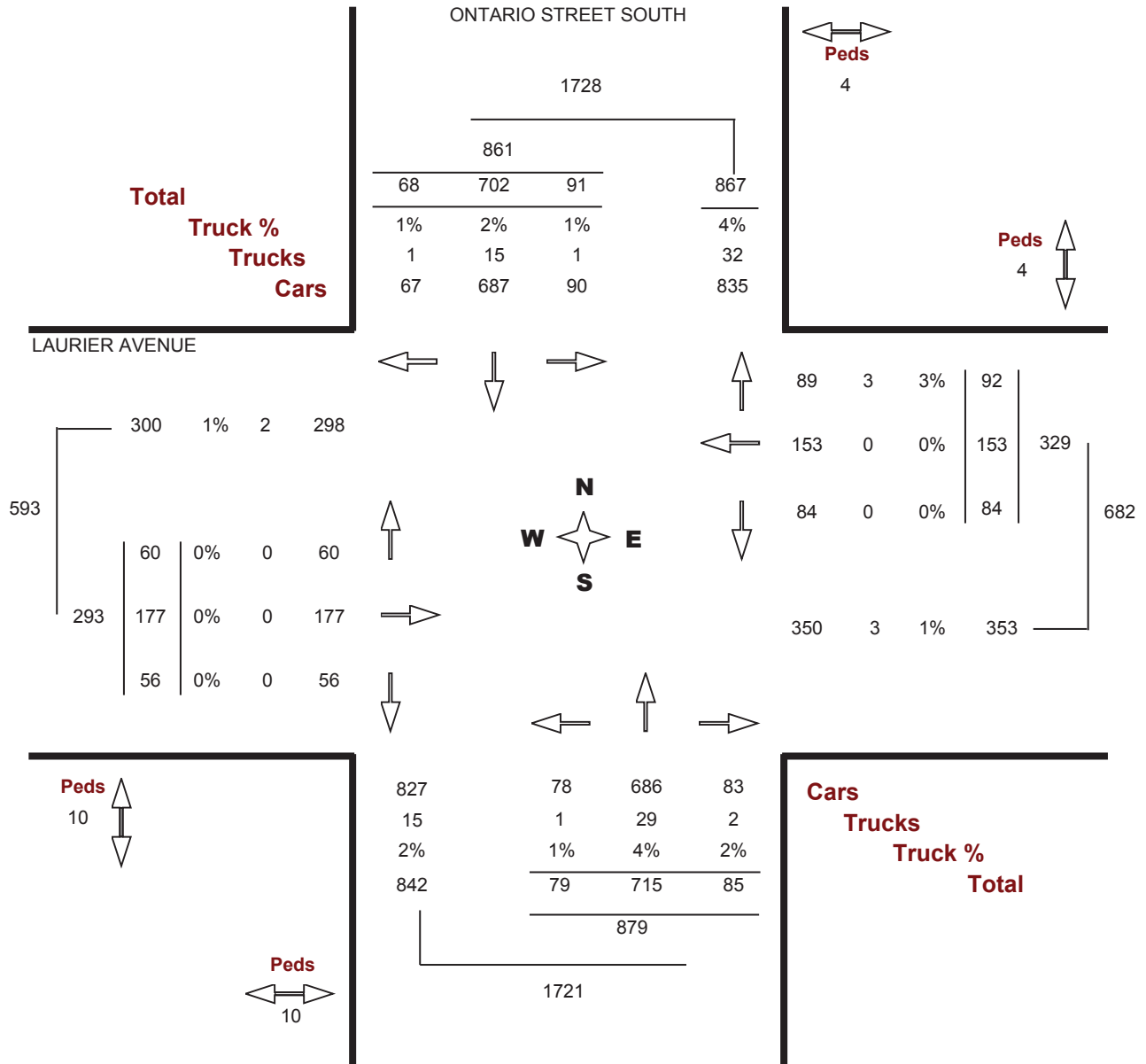
**Location.....** ONTARIO STREET SOUTH @ LAURIER AVENUE

**Municipality.....** MILTON

**GeoID.....** 50278201

**Count Date.....** Tuesday, 07 February, 2012

**Peak Hour.....** 05:00 PM — 06:00 PM





Date: 20-04-2016  
 Intersection: Ontario Street & Laurier Ave.

8 Phase Basic Timing Sheet												
	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		x		x		x		x	x	x	x	x
Direction		NB		WB		SB		WB				
Min Green		15		10		15		10				
Veh Ext.		2.0		2.0		2.0		2.0				
Yellow		4		4		4		4				
Red		2		3		2		3				
Walk		7		7		7		7				
Don't Walk		14		19		14		19				
Max 1		67		38		67		38				
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall		x				x						
Notes:												



<p><b>Pattern 1</b>  <b>Time:</b> 6:30  <b>Cycle Length:</b> 90  <b>Offset (%):</b> 43%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>61</td> <td>0</td> <td>39</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>61</td> <td>0</td> <td>39</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	61	0	39	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	61	0	39	<p><b>Pattern 2</b>  <b>Time:</b> 9:30  <b>Cycle Length:</b> 90  <b>Offset (%):</b> 43%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>61</td> <td>0</td> <td>39</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>61</td> <td>0</td> <td>39</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	61	0	39	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	61	0	39
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<p><b>Pattern 3</b>  <b>Time:</b> 15:30  <b>Cycle Length:</b> 100  <b>Offset (%):</b> 42%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>65</td> <td>0</td> <td>35</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>65</td> <td>0</td> <td>35</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	65	0	35	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	65	0	35	<p><b>Pattern 4</b>  <b>Time:</b> 18:30  <b>Cycle Length:</b> 90  <b>Offset (%):</b> 43%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>61</td> <td>0</td> <td>39</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>61</td> <td>0</td> <td>39</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	61	0	39	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	61	0	39
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<p><b>Pattern 5</b>  <b>Time:</b> 21:00  <b>Cycle Length:</b> Local  <b>Offset (%):</b></p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>					<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>					<p><b>Pattern 6</b>  <b>Time:</b>  <b>Cycle Length:</b>  <b>Offset (%):</b></p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>					<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>				
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Date: 6-Oct-15  
 Intersection: Derry & Ontario

8 Phase Basic Timing Sheet												
	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	x	X	x	x	x	x	x	x	X	x	x	x
Direction	WBL	EB	NBL	SB	EBL	WB	SBL	NB				
Min Green	6	15	6	10	6	15	6	10				
Veh Ext.	3.0		3.0	3.0	3.0		3.0	3.0				
Yellow	3	3.7	3	3.7	3	3.7	3	3.7				
Red	1	3	1	3	1	3	1	3				
Walk		7		7		7		7				
Don't Walk		27		28		27		28				
Max 1	15	50	15	40	15	50	15	40				
Max 2												
Max 3												
Veh Recall												
Ped Recall												
Notes:												



<p><b>Pattern 1</b>  <b>Time:</b> 6:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 7%  8.0</p> <table border="1"> <thead> <tr> <th>Direction</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>13%</td> <td>41%</td> <td>11%</td> <td>35%</td> </tr> <tr> <td>Direction</td> <td>16.0</td> <td>49.0</td> <td>13.0</td> <td>42.0</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>18%</td> <td>36%</td> <td>11%</td> <td>35%</td> </tr> <tr> <td></td> <td>22.0</td> <td>43.0</td> <td>13.0</td> <td>42.0</td> </tr> </tbody> </table>	Direction	1	2	3	4	Phase	1	2	3	4	%	13%	41%	11%	35%	Direction	16.0	49.0	13.0	42.0	Phase	5	6	7	8	%	18%	36%	11%	35%		22.0	43.0	13.0	42.0	<p><b>Pattern 2</b>  <b>Time:</b> 10:00  <b>Cycle Length:</b> 105  <b>Offset (%):</b> 20%</p> <table border="1"> <thead> <tr> <th>Direction</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>11%</td> <td>39%</td> <td>10%</td> <td>40%</td> </tr> <tr> <td>Direction</td> <td>11.0</td> <td>40.5</td> <td>10.5</td> <td>42.0</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>11%</td> <td>39%</td> <td>10%</td> <td>40%</td> </tr> </tbody> </table>	Direction	1	2	3	4	Phase	1	2	3	4	%	11%	39%	10%	40%	Direction	11.0	40.5	10.5	42.0	Phase	5	6	7	8	%	11%	39%	10%	40%
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<p><b>Pattern 3</b>  <b>Time:</b> 15:15  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 87%  104.0</p> <table border="1"> <thead> <tr> <th>Direction</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>9%</td> <td>44%</td> <td>12%</td> <td>35%</td> </tr> <tr> <td>Direction</td> <td>11.0</td> <td>53.0</td> <td>14.0</td> <td>42.0</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>15%</td> <td>38%</td> <td>12%</td> <td>35%</td> </tr> <tr> <td></td> <td>18.0</td> <td>46.0</td> <td>14.0</td> <td>42.0</td> </tr> </tbody> </table>	Direction	1	2	3	4	Phase	1	2	3	4	%	9%	44%	12%	35%	Direction	11.0	53.0	14.0	42.0	Phase	5	6	7	8	%	15%	38%	12%	35%		18.0	46.0	14.0	42.0	<p><b>Pattern 4</b>  <b>Time:</b> 20:30  <b>Cycle Length:</b> 85  <b>Offset (%):</b> 26%</p> <table border="1"> <thead> <tr> <th>Direction</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>0%</td> <td>51%</td> <td>0%</td> <td>49%</td> </tr> <tr> <td>Direction</td> <td>0.0</td> <td>43.25</td> <td>0.0</td> <td>41.75</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>0%</td> <td>51%</td> <td>0%</td> <td>49%</td> </tr> </tbody> </table>	Direction	1	2	3	4	Phase	1	2	3	4	%	0%	51%	0%	49%	Direction	0.0	43.25	0.0	41.75	Phase	5	6	7	8	%	0%	51%	0%	49%
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Date: 6-Oct-2015  
 Intersection: Derry & Holly

8 Phase Basic Timing Sheet											
	1	2	3	4	5	6	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		X		X		X	X	X	X	X	X
Direction		EB		SB		WB	NB				
Min Green		15		10		15	10				
Veh Ext.				3.0			3.0				
Yellow		3.7		3.7		3.7	3.7				
Red		2		3.5		2	3.5				
Walk		7		7		7	7				
Don't Walk		19		23		19	23				
Max 1		60		40		60	40				
Max 2											
Max 3											
Veh Recall											
Ped Recall											
Notes:											

<p><b>Pattern 1</b> Time: 6:00 Cycle Length: 120 Offset (%): 37%</p> <p>44</p> <table border="1"> <thead> <tr> <th>Direction</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>0%</td> <td>59%</td> <td>0%</td> <td>41%</td> </tr> <tr> <td>Direction</td> <td>0</td> <td>71</td> <td>0</td> <td>49</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>0%</td> <td>59%</td> <td>0%</td> <td>41%</td> </tr> <tr> <td></td> <td>0</td> <td>71</td> <td>0</td> <td>49</td> </tr> </tbody> </table>	Direction	1	2	3	4	Phase	1	2	3	4	%	0%	59%	0%	41%	Direction	0	71	0	49	Phase	5	6	7	8	%	0%	59%	0%	41%		0	71	0	49	<p><b>Pattern 2</b> Time: 10:00 Cycle Length: 105 Offset (%): 76%</p> <table border="1"> <thead> <tr> <th>Direction</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>0%</td> <td>58%</td> <td>0%</td> <td>42%</td> </tr> <tr> <td>Direction</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>0%</td> <td>58%</td> <td>0%</td> <td>42%</td> </tr> </tbody> </table>	Direction	1	2	3	4	Phase	1	2	3	4	%	0%	58%	0%	42%	Direction	5	6	7	8	Phase	5	6	7	8	%	0%	58%	0%	42%
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Phase	1	2	3	4																																																														
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<p><b>Pattern 3</b> Time: 15:15 Cycle Length: 120 Offset (%): 37%</p> <p>44</p> <table border="1"> <thead> <tr> <th>Direction</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>0%</td> <td>68%</td> <td>0%</td> <td>33%</td> </tr> <tr> <td>Direction</td> <td>0</td> <td>81</td> <td>0</td> <td>39</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>0%</td> <td>68%</td> <td>0%</td> <td>33%</td> </tr> <tr> <td></td> <td>0</td> <td>81</td> <td>0</td> <td>39</td> </tr> </tbody> </table>	Direction	1	2	3	4	Phase	1	2	3	4	%	0%	68%	0%	33%	Direction	0	81	0	39	Phase	5	6	7	8	%	0%	68%	0%	33%		0	81	0	39	<p><b>Pattern 4</b> Time: 20:30 Cycle Length: 85 Offset (%): 93%</p> <table border="1"> <thead> <tr> <th>Direction</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>0%</td> <td>51%</td> <td>0%</td> <td>49%</td> </tr> <tr> <td>Direction</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>0%</td> <td>51%</td> <td>0%</td> <td>49%</td> </tr> </tbody> </table>	Direction	1	2	3	4	Phase	1	2	3	4	%	0%	51%	0%	49%	Direction	5	6	7	8	Phase	5	6	7	8	%	0%	51%	0%	49%
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%	0%	51%	0%	49%																																																														
<p><b>Pattern 5</b> Time: Weekend Cycle Length: 105 Offset (%): 70%</p> <table border="1"> <thead> <tr> <th>Direction</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>0%</td> <td>64%</td> <td>0%</td> <td>36%</td> </tr> <tr> <td>Direction</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>0%</td> <td>64%</td> <td>0%</td> <td>36%</td> </tr> </tbody> </table>	Direction	1	2	3	4	Phase	1	2	3	4	%	0%	64%	0%	36%	Direction	5	6	7	8	Phase	5	6	7	8	%	0%	64%	0%	36%	<p><b>Pattern 6</b> Time: Cycle Length: Local Offset (%):</p> <table border="1"> <thead> <tr> <th>Direction</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td></td> <td>x</td> <td></td> <td>x</td> </tr> <tr> <td>Direction</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td></td> <td>x</td> <td></td> <td>x</td> </tr> </tbody> </table>	Direction	1	2	3	4	Phase	1	2	3	4	%		x		x	Direction	5	6	7	8	Phase	5	6	7	8	%		x		x					
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Date: 1-Nov-16  
 Intersection: Regional Road 25 & Louis St. Laurent Avenue

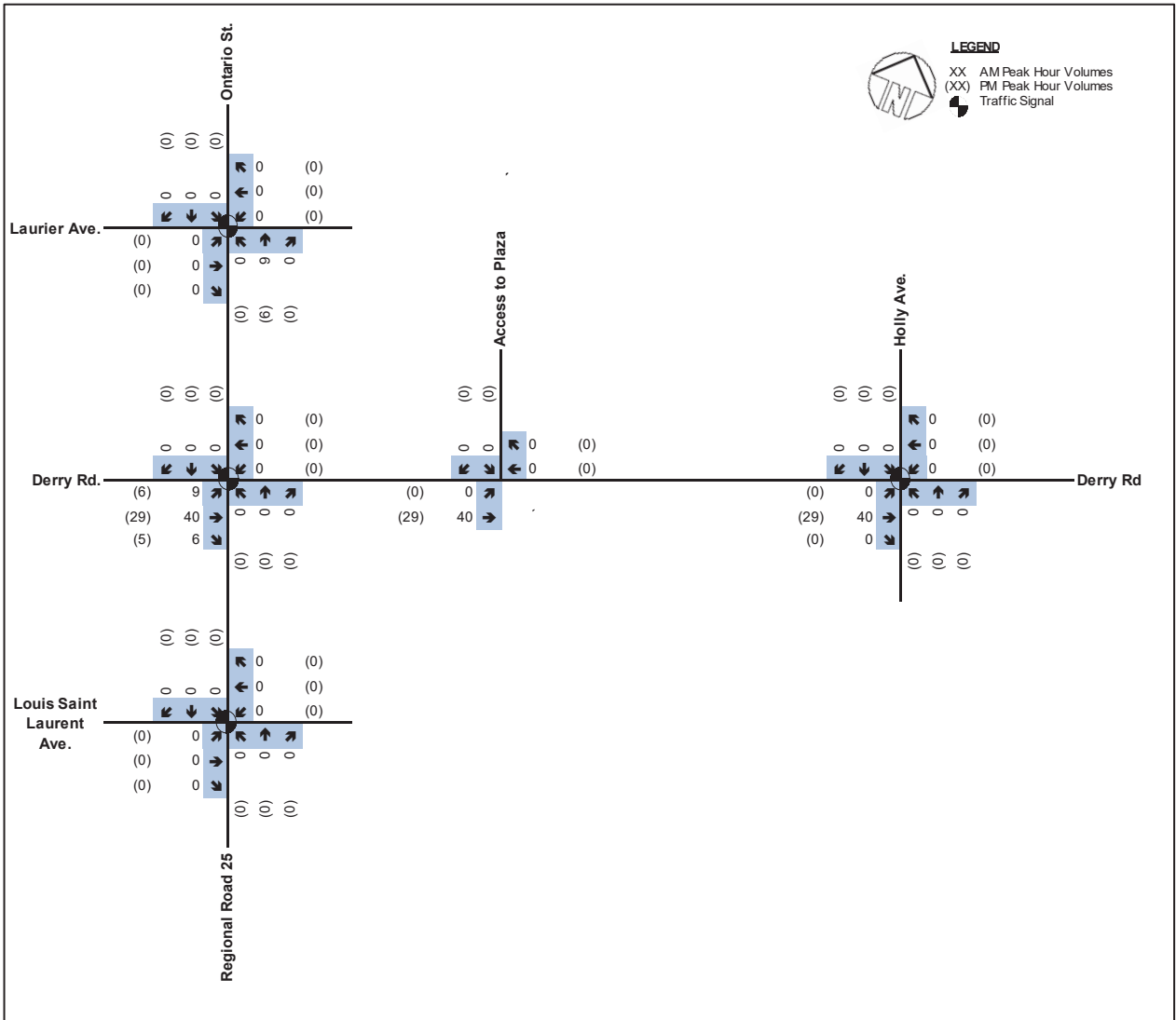
8 Phase Basic Timing Sheet												
	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		x		x		x		x				
Direction		NB		EB		SB		WB				
Min Green		20		10		20		10				
Veh Ext.		3.2		-		3.2		-				
Yellow		4		4		4		4				
Red		3		3		3		3				
Walk		7		7		7		7				
Don't Walk		18		16		18		16				
Max 1		70		45		70		45				
Max 2		60		30		60		30				
Max 3												
Veh Recall												
Ped Recall												
Notes:	Use Max 1 During AM & PM Peak Periods (6:00am-9:30am, 3:00pm-7:00pm) Use Max 2 During Other Periods (9:30am-3:00pm, 7:00pm-6:00am)											

<p><b>Pattern 1</b> Time: Cycle Length: Offset (%):</p> <table border="0"> <tr> <td>Direction Phase %</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>Direction Phase %</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> </table>	Direction Phase %	1	2	3	4	Direction Phase %	5	6	7	8	<p><b>Pattern 2</b> Time: Cycle Length: Offset (%):</p> <table border="0"> <tr> <td>Direction Phase %</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>Direction Phase %</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> </table>	Direction Phase %	1	2	3	4	Direction Phase %	5	6	7	8
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<p><b>Pattern 3</b> Time: Cycle Length: Offset (%):</p> <table border="0"> <tr> <td>Direction Phase %</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>Direction Phase %</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> </table>	Direction Phase %	1	2	3	4	Direction Phase %	5	6	7	8	<p><b>Pattern 4</b> Time: Cycle Length: Offset (%):</p> <table border="0"> <tr> <td>Direction Phase %</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>Direction Phase %</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> </table>	Direction Phase %	1	2	3	4	Direction Phase %	5	6	7	8
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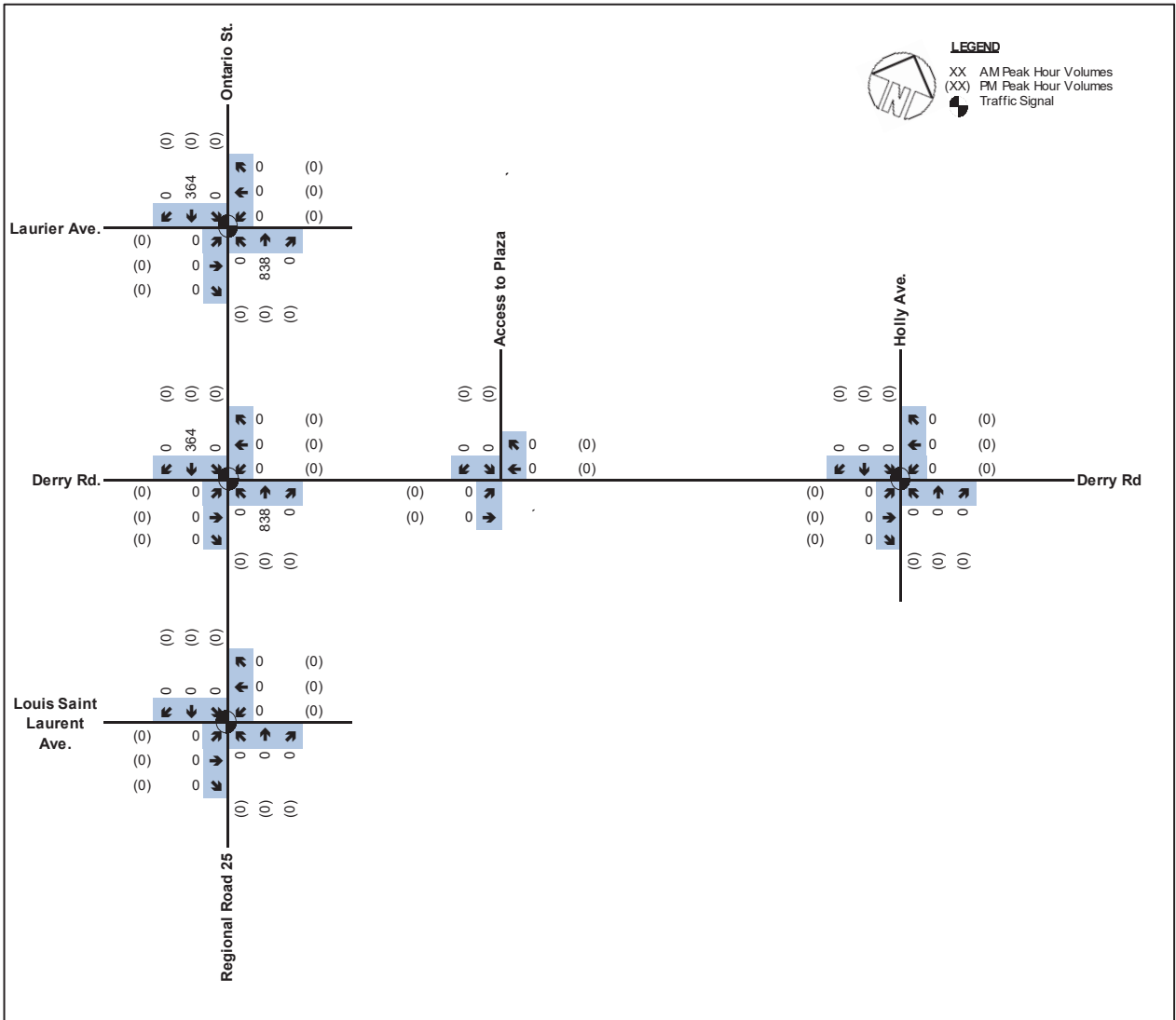
# **Appendix C**

## **Background Developments**

# 610 Farmstead Drive (BD 1)

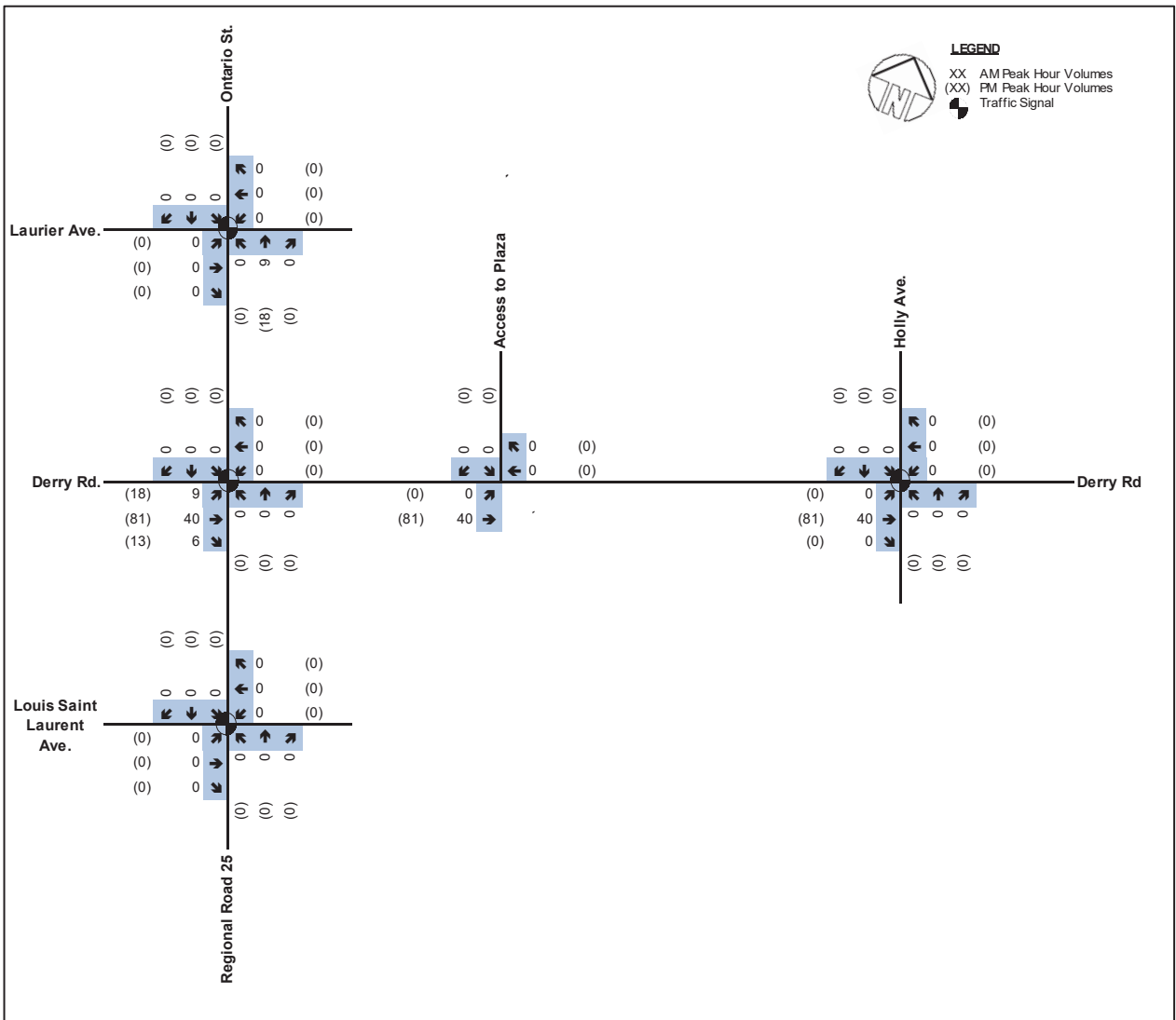


# Boyne Secondary Plan (BD 2)

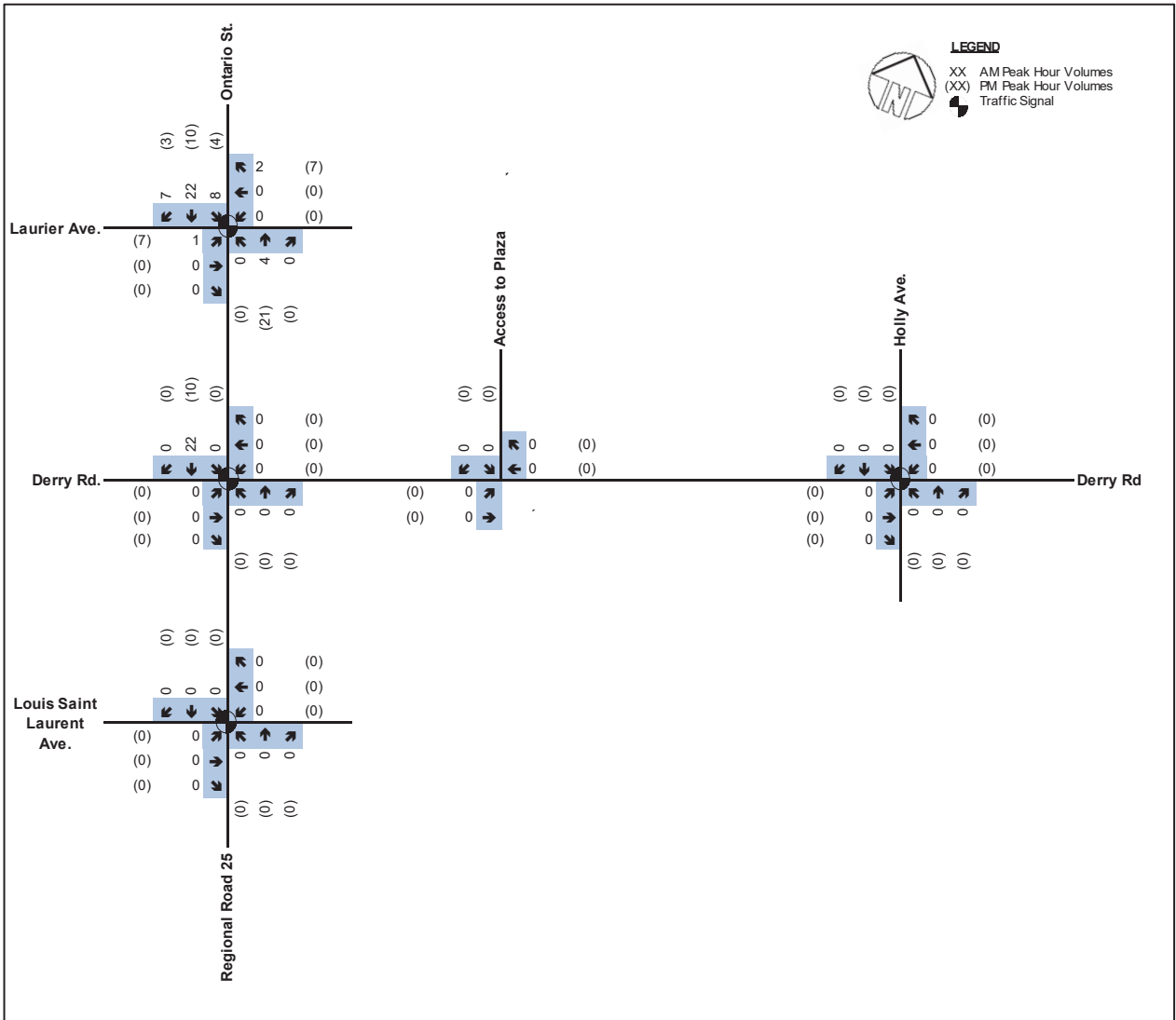




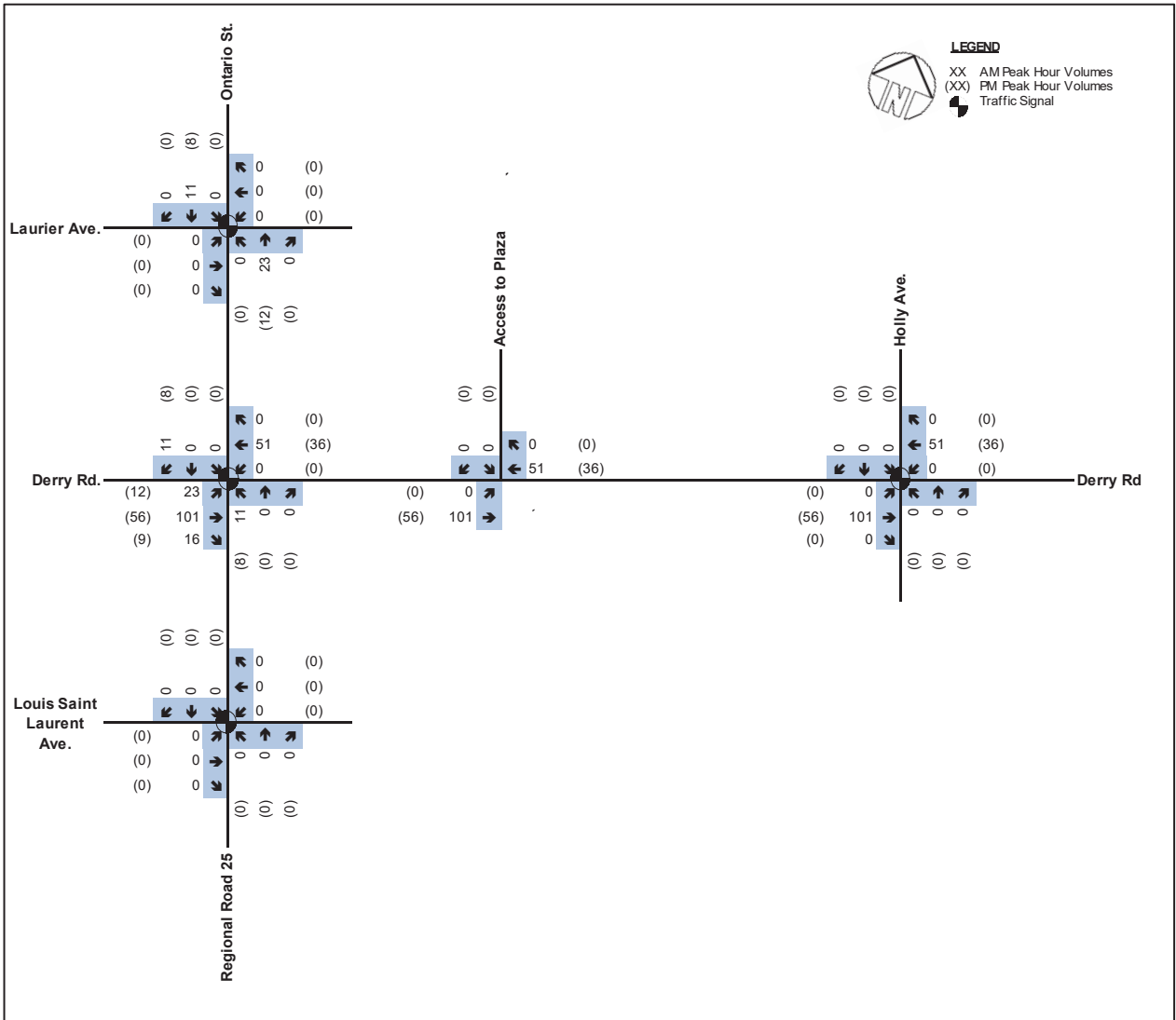
# Milton Hospital (BD 3)



# Hallowest Development (BD 4)



# 7400 Derry Road (BD 5)



**Appendix D**  
**Transportation Tomorrow Survey**

TTS AM OUTBOUND

PLANNING DISTRICTS  
 Wed Nov 21 2018 14:09:36 GMT-0500 (Eastern Standard Time) - Run Time: 1942ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd\_dest  
 Column: 2006 GTA zone of origin - gta06\_orig

RowG:  
 ColG:(4105,4108)  
 TblG:

Filters:  
 (Start time of trip - start\_time In 600-900  
 and  
 Trip purpose - trip\_purp In 1,2,3  
 and  
 Type of dwelling unit - dwell\_type In 2,3  
 and  
 Primary travel mode of trip - mode\_prime In D,m,p,t)

Trip 2016

Table:

,1	North RR25	South Holly/RR25	East Derry	West Holly/Derry	Sum	North RR25	South Holly/RR25	East Derry	West Holly/Derry
PD 1 of Toronto	54		1		1	0	0	54	0
PD 2 of Toronto	16		1		1	0	0	16	0
PD 3 of Toronto	31		1		1	0	0	31	0
PD 5 of Toronto	11		1		1	0	0	11	0
PD 7 of Toronto	36		1		1	0	0	36	0
PD 8 of Toronto	75		1		1	0	0	75	0
PD 9 of Toronto	50		1		1	0	0	50	0
PD 11 of Toronto	40		1		1	0	0	40	0
PD 12 of Toronto	17		1		1	0	0	17	0
PD 16 of Toronto	13		1		1	0	0	13	0
Markham	44		1		1	0	0	44	0
Vaughan	28		1		1	0	0	28	0
Brampton	139		1		1	0	0	139	0
<b>Mississauga</b>	<b>786</b>								
Halton Hills	30	0.5	0.5		1	15	0	15	0
<b>Milton</b>	<b>854</b>								
Oakville	133	0.5	0.5		1	0	66.5	66.5	0
Burlington	32	0.5		0.5	1	0	16	0	16
Dundas	46	0.5		0.5	1	0	23	0	23
Hamilton	53	0.5		0.5	1	0	26.5	0	26.5
Kitchener	26	1			1	26	0	0	0
City of Guelph	14	0.5		0.5	1	7	0	0	7
	2528								
<b>Mississauga</b>									
3601	30	0.5	0.5		1	0	15	15	0
3612	18		1		1	0	0	18	0
3616	11		1		1	0	0	11	0
3618	48		1		1	0	0	48	0
3620	17		1		1	0	0	17	0
3621	31		1		1	0	0	31	0
3631	12	0.5	0.5		1	0	6	6	0
3634	37	0.5	0.5		1	0	18.5	18.5	0
3638	26		1		1	0	0	26	0
3671	52	0.5	0.5		1	0	26	26	0
3704	22		1		1	0	0	22	0
3706	6		1		1	0	0	6	0
3710	131		1		1	0	0	131	0
3714	28	0.5	0.5		1	0	14	14	0
3721	35		1		1	0	0	35	0
3809	62	0.5	0.5		1	0	31	31	0
3811	36	0.5	0.5		1	0	18	18	0
3816	31		1		1	0	0	31	0
3818	30		1		1	0	0	30	0
3821	18		1		1	0	0	18	0
3823	19		1		1	0	0	19	0
3824	22	0.5	0.5		1	11	0	11	0
3825	29		1		1	0	0	29	0
3854	32	0.5	0.5		1	0	16	16	0
	783								
<b>Milton</b>									
4104	48	0.5		0.5	1	0	24	0	24
4105	106	0.5		0.5	1	0	53	0	53
4108	102	0.5	0.5		1	0	51	51	0
4109	89	0.5	0.5		1	0	44.5	44.5	0
4110	15	0.5	0.5		1	0	7.5	7.5	0
4117	19	0.5	0.5		1	9.5	0	9.5	0
4118	18	0.5	0.5		1	9	0	9	0
4119	7	0.5	0.5		1	3.5	0	3.5	0
4120	27	0.5	0.5		1	13.5	0	13.5	0
4122	11	0.5		0.5	1	5.5	0	0	5.5
4124	25	0.5	0.5		1	12.5	0	12.5	0

170145  
 56.715  
 567.15

2006 GTA Traffic Analysis Zones  
 Wed Nov 21 2018 14:16:56 GMT-0500 (Eastern Standard Time) - Run Time: 2805ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06\_dest  
 Column: 2006 GTA zone of origin - gta06\_orig

RowG:  
 ColG:(4105,4108)  
 TblG:

Filters:  
 (Start time of trip - start\_time In 600-900  
 and  
 Trip purpose - trip\_purp In 1,2,3  
 and  
 Type of dwelling unit - dwell\_type In 2,3  
 and  
 Primary travel mode of trip - mode\_prime In D,m,p,t)

Trip 2016

Table:

4125	175	0.5	0.5	1	87.5	0	0	87.5	
4126	14	0.5	0.5	1	7	0	0	7	
4127	40		1	1	0	0	0	40	
4144	12	1		1	12	0	0	0	
4145	29	1		1	29	0	0	0	
4147	60	1		1	60	0	0	0	
4148	31	0.5	0.5	1	15.5	0	0	15.5	
4192	25	0.5	0.5	1	12.5	0	0	12.5	
853									
					North	South	East	West	
					RR25	Holly/RR25	Derry	Holly/Derry	2524
					336	456.5	1414	317.5	
					13%	18%	56%	13%	
					15%	20%	55%	10%	100%

TTS PM INBOUND

PLANNING DISTRICTS  
 Wed Nov 21 2018 17:05:48 GMT-0500 (Eastern Standard Time) - Run Time: 2096ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of origin - pd\_orig  
 Column: 2006 GTA zone of destination - gta06\_dest

RowG:  
 ColG:(4105,4108)  
 TblG:

Filters:  
 (Start time of trip - start\_time In 1400-1700  
 and  
 Trip purpose - trip\_purp In 1,2,3  
 and  
 Type of dwelling unit - dwell\_type In 2,3  
 and  
 Primary travel mode of trip - mode\_prime In D,m,p,t)

Trip 2016  
 Table:

,1		North RR25	South Holly/RR25	East Derry	West Holly/Derry	Sum	North RR25	South Holly/RR25	East Derry	West Holly/Derry
PD 1 of Toronto	75	0.25	0.5	0.25		1	18.75	37.5	18.75	0
PD 2 of Toronto	46	0.25	0.5	0.25		1	11.5	23	11.5	0
PD 3 of Toronto	31	0.25	0.5	0.25		1	7.75	15.5	7.75	0
PD 5 of Toronto	14	0.25	0.5	0.25		1	3.5	7	3.5	0
PD 7 of Toronto	29	0.25	0.5	0.25		1	7.25	14.5	7.25	0
PD 8 of Toronto	47	0.25	0.5	0.25		1	11.75	23.5	11.75	0
PD 9 of Toronto	50	0.25	0.5	0.25		1	12.5	25	12.5	0
PD 11 of Toronto	40	0.25	0.5	0.25		1	10	20	10	0
PD 12 of Toronto	17	0.25	0.5	0.25		1	4.25	8.5	4.25	0
Vaughan	83	0.5		0.5		1	41.5	0	41.5	0
Brampton	60	0.5		0.5		1	30	0	30	0
Mississauga	585									
Halton Hills	47	1				1	47	0	0	0
Milton	725									
Oakville	115		0.5	0.5		1	0	57.5	57.5	0
Burlington	58		1			1	0	58	0	0
Hamilton	31		1			1	0	31	0	0
Waterloo	13	0.5			0.5	1	6.5	0	0	6.5
City of Guelph	14	0.5			0.5	1	7	0	0	7
Barrie	17	0.5		0.5		1	8.5	0	8.5	0
New Tecumseth	30	0.5		0.5		1	15	0	15	0
	2127									
Mississauga										
3601	30		0.5	0.5		1	0	15	15	0
3612	18	0.5	0.25	0.25		1	9	4.5	4.5	0
3613	21		0.5	0.5		1	0	10.5	10.5	0
3618	48	0.5		0.5		1	24	0	24	0
3621	31	0.5		0.5		1	15.5	0	15.5	0
3634	26		0.5	0.5		1	0	13	13	0
3663	26		0.5	0.5		1	0	13	13	0
3671	36		0.5	0.5		1	0	18	18	0
3691	31	0.25	0.5	0.25		1	7.75	15.5	7.75	0
3703	7	0.5	0.5			1	3.5	3.5	0	0
3704	22	0.5	0.5			1	11	11	0	0
3705	19	0.5	0.5			1	9.5	9.5	0	0
3706	6	0.5	0.5			1	3	3	0	0
3710	69	0.5	0.5			1	34.5	34.5	0	0
3721	10	0.5	0.5			1	5	5	0	0
3809	62		0.5	0.5		1	0	31	31	0
3816	31	0.5		0.5		1	15.5	0	15.5	0
3818	30	0.25	0.5	0.25		1	7.5	15	7.5	0
3821	18	0.25	0.5	0.25		1	4.5	9	4.5	0
3835	14	0.5		0.5		1	7	0	7	0
3851	30		0.5	0.5		1	0	15	15	0
	585									
Milton										
4103	16				1	1	0	0	0	16
4104	19		0.5		0.5	1	0	9.5	0	9.5
4105	112		0.5		0.5	1	0	56	0	56
4108	81		0.5	0.5		1	0	40.5	40.5	0
4117	19	0.5		0.5		1	9.5	0	9.5	0
4119	18	0.5		0.5		1	9	0	9	0
4120	67	0.5		0.5		1	33.5	0	33.5	0
4122	11	0.5			0.5	1	5.5	0	0	5.5
4124	10	0.5		0.5		1	5	0	5	0
4125	81	0.5			0.5	1	40.5	0	0	40.5
4126	55	0.5			0.5	1	27.5	0	0	27.5
4127	59	0.5			0.5	1	29.5	0	0	29.5
4144	12	1				1	12	0	0	0
4145	29	1				1	29	0	0	0
4148	83	0.5		0.5		1	41.5	0	41.5	0
4192	53	1				1	53	0	0	0
	725						North	South	East	West

2006 GTA Traffic Analysis Zones  
 Wed Nov 21 2018 14:16:56 GMT-0500 (Eastern Standard Time) - Run Time: 2805ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06\_dest  
 Column: 2006 GTA zone of origin - gta06\_orig

RowG:  
 ColG:(4105,4108)  
 TblG:

Filters:  
 (Start time of trip - start\_time In 600-900  
 and  
 Trip purpose - trip\_purp In 1,2,3  
 and  
 Type of dwelling unit - dwell\_type In 2,3  
 and  
 Primary travel mode of trip - mode\_prime In D,m,p,t)

Trip 2016  
 Table:

RR25	Holly/RR25	Derry	Holly/Derry	
695.5	653	580.5	198	2127
33%	31%	27%	9%	
35%	30%	25%	10%	100%



**TTS AM OUTBOUND (RIRO)**

PLANNING DISTRICTS  
 Wed Nov 21 2018 14:09:36 GMT-0500 (Eastern Standard Time) - Run Time: 1942ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd\_dest  
 Column: 2006 GTA zone of origin - gta06\_orig

RowG:  
 ColG:(4105,4108)  
 TblG:

Filters:  
 (Start time of trip - start\_time In 600-900  
 and  
 Trip purpose - trip\_purp In 1,2,3  
 and  
 Type of dwelling unit - dwell\_type In 2,3  
 and  
 Primary travel mode of trip - mode\_prime In D,m,p,t)

Trip 2016  
 Table:

,1	North RR25	South Holly/RR25	East Derry	West Holly/Derry	Sum	North RR25	South Holly/RR25	East Derry	West Holly/Derry
PD 1 of Toronto	54		1		1	0	0	54	0
PD 2 of Toronto	16		1		1	0	0	16	0
PD 3 of Toronto	31		1		1	0	0	31	0
PD 5 of Toronto	11		1		1	0	0	11	0
PD 7 of Toronto	36		1		1	0	0	36	0
PD 8 of Toronto	75		1		1	0	0	75	0
PD 9 of Toronto	50		1		1	0	0	50	0
PD 11 of Toronto	40		1		1	0	0	40	0
PD 12 of Toronto	17		1		1	0	0	17	0
PD 16 of Toronto	13		1		1	0	0	13	0
Markham	44		1		1	0	0	44	0
Vaughan	28		1		1	0	0	28	0
Brampton	139		1		1	0	0	139	0
<b>Mississauga</b>	<b>786</b>								
Halton Hills	30	0.5	0.5		1	15	0	15	0
<b>Milton</b>	<b>854</b>								
Oakville	133	0.5	0.5		1	0	66.5	66.5	0
Burlington	32	0.5		0.5	1	0	16	0	16
Dundas	46	0.5		0.5	1	0	23	0	23
Hamilton	53	0.5		0.5	1	0	26.5	0	26.5
Kitchener	26	1			1	26	0	0	0
City of Guelph	14	0.5		0.5	1	7	0	0	7
	2528								
<b>Mississauga</b>									
3601	30		1		1	0	0	30	0
3612	18		1		1	0	0	18	0
3616	11		1		1	0	0	11	0
3618	48		1		1	0	0	48	0
3620	17		1		1	0	0	17	0
3621	31		1		1	0	0	31	0
3631	12		1		1	0	0	12	0
3634	37	0.5	0.5		1	0	18.5	18.5	0
3638	26		1		1	0	0	26	0
3671	52		1		1	0	0	52	0
3704	22		1		1	0	0	22	0
3706	6		1		1	0	0	6	0
3710	131		1		1	0	0	131	0
3714	28		1		1	0	0	28	0
3721	35		1		1	0	0	35	0
3809	62		1		1	0	0	62	0
3811	36		1		1	0	0	36	0
3816	31		1		1	0	0	31	0
3818	30		1		1	0	0	30	0
3821	18		1		1	0	0	18	0
3823	19		1		1	0	0	19	0
3824	22		1		1	0	0	22	0
3825	29		1		1	0	0	29	0
3854	32		1		1	0	0	32	0
	783								
<b>Milton</b>									
4104	48	0.5		0.5	1	0	24	0	24
4105	106	0.5		0.5	1	0	53	0	53
4108	102	0.5	0.5		1	0	51	51	0
4109	89	0.5	0.5		1	0	44.5	44.5	0
4110	15	0.5	0.5		1	0	7.5	7.5	0
4117	19	0.5	0.5		1	9.5	0	9.5	0
4118	18	0.5	0.5		1	9	0	9	0
4119	7	0.5	0.5		1	3.5	0	3.5	0
4120	27	0.5	0.5		1	13.5	0	13.5	0
4122	11	0.5		0.5	1	5.5	0	0	5.5
4124	25	0.5	0.5		1	12.5	0	12.5	0

**2006 GTA Traffic Analysis Zones**

Wed Nov 21 2018 14:16:56 GMT-0500 (Eastern Standard Time) - Run Time: 2805ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06\_dest  
 Column: 2006 GTA zone of origin - gta06\_orig

RowG:  
 ColG:(4105,4108)  
 TblG:

Filters:  
 (Start time of trip - start\_time In 600-900  
 and  
 Trip purpose - trip\_purp In 1,2,3  
 and  
 Type of dwelling unit - dwell\_type In 2,3  
 and  
 Primary travel mode of trip - mode\_prime In D,m,p,t)

Trip 2016  
 Table:

4125	175	0.5	0.5	1	87.5	0	0	87.5	
4126	14	0.5	0.5	1	7	0	0	7	
4127	40		1	1	0	0	0	40	
4144	12	1		1	12	0	0	0	
4145	29	1		1	29	0	0	0	
4147	60	1		1	60	0	0	0	
4148	31	0.5	0.5	1	15.5	0	0	15.5	
4192	25	0.5	0.5	1	12.5	0	0	12.5	
853									
					North	South	East	West	
					RR25	Holly/RR25	Derry	Holly/Derry	2524
					325	330.5	1551	317.5	
					13%	13%	61%	13%	
					15%	15%	60%	10%	100%

TTS PM INBOUND (RIRO)

PLANNING DISTRICTS  
Wed Nov 21 2018 17:05:48 GMT-0500 (Eastern Standard Time) - Run Time: 2096ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of origin - pd\_orig  
Column: 2006 GTA zone of destination - gta06\_dest

RowG:  
ColG:(4105,4108)  
TblG:

Filters:  
(Start time of trip - start\_time In 1400-1700  
and  
Trip purpose - trip\_purp In 1,2,3  
and  
Type of dwelling unit - dwell\_type In 2,3  
and  
Primary travel mode of trip - mode\_prime In D,m,p,t)

Trip 2016  
Table:

,1		North RR25	South Holly/RR25	East Derry	West Holly/Derry	Sum	North RR25	South Holly/RR25	East Derry	West Holly/Derry
PD 1 of Toronto	75	0.5	0.5			1	37.5	37.5	0	0
PD 2 of Toronto	46	0.5	0.5			1	23	23	0	0
PD 3 of Toronto	31	0.5	0.5			1	15.5	15.5	0	0
PD 5 of Toronto	14	0.5	0.5			1	7	7	0	0
PD 7 of Toronto	29	0.5	0.5			1	14.5	14.5	0	0
PD 8 of Toronto	47	0.5	0.5			1	23.5	23.5	0	0
PD 9 of Toronto	50	0.5	0.5			1	25	25	0	0
PD 11 of Toronto	40	0.5	0.5			1	20	20	0	0
PD 12 of Toronto	17	0.5	0.5			1	8.5	8.5	0	0
Vaughan	83	1				1	83	0	0	0
Brampton	60	1				1	60	0	0	0
Mississauga	585									
Halton Hills	47	1				1	47	0	0	0
Milton	725									
Oakville	115		1			1	0	115	0	0
Burlington	58		1			1	0	58	0	0
Hamilton	31		1			1	0	31	0	0
Waterloo	13	0.5			0.5	1	6.5	0	0	6.5
City of Guelph	14	0.5				1	7	0	0	7
Barrie	17	1				1	17	0	0	0
New Tecumseth	30	1				1	30	0	0	0
	2127									
Mississauga										
3601	30		1			1	0	30	0	0
3612	18	0.5	0.5			1	9	9	0	0
3613	21		1			1	0	21	0	0
3618	48	1				1	48	0	0	0
3621	31	1				1	31	0	0	0
3634	26		1			1	0	26	0	0
3663	26		1			1	0	26	0	0
3671	36		1			1	0	36	0	0
3691	31	0.5	0.5			1	15.5	15.5	0	0
3703	7	1				1	7	0	0	0
3704	22	1				1	22	0	0	0
3705	19	1				1	19	0	0	0
3706	6	1				1	6	0	0	0
3710	69	1				1	69	0	0	0
3721	10	1				1	10	0	0	0
3809	62		1			1	0	62	0	0
3816	31	1				1	31	0	0	0
3818	30	0.5	0.5			1	15	15	0	0
3821	18	0.5	0.5			1	9	9	0	0
3835	14	1				1	14	0	0	0
3851	30		1			1	0	30	0	0
	585									
Milton										
4103	16				1	1	0	0	0	16
4104	19		0.5		0.5	1	0	9.5	0	9.5
4105	112		0.5		0.5	1	0	56	0	56
4108	81		1			1	0	81	0	0
4117	19	1				1	19	0	0	0
4119	18	1				1	18	0	0	0
4120	67	1				1	67	0	0	0
4122	11	0.5			0.5	1	5.5	0	0	5.5
4124	10	1				1	10	0	0	0
4125	81	0.5			0.5	1	40.5	0	0	40.5
4126	55	0.5			0.5	1	27.5	0	0	27.5
4127	59	0.5			0.5	1	29.5	0	0	29.5
4144	12	1				1	12	0	0	0
4145	29	1				1	29	0	0	0
4148	83	1				1	83	0	0	0
4192	53	1				1	53	0	0	0
	725						North	South	East	West

2006 GTA Traffic Analysis Zones  
Wed Nov 21 2018 14:16:56 GMT-0500 (Eastern Standard Time) - Run Time: 2805ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06\_dest  
Column: 2006 GTA zone of origin - gta06\_orig

RowG:  
ColG:(4105,4108)  
TblG:

Filters:  
(Start time of trip - start\_time In 600-900  
and  
Trip purpose - trip\_purp In 1,2,3  
and  
Type of dwelling unit - dwell\_type In 2,3  
and  
Primary travel mode of trip - mode\_prime In D,m,p,t)

Trip 2016  
Table:

RR25	Holly/RR25	Derry	Holly/Derry	
1124.5	804.5	0	198	2127
53%	38%	0%	9%	
50%	40%	0%	10%	100%

**Appendix E**  
**Synchro Reports**



Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 80.1%	ICU Level of Service D
Analysis Period (min) 15	









Splits and Phases: 1: Ontario Street & Laurier Road

 55 s	 35 s
 55 s	 35 s

Queues

1: Ontario Street & Laurier Road

03/20/2019

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	68	215	79	258	41	1053	66	666
v/c Ratio	0.48	0.55	0.46	0.68	0.08	0.44	0.22	0.29
Control Delay	41.4	32.9	38.7	37.0	6.6	7.7	9.1	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	32.9	38.7	37.0	6.6	7.7	9.1	6.5
Queue Length 50th (m)	10.5	29.7	12.1	36.0	2.1	36.9	3.7	20.1
Queue Length 95th (m)	21.6	46.3	23.4	55.2	6.9	62.8	12.2	35.5
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	233	622	282	600	507	2380	297	2327
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.35	0.28	0.43	0.08	0.44	0.22	0.29
<b>Intersection Summary</b>								



HCM Signalized Intersection Capacity Analysis  
 1: Ontario Street & Laurier Road

03/20/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	65	145	59	75	156	89	39	949	51	63	593	40	
Future Volume (vph)	65	145	59	75	156	89	39	949	51	63	593	40	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0		
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95		
Flpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	0.99		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1785	1817		1734	1734		1825	3475		1737	3393		
Flt Permitted	0.37	1.00		0.46	1.00		0.39	1.00		0.24	1.00		
Satd. Flow (perm)	699	1817		847	1734		742	3475		435	3393		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	68	153	62	79	164	94	41	999	54	66	624	42	
RTOR Reduction (vph)	0	19	0	0	27	0	0	3	0	0	4	0	
Lane Group Flow (vph)	68	196	0	79	231	0	41	1050	0	66	662	0	
Confl. Peds. (#/hr)	4		3	3		4			2	2			
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		4			8			2			6		
Permitted Phases	4			8			2			6			
Actuated Green, G (s)	16.4	16.4		16.4	16.4		60.6	60.6		60.6	60.6		
Effective Green, g (s)	18.4	18.4		18.4	18.4		61.6	61.6		61.6	61.6		
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.68	0.68		0.68	0.68		
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		
Lane Grp Cap (vph)	142	371		173	354		507	2378		297	2322		
v/s Ratio Prot		0.11			c0.13			c0.30			0.20		
v/s Ratio Perm	0.10			0.09			0.06			0.15			
v/c Ratio	0.48	0.53		0.46	0.65		0.08	0.44		0.22	0.29		
Uniform Delay, d1	31.6	31.9		31.4	32.9		4.7	6.4		5.3	5.6		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.9	0.6		0.7	3.3		0.3	0.6		1.7	0.3		
Delay (s)	32.5	32.6		32.1	36.1		5.1	7.0		7.0	5.9		
Level of Service	C	C		C	D		A	A		A	A		
Approach Delay (s)		32.5			35.2			6.9			6.0		
Approach LOS		C			D			A			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			13.5	HCM 2000 Level of Service						B			
HCM 2000 Volume to Capacity ratio			0.49										
Actuated Cycle Length (s)			90.0	Sum of lost time (s)						10.0			
Intersection Capacity Utilization			80.1%	ICU Level of Service						D			
Analysis Period (min)			15										
c Critical Lane Group													



Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 34.4	Intersection LOS: C
Intersection Capacity Utilization 83.9%	ICU Level of Service E
Analysis Period (min) 15	













Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



## Queues

## 2: Regional Road 25/Ontario Street &amp; Derry Road

03/20/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Lane Group Flow (vph)	250	1116	177	271	571	182	138	589	175	143	609	
v/c Ratio	0.47	0.82	0.27	0.78	0.40	0.25	0.46	0.69	0.34	0.49	0.75	
Control Delay	16.1	40.1	12.2	43.2	30.4	9.9	28.1	44.8	6.4	29.2	45.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	16.1	40.1	12.2	43.2	30.4	9.9	28.1	44.8	6.4	29.2	45.3	
Queue Length 50th (m)	26.5	126.1	11.0	46.0	53.8	6.0	21.1	66.4	0.0	22.1	67.1	
Queue Length 95th (m)	46.6	154.0	27.2	#108.1	80.1	23.9	31.8	79.3	15.6	33.1	80.7	
Internal Link Dist (m)		598.6			194.7			1506.3			211.1	
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		
Base Capacity (vph)	594	1358	654	348	1428	734	301	1042	597	291	991	
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	0.42	0.82	0.27	0.78	0.40	0.25	0.46	0.57	0.29	0.49	0.61	

## Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	1071	170	260	548	175	132	565	168	137	468	116
Future Volume (vph)	240	1071	170	260	548	175	132	565	168	137	468	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1753	3579	1550	1690	3476	1527	1789	3380	1545	1689	3159	1900
Flt Permitted	0.39	1.00	1.00	0.08	1.00	1.00	0.23	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	714	3579	1550	149	3476	1527	432	3380	1545	431	3159	1900
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	250	1116	177	271	571	182	138	589	175	143	488	121
RTOR Reduction (vph)	0	0	66	0	0	107	0	0	131	0	19	0
Lane Group Flow (vph)	250	1116	111	271	571	75	138	589	44	143	590	0
Confl. Peds. (#/hr)	6		1	1		6	2		4	4		2
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	NA
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	57.4	43.8	43.8	65.0	47.6	47.6	37.3	28.5	28.5	37.5	28.6	
Effective Green, g (s)	63.4	45.5	45.5	68.2	49.3	49.3	43.3	30.2	30.2	43.5	30.3	
Actuated g/C Ratio	0.53	0.38	0.38	0.57	0.41	0.41	0.36	0.25	0.25	0.36	0.25	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	520	1357	587	346	1428	627	289	850	388	280	797	
v/s Ratio Prot	0.07	c0.31		c0.13	0.16		0.05	0.17		c0.05	c0.19	
v/s Ratio Perm	0.19		0.07	0.31		0.05	0.13		0.03	0.13		
v/c Ratio	0.48	0.82	0.19	0.78	0.40	0.12	0.48	0.69	0.11	0.51	0.74	
Uniform Delay, d1	15.7	33.6	24.9	32.5	24.9	21.9	27.6	40.7	34.6	27.6	41.2	
Progression Factor	1.00	1.00	1.00	0.90	1.10	2.16	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	5.7	0.7	10.5	0.8	0.4	1.2	2.5	0.1	1.6	3.6	
Delay (s)	16.4	39.3	25.6	39.7	28.3	47.7	28.8	43.2	34.7	29.2	44.8	
Level of Service	B	D	C	D	C	D	C	D	C	C	D	
Approach Delay (s)		34.1			34.8			39.3			41.9	
Approach LOS		C			C			D			D	

Intersection Summary		
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.74	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	83.9%	12.0
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↕	↕		↕	
Traffic Volume (vph)	20	1356	1126	16	18	4
Future Volume (vph)	20	1356	1126	16	18	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Fit			0.998		0.974	
Fit Protected	0.950				0.961	
Satd. Flow (prot)	1825	3544	3439	0	1715	0
Fit Permitted	0.950				0.961	
Satd. Flow (perm)	1825	3544	3439	0	1715	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		218.7	493.3		86.5	
Travel Time (s)		13.1	29.6		6.2	
Confl. Peds. (#/hr)	8			8		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	3%	6%	0%	6%	0%
Adj. Flow (vph)	23	1559	1294	18	21	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	1559	1312	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.5%			ICU Level of Service A		
Analysis Period (min)	15					

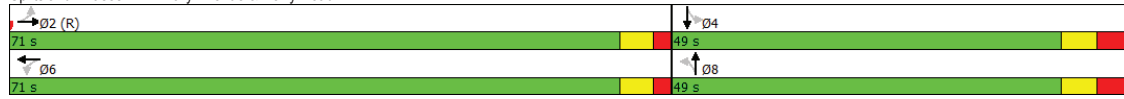
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↕	↕		↵	
Traffic Volume (veh/h)	20	1356	1126	16	18	4
Future Volume (Veh/h)	20	1356	1126	16	18	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	23	1559	1294	18	21	5
Pedestrians					8	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (m)		219				
pX, platoon unblocked					0.71	
vC, conflicting volume	1320				2136	664
vC1, stage 1 conf vol					1311	
vC2, stage 2 conf vol					826	
vCu, unblocked vol	1320				1790	664
tC, single (s)	4.1				6.9	6.9
tC, 2 stage (s)					5.9	
tF (s)	2.2				3.6	3.3
p0 queue free %	96				89	99
cM capacity (veh/h)	526				195	405
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>EB 3</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>
Volume Total	23	780	780	863	449	26
Volume Left	23	0	0	0	0	21
Volume Right	0	0	0	0	18	5
cSH	526	1700	1700	1700	1700	217
Volume to Capacity	0.04	0.46	0.46	0.51	0.26	0.12
Queue Length 95th (m)	1.0	0.0	0.0	0.0	0.0	3.1
Control Delay (s)	12.2	0.0	0.0	0.0	0.0	23.9
Lane LOS	B					C
Approach Delay (s)	0.2			0.0		23.9
Approach LOS						C
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			47.5%		ICU Level of Service	A
Analysis Period (min)			15			













Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 80.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: Holly Avenue & Derry Road



Queues  
4: Holly Avenue & Derry Road

03/20/2019

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	1402	59	984	171	177	45	119
v/c Ratio	0.19	0.56	0.30	0.40	0.72	0.51	0.25	0.30
Control Delay	3.1	2.5	13.0	8.0	61.0	35.3	41.2	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	2.5	13.0	8.0	61.0	35.3	41.2	15.6
Queue Length 50th (m)	1.1	14.4	4.4	42.4	38.0	27.5	9.0	7.2
Queue Length 95th (m)	m2.4	23.3	15.6	70.3	56.7	44.9	18.1	20.7
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	324	2515	196	2463	437	596	332	652
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.56	0.30	0.40	0.39	0.30	0.14	0.18
<b>Intersection Summary</b>								
m Volume for 95th percentile queue is metered by upstream signal.								

HCM Signalized Intersection Capacity Analysis  
 4: Holly Avenue & Derry Road

03/20/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1219	99	55	904	21	161	34	133	42	35	77
Future Volume (vph)	56	1219	99	55	904	21	161	34	133	42	35	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1643	3501		1738	3431		1803	1548		1729	1638	
Flt Permitted	0.26	1.00		0.15	1.00		0.63	1.00		0.50	1.00	
Satd. Flow (perm)	453	3501		275	3431		1194	1548		906	1638	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	60	1297	105	59	962	22	171	36	141	45	37	82
RTOR Reduction (vph)	0	3	0	0	1	0	0	37	0	0	66	0
Lane Group Flow (vph)	60	1399	0	59	983	0	171	140	0	45	53	0
Confl. Peds. (#/hr)	2		1	1		2	2		6	6		2
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.4	85.4		85.4	85.4		21.7	21.7		21.7	21.7	
Effective Green, g (s)	86.1	86.1		86.1	86.1		23.9	23.9		23.9	23.9	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	325	2511		197	2461		237	308		180	326	
v/s Ratio Prot		c0.40			0.29			0.09			0.03	
v/s Ratio Perm	0.13			0.21			c0.14			0.05		
v/c Ratio	0.18	0.56		0.30	0.40		0.72	0.46		0.25	0.16	
Uniform Delay, d1	5.5	8.0		6.1	6.7		44.9	42.3		40.5	39.8	
Progression Factor	0.28	0.21		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.7		0.3	0.0		10.3	1.1		0.7	0.2	
Delay (s)	2.5	2.3		6.4	6.8		55.3	43.4		41.2	40.0	
Level of Service	A	A		A	A		E	D		D	D	
Approach Delay (s)		2.3			6.7			49.2			40.3	
Approach LOS		A			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			11.3	HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)						10.0		
Intersection Capacity Utilization			80.5%	ICU Level of Service						D		
Analysis Period (min)			15									
c Critical Lane Group												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↔		↔	↕↔		↔	↕↔	↔	↔	↕↔	↔
Traffic Volume (vph)	130	452	483	150	334	83	155	607	138	50	679	100
Future Volume (vph)	130	452	483	150	334	83	155	607	138	50	679	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00				1.00				0.98	1.00		
Frt		0.923			0.970				0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1659	3270	0	1722	3416	0	1674	3411	1541	1755	3380	1471
Fit Permitted	0.420			*0.250			0.323			0.359		
Satd. Flow (perm)	730	3270	0	453	3416	0	569	3411	1517	662	3380	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		198			27				147			106
Link Speed (k/h)		50			50				70			70
Link Distance (m)		455.0			858.9				517.1			1530.3
Travel Time (s)		32.8			61.8				26.6			78.7
Confl. Peds. (#/hr)	6					6			2	2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Adj. Flow (vph)	138	481	514	160	355	88	165	646	147	53	722	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	995	0	160	443	0	165	646	147	53	722	106
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7				3.7			3.7
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.9			4.9				4.9			4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases		4			8			2			6	
Detector Phase		4			8			2			6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0	32.0	32.0	32.0	32.0
Total Split (s)	53.0	53.0		53.0	53.0		77.0	77.0	77.0	77.0	77.0	77.0
Total Split (%)	40.8%	40.8%		40.8%	40.8%		59.2%	59.2%	59.2%	59.2%	59.2%	59.2%
Maximum Green (s)	46.0	46.0		46.0	46.0		70.0	70.0	70.0	70.0	70.0	70.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		3.0	3.0		3.2	3.2	3.2	3.2	3.2	3.2
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		18.0	18.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	47.2	47.2		47.2	47.2		72.0	72.0	72.0	72.0	72.0	72.0
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.56	0.56	0.56	0.56	0.56	0.56
v/c Ratio	0.52	0.75		0.97	0.35		0.52	0.34	0.16	0.14	0.38	0.12
Control Delay	40.4	32.5		103.8	28.8		25.5	16.4	2.5	15.4	17.0	2.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	32.5		103.8	28.8		25.5	16.4	2.5	15.4	17.0	2.8
LOS	D	C		F	C		C	B	A	B	B	A
Approach Delay		33.5			48.7			15.8			15.2	
Approach LOS		C			D			B			B	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	129.2											
Natural Cycle:	65											
Control Type:	Actuated-Uncoordinated											

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 26.8

Intersection LOS: C

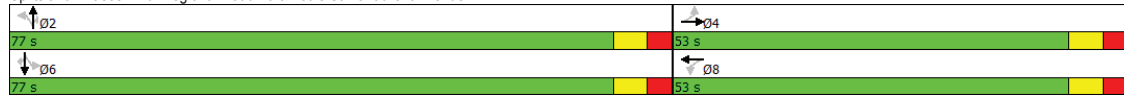
Intersection Capacity Utilization 90.5%

ICU Level of Service E

Analysis Period (min) 15

\* User Entered Value













Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



## Queues

## 6: Regional Road 25 &amp; Louis Saint Laurent Avenue

03/20/2019

												
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Group Flow (vph)	138	995	160	443	165	646	147	53	722	106		
v/c Ratio	0.52	0.75	0.97	0.35	0.52	0.34	0.16	0.14	0.38	0.12		
Control Delay	40.4	32.5	103.8	28.8	25.5	16.4	2.5	15.4	17.0	2.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	40.4	32.5	103.8	28.8	25.5	16.4	2.5	15.4	17.0	2.8		
Queue Length 50th (m)	27.3	94.8	39.7	40.1	25.5	46.0	0.0	6.3	53.0	0.0		
Queue Length 95th (m)	49.2	120.3	#84.3	54.0	48.3	58.3	9.3	13.6	66.6	8.1		
Internal Link Dist (m)		431.0		834.9		493.1			1506.3			
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0		
Base Capacity (vph)	271	1339	168	1286	317	1900	910	368	1883	866		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.51	0.74	0.95	0.34	0.52	0.34	0.16	0.14	0.38	0.12		

## Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	452	483	150	334	83	155	607	138	50	679	100
Future Volume (vph)	130	452	483	150	334	83	155	607	138	50	679	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1651	3268		1722	3417		1674	3411	1517	1753	3380	1471
Flt Permitted	0.42	1.00		0.25	1.00		0.32	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	730	3268		453	3417		570	3411	1517	663	3380	1471
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	138	481	514	160	355	88	165	646	147	53	722	106
RTOR Reduction (vph)	0	126	0	0	17	0	0	0	65	0	0	47
Lane Group Flow (vph)	138	869	0	160	426	0	165	646	82	53	722	59
Confl. Peds. (#/hr)	6						6			2	2	
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	45.2	45.2		45.2	45.2		70.0	70.0	70.0	70.0	70.0	70.0
Effective Green, g (s)	47.2	47.2		47.2	47.2		72.0	72.0	72.0	72.0	72.0	72.0
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.56	0.56	0.56	0.56	0.56	0.56
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		3.0	3.0		3.2	3.2	3.2	3.2	3.2	3.2
Lane Grp Cap (vph)	266	1193		165	1248		317	1900	845	369	1883	819
v/s Ratio Prot		0.27			0.12			0.19			0.21	
v/s Ratio Perm	0.19			c0.35			c0.29		0.05	0.08		0.04
v/c Ratio	0.52	0.73		0.97	0.34		0.52	0.34	0.10	0.14	0.38	0.07
Uniform Delay, d1	32.1	35.5		40.3	29.7		17.8	15.6	13.4	13.8	16.1	13.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	1.9		60.3	0.2		6.0	0.5	0.2	0.8	0.6	0.2
Delay (s)	32.8	37.4		100.6	29.9		23.8	16.1	13.6	14.6	16.7	13.4
Level of Service	C	D		F	C		C	B	B	B	B	B
Approach Delay (s)		36.8			48.6			17.1			16.2	
Approach LOS		D			D			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			28.4		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			129.2		Sum of lost time (s)					10.0		
Intersection Capacity Utilization			90.5%		ICU Level of Service					E		
Analysis Period (min)			15									

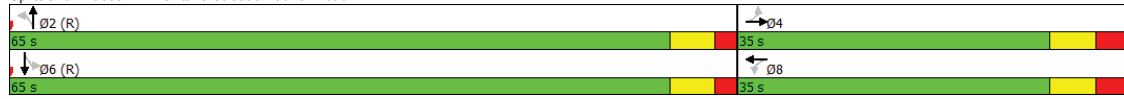
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	165	39	103	198	98	58	793	87	125	877	84
Future Volume (vph)	60	165	39	103	198	98	58	793	87	125	877	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Frt		0.971			0.950			0.985			0.987	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1859	0	1807	1782	0	1825	3491	0	1789	3492	0
Fit Permitted	0.293			0.475			0.250			0.279		
Satd. Flow (perm)	549	1859	0	900	1782	0	480	3491	0	525	3492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			25			21			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Confl. Peds. (#/hr)	9		5	5		9	3		3	3		3
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Adj. Flow (vph)	63	172	41	107	206	102	60	826	91	130	914	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	213	0	107	308	0	60	917	0	130	1002	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8		2		2		6
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (s)	35.0	35.0		35.0	35.0		65.0	65.0		65.0	65.0	
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%		65.0%	65.0%	
Maximum Green (s)	28.0	28.0		28.0	28.0		59.0	59.0		59.0	59.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	22.5	22.5		22.5	22.5		67.5	67.5		67.5	67.5	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.68	0.68		0.68	0.68	
v/c Ratio	0.51	0.50		0.53	0.74		0.19	0.39		0.37	0.42	
Control Delay	47.4	34.9		42.6	43.0		9.4	8.2		12.2	8.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	47.4	34.9		42.6	43.0		9.4	8.2		12.2	8.6	
LOS	D	C		D	D		A	A		B	A	
Approach Delay		37.7			42.9			8.3			9.0	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	42 (42%), Referenced to phase 2:NBT and 6:SBTL, Start of Green											
Natural Cycle:	65											



Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	









Splits and Phases: 1: Ontario Street & Laurier Road



Queues

1: Ontario Street & Laurier Road

03/20/2019

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	63	213	107	308	60	917	130	1002
v/c Ratio	0.51	0.50	0.53	0.74	0.19	0.39	0.37	0.42
Control Delay	47.4	34.9	42.6	43.0	9.4	8.2	12.2	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.4	34.9	42.6	43.0	9.4	8.2	12.2	8.6
Queue Length 50th (m)	10.7	34.1	18.3	51.3	3.9	35.6	9.7	40.4
Queue Length 95th (m)	22.3	50.3	32.1	72.4	11.8	58.9	27.0	66.4
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	164	566	270	552	324	2364	354	2364
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.38	0.40	0.56	0.19	0.39	0.37	0.42
<b>Intersection Summary</b>								

HCM Signalized Intersection Capacity Analysis  
 1: Ontario Street & Laurier Road

03/20/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	165	39	103	198	98	58	793	87	125	877	84
Future Volume (vph)	60	165	39	103	198	98	58	793	87	125	877	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Flpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1780	1859		1800	1783		1822	3492		1786	3492	
Flt Permitted	0.29	1.00		0.47	1.00		0.25	1.00		0.28	1.00	
Satd. Flow (perm)	549	1859		900	1783		480	3492		525	3492	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	62	172	41	107	206	102	60	826	91	130	914	88
RTOR Reduction (vph)	0	9	0	0	19	0	0	7	0	0	6	0
Lane Group Flow (vph)	63	204	0	107	289	0	60	910	0	130	996	0
Confl. Peds. (#/hr)	9		5	5		9	3		3	3		3
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.5	20.5		20.5	20.5		66.5	66.5		66.5	66.5	
Effective Green, g (s)	22.5	22.5		22.5	22.5		67.5	67.5		67.5	67.5	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.68	0.68		0.68	0.68	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	123	418		202	401		324	2357		354	2357	
v/s Ratio Prot		0.11			c0.16			0.26			c0.29	
v/s Ratio Perm	0.11			0.12			0.13			0.25		
v/c Ratio	0.51	0.49		0.53	0.72		0.19	0.39		0.37	0.42	
Uniform Delay, d1	33.9	33.7		34.1	35.8		6.0	7.1		7.0	7.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.3		1.2	5.1		1.3	0.5		2.9	0.6	
Delay (s)	35.4	34.1		35.3	40.9		7.3	7.6		9.9	7.9	
Level of Service	D	C		D	D		A	A		A	A	
Approach Delay (s)		34.4			39.5			7.6			8.2	
Approach LOS		C			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			15.2		HCM 2000 Level of Service						B	
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			100.0		Sum of lost time (s)						10.0	
Intersection Capacity Utilization			82.4%		ICU Level of Service						E	
Analysis Period (min)			15									

c Critical Lane Group

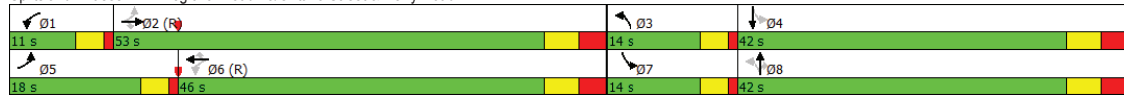
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	249	733	93	170	943	208	170	628	134	181	508	205
Future Volume (vph)	249	733	93	170	943	208	170	628	134	181	508	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00		0.99	1.00		0.99	1.00		0.99	1.00		1.00
Frt			0.850			0.850			0.850			0.957
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3614	1617	1807	3614	1633	1789	3476	1498	1807	3342	0
Fit Permitted	0.113			0.279			0.153			0.210		
Satd. Flow (perm)	211	3614	1594	530	3614	1612	288	3476	1479	399	3342	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			143			144			52
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		622.6			218.7			1530.3			235.1	
Travel Time (s)		37.4			13.1			110.2			16.9	
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Adj. Flow (vph)	268	788	100	183	1014	224	183	675	144	195	546	220
Shared Lane Traffic (%)												
Lane Group Flow (vph)	268	788	100	183	1014	224	183	675	144	195	766	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7	
Total Split (s)	18.0	53.0	53.0	11.0	46.0	46.0	14.0	42.0	42.0	14.0	42.0	
Total Split (%)	15.0%	44.2%	44.2%	9.2%	38.3%	38.3%	11.7%	35.0%	35.0%	11.7%	35.0%	
Maximum Green (s)	14.0	46.3	46.3	7.0	39.3	39.3	10.0	35.3	35.3	10.0	35.3	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	66.7	50.5	50.5	59.5	44.3	44.3	50.2	33.3	33.3	50.3	33.4	
Actuated g/C Ratio	0.56	0.42	0.42	0.50	0.37	0.37	0.42	0.28	0.28	0.42	0.28	
v/c Ratio	0.78	0.52	0.14	0.48	0.76	0.33	0.65	0.70	0.28	0.61	0.79	
Control Delay	40.0	27.9	4.3	15.6	35.4	8.7	32.5	42.8	6.4	30.0	43.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	40.0	27.9	4.3	15.6	35.4	8.7	32.5	42.8	6.4	30.0	43.7	
LOS	D	C	A	B	D	A	C	D	A	C	D	
Approach Delay		28.6			28.7			35.7			40.9	
Approach LOS		C			C			D			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 105

Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 32.8	Intersection LOS: C
Intersection Capacity Utilization 87.5%	ICU Level of Service E
Analysis Period (min) 15	













Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Queues

2: Regional Road 25/Ontario Street & Derry Road

03/20/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Lane Group Flow (vph)	268	788	100	183	1014	224	183	675	144	195	766	
v/c Ratio	0.78	0.52	0.14	0.48	0.76	0.33	0.65	0.70	0.28	0.61	0.79	
Control Delay	40.0	27.9	4.3	15.6	35.4	8.7	32.5	42.8	6.4	30.0	43.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	40.0	27.9	4.3	15.6	35.4	8.7	32.5	42.8	6.4	30.0	43.7	
Queue Length 50th (m)	38.7	73.8	0.0	16.3	118.1	16.1	26.6	74.2	0.0	28.5	81.5	
Queue Length 95th (m)	#81.8	92.8	9.5	18.7	143.5	26.6	40.5	91.5	14.3	42.9	101.1	
Internal Link Dist (m)		598.6			194.7			1506.3			211.1	
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		
Base Capacity (vph)	351	1519	731	383	1332	684	283	1071	555	320	1066	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.76	0.52	0.14	0.48	0.76	0.33	0.65	0.63	0.26	0.61	0.72	

Intersection Summary












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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	249	733	93	170	943	208	170	628	134	181	508	205
Future Volume (vph)	249	733	93	170	943	208	170	628	134	181	508	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1772	3614	1594	1807	3614	1612	1789	3476	1479	1807	3342	3342
Flt Permitted	0.11	1.00	1.00	0.28	1.00	1.00	0.15	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	210	3614	1594	530	3614	1612	288	3476	1479	399	3342	3342
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	268	788	100	183	1014	224	183	675	144	195	546	220
RTOR Reduction (vph)	0	0	58	0	0	90	0	0	104	0	38	0
Lane Group Flow (vph)	268	788	42	183	1014	134	183	675	40	195	728	0
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	NA
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	61.0	48.7	48.7	50.8	42.5	42.5	41.6	31.7	31.7	41.6	31.7	
Effective Green, g (s)	64.0	50.4	50.4	56.8	44.2	44.2	47.6	33.4	33.4	47.6	33.4	
Actuated g/C Ratio	0.53	0.42	0.42	0.47	0.37	0.37	0.40	0.28	0.28	0.40	0.28	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	339	1517	669	371	1331	593	275	967	411	309	930	
v/s Ratio Prot	c0.12	0.22		0.05	c0.28		c0.07	0.19		0.07	c0.22	
v/s Ratio Perm	0.31		0.03	0.19		0.08	0.19		0.03	0.18		
v/c Ratio	0.79	0.52	0.06	0.49	0.76	0.23	0.67	0.70	0.10	0.63	0.78	
Uniform Delay, d1	27.2	25.8	20.7	19.1	33.3	26.1	26.6	38.8	32.1	26.0	40.0	
Progression Factor	1.00	1.00	1.00	0.80	0.92	0.69	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.9	1.3	0.2	0.9	3.8	0.8	6.0	2.2	0.1	4.2	4.4	
Delay (s)	39.0	27.1	20.9	16.2	34.3	18.8	32.6	41.0	32.2	30.1	44.3	
Level of Service	D	C	C	B	C	B	C	D	C	C	D	
Approach Delay (s)		29.3			29.6			38.2			41.4	
Approach LOS		C			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			33.9	HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)				12.0				
Intersection Capacity Utilization			87.5%	ICU Level of Service				E				
Analysis Period (min)			15									

c Critical Lane Group

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↕	↕		↕	
Traffic Volume (vph)	10	1038	1365	20	19	24
Future Volume (vph)	10	1038	1365	20	19	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Fit			0.998		0.924	
Fit Protected	0.950				0.979	
Satd. Flow (prot)	1825	3510	3607	0	1738	0
Fit Permitted	0.950				0.979	
Satd. Flow (perm)	1825	3510	3607	0	1738	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		218.7	493.3		86.5	
Travel Time (s)		13.1	29.6		6.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	4%	1%	0%	0%	0%
Adj. Flow (vph)	11	1166	1534	22	21	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	1166	1556	0	48	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	48.4%			ICU Level of Service A		
Analysis Period (min)	15					



						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	1038	1365	20	19	24
Future Volume (Veh/h)	10	1038	1365	20	19	24
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	11	1166	1534	22	21	27
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (m)		219				
pX, platoon unblocked					0.84	
vC, conflicting volume	1558				2152	780
vC1, stage 1 conf vol					1547	
vC2, stage 2 conf vol					605	
vCu, unblocked vol	1558				1988	780
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	97				87	92
cM capacity (veh/h)	429				157	342
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>EB 3</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>
Volume Total	11	583	583	1023	533	48
Volume Left	11	0	0	0	0	21
Volume Right	0	0	0	0	22	27
cSH	429	1700	1700	1700	1700	226
Volume to Capacity	0.03	0.34	0.34	0.60	0.31	0.21
Queue Length 95th (m)	0.6	0.0	0.0	0.0	0.0	5.9
Control Delay (s)	13.6	0.0	0.0	0.0	0.0	25.2
Lane LOS	B					D
Approach Delay (s)	0.1			0.0		25.2
Approach LOS						D
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			48.4%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

03/20/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	833	167	147	1169	52	165	64	77	34	67	51
Future Volume (vph)	57	833	167	147	1169	52	165	64	77	34	67	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00				0.99		1.00		
Frt		0.975			0.994			0.918			0.935	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3486	0	1825	3594	0	1807	1712	0	1825	1766	0
Fit Permitted	0.180			0.243			0.621			0.567		
Satd. Flow (perm)	346	3486	0	466	3594	0	1181	1712	0	1088	1766	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			7			50			32	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Confl. Peds. (#/hr)			2	2					1	1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Adj. Flow (vph)	59	868	174	153	1218	54	172	67	80	35	70	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	1042	0	153	1272	0	172	147	0	35	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases		2			6			8			4	
Detector Phase		2			6			8			4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	81.0	81.0		81.0	81.0		39.0	39.0		39.0	39.0	
Total Split (%)	67.5%	67.5%		67.5%	67.5%		32.5%	32.5%		32.5%	32.5%	
Maximum Green (s)	75.3	75.3		75.3	75.3		31.8	31.8		31.8	31.8	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	85.8	85.8		85.8	85.8		24.2	24.2		24.2	24.2	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
v/c Ratio	0.24	0.42		0.46	0.49		0.72	0.38		0.16	0.32	
Control Delay	13.1	11.9		14.6	9.1		61.0	28.2		38.1	30.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.1	11.9		14.6	9.1		61.0	28.2		38.1	30.4	
LOS	B	B		B	A		E	C		D	C	
Approach Delay		12.0			9.7			45.9			32.1	
Approach LOS		B			A			D			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90









Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 15.6	Intersection LOS: B
Intersection Capacity Utilization 80.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: Holly Avenue & Derry Road



Queues  
4: Holly Avenue & Derry Road

03/20/2019

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	59	1042	153	1272	172	147	35	123
v/c Ratio	0.24	0.42	0.46	0.49	0.72	0.38	0.16	0.32
Control Delay	13.1	11.9	14.6	9.1	61.0	28.2	38.1	30.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	11.9	14.6	9.1	61.0	28.2	38.1	30.4
Queue Length 50th (m)	8.6	88.7	13.5	61.1	38.2	19.5	6.9	18.2
Queue Length 95th (m)	m21.0	117.4	38.5	98.6	57.0	34.7	14.5	32.0
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	247	2502	333	2571	334	520	308	523
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.42	0.46	0.49	0.51	0.28	0.11	0.24
<b>Intersection Summary</b>								
m Volume for 95th percentile queue is metered by upstream signal.								

HCM Signalized Intersection Capacity Analysis  
 4: Holly Avenue & Derry Road

03/20/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	833	167	147	1169	52	165	64	77	34	67	51
Future Volume (vph)	57	833	167	147	1169	52	165	64	77	34	67	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3486		1823	3592		1807	1713		1823	1767	
Flt Permitted	0.18	1.00		0.24	1.00		0.62	1.00		0.57	1.00	
Satd. Flow (perm)	345	3486		466	3592		1182	1713		1088	1767	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	59	868	174	153	1218	54	172	67	80	35	70	53
RTOR Reduction (vph)	0	11	0	0	2	0	0	40	0	0	26	0
Lane Group Flow (vph)	59	1031	0	153	1270	0	172	107	0	35	97	0
Confl. Peds. (#/hr)			2	2					1	1		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.1	85.1		85.1	85.1		22.0	22.0		22.0	22.0	
Effective Green, g (s)	85.8	85.8		85.8	85.8		24.2	24.2		24.2	24.2	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.20	0.20		0.20	0.20	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	246	2492		333	2568		238	345		219	356	
v/s Ratio Prot		0.30			c0.35			0.06			0.06	
v/s Ratio Perm	0.17			0.33			c0.15			0.03		
v/c Ratio	0.24	0.41		0.46	0.49		0.72	0.31		0.16	0.27	
Uniform Delay, d1	5.9	6.9		7.3	7.5		44.8	40.8		39.5	40.5	
Progression Factor	1.33	1.53		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.5		0.4	0.1		10.3	0.5		0.3	0.4	
Delay (s)	9.9	11.1		7.6	7.6		55.1	41.3		39.9	40.9	
Level of Service	A	B		A	A		E	D		D	D	
Approach Delay (s)		11.0			7.6			48.7			40.7	
Approach LOS		B			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			15.0	HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)				10.0				
Intersection Capacity Utilization			80.6%	ICU Level of Service				D				
Analysis Period (min)	15											
c Critical Lane Group												

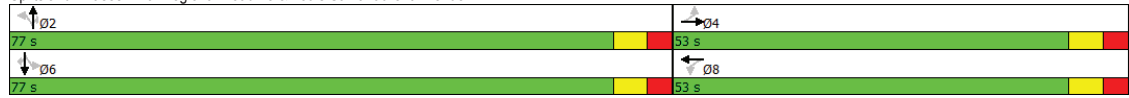
	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗	↖	↖	↖↗	↖
Traffic Volume (vph)	89	308	197	95	451	61	299	771	196	67	563	139
Future Volume (vph)	89	308	197	95	451	61	299	771	196	67	563	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00				1.00				0.99	1.00		
Frt		0.942			0.982				0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3391	0	1772	3547	0	1789	3476	1570	1825	3476	1633
Fit Permitted	0.270			0.277			0.413			0.316		
Satd. Flow (perm)	503	3391	0	517	3547	0	778	3476	1549	607	3476	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		126			13				206			146
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1530.3	
Travel Time (s)		32.8			61.8			26.6			78.7	
Confl. Peds. (#/hr)	1					1			1	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Adj. Flow (vph)	94	324	207	100	475	64	315	812	206	71	593	146
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	531	0	100	539	0	315	812	206	71	593	146
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases		4			8			2			6	
Detector Phase		4			8			2			6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0	32.0	32.0	32.0	32.0
Total Split (s)	53.0	53.0		53.0	53.0		77.0	77.0	77.0	77.0	77.0	77.0
Total Split (%)	40.8%	40.8%		40.8%	40.8%		59.2%	59.2%	59.2%	59.2%	59.2%	59.2%
Maximum Green (s)	46.0	46.0		46.0	46.0		70.0	70.0	70.0	70.0	70.0	70.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		3.0	3.0		3.2	3.2	3.2	3.2	3.2	3.2
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		18.0	18.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	25.9	25.9		25.9	25.9		72.3	72.3	72.3	72.3	72.3	72.3
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.67	0.67	0.67	0.67	0.67	0.67
v/c Ratio	0.78	0.58		0.81	0.63		0.61	0.35	0.19	0.18	0.26	0.13
Control Delay	78.3	29.6		81.6	38.9		18.4	9.2	1.7	10.0	8.4	1.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.3	29.6		81.6	38.9		18.4	9.2	1.7	10.0	8.4	1.8
LOS	E	C		F	D		B	A	A	A	A	A
Approach Delay		36.9			45.6			10.2			7.4	
Approach LOS		D			D			B			A	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 108.3  
 Natural Cycle: 70  
 Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 21.1	Intersection LOS: C
Intersection Capacity Utilization 77.8%	ICU Level of Service D
Analysis Period (min) 15	











Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



## Queues

## 6: Regional Road 25 &amp; Louis Saint Laurent Avenue

03/20/2019

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	94	531	100	539	315	812	206	71	593	146
v/c Ratio	0.78	0.58	0.81	0.63	0.61	0.35	0.19	0.18	0.26	0.13
Control Delay	78.3	29.6	81.6	38.9	18.4	9.2	1.7	10.0	8.4	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.3	29.6	81.6	38.9	18.4	9.2	1.7	10.0	8.4	1.8
Queue Length 50th (m)	18.5	39.5	19.9	52.2	30.9	32.5	0.0	4.7	22.0	0.0
Queue Length 95th (m)	#38.9	55.4	#43.3	68.5	86.3	63.6	9.4	15.4	44.3	8.0
Internal Link Dist (m)		431.0		834.9		493.1			1506.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	223	1579	230	1585	519	2321	1102	405	2321	1138
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.34	0.43	0.34	0.61	0.35	0.19	0.18	0.26	0.13

## Intersection Summary

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

Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	308	197	95	451	61	299	771	196	67	563	139
Future Volume (vph)	89	308	197	95	451	61	299	771	196	67	563	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1771	3390		1772	3548		1789	3476	1549	1824	3476	1633
Flt Permitted	0.27	1.00		0.28	1.00		0.41	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	503	3390		517	3548		778	3476	1549	606	3476	1633
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	94	324	207	100	475	64	315	812	206	71	593	146
RTOR Reduction (vph)	0	96	0	0	10	0	0	0	68	0	0	48
Lane Group Flow (vph)	94	435	0	100	529	0	315	812	138	71	593	98
Confl. Peds. (#/hr)	1					1			1	1		
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	23.9	23.9		23.9	23.9		70.3	70.3	70.3	70.3	70.3	70.3
Effective Green, g (s)	25.9	25.9		25.9	25.9		72.3	72.3	72.3	72.3	72.3	72.3
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.67	0.67	0.67	0.67	0.67	0.67
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		3.0	3.0		3.2	3.2	3.2	3.2	3.2	3.2
Lane Grp Cap (vph)	120	811		123	849		519	2322	1035	404	2322	1091
v/s Ratio Prot		0.13			0.15			0.23			0.17	
v/s Ratio Perm	0.19			c0.19			c0.40		0.09	0.12		0.06
v/c Ratio	0.78	0.54		0.81	0.62		0.61	0.35	0.13	0.18	0.26	0.09
Uniform Delay, d1	38.5	35.9		38.9	36.8		10.0	7.8	6.5	6.7	7.2	6.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.7	0.3		32.1	1.4		5.2	0.4	0.3	0.9	0.3	0.2
Delay (s)	64.3	36.3		70.9	38.2		15.2	8.2	6.8	7.7	7.4	6.5
Level of Service	E	D		E	D		B	A	A	A	A	A
Approach Delay (s)		40.5			43.3			9.6			7.3	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.1		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			108.2		Sum of lost time (s)					10.0		
Intersection Capacity Utilization			77.8%		ICU Level of Service					D		
Analysis Period (min)			15									

c Critical Lane Group

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

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	145	59	75	156	91	39	994	51	71	626	47
Future Volume (vph)	66	145	59	75	156	91	39	994	51	71	626	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	0.99			1.00		1.00		
Frt		0.957			0.945			0.993				0.990
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1818	0	1738	1734	0	1825	3478	0	1738	3393	0
Flt Permitted	0.387			0.482			0.396			0.213		
Satd. Flow (perm)	727	1818	0	880	1734	0	761	3478	0	389	3393	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			34			8				15
Link Speed (k/h)		50			50			50				50
Link Distance (m)		315.0			196.8			235.1				311.8
Travel Time (s)		22.7			14.2			16.9				22.4
Confl. Peds. (#/hr)	4		3	3		4			2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Adj. Flow (vph)	66	145	59	75	156	91	39	994	51	71	626	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	204	0	75	247	0	39	1045	0	71	673	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

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

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		5.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		9.7	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		47.2	47.2		9.8	57.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		52.4%	52.4%		10.9%	63.3%	
Maximum Green (s)	26.0	26.0		26.0	26.0		41.2	41.2		5.8	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-3.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	17.9	17.9		17.9	17.9		53.4	53.4		66.1	62.1	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.59	0.59		0.73	0.69	
v/c Ratio	0.46	0.54		0.43	0.67		0.09	0.51		0.17	0.29	
Control Delay	40.9	32.8		38.0	36.9		11.5	13.2		5.1	6.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.9	32.8		38.0	36.9		11.5	13.2		5.1	6.2	
LOS	D	C		D	D		B	B		A	A	
Approach Delay		34.8			37.2			13.1			6.1	
Approach LOS		C			D			B			A	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 39 (43%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 16.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 72.3%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



# Timings

## 1: Ontario Street & Laurier Road

07/19/2023



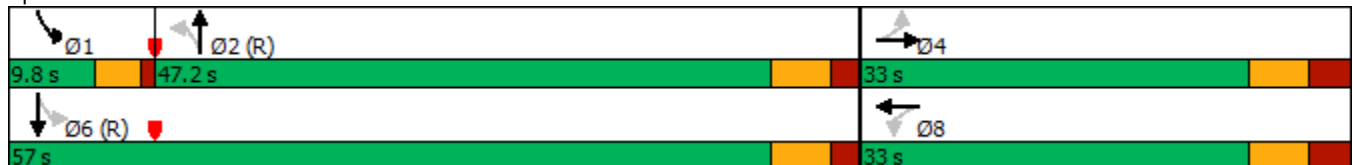
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↕	↖	↕
Traffic Volume (vph)	66	145	75	156	39	994	71	626
Future Volume (vph)	66	145	75	156	39	994	71	626
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	5.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	9.7	27.0
Total Split (s)	33.0	33.0	33.0	33.0	47.2	47.2	9.8	57.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	52.4%	52.4%	10.9%	63.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-1.0	-3.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	1.0	5.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	17.9	17.9	17.9	17.9	53.4	53.4	66.1	62.1
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.59	0.59	0.73	0.69
v/c Ratio	0.46	0.54	0.43	0.67	0.09	0.51	0.17	0.29
Control Delay	40.9	32.8	38.0	36.9	11.5	13.2	5.1	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	32.8	38.0	36.9	11.5	13.2	5.1	6.2
LOS	D	C	D	D	B	B	A	A
Approach Delay		34.8		37.2		13.1		6.1
Approach LOS		C		D		B		A

### Intersection Summary

Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 39 (43%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 16.6  
 Intersection Capacity Utilization 72.3%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service C

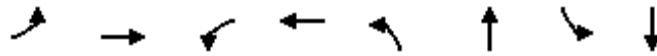
### Splits and Phases: 1: Ontario Street & Laurier Road



# Phasings

## 1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	5.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	9.7	27.0
Total Split (s)	33.0	33.0	33.0	33.0	47.2	47.2	9.8	57.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	52.4%	52.4%	10.9%	63.3%
Maximum Green (s)	26.0	26.0	26.0	26.0	41.2	41.2	5.8	51.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	1.0	2.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0
90th %ile Green (s)	22.3	22.3	22.3	22.3	42.6	42.6	8.1	54.7
90th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Gap	Coord
70th %ile Green (s)	18.4	18.4	18.4	18.4	47.6	47.6	7.0	58.6
70th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Gap	Coord
50th %ile Green (s)	15.7	15.7	15.7	15.7	50.8	50.8	6.5	61.3
50th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	12.9	12.9	12.9	12.9	54.1	54.1	6.0	64.1
30th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Gap	Coord
10th %ile Green (s)	10.0	10.0	10.0	10.0	67.0	67.0	0.0	67.0
10th %ile Term Code	Min	Min	Min	Min	Coord	Coord	Skip	Coord

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

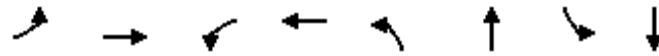
Offset: 39 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Actuated-Coordinated

# Queues

## 1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	204	75	247	39	1045	71	673
v/c Ratio	0.46	0.54	0.43	0.67	0.09	0.51	0.17	0.29
Control Delay	40.9	32.8	38.0	36.9	11.5	13.2	5.1	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	32.8	38.0	36.9	11.5	13.2	5.1	6.2
Queue Length 50th (m)	10.2	28.1	11.5	34.3	2.8	53.0	2.8	19.6
Queue Length 95th (m)	21.1	44.5	22.6	53.3	9.2	86.2	8.0	34.8
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	226	582	273	562	451	2067	430	2347
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.35	0.27	0.44	0.09	0.51	0.17	0.29

### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 1: Ontario Street & Laurier Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Traffic Volume (vph)	66	145	59	75	156	91	39	994	51	71	626	47
Future Volume (vph)	66	145	59	75	156	91	39	994	51	71	626	47
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.94		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	1817		1734	1733		1825	3477		1738	3391	
Flt Permitted	0.39	1.00		0.48	1.00		0.40	1.00		0.21	1.00	
Satd. Flow (perm)	727	1817		879	1733		760	3477		389	3391	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	145	59	75	156	91	39	994	51	71	626	47
RTOR Reduction (vph)	0	19	0	0	27	0	0	3	0	0	5	0
Lane Group Flow (vph)	66	185	0	75	220	0	39	1042	0	71	668	0
Confl. Peds. (#/hr)	4		3	3		4			2	2		
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.9	15.9		15.9	15.9		51.6	51.6		61.1	61.1	
Effective Green, g (s)	17.9	17.9		17.9	17.9		52.6	52.6		64.1	62.1	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.58	0.58		0.71	0.69	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		4.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	144	361		174	344		444	2032		404	2339	
v/s Ratio Prot		0.10			c0.13			c0.30		0.02	c0.20	
v/s Ratio Perm	0.09			0.09			0.05			0.11		
v/c Ratio	0.46	0.51		0.43	0.64		0.09	0.51		0.18	0.29	
Uniform Delay, d1	31.8	32.2		31.6	33.1		8.2	11.1		4.9	5.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.5		0.6	2.9		0.4	0.9		0.2	0.3	
Delay (s)	32.6	32.7		32.2	35.9		8.6	12.0		5.1	5.7	
Level of Service	C	C		C	D		A	B		A	A	
Approach Delay (s)		32.7			35.1			11.9			5.6	
Approach LOS		C			D			B			A	

### Intersection Summary

HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# Lanes, Volumes, Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	281	1252	198	260	599	175	143	565	168	137	490	127
Future Volume (vph)	281	1252	198	260	599	175	143	565	168	137	490	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00		0.99			0.98	1.00		0.98	1.00	1.00	
Frt			0.850			0.850			0.850		0.969	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3579	1570	1690	3476	1555	1789	3380	1570	1690	3155	0
Flt Permitted	0.368			0.079			0.217			0.280		
Satd. Flow (perm)	678	3579	1550	141	3476	1527	409	3380	1545	497	3155	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			175			168			28
Link Speed (k/h)		60			60			50				50
Link Distance (m)		622.6			218.7			1530.3				235.1
Travel Time (s)		37.4			13.1			110.2				16.9
Confl. Peds. (#/hr)	6		1	1		6	2		4	4		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Adj. Flow (vph)	281	1252	198	260	599	175	143	565	168	137	490	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	281	1252	198	260	599	175	143	565	168	137	617	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0



Lanes, Volumes, Timings  
 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023

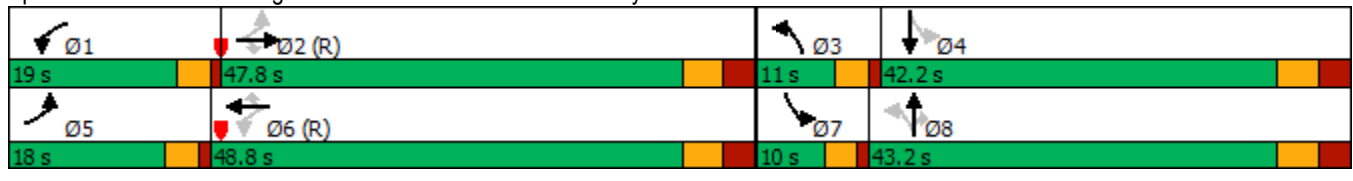


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7	
Total Split (s)	18.0	47.8	47.8	19.0	48.8	48.8	11.0	43.2	43.2	10.0	42.2	
Total Split (%)	15.0%	39.8%	39.8%	15.8%	40.7%	40.7%	9.2%	36.0%	36.0%	8.3%	35.2%	
Maximum Green (s)	14.0	41.1	41.1	15.0	42.1	42.1	7.0	36.5	36.5	6.0	35.5	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	68.5	48.1	48.1	72.6	51.1	51.1	45.4	31.4	31.4	43.4	30.4	
Actuated g/C Ratio	0.57	0.40	0.40	0.60	0.43	0.43	0.38	0.26	0.26	0.36	0.25	
v/c Ratio	0.53	0.87	0.29	0.77	0.40	0.23	0.53	0.64	0.32	0.51	0.75	
Control Delay	16.0	42.4	13.7	39.9	30.2	8.9	31.6	42.2	6.2	31.2	45.1	
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	16.0	42.4	13.7	39.9	30.2	8.9	31.6	42.2	6.2	31.2	45.1	
LOS	B	D	B	D	C	A	C	D	A	C	D	
Approach Delay		34.8			29.0			33.6			42.6	
Approach LOS		C			C			C			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 34.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 90.3%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



# Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗
Traffic Volume (vph)	281	1252	198	260	599	175	143	565	168	137	490
Future Volume (vph)	281	1252	198	260	599	175	143	565	168	137	490
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	18.0	47.8	47.8	19.0	48.8	48.8	11.0	43.2	43.2	10.0	42.2
Total Split (%)	15.0%	39.8%	39.8%	15.8%	40.7%	40.7%	9.2%	36.0%	36.0%	8.3%	35.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)	68.5	48.1	48.1	72.6	51.1	51.1	45.4	31.4	31.4	43.4	30.4
Actuated g/C Ratio	0.57	0.40	0.40	0.60	0.43	0.43	0.38	0.26	0.26	0.36	0.25
v/c Ratio	0.53	0.87	0.29	0.77	0.40	0.23	0.53	0.64	0.32	0.51	0.75
Control Delay	16.0	42.4	13.7	39.9	30.2	8.9	31.6	42.2	6.2	31.2	45.1
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	16.0	42.4	13.7	39.9	30.2	8.9	31.6	42.2	6.2	31.2	45.1
LOS	B	D	B	D	C	A	C	D	A	C	D
Approach Delay		34.8			29.0			33.6			42.6
Approach LOS		C			C			C			D

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 34.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 90.3%  
 ICU Level of Service E  
 Analysis Period (min) 15

### Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



# Phasings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	18.0	47.8	47.8	19.0	48.8	48.8	11.0	43.2	43.2	10.0	42.2
Total Split (%)	15.0%	39.8%	39.8%	15.8%	40.7%	40.7%	9.2%	36.0%	36.0%	8.3%	35.2%
Maximum Green (s)	14.0	41.1	41.1	15.0	42.1	42.1	7.0	36.5	36.5	6.0	35.5
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0
90th %ile Green (s)	14.0	41.1	41.1	15.0	42.1	42.1	7.0	36.5	36.5	6.0	35.5
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Max
70th %ile Green (s)	17.1	41.1	41.1	18.5	42.5	42.5	7.0	33.0	33.0	6.0	32.0
70th %ile Term Code	Gap	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Gap
50th %ile Green (s)	14.5	43.0	43.0	19.9	48.4	48.4	7.0	29.7	29.7	6.0	28.7
50th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Max	Hold	Hold	Max	Gap
30th %ile Green (s)	12.3	48.6	48.6	16.9	53.2	53.2	7.0	27.1	27.1	6.0	26.1
30th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Max	Hold	Hold	Max	Gap
10th %ile Green (s)	9.5	58.0	58.0	12.3	60.8	60.8	7.0	22.3	22.3	6.0	21.3
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Max	Hold	Hold	Max	Gap

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated

Queues

2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	281	1252	198	260	599	175	143	565	168	137	617
v/c Ratio	0.53	0.87	0.29	0.77	0.40	0.23	0.53	0.64	0.32	0.51	0.75
Control Delay	16.0	42.4	13.7	39.9	30.2	8.9	31.6	42.2	6.2	31.2	45.1
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	16.0	42.4	13.7	39.9	30.2	8.9	31.6	42.2	6.2	31.2	45.1
Queue Length 50th (m)	29.3	148.3	14.3	43.6	58.3	6.1	22.5	62.2	0.0	21.6	67.7
Queue Length 95th (m)	50.9	#200.0	33.0	#89.4	81.7	22.9	33.8	74.5	15.1	32.7	81.5
Internal Link Dist (m)		598.6			194.7			1506.3			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	552	1433	684	344	1480	750	269	1075	606	269	997
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.87	0.29	0.76	0.40	0.23	0.53	0.53	0.28	0.51	0.62

Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	281	1252	198	260	599	175	143	565	168	137	490	127
Future Volume (vph)	281	1252	198	260	599	175	143	565	168	137	490	127
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1753	3579	1550	1690	3476	1527	1789	3380	1545	1689	3155	
Flt Permitted	0.37	1.00	1.00	0.08	1.00	1.00	0.22	1.00	1.00	0.28	1.00	
Satd. Flow (perm)	680	3579	1550	141	3476	1527	409	3380	1545	498	3155	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	281	1252	198	260	599	175	143	565	168	137	490	127
RTOR Reduction (vph)	0	0	64	0	0	100	0	0	124	0	21	0
Lane Group Flow (vph)	281	1252	134	260	599	75	143	565	44	137	596	0
Confl. Peds. (#/hr)	6		1	1		6	2		4	4		2
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	59.9	46.4	46.4	65.9	49.4	49.4	36.7	29.7	29.7	34.7	28.7	
Effective Green, g (s)	65.9	48.1	48.1	69.9	51.1	51.1	42.7	31.4	31.4	40.7	30.4	
Actuated g/C Ratio	0.55	0.40	0.40	0.58	0.43	0.43	0.36	0.26	0.26	0.34	0.25	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	520	1434	621	333	1480	650	260	884	404	258	799	
v/s Ratio Prot	0.07	c0.35		c0.13	0.17		c0.05	0.17		0.04	c0.19	
v/s Ratio Perm	0.22		0.09	0.33		0.05	0.15		0.03	0.14		
v/c Ratio	0.54	0.87	0.22	0.78	0.40	0.11	0.55	0.64	0.11	0.53	0.75	
Uniform Delay, d1	14.8	33.1	23.6	33.2	23.9	20.8	28.3	39.3	33.7	29.2	41.2	
Progression Factor	1.00	1.00	1.00	0.85	1.16	2.15	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	7.6	0.8	10.6	0.8	0.3	2.5	1.5	0.1	2.1	3.8	
Delay (s)	16.0	40.8	24.4	39.0	28.4	45.0	30.8	40.8	33.8	31.3	45.1	
Level of Service	B	D	C	D	C	D	C	D	C	C	D	
Approach Delay (s)		34.9			33.9			37.8			42.6	
Approach LOS		C			C			D			D	

### Intersection Summary

HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# Lanes, Volumes, Timings

## 3: Derry Road

07/19/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	20	1537	1177	16	18	4
Future Volume (vph)	20	1537	1177	16	18	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.975	
Flt Protected	0.950				0.961	
Satd. Flow (prot)	1825	3544	3439	0	1716	0
Flt Permitted	0.950				0.961	
Satd. Flow (perm)	1825	3544	3439	0	1716	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		218.7	493.3		86.5	
Travel Time (s)		13.1	29.6		6.2	
Confl. Peds. (#/hr)	8			8		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	6%	0%	6%	0%
Adj. Flow (vph)	20	1537	1177	16	18	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	1537	1193	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

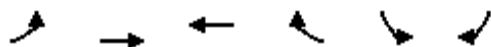
### Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.5%
Analysis Period (min)	15
	ICU Level of Service A

# HCM Unsignalized Intersection Capacity Analysis

## 3: Derry Road

07/19/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	1537	1177	16	18	4
Future Volume (Veh/h)	20	1537	1177	16	18	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	1537	1177	16	18	4
Pedestrians					8	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (m)		219				
pX, platoon unblocked					0.67	
vC, conflicting volume	1201				2002	604
vC1, stage 1 conf vol					1193	
vC2, stage 2 conf vol					808	
vCu, unblocked vol	1201				1508	604
tC, single (s)	4.1				6.9	6.9
tC, 2 stage (s)					5.9	
tF (s)	2.2				3.6	3.3
p0 queue free %	97				92	99
cM capacity (veh/h)	584				224	443
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	20	768	768	785	408	22
Volume Left	20	0	0	0	0	18
Volume Right	0	0	0	0	16	4
cSH	584	1700	1700	1700	1700	246
Volume to Capacity	0.03	0.45	0.45	0.46	0.24	0.09
Queue Length 95th (m)	0.8	0.0	0.0	0.0	0.0	2.2
Control Delay (s)	11.4	0.0	0.0	0.0	0.0	21.0
Lane LOS	B					C
Approach Delay (s)	0.1			0.0		21.0
Approach LOS						C
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			52.5%		ICU Level of Service	A
Analysis Period (min)			15			

# Lanes, Volumes, Timings

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1400	99	55	955	21	161	34	133	42	35	77
Future Volume (vph)	56	1400	99	55	955	21	161	34	133	42	35	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		1.00	0.98		0.99	0.99	
Frt		0.990			0.997			0.881			0.897	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1644	3505	0	1738	3432	0	1807	1548	0	1738	1639	0
Flt Permitted	0.266			0.133			0.641			0.510		
Satd. Flow (perm)	460	3505	0	243	3432	0	1217	1548	0	928	1639	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			4			60			77	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Confl. Peds. (#/hr)	2		1	1		2	2		6	6		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Adj. Flow (vph)	56	1400	99	55	955	21	161	34	133	42	35	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	1499	0	55	976	0	161	167	0	42	112	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



# Lanes, Volumes, Timings

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.5	82.5		82.5	82.5		37.5	37.5		37.5	37.5	
Total Split (%)	68.8%	68.8%		68.8%	68.8%		31.3%	31.3%		31.3%	31.3%	
Maximum Green (s)	76.8	76.8		76.8	76.8		30.3	30.3		30.3	30.3	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	87.2	87.2		87.2	87.2		22.8	22.8		22.8	22.8	
Actuated g/C Ratio	0.73	0.73		0.73	0.73		0.19	0.19		0.19	0.19	
v/c Ratio	0.17	0.59		0.31	0.39		0.70	0.49		0.24	0.30	
Control Delay	1.8	2.7		13.5	7.5		60.2	30.9		41.9	16.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	1.8	2.7		13.5	7.5		60.2	30.9		41.9	16.2	
LOS	A	A		B	A		E	C		D	B	
Approach Delay		2.7			7.8			45.3			23.2	
Approach LOS		A			A			D			C	

### Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 10.0  
 Intersection LOS: A  
 Intersection Capacity Utilization 80.5%  
 ICU Level of Service D  
 Analysis Period (min) 15

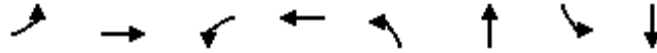
### Splits and Phases: 4: Holly Avenue & Derry Road



# Timings

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↕	↖	↕	↖	↕	↖	↕
Traffic Volume (vph)	56	1400	55	955	161	34	42	35
Future Volume (vph)	56	1400	55	955	161	34	42	35
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.5	82.5	82.5	82.5	37.5	37.5	37.5	37.5
Total Split (%)	68.8%	68.8%	68.8%	68.8%	31.3%	31.3%	31.3%	31.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	-0.7	-0.7	-0.7	-0.7	-2.2	-2.2	-2.2	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	87.2	87.2	87.2	87.2	22.8	22.8	22.8	22.8
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.19	0.19	0.19	0.19
v/c Ratio	0.17	0.59	0.31	0.39	0.70	0.49	0.24	0.30
Control Delay	1.8	2.7	13.5	7.5	60.2	30.9	41.9	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.8	2.7	13.5	7.5	60.2	30.9	41.9	16.2
LOS	A	A	B	A	E	C	D	B
Approach Delay		2.7		7.8		45.3		23.2
Approach LOS		A		A		D		C

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 10.0  
 Intersection LOS: A  
 Intersection Capacity Utilization 80.5%  
 ICU Level of Service D  
 Analysis Period (min) 15

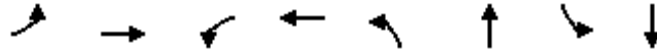
Splits and Phases: 4: Holly Avenue & Derry Road



Phasings

4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.5	82.5	82.5	82.5	37.5	37.5	37.5	37.5
Total Split (%)	68.8%	68.8%	68.8%	68.8%	31.3%	31.3%	31.3%	31.3%
Maximum Green (s)	76.8	76.8	76.8	76.8	30.3	30.3	30.3	30.3
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0
90th %ile Green (s)	77.7	77.7	77.7	77.7	29.4	29.4	29.4	29.4
90th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
70th %ile Green (s)	83.2	83.2	83.2	83.2	23.9	23.9	23.9	23.9
70th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
50th %ile Green (s)	86.6	86.6	86.6	86.6	20.5	20.5	20.5	20.5
50th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
30th %ile Green (s)	89.9	89.9	89.9	89.9	17.2	17.2	17.2	17.2
30th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
10th %ile Green (s)	94.9	94.9	94.9	94.9	12.2	12.2	12.2	12.2
10th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

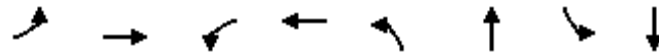
Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green

Control Type: Actuated-Coordinated

# Queues

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	1499	55	976	161	167	42	112
v/c Ratio	0.17	0.59	0.31	0.39	0.70	0.49	0.24	0.30
Control Delay	1.8	2.7	13.5	7.5	60.2	30.9	41.9	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.8	2.7	13.5	7.5	60.2	30.9	41.9	16.2
Queue Length 50th (m)	0.6	8.5	4.0	40.2	35.8	22.3	8.5	6.9
Queue Length 95th (m)	m1.0	15.1	15.1	66.4	54.2	39.7	17.4	20.3
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	334	2549	176	2493	329	463	251	500
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.59	0.31	0.39	0.49	0.36	0.17	0.22

### Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 4: Holly Avenue & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	56	1400	99	55	955	21	161	34	133	42	35	77
Future Volume (vph)	56	1400	99	55	955	21	161	34	133	42	35	77
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1643	3506		1738	3431		1803	1548		1729	1638	
Flt Permitted	0.27	1.00		0.13	1.00		0.64	1.00		0.51	1.00	
Satd. Flow (perm)	460	3506		243	3431		1217	1548		929	1638	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	1400	99	55	955	21	161	34	133	42	35	77
RTOR Reduction (vph)	0	3	0	0	1	0	0	49	0	0	62	0
Lane Group Flow (vph)	56	1496	0	55	975	0	161	118	0	42	50	0
Confl. Peds. (#/hr)	2		1	1		2	2		6	6		2
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	86.5	86.5		86.5	86.5		20.6	20.6		20.6	20.6	
Effective Green, g (s)	87.2	87.2		87.2	87.2		22.8	22.8		22.8	22.8	
Actuated g/C Ratio	0.73	0.73		0.73	0.73		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	334	2547		176	2493		231	294		176	311	
v/s Ratio Prot		c0.43			0.28			0.08			0.03	
v/s Ratio Perm	0.12			0.23			c0.13			0.05		
v/c Ratio	0.17	0.59		0.31	0.39		0.70	0.40		0.24	0.16	
Uniform Delay, d1	5.1	7.8		5.8	6.3		45.4	42.6		41.2	40.6	
Progression Factor	0.16	0.24		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.6		0.4	0.0		8.8	0.9		0.7	0.2	
Delay (s)	1.5	2.5		6.2	6.3		54.2	43.5		41.9	40.8	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		2.5			6.3			48.8			41.1	
Approach LOS		A			A			D			D	

### Intersection Summary

HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	452	483	150	334	83	155	618	138	50	729	100
Future Volume (vph)	130	452	483	150	334	83	155	618	138	50	729	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00				0.98	1.00		
Frt		0.923			0.970				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1659	3270	0	1722	3416	0	1674	3411	1541	1755	3380	1471
Flt Permitted	0.372			*0.250			0.257			0.395		
Satd. Flow (perm)	650	3270	0	453	3416	0	453	3411	1517	729	3380	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		243			25				138			168
Link Speed (k/h)		50			50			70				70
Link Distance (m)		455.0			858.9			517.1			1530.3	
Travel Time (s)		32.8			61.8			26.6			78.7	
Confl. Peds. (#/hr)	6					6			2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Adj. Flow (vph)	130	452	483	150	334	83	155	618	138	50	729	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	935	0	150	417	0	155	618	138	50	729	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023

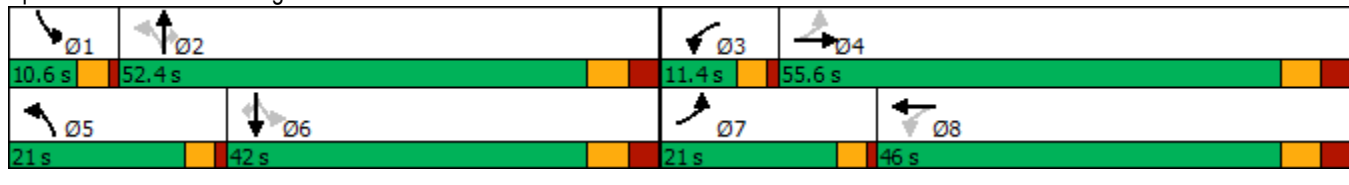


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	21.0	55.6		11.4	46.0		21.0	52.4	52.4	10.6	42.0	42.0
Total Split (%)	16.2%	42.8%		8.8%	35.4%		16.2%	40.3%	40.3%	8.2%	32.3%	32.3%
Maximum Green (s)	17.0	48.6		7.4	39.0		17.0	45.4	45.4	6.6	35.0	35.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	44.6	29.3		40.3	25.8		60.2	48.1	48.1	54.6	41.2	41.2
Actuated g/C Ratio	0.42	0.27		0.38	0.24		0.56	0.45	0.45	0.51	0.38	0.38
v/c Ratio	0.32	0.87		0.51	0.50		0.38	0.40	0.18	0.11	0.56	0.15
Control Delay	21.9	36.9		26.5	35.5		15.4	22.7	4.4	13.4	29.7	0.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	36.9		26.5	35.5		15.4	22.7	4.4	13.4	29.7	0.6
LOS	C	D		C	D		B	C	A	B	C	A
Approach Delay		35.1			33.2			18.7			25.5	
Approach LOS		D			C			B			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 107.1  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 27.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 80.1%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Timings

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023

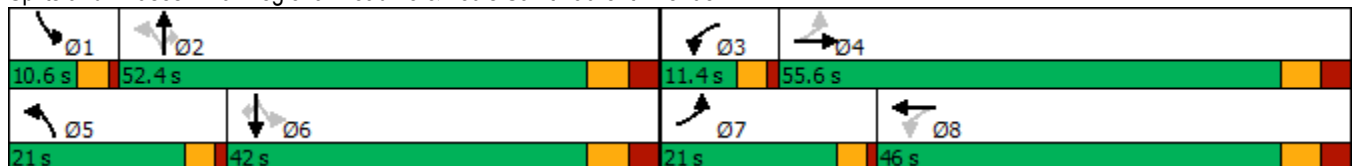


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↘	↗	↗	↘	↗	↗
Traffic Volume (vph)	130	452	150	334	155	618	138	50	729	100
Future Volume (vph)	130	452	150	334	155	618	138	50	729	100
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	21.0	55.6	11.4	46.0	21.0	52.4	52.4	10.6	42.0	42.0
Total Split (%)	16.2%	42.8%	8.8%	35.4%	16.2%	40.3%	40.3%	8.2%	32.3%	32.3%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.0	-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0	1.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	44.6	29.3	40.3	25.8	60.2	48.1	48.1	54.6	41.2	41.2
Actuated g/C Ratio	0.42	0.27	0.38	0.24	0.56	0.45	0.45	0.51	0.38	0.38
v/c Ratio	0.32	0.87	0.51	0.50	0.38	0.40	0.18	0.11	0.56	0.15
Control Delay	21.9	36.9	26.5	35.5	15.4	22.7	4.4	13.4	29.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	36.9	26.5	35.5	15.4	22.7	4.4	13.4	29.7	0.6
LOS	C	D	C	D	B	C	A	B	C	A
Approach Delay		35.1		33.2		18.7			25.5	
Approach LOS		D		C		B			C	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 107.1  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 27.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 80.1%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue





Phasings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	21.0	55.6	11.4	46.0	21.0	52.4	52.4	10.6	42.0	42.0
Total Split (%)	16.2%	42.8%	8.8%	35.4%	16.2%	40.3%	40.3%	8.2%	32.3%	32.3%
Maximum Green (s)	17.0	48.6	7.4	39.0	17.0	45.4	45.4	6.6	35.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2
Minimum Gap (s)	3.0	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0		7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0		16.0		18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0		0		0	0		0	0
90th %ile Green (s)	15.9	39.0	7.4	30.5	17.0	45.4	45.4	6.6	35.0	35.0
90th %ile Term Code	Gap	Gap	Max	Hold	Max	MaxR	MaxR	Max	MaxR	MaxR
70th %ile Green (s)	12.5	31.6	7.4	26.5	12.2	45.4	45.4	6.6	39.8	39.8
70th %ile Term Code	Gap	Gap	Max	Hold	Gap	MaxR	MaxR	Max	Hold	Hold
50th %ile Green (s)	10.9	27.5	7.4	24.0	10.2	45.4	45.4	6.6	41.8	41.8
50th %ile Term Code	Gap	Gap	Max	Hold	Gap	MaxR	MaxR	Max	Hold	Hold
30th %ile Green (s)	9.5	23.7	7.4	21.6	8.8	45.4	45.4	6.2	42.8	42.8
30th %ile Term Code	Gap	Gap	Max	Hold	Gap	MaxR	MaxR	Gap	Hold	Hold
10th %ile Green (s)	7.3	17.1	7.4	17.2	7.2	46.2	46.2	0.0	35.0	35.0
10th %ile Term Code	Gap	Gap	Max	Hold	Gap	Hold	Hold	Skip	MaxR	MaxR

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 107.1  
 Control Type: Actuated-Uncoordinated  
 90th %ile Actuated Cycle: 120.4  
 70th %ile Actuated Cycle: 113  
 50th %ile Actuated Cycle: 108.9  
 30th %ile Actuated Cycle: 104.7  
 10th %ile Actuated Cycle: 88.7

Queues

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	935	150	417	155	618	138	50	729	100
v/c Ratio	0.32	0.87	0.51	0.50	0.38	0.40	0.18	0.11	0.56	0.15
Control Delay	21.9	36.9	26.5	35.5	15.4	22.7	4.4	13.4	29.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	36.9	26.5	35.5	15.4	22.7	4.4	13.4	29.7	0.6
Queue Length 50th (m)	17.3	76.7	20.1	38.0	14.8	46.5	0.0	4.5	61.1	0.0
Queue Length 95th (m)	29.5	101.1	33.2	55.5	31.0	72.5	12.3	12.1	101.5	0.5
Internal Link Dist (m)		431.0		834.9		493.1			1506.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	462	1687	295	1336	484	1531	757	466	1300	669
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.55	0.51	0.31	0.32	0.40	0.18	0.11	0.56	0.15

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	452	483	150	334	83	155	618	138	50	729	100
Future Volume (vph)	130	452	483	150	334	83	155	618	138	50	729	100
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1657	3268		1722	3418		1674	3411	1518	1754	3380	1471
Flt Permitted	0.37	1.00		0.25	1.00		0.26	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	650	3268		453	3418		454	3411	1518	730	3380	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	452	483	150	334	83	155	618	138	50	729	100
RTOR Reduction (vph)	0	177	0	0	19	0	0	0	77	0	0	61
Lane Group Flow (vph)	130	758	0	150	398	0	155	618	61	50	729	39
Confl. Peds. (#/hr)	6						6			2	2	
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	38.5	27.4		31.3	23.8		55.1	46.1	46.1	45.2	40.2	40.2
Effective Green, g (s)	41.9	29.4		37.3	25.8		58.1	48.1	48.1	51.2	42.2	42.2
Actuated g/C Ratio	0.39	0.27		0.35	0.24		0.54	0.45	0.45	0.47	0.39	0.39
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	383	889		279	816		401	1519	676	421	1320	574
v/s Ratio Prot	c0.04	c0.23		c0.05	0.12		c0.05	0.18		0.01	c0.22	
v/s Ratio Perm	0.09			0.13			0.16		0.04	0.05		0.03
v/c Ratio	0.34	0.85		0.54	0.49		0.39	0.41	0.09	0.12	0.55	0.07
Uniform Delay, d1	22.2	37.2		25.3	35.4		13.9	20.3	17.3	15.4	25.6	20.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	7.7		2.0	0.5		0.6	0.8	0.3	0.1	1.7	0.2
Delay (s)	22.8	44.9		27.3	35.9		14.5	21.1	17.6	15.5	27.2	20.8
Level of Service	C	D		C	D		B	C	B	B	C	C
Approach Delay (s)		42.2			33.6			19.4			25.8	
Approach LOS		D			C			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			30.5				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			108.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			80.1%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

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

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	165	39	103	198	105	58	850	87	129	895	87
Future Volume (vph)	67	165	39	103	198	105	58	850	87	129	895	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Frt		0.971			0.948			0.986			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1859	0	1807	1777	0	1825	3495	0	1789	3492	0
Flt Permitted	0.290			0.486			0.258			0.274		
Satd. Flow (perm)	543	1859	0	921	1777	0	495	3495	0	515	3492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			27			20			19	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Confl. Peds. (#/hr)	9		5	5		9	3		3	3		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Adj. Flow (vph)	67	165	39	103	198	105	58	850	87	129	895	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	204	0	103	303	0	58	937	0	129	982	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

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

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		67.0	67.0		67.0	67.0	
Total Split (%)	33.0%	33.0%		33.0%	33.0%		67.0%	67.0%		67.0%	67.0%	
Maximum Green (s)	26.0	26.0		26.0	26.0		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	21.8	21.8		21.8	21.8		68.2	68.2		68.2	68.2	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.68	0.68		0.68	0.68	
v/c Ratio	0.57	0.49		0.52	0.74		0.17	0.39		0.37	0.41	
Control Delay	52.7	35.4		42.7	44.1		8.7	7.9		11.8	8.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	52.7	35.4		42.7	44.1		8.7	7.9		11.8	8.1	
LOS	D	D		D	D		A	A		B	A	
Approach Delay		39.6			43.7			7.9			8.5	
Approach LOS		D			D			A			A	

Intersection Summary

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 16.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 83.4%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



# Timings

## 1: Ontario Street & Laurier Road

07/19/2023

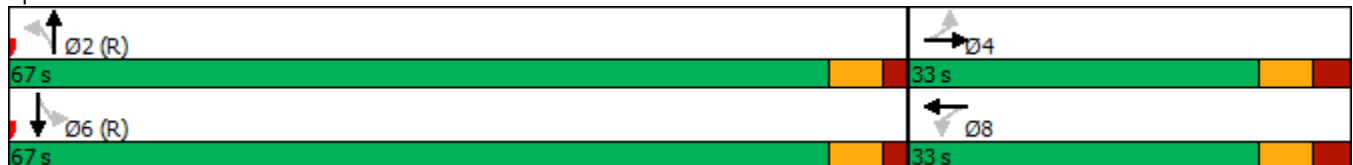


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↕	↖	↕
Traffic Volume (vph)	67	165	103	198	58	850	129	895
Future Volume (vph)	67	165	103	198	58	850	129	895
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	27.0	27.0
Total Split (s)	33.0	33.0	33.0	33.0	67.0	67.0	67.0	67.0
Total Split (%)	33.0%	33.0%	33.0%	33.0%	67.0%	67.0%	67.0%	67.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	21.8	21.8	21.8	21.8	68.2	68.2	68.2	68.2
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.68	0.68	0.68	0.68
v/c Ratio	0.57	0.49	0.52	0.74	0.17	0.39	0.37	0.41
Control Delay	52.7	35.4	42.7	44.1	8.7	7.9	11.8	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	35.4	42.7	44.1	8.7	7.9	11.8	8.1
LOS	D	D	D	D	A	A	B	A
Approach Delay		39.6		43.7		7.9		8.5
Approach LOS		D		D		A		A

### Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 16.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 83.4%  
 ICU Level of Service E  
 Analysis Period (min) 15

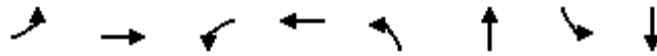
### Splits and Phases: 1: Ontario Street & Laurier Road



# Phasings

## 1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	27.0	27.0
Total Split (s)	33.0	33.0	33.0	33.0	67.0	67.0	67.0	67.0
Total Split (%)	33.0%	33.0%	33.0%	33.0%	67.0%	67.0%	67.0%	67.0%
Maximum Green (s)	26.0	26.0	26.0	26.0	61.0	61.0	61.0	61.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0
90th %ile Green (s)	26.0	26.0	26.0	26.0	61.0	61.0	61.0	61.0
90th %ile Term Code	Hold	Hold	Max	Max	Coord	Coord	Coord	Coord
70th %ile Green (s)	23.2	23.2	23.2	23.2	63.8	63.8	63.8	63.8
70th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord
50th %ile Green (s)	20.1	20.1	20.1	20.1	66.9	66.9	66.9	66.9
50th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord
30th %ile Green (s)	17.0	17.0	17.0	17.0	70.0	70.0	70.0	70.0
30th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord
10th %ile Green (s)	12.5	12.5	12.5	12.5	74.5	74.5	74.5	74.5
10th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord

### Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 42 (42%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Actuated-Coordinated

Queues

1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	204	103	303	58	937	129	982
v/c Ratio	0.57	0.49	0.52	0.74	0.17	0.39	0.37	0.41
Control Delay	52.7	35.4	42.7	44.1	8.7	7.9	11.8	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	35.4	42.7	44.1	8.7	7.9	11.8	8.1
Queue Length 50th (m)	11.6	32.6	17.6	50.1	3.6	36.2	9.5	38.7
Queue Length 95th (m)	24.6	49.9	31.8	73.2	10.7	56.9	25.4	60.8
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	152	529	257	517	337	2391	351	2389
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.39	0.40	0.59	0.17	0.39	0.37	0.41

Intersection Summary



# HCM Signalized Intersection Capacity Analysis

## 1: Ontario Street & Laurier Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	165	39	103	198	105	58	850	87	129	895	87
Future Volume (vph)	67	165	39	103	198	105	58	850	87	129	895	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1780	1860		1800	1777		1822	3495		1786	3491	
Flt Permitted	0.29	1.00		0.49	1.00		0.26	1.00		0.27	1.00	
Satd. Flow (perm)	543	1860		920	1777		496	3495		515	3491	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	165	39	103	198	105	58	850	87	129	895	87
RTOR Reduction (vph)	0	9	0	0	21	0	0	6	0	0	6	0
Lane Group Flow (vph)	67	195	0	103	282	0	58	931	0	129	976	0
Confl. Peds. (#/hr)	9		5	5		9	3		3	3		3
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.8	19.8		19.8	19.8		67.2	67.2		67.2	67.2	
Effective Green, g (s)	21.8	21.8		21.8	21.8		68.2	68.2		68.2	68.2	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.68	0.68		0.68	0.68	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	118	405		200	387		338	2383		351	2380	
v/s Ratio Prot		0.10			c0.16			0.27			c0.28	
v/s Ratio Perm	0.12			0.11			0.12			0.25		
v/c Ratio	0.57	0.48		0.52	0.73		0.17	0.39		0.37	0.41	
Uniform Delay, d1	34.9	34.2		34.4	36.3		5.7	6.9		6.7	7.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	0.3		0.9	5.7		1.1	0.5		2.9	0.5	
Delay (s)	38.6	34.5		35.4	42.1		6.8	7.4		9.7	7.5	
Level of Service	D	C		D	D		A	A		A	A	
Approach Delay (s)		35.5			40.4			7.3			7.8	
Approach LOS		D			D			A			A	

### Intersection Summary

HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	899	120	170	979	208	178	628	134	181	518	213
Future Volume (vph)	285	899	120	170	979	208	178	628	134	181	518	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00		0.99	1.00		0.99	1.00		0.99	1.00	1.00	
Frt			0.850			0.850			0.850		0.956	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3614	1617	1807	3614	1633	1789	3476	1498	1807	3339	0
Flt Permitted	0.108			0.208			0.168			0.309		
Satd. Flow (perm)	201	3614	1594	395	3614	1612	316	3476	1479	588	3339	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143			143			134			56
Link Speed (k/h)		60			60			50				50
Link Distance (m)		622.6			218.7			1530.3				235.1
Travel Time (s)		37.4			13.1			110.2				16.9
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Adj. Flow (vph)	285	899	120	170	979	208	178	628	134	181	518	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	899	120	170	979	208	178	628	134	181	731	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

# Lanes, Volumes, Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023

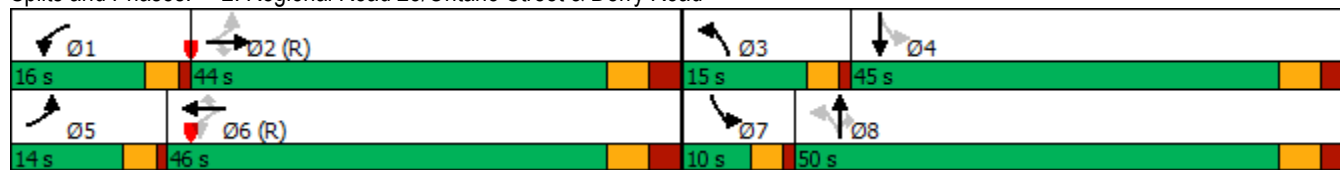


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7	
Total Split (s)	14.0	44.0	44.0	16.0	46.0	46.0	15.0	50.0	50.0	10.0	45.0	
Total Split (%)	11.7%	36.7%	36.7%	13.3%	38.3%	38.3%	12.5%	41.7%	41.7%	8.3%	37.5%	
Maximum Green (s)	10.0	37.3	37.3	12.0	39.3	39.3	11.0	43.3	43.3	6.0	38.3	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	65.4	47.5	47.5	58.7	41.3	41.3	51.9	37.9	37.9	46.2	33.2	
Actuated g/C Ratio	0.54	0.40	0.40	0.49	0.34	0.34	0.43	0.32	0.32	0.38	0.28	
v/c Ratio	0.77	0.63	0.17	0.48	0.79	0.32	0.59	0.57	0.24	0.57	0.76	
Control Delay	42.4	33.1	3.4	15.3	37.3	7.5	28.6	35.8	5.3	28.4	41.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.4	33.1	3.4	15.3	37.3	7.5	28.6	35.8	5.3	28.4	41.5	
LOS	D	C	A	B	D	A	C	D	A	C	D	
Approach Delay		32.4			29.9			30.1			38.9	
Approach LOS		C			C			C			D	

### Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 32.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 90.4%  
 ICU Level of Service E  
 Analysis Period (min) 15

### Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



# Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023

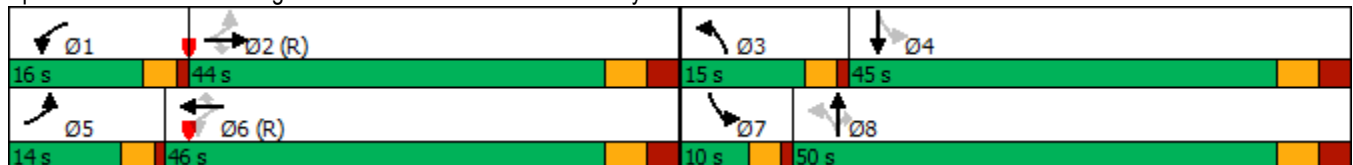


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑
Traffic Volume (vph)	285	899	120	170	979	208	178	628	134	181	518
Future Volume (vph)	285	899	120	170	979	208	178	628	134	181	518
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	14.0	44.0	44.0	16.0	46.0	46.0	15.0	50.0	50.0	10.0	45.0
Total Split (%)	11.7%	36.7%	36.7%	13.3%	38.3%	38.3%	12.5%	41.7%	41.7%	8.3%	37.5%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)	65.4	47.5	47.5	58.7	41.3	41.3	51.9	37.9	37.9	46.2	33.2
Actuated g/C Ratio	0.54	0.40	0.40	0.49	0.34	0.34	0.43	0.32	0.32	0.38	0.28
v/c Ratio	0.77	0.63	0.17	0.48	0.79	0.32	0.59	0.57	0.24	0.57	0.76
Control Delay	42.4	33.1	3.4	15.3	37.3	7.5	28.6	35.8	5.3	28.4	41.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	33.1	3.4	15.3	37.3	7.5	28.6	35.8	5.3	28.4	41.5
LOS	D	C	A	B	D	A	C	D	A	C	D
Approach Delay		32.4			29.9			30.1			38.9
Approach LOS		C			C			C			D

### Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 32.5	Intersection LOS: C
Intersection Capacity Utilization 90.4%	ICU Level of Service E
Analysis Period (min) 15	

### Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



# Phasings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	14.0	44.0	44.0	16.0	46.0	46.0	15.0	50.0	50.0	10.0	45.0
Total Split (%)	11.7%	36.7%	36.7%	13.3%	38.3%	38.3%	12.5%	41.7%	41.7%	8.3%	37.5%
Maximum Green (s)	10.0	37.3	37.3	12.0	39.3	39.3	11.0	43.3	43.3	6.0	38.3
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0
90th %ile Green (s)	10.0	37.3	37.3	12.0	39.3	39.3	11.0	43.3	43.3	6.0	38.3
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Max
70th %ile Green (s)	13.4	39.8	39.8	12.9	39.3	39.3	11.0	39.9	39.9	6.0	34.9
70th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Max	Hold	Hold	Max	Gap
50th %ile Green (s)	16.7	44.9	44.9	11.1	39.3	39.3	11.0	36.6	36.6	6.0	31.6
50th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Max	Hold	Hold	Max	Gap
30th %ile Green (s)	19.4	49.2	49.2	9.5	39.3	39.3	11.0	33.9	33.9	6.0	28.9
30th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Max	Hold	Hold	Max	Gap
10th %ile Green (s)	24.4	57.7	57.7	7.5	40.8	40.8	9.4	27.4	27.4	6.0	24.0
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Gap	Hold	Hold	Max	Gap

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated

Queues

2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	285	899	120	170	979	208	178	628	134	181	731
v/c Ratio	0.77	0.63	0.17	0.48	0.79	0.32	0.59	0.57	0.24	0.57	0.76
Control Delay	42.4	33.1	3.4	15.3	37.3	7.5	28.6	35.8	5.3	28.4	41.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	33.1	3.4	15.3	37.3	7.5	28.6	35.8	5.3	28.4	41.5
Queue Length 50th (m)	44.4	89.6	0.0	12.7	113.0	13.8	25.8	64.5	0.0	26.2	77.0
Queue Length 95th (m)	#110.7	123.7	8.9	18.1	137.5	19.1	36.6	75.7	12.3	37.2	91.2
Internal Link Dist (m)		598.6			194.7			1506.3			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	368	1429	717	377	1243	648	308	1303	638	318	1150
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.63	0.17	0.45	0.79	0.32	0.58	0.48	0.21	0.57	0.64

Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	899	120	170	979	208	178	628	134	181	518	213
Future Volume (vph)	285	899	120	170	979	208	178	628	134	181	518	213
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1772	3614	1594	1807	3614	1612	1789	3476	1479	1807	3340	
Flt Permitted	0.11	1.00	1.00	0.21	1.00	1.00	0.17	1.00	1.00	0.31	1.00	
Satd. Flow (perm)	201	3614	1594	395	3614	1612	315	3476	1479	587	3340	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	285	899	120	170	979	208	178	628	134	181	518	213
RTOR Reduction (vph)	0	0	73	0	0	94	0	0	92	0	41	0
Lane Group Flow (vph)	285	899	48	170	979	114	178	628	42	181	690	0
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	60.4	45.8	45.8	50.2	39.6	39.6	46.2	36.2	36.2	37.5	31.5	
Effective Green, g (s)	63.4	47.5	47.5	56.2	41.3	41.3	49.2	37.9	37.9	43.5	33.2	
Actuated g/C Ratio	0.53	0.40	0.40	0.47	0.34	0.34	0.41	0.32	0.32	0.36	0.28	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	365	1430	630	345	1243	554	297	1097	467	304	924	
v/s Ratio Prot	c0.13	0.25		0.06	c0.27		c0.07	0.18		0.04	c0.21	
v/s Ratio Perm	0.28		0.03	0.17		0.07	0.18		0.03	0.17		
v/c Ratio	0.78	0.63	0.08	0.49	0.79	0.21	0.60	0.57	0.09	0.60	0.75	
Uniform Delay, d1	29.2	29.2	22.6	20.0	35.4	27.8	25.3	34.3	28.9	27.5	39.6	
Progression Factor	1.00	1.00	1.00	0.74	0.91	0.64	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.4	2.1	0.2	1.0	4.6	0.8	3.2	0.7	0.1	3.1	3.3	
Delay (s)	39.5	31.3	22.8	15.7	36.8	18.7	28.6	35.0	29.0	30.6	42.9	
Level of Service	D	C	C	B	D	B	C	D	C	C	D	
Approach Delay (s)		32.3			31.4			32.9			40.5	
Approach LOS		C			C			C			D	

Intersection Summary		
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.73	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	90.4%	ICU Level of Service E
Analysis Period (min)	15	

c Critical Lane Group

# Lanes, Volumes, Timings

## 3: Derry Road

07/19/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	1204	1401	20	19	24
Future Volume (vph)	10	1204	1401	20	19	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.925	
Flt Protected	0.950				0.978	
Satd. Flow (prot)	1825	3510	3607	0	1738	0
Flt Permitted	0.950				0.978	
Satd. Flow (perm)	1825	3510	3607	0	1738	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		218.7	493.3		86.5	
Travel Time (s)		13.1	29.6		6.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	1%	0%	0%	0%
Adj. Flow (vph)	10	1204	1401	20	19	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	1204	1421	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

### Intersection Summary

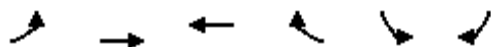
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.4%
Analysis Period (min)	15
	ICU Level of Service A



# HCM Unsignalized Intersection Capacity Analysis

## 3: Derry Road

07/19/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	1204	1401	20	19	24
Future Volume (Veh/h)	10	1204	1401	20	19	24
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	1204	1401	20	19	24
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (m)		219				
pX, platoon unblocked					0.80	
vC, conflicting volume	1423				2035	712
vC1, stage 1 conf vol					1413	
vC2, stage 2 conf vol					622	
vCu, unblocked vol	1423				1790	712
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				90	94
cM capacity (veh/h)	484				185	378
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	10	602	602	934	487	43
Volume Left	10	0	0	0	0	19
Volume Right	0	0	0	0	20	24
cSH	484	1700	1700	1700	1700	259
Volume to Capacity	0.02	0.35	0.35	0.55	0.29	0.17
Queue Length 95th (m)	0.5	0.0	0.0	0.0	0.0	4.4
Control Delay (s)	12.6	0.0	0.0	0.0	0.0	21.6
Lane LOS	B					C
Approach Delay (s)	0.1			0.0		21.6
Approach LOS						C
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			49.4%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	999	167	147	1205	52	165	64	77	34	67	51
Future Volume (vph)	57	999	167	147	1205	52	165	64	77	34	67	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00				0.99		1.00		
Frt		0.979			0.994			0.918				0.935
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3501	0	1825	3594	0	1807	1712	0	1825	1766	0
Flt Permitted	0.185			0.208			0.629			0.576		
Satd. Flow (perm)	355	3501	0	399	3594	0	1196	1712	0	1106	1766	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			7			49				31
Link Speed (k/h)		60			60			50				50
Link Distance (m)		493.3			470.6			88.3				198.3
Travel Time (s)		29.6			28.2			6.4				14.3
Confl. Peds. (#/hr)			2	2					1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Adj. Flow (vph)	57	999	167	147	1205	52	165	64	77	34	67	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1166	0	147	1257	0	165	141	0	34	118	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

# Lanes, Volumes, Timings

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.8	82.8		82.8	82.8		37.2	37.2		37.2	37.2	
Total Split (%)	69.0%	69.0%		69.0%	69.0%		31.0%	31.0%		31.0%	31.0%	
Maximum Green (s)	77.1	77.1		77.1	77.1		30.0	30.0		30.0	30.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	86.6	86.6		86.6	86.6		23.4	23.4		23.4	23.4	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
v/c Ratio	0.22	0.46		0.51	0.48		0.71	0.38		0.16	0.32	
Control Delay	10.4	13.1		17.0	8.6		60.8	28.4		38.9	30.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.4	13.1		17.0	8.6		60.8	28.4		38.9	30.9	
LOS	B	B		B	A		E	C		D	C	
Approach Delay		13.0			9.5			45.9			32.7	
Approach LOS		B			A			D			C	

### Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 15.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 81.6%  
 ICU Level of Service D  
 Analysis Period (min) 15

### Splits and Phases: 4: Holly Avenue & Derry Road



# Timings

## 4: Holly Avenue & Derry Road

07/19/2023

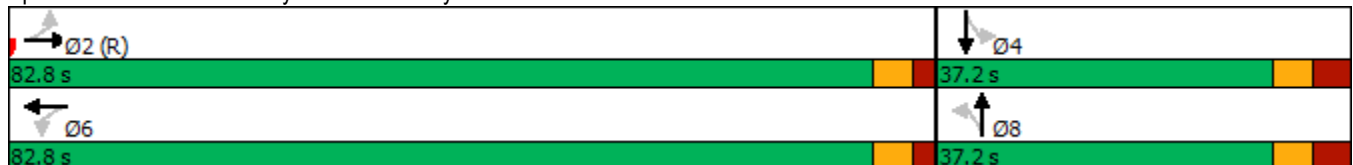


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↗	↗↘	↗	↗↘	↗	↘	↗	↘
Traffic Volume (vph)	57	999	147	1205	165	64	34	67
Future Volume (vph)	57	999	147	1205	165	64	34	67
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.8	82.8	82.8	82.8	37.2	37.2	37.2	37.2
Total Split (%)	69.0%	69.0%	69.0%	69.0%	31.0%	31.0%	31.0%	31.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	-0.7	-0.7	-0.7	-0.7	-2.2	-2.2	-2.2	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	86.6	86.6	86.6	86.6	23.4	23.4	23.4	23.4
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.20	0.20	0.20	0.20
v/c Ratio	0.22	0.46	0.51	0.48	0.71	0.38	0.16	0.32
Control Delay	10.4	13.1	17.0	8.6	60.8	28.4	38.9	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	13.1	17.0	8.6	60.8	28.4	38.9	30.9
LOS	B	B	B	A	E	C	D	C
Approach Delay		13.0		9.5		45.9		32.7
Approach LOS		B		A		D		C

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 15.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 81.6%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 4: Holly Avenue & Derry Road



Phasings  
4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.8	82.8	82.8	82.8	37.2	37.2	37.2	37.2
Total Split (%)	69.0%	69.0%	69.0%	69.0%	31.0%	31.0%	31.0%	31.0%
Maximum Green (s)	77.1	77.1	77.1	77.1	30.0	30.0	30.0	30.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0
90th %ile Green (s)	77.1	77.1	77.1	77.1	30.0	30.0	30.0	30.0
90th %ile Term Code	Coord	Coord	Coord	Coord	Max	Max	Hold	Hold
70th %ile Green (s)	82.5	82.5	82.5	82.5	24.6	24.6	24.6	24.6
70th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
50th %ile Green (s)	86.0	86.0	86.0	86.0	21.1	21.1	21.1	21.1
50th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
30th %ile Green (s)	89.5	89.5	89.5	89.5	17.6	17.6	17.6	17.6
30th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
10th %ile Green (s)	94.6	94.6	94.6	94.6	12.5	12.5	12.5	12.5
10th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold

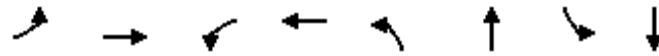
Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Control Type: Actuated-Coordinated

Queues

4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	1166	147	1257	165	141	34	118
v/c Ratio	0.22	0.46	0.51	0.48	0.71	0.38	0.16	0.32
Control Delay	10.4	13.1	17.0	8.6	60.8	28.4	38.9	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	13.1	17.0	8.6	60.8	28.4	38.9	30.9
Queue Length 50th (m)	7.8	115.1	13.4	58.3	36.7	18.6	6.7	17.5
Queue Length 95th (m)	m18.1	145.2	41.6	93.8	55.4	33.8	14.5	31.2
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	256	2536	287	2596	320	495	296	496
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.46	0.51	0.48	0.52	0.28	0.11	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 4: Holly Avenue & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	999	167	147	1205	52	165	64	77	34	67	51
Future Volume (vph)	57	999	167	147	1205	52	165	64	77	34	67	51
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3499		1824	3593		1807	1712		1823	1766	
Flt Permitted	0.18	1.00		0.21	1.00		0.63	1.00		0.58	1.00	
Satd. Flow (perm)	355	3499		400	3593		1197	1712		1105	1766	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	999	167	147	1205	52	165	64	77	34	67	51
RTOR Reduction (vph)	0	9	0	0	2	0	0	39	0	0	25	0
Lane Group Flow (vph)	57	1157	0	147	1255	0	165	102	0	34	93	0
Confl. Peds. (#/hr)			2	2					1	1		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.9	85.9		85.9	85.9		21.2	21.2		21.2	21.2	
Effective Green, g (s)	86.6	86.6		86.6	86.6		23.4	23.4		23.4	23.4	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	256	2525		288	2592		233	333		215	344	
v/s Ratio Prot		0.33			0.35			0.06			0.05	
v/s Ratio Perm	0.16			c0.37			c0.14			0.03		
v/c Ratio	0.22	0.46		0.51	0.48		0.71	0.30		0.16	0.27	
Uniform Delay, d1	5.5	6.9		7.4	7.1		45.1	41.3		40.1	41.0	
Progression Factor	1.12	1.67		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.5		0.6	0.1		9.4	0.5		0.3	0.4	
Delay (s)	7.9	12.1		8.0	7.2		54.6	41.9		40.5	41.5	
Level of Service	A	B		A	A		D	D		D	D	
Approach Delay (s)		11.9			7.3			48.7			41.2	
Approach LOS		B			A			D			D	

### Intersection Summary

HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	308	197	95	451	61	299	779	196	67	600	139
Future Volume (vph)	89	308	197	95	451	61	299	779	196	67	600	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00				1.00				0.99	1.00		
Frt		0.941			0.982				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3388	0	1772	3547	0	1789	3476	1570	1825	3476	1633
Flt Permitted	0.324			0.261			0.328			0.348		
Satd. Flow (perm)	604	3388	0	487	3547	0	618	3476	1549	668	3476	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		115			12				170			132
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1530.3	
Travel Time (s)		32.8			61.8			26.6			78.7	
Confl. Peds. (#/hr)	1						1		1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Adj. Flow (vph)	89	308	197	95	451	61	299	779	196	67	600	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	505	0	95	512	0	299	779	196	67	600	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023

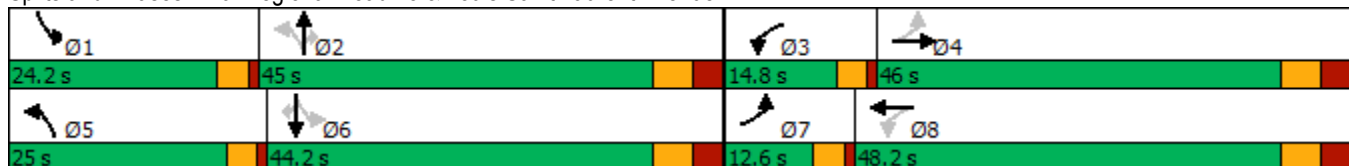


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	12.6	46.0		14.8	48.2		25.0	45.0	45.0	24.2	44.2	44.2
Total Split (%)	9.7%	35.4%		11.4%	37.1%		19.2%	34.6%	34.6%	18.6%	34.0%	34.0%
Maximum Green (s)	8.6	39.0		10.8	41.2		21.0	38.0	38.0	20.2	37.2	37.2
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	36.0	20.8		37.4	24.1		63.5	50.6	50.6	53.8	39.6	39.6
Actuated g/C Ratio	0.35	0.20		0.36	0.23		0.61	0.49	0.49	0.52	0.38	0.38
v/c Ratio	0.27	0.65		0.29	0.61		0.51	0.46	0.23	0.15	0.45	0.20
Control Delay	24.1	33.4		24.5	39.0		13.4	20.3	4.9	10.9	26.8	6.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	33.4		24.5	39.0		13.4	20.3	4.9	10.9	26.8	6.0
LOS	C	C		C	D		B	C	A	B	C	A
Approach Delay		32.0			36.7			16.3			21.9	
Approach LOS		C			D			B			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 103.3  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.65  
 Intersection Signal Delay: 24.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 68.3%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Timings

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023

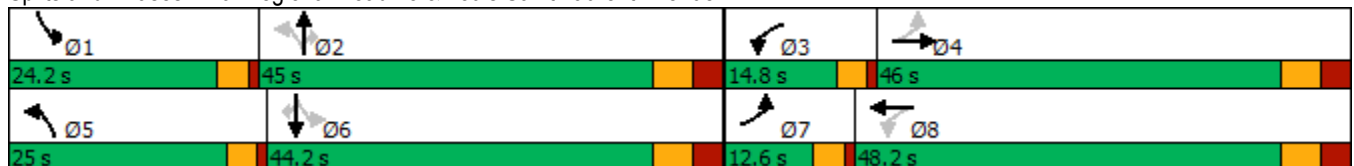


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↕	↘	↕	↘	↕	↗	↘	↕	↗
Traffic Volume (vph)	89	308	95	451	299	779	196	67	600	139
Future Volume (vph)	89	308	95	451	299	779	196	67	600	139
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	12.6	46.0	14.8	48.2	25.0	45.0	45.0	24.2	44.2	44.2
Total Split (%)	9.7%	35.4%	11.4%	37.1%	19.2%	34.6%	34.6%	18.6%	34.0%	34.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.0	-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0	1.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	36.0	20.8	37.4	24.1	63.5	50.6	50.6	53.8	39.6	39.6
Actuated g/C Ratio	0.35	0.20	0.36	0.23	0.61	0.49	0.49	0.52	0.38	0.38
v/c Ratio	0.27	0.65	0.29	0.61	0.51	0.46	0.23	0.15	0.45	0.20
Control Delay	24.1	33.4	24.5	39.0	13.4	20.3	4.9	10.9	26.8	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	33.4	24.5	39.0	13.4	20.3	4.9	10.9	26.8	6.0
LOS	C	C	C	D	B	C	A	B	C	A
Approach Delay		32.0		36.7		16.3			21.9	
Approach LOS		C		D		B			C	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 103.3  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.65  
 Intersection Signal Delay: 24.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 68.3%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Phasings

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	12.6	46.0	14.8	48.2	25.0	45.0	45.0	24.2	44.2	44.2
Total Split (%)	9.7%	35.4%	11.4%	37.1%	19.2%	34.6%	34.6%	18.6%	34.0%	34.0%
Maximum Green (s)	8.6	39.0	10.8	41.2	21.0	38.0	38.0	20.2	37.2	37.2
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2
Minimum Gap (s)	3.0	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0		7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0		16.0		18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0		0		0	0		0	0
90th %ile Green (s)	8.6	25.9	10.8	28.1	21.0	49.3	49.3	8.9	37.2	37.2
90th %ile Term Code	Max	Hold	Max	Gap	Max	Hold	Hold	Gap	MaxR	MaxR
70th %ile Green (s)	8.6	21.7	10.5	23.6	18.9	48.4	48.4	7.7	37.2	37.2
70th %ile Term Code	Max	Hold	Gap	Gap	Gap	Hold	Hold	Gap	MaxR	MaxR
50th %ile Green (s)	8.6	20.5	9.1	21.0	15.9	46.0	46.0	7.1	37.2	37.2
50th %ile Term Code	Max	Hold	Gap	Gap	Gap	Hold	Hold	Gap	MaxR	MaxR
30th %ile Green (s)	8.1	17.6	7.9	17.4	13.0	43.8	43.8	6.4	37.2	37.2
30th %ile Term Code	Gap	Hold	Gap	Gap	Gap	Hold	Hold	Gap	MaxR	MaxR
10th %ile Green (s)	0.0	10.0	6.5	20.5	11.0	52.2	52.2	0.0	37.2	37.2
10th %ile Term Code	Skip	Min	Gap	Hold	Gap	Hold	Hold	Skip	MaxR	MaxR

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 103.3  
 Control Type: Actuated-Uncoordinated  
 90th %ile Actuated Cycle: 116.9  
 70th %ile Actuated Cycle: 110.3  
 50th %ile Actuated Cycle: 104.7  
 30th %ile Actuated Cycle: 97.7  
 10th %ile Actuated Cycle: 86.7

Queues

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	89	505	95	512	299	779	196	67	600	139
v/c Ratio	0.27	0.65	0.29	0.61	0.51	0.46	0.23	0.15	0.45	0.20
Control Delay	24.1	33.4	24.5	39.0	13.4	20.3	4.9	10.9	26.8	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	33.4	24.5	39.0	13.4	20.3	4.9	10.9	26.8	6.0
Queue Length 50th (m)	11.7	37.9	12.5	49.0	27.0	56.5	2.8	5.2	47.9	0.9
Queue Length 95th (m)	23.5	58.6	24.8	69.6	48.1	84.1	16.7	12.4	75.1	14.4
Internal Link Dist (m)		431.0		834.9		493.1			1506.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	345	1428	351	1506	654	1702	845	671	1333	707
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.35	0.27	0.34	0.46	0.46	0.23	0.10	0.45	0.20

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↕		↖	↕		↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	89	308	197	95	451	61	299	779	196	67	600	139
Future Volume (vph)	89	308	197	95	451	61	299	779	196	67	600	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1772	3389		1772	3548		1789	3476	1549	1825	3476	1633
Flt Permitted	0.32	1.00		0.26	1.00		0.33	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	604	3389		488	3548		618	3476	1549	668	3476	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	308	197	95	451	61	299	779	196	67	600	139
RTOR Reduction (vph)	0	91	0	0	9	0	0	0	88	0	0	81
Lane Group Flow (vph)	89	414	0	95	503	0	299	779	108	67	600	58
Confl. Peds. (#/hr)	1						1		1	1		
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	26.2	19.7		31.0	22.1		58.3	48.5	48.5	44.3	38.5	38.5
Effective Green, g (s)	32.2	21.7		35.6	24.1		61.3	50.5	50.5	50.3	40.5	40.5
Actuated g/C Ratio	0.31	0.21		0.34	0.23		0.58	0.48	0.48	0.48	0.39	0.39
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	291	701		311	815		571	1673	745	417	1342	630
v/s Ratio Prot	c0.03	0.12		c0.03	c0.14		c0.09	c0.22		0.01	0.17	
v/s Ratio Perm	0.07			0.07			0.21		0.07	0.06		0.04
v/c Ratio	0.31	0.59		0.31	0.62		0.52	0.47	0.14	0.16	0.45	0.09
Uniform Delay, d1	26.8	37.6		24.8	36.3		11.6	18.2	15.2	14.8	23.9	20.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.9		0.6	1.4		0.9	0.9	0.4	0.2	1.1	0.3
Delay (s)	27.4	38.5		25.3	37.7		12.5	19.1	15.6	14.9	25.0	20.8
Level of Service	C	D		C	D		B	B	B	B	C	C
Approach Delay (s)		36.8			35.7			17.0			23.4	
Approach LOS		D			D			B			C	

### Intersection Summary

HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	104.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

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

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	160	59	75	172	91	39	1093	51	71	720	47
Future Volume (vph)	66	160	59	75	172	91	39	1093	51	71	720	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	0.99			1.00		1.00		
Frt		0.960			0.948			0.993			0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1823	0	1738	1741	0	1825	3478	0	1738	3394	0
Flt Permitted	0.365			0.458			0.361			0.179		
Satd. Flow (perm)	686	1823	0	836	1741	0	694	3478	0	327	3394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			31			7			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Confl. Peds. (#/hr)	4		3	3		4			2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Adj. Flow (vph)	66	160	59	75	172	91	39	1093	51	71	720	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	219	0	75	263	0	39	1144	0	71	767	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

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

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		5.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		9.7	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		47.2	47.2		9.8	57.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		52.4%	52.4%		10.9%	63.3%	
Maximum Green (s)	26.0	26.0		26.0	26.0		41.2	41.2		5.8	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-3.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	18.6	18.6		18.6	18.6		52.6	52.6		65.4	61.4	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.58	0.58		0.73	0.68	
v/c Ratio	0.47	0.56		0.43	0.68		0.10	0.56		0.18	0.33	
Control Delay	40.8	33.4		37.5	37.6		12.3	14.6		5.6	6.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.8	33.4		37.5	37.6		12.3	14.6		5.6	6.9	
LOS	D	C		D	D		B	B		A	A	
Approach Delay		35.1			37.6			14.6			6.8	
Approach LOS		D			D			B			A	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 39 (43%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 17.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 75.8%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



# Timings

## 1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↶	↷	↶	↷	↶	↷	↶	↷
Traffic Volume (vph)	66	160	75	172	39	1093	71	720
Future Volume (vph)	66	160	75	172	39	1093	71	720
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	5.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	9.7	27.0
Total Split (s)	33.0	33.0	33.0	33.0	47.2	47.2	9.8	57.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	52.4%	52.4%	10.9%	63.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-1.0	-3.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	1.0	5.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	18.6	18.6	18.6	18.6	52.6	52.6	65.4	61.4
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.58	0.58	0.73	0.68
v/c Ratio	0.47	0.56	0.43	0.68	0.10	0.56	0.18	0.33
Control Delay	40.8	33.4	37.5	37.6	12.3	14.6	5.6	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	33.4	37.5	37.6	12.3	14.6	5.6	6.9
LOS	D	C	D	D	B	B	A	A
Approach Delay		35.1		37.6		14.6		6.8
Approach LOS		D		D		B		A

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 39 (43%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 17.2

Intersection LOS: B

Intersection Capacity Utilization 75.8%

ICU Level of Service D

Analysis Period (min) 15

### Splits and Phases: 1: Ontario Street & Laurier Road

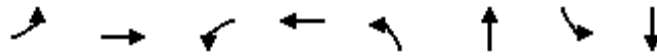




# Phasings

## 1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	5.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	9.7	27.0
Total Split (s)	33.0	33.0	33.0	33.0	47.2	47.2	9.8	57.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	52.4%	52.4%	10.9%	63.3%
Maximum Green (s)	26.0	26.0	26.0	26.0	41.2	41.2	5.8	51.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	1.0	2.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0
90th %ile Green (s)	23.3	23.3	23.3	23.3	41.5	41.5	8.2	53.7
90th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Gap	Coord
70th %ile Green (s)	19.5	19.5	19.5	19.5	46.4	46.4	7.1	57.5
70th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Gap	Coord
50th %ile Green (s)	16.6	16.6	16.6	16.6	49.9	49.9	6.5	60.4
50th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	13.8	13.8	13.8	13.8	53.2	53.2	6.0	63.2
30th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Gap	Coord
10th %ile Green (s)	10.0	10.0	10.0	10.0	67.0	67.0	0.0	67.0
10th %ile Term Code	Min	Min	Min	Min	Coord	Coord	Skip	Coord

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

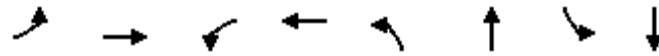
Offset: 39 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Actuated-Coordinated

# Queues

## 1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	219	75	263	39	1144	71	767
v/c Ratio	0.47	0.56	0.43	0.68	0.10	0.56	0.18	0.33
Control Delay	40.8	33.4	37.5	37.6	12.3	14.6	5.6	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	33.4	37.5	37.6	12.3	14.6	5.6	6.9
Queue Length 50th (m)	10.1	30.8	11.4	37.3	2.9	62.3	2.9	24.4
Queue Length 95th (m)	21.0	47.6	22.5	56.7	9.5	100.7	8.3	42.3
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	213	581	260	563	405	2035	389	2317
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.38	0.29	0.47	0.10	0.56	0.18	0.33

### Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 1: Ontario Street & Laurier Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	160	59	75	172	91	39	1093	51	71	720	47
Future Volume (vph)	66	160	59	75	172	91	39	1093	51	71	720	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	1823		1735	1741		1825	3480		1738	3394	
Flt Permitted	0.37	1.00		0.46	1.00		0.36	1.00		0.18	1.00	
Satd. Flow (perm)	686	1823		836	1741		693	3480		328	3394	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	160	59	75	172	91	39	1093	51	71	720	47
RTOR Reduction (vph)	0	17	0	0	25	0	0	3	0	0	4	0
Lane Group Flow (vph)	66	202	0	75	238	0	39	1141	0	71	763	0
Confl. Peds. (#/hr)	4		3	3		4			2	2		
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.6	16.6		16.6	16.6		50.8	50.8		60.4	60.4	
Effective Green, g (s)	18.6	18.6		18.6	18.6		51.8	51.8		63.4	61.4	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.58	0.58		0.70	0.68	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		4.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	141	376		172	359		398	2002		365	2315	
v/s Ratio Prot		0.11			c0.14			c0.33		0.02	c0.22	
v/s Ratio Perm	0.10			0.09			0.06			0.12		
v/c Ratio	0.47	0.54		0.44	0.66		0.10	0.57		0.19	0.33	
Uniform Delay, d1	31.4	31.9		31.1	32.8		8.6	12.1		5.6	5.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.7		0.6	3.6		0.5	1.2		0.3	0.4	
Delay (s)	32.3	32.6		31.8	36.4		9.1	13.2		5.9	6.2	
Level of Service	C	C		C	D		A	B		A	A	
Approach Delay (s)		32.5			35.4			13.1			6.2	
Approach LOS		C			D			B			A	

### Intersection Summary

HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	1423	225	301	686	203	164	655	195	159	565	145
Future Volume (vph)	319	1423	225	301	686	203	164	655	195	159	565	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00		0.99			0.98	1.00		0.98	1.00	1.00	
Frt			0.850			0.850			0.850		0.969	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3579	1570	1690	3476	1555	1789	3380	1570	1690	3155	0
Flt Permitted	0.294			0.085			0.181			0.236		
Satd. Flow (perm)	542	3579	1550	151	3476	1527	341	3380	1545	419	3155	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			180			195			27
Link Speed (k/h)		60			60			50				50
Link Distance (m)		622.6			218.7			1530.3				235.1
Travel Time (s)		37.4			13.1			110.2				16.9
Confl. Peds. (#/hr)	6		1	1		6	2		4	4		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Adj. Flow (vph)	319	1423	225	301	686	203	164	655	195	159	565	145
Shared Lane Traffic (%)												
Lane Group Flow (vph)	319	1423	225	301	686	203	164	655	195	159	710	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings  
 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023

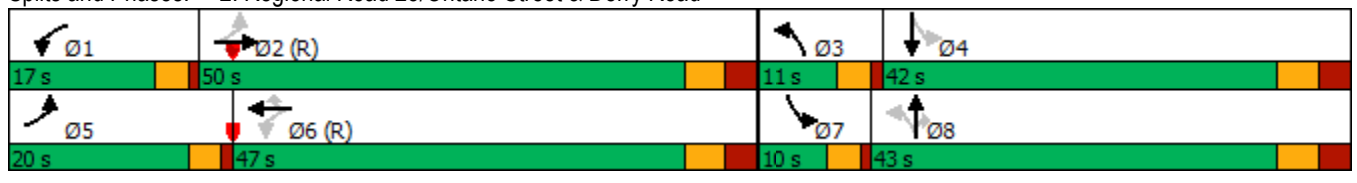


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	SBR
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7	
Total Split (s)	20.0	50.0	50.0	17.0	47.0	47.0	11.0	43.0	43.0	10.0	42.0	
Total Split (%)	16.7%	41.7%	41.7%	14.2%	39.2%	39.2%	9.2%	35.8%	35.8%	8.3%	35.0%	
Maximum Green (s)	16.0	43.3	43.3	13.0	40.3	40.3	7.0	36.3	36.3	6.0	35.3	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	65.9	45.0	45.0	67.6	46.9	46.9	48.3	34.3	34.3	46.3	33.3	
Actuated g/C Ratio	0.55	0.38	0.38	0.56	0.39	0.39	0.40	0.29	0.29	0.39	0.28	
v/c Ratio	0.67	1.06	0.35	0.89	0.50	0.29	0.64	0.68	0.34	0.62	0.79	
Control Delay	21.2	79.0	15.5	55.8	33.8	10.4	34.7	41.5	5.8	34.5	45.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	21.2	79.0	15.5	55.8	33.8	10.4	34.7	41.5	5.8	34.5	45.5	
LOS	C	E	B	E	C	B	C	D	A	C	D	
Approach Delay		62.3			35.4			33.5			43.5	
Approach LOS		E			D			C			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 125  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.06  
 Intersection Signal Delay: 46.9  
 Intersection LOS: D  
 Intersection Capacity Utilization 101.0%  
 ICU Level of Service G  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



# Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑
Traffic Volume (vph)	319	1423	225	301	686	203	164	655	195	159	565
Future Volume (vph)	319	1423	225	301	686	203	164	655	195	159	565
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	20.0	50.0	50.0	17.0	47.0	47.0	11.0	43.0	43.0	10.0	42.0
Total Split (%)	16.7%	41.7%	41.7%	14.2%	39.2%	39.2%	9.2%	35.8%	35.8%	8.3%	35.0%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)	65.9	45.0	45.0	67.6	46.9	46.9	48.3	34.3	34.3	46.3	33.3
Actuated g/C Ratio	0.55	0.38	0.38	0.56	0.39	0.39	0.40	0.29	0.29	0.39	0.28
v/c Ratio	0.67	1.06	0.35	0.89	0.50	0.29	0.64	0.68	0.34	0.62	0.79
Control Delay	21.2	79.0	15.5	55.8	33.8	10.4	34.7	41.5	5.8	34.5	45.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	79.0	15.5	55.8	33.8	10.4	34.7	41.5	5.8	34.5	45.5
LOS	C	E	B	E	C	B	C	D	A	C	D
Approach Delay		62.3			35.4			33.5			43.5
Approach LOS		E			D			C			D

### Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 46.9	Intersection LOS: D
Intersection Capacity Utilization 101.0%	ICU Level of Service G
Analysis Period (min) 15	

### Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Phasings

2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	20.0	50.0	50.0	17.0	47.0	47.0	11.0	43.0	43.0	10.0	42.0
Total Split (%)	16.7%	41.7%	41.7%	14.2%	39.2%	39.2%	9.2%	35.8%	35.8%	8.3%	35.0%
Maximum Green (s)	16.0	43.3	43.3	13.0	40.3	40.3	7.0	36.3	36.3	6.0	35.3
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0
90th %ile Green (s)	16.0	43.3	43.3	13.0	40.3	40.3	7.0	36.3	36.3	6.0	35.3
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Max	Max	Max	Max
70th %ile Green (s)	16.0	43.3	43.3	13.0	40.3	40.3	7.0	36.3	36.3	6.0	35.3
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Max
50th %ile Green (s)	16.9	43.3	43.3	15.5	41.9	41.9	7.0	33.8	33.8	6.0	32.8
50th %ile Term Code	Gap	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Gap
30th %ile Green (s)	14.1	43.3	43.3	19.0	48.2	48.2	7.0	30.3	30.3	6.0	29.3
30th %ile Term Code	Gap	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Gap
10th %ile Green (s)	10.9	43.3	43.3	23.1	55.5	55.5	7.0	26.2	26.2	6.0	25.2
10th %ile Term Code	Gap	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Gap

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated

# Queues

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	319	1423	225	301	686	203	164	655	195	159	710
v/c Ratio	0.67	1.06	0.35	0.89	0.50	0.29	0.64	0.68	0.34	0.62	0.79
Control Delay	21.2	79.0	15.5	55.8	33.8	10.4	34.7	41.5	5.8	34.5	45.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	79.0	15.5	55.8	33.8	10.4	34.7	41.5	5.8	34.5	45.5
Queue Length 50th (m)	37.5	~193.8	18.8	56.5	73.9	8.8	24.6	70.9	0.0	23.9	77.6
Queue Length 95th (m)	58.1	#236.2	38.5	#119.4	95.9	29.0	38.3	88.1	16.1	37.7	96.9
Internal Link Dist (m)		598.6			194.7			1506.3			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	498	1342	647	338	1359	707	257	1070	622	256	991
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.06	0.35	0.89	0.50	0.29	0.64	0.61	0.31	0.62	0.72

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.



# HCM Signalized Intersection Capacity Analysis

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	319	1423	225	301	686	203	164	655	195	159	565	145
Future Volume (vph)	319	1423	225	301	686	203	164	655	195	159	565	145
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1754	3579	1550	1690	3476	1527	1789	3380	1545	1689	3156	
Flt Permitted	0.29	1.00	1.00	0.08	1.00	1.00	0.18	1.00	1.00	0.24	1.00	
Satd. Flow (perm)	543	3579	1550	150	3476	1527	341	3380	1545	420	3156	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	319	1423	225	301	686	203	164	655	195	159	565	145
RTOR Reduction (vph)	0	0	66	0	0	110	0	0	139	0	20	0
Lane Group Flow (vph)	319	1423	159	301	686	93	164	655	56	159	690	0
Confl. Peds. (#/hr)	6		1	1		6	2		4	4		2
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	58.1	43.3	43.3	61.9	45.2	45.2	39.6	32.6	32.6	37.6	31.6	
Effective Green, g (s)	64.1	45.0	45.0	67.0	46.9	46.9	45.6	34.3	34.3	43.6	33.3	
Actuated g/C Ratio	0.53	0.38	0.38	0.56	0.39	0.39	0.38	0.29	0.29	0.36	0.28	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	469	1342	581	336	1358	596	250	966	441	247	875	
v/s Ratio Prot	0.10	c0.40		c0.15	0.20		c0.05	0.19		0.05	c0.22	
v/s Ratio Perm	0.26		0.10	0.35		0.06	0.19		0.04	0.18		
v/c Ratio	0.68	1.06	0.27	0.90	0.51	0.16	0.66	0.68	0.13	0.64	0.79	
Uniform Delay, d1	16.9	37.5	26.1	36.4	27.7	23.7	27.3	38.0	31.7	27.9	40.1	
Progression Factor	1.00	1.00	1.00	0.84	1.12	1.68	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.0	42.3	1.2	23.3	1.2	0.5	6.1	1.9	0.1	5.6	4.8	
Delay (s)	20.9	79.8	27.3	53.7	32.3	40.3	33.4	39.9	31.9	33.6	44.9	
Level of Service	C	E	C	D	C	D	C	D	C	C	D	
Approach Delay (s)		64.2			39.1			37.3			42.8	
Approach LOS		E			D			D			D	

### Intersection Summary

HCM 2000 Control Delay	49.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

# Lanes, Volumes, Timings

## 3: Derry Road

07/19/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	20	1753	1356	16	18	4
Future Volume (vph)	20	1753	1356	16	18	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.975	
Flt Protected	0.950				0.961	
Satd. Flow (prot)	1825	3544	3439	0	1716	0
Flt Permitted	0.950				0.961	
Satd. Flow (perm)	1825	3544	3439	0	1716	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		218.7	493.3		86.5	
Travel Time (s)		13.1	29.6		6.2	
Confl. Peds. (#/hr)	8			8		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	6%	0%	6%	0%
Adj. Flow (vph)	20	1753	1356	16	18	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	1753	1372	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

### Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.5%
Analysis Period (min)	15
	ICU Level of Service B

# HCM Unsignalized Intersection Capacity Analysis

## 3: Derry Road

07/19/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	1753	1356	16	18	4
Future Volume (Veh/h)	20	1753	1356	16	18	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	1753	1356	16	18	4
Pedestrians					8	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (m)		219				
pX, platoon unblocked					0.63	
vC, conflicting volume	1380				2288	694
vC1, stage 1 conf vol					1372	
vC2, stage 2 conf vol					916	
vCu, unblocked vol	1380				1875	694
tC, single (s)	4.1				6.9	6.9
tC, 2 stage (s)					5.9	
tF (s)	2.2				3.6	3.3
p0 queue free %	96				90	99
cM capacity (veh/h)	499				179	387

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	20	876	876	904	468	22
Volume Left	20	0	0	0	0	18
Volume Right	0	0	0	0	16	4
cSH	499	1700	1700	1700	1700	199
Volume to Capacity	0.04	0.52	0.52	0.53	0.28	0.11
Queue Length 95th (m)	0.9	0.0	0.0	0.0	0.0	2.8
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	25.4
Lane LOS	B					D
Approach Delay (s)	0.1			0.0		25.4
Approach LOS						D

Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			58.5%		ICU Level of Service	B
Analysis Period (min)			15			

# Lanes, Volumes, Timings

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1594	99	55	1099	21	161	38	133	42	39	77
Future Volume (vph)	56	1594	99	55	1099	21	161	38	133	42	39	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		1.00	0.99		0.99	0.99	
Frt		0.991			0.997			0.883			0.900	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1644	3509	0	1738	3432	0	1807	1549	0	1738	1641	0
Flt Permitted	0.222			0.098			0.632			0.503		
Satd. Flow (perm)	384	3509	0	179	3432	0	1200	1549	0	915	1641	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			3			39			77	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Confl. Peds. (#/hr)	2		1	1		2	2		6	6		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Adj. Flow (vph)	56	1594	99	55	1099	21	161	38	133	42	39	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	1693	0	55	1120	0	161	171	0	42	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

# Lanes, Volumes, Timings

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.5	82.5		82.5	82.5		37.5	37.5		37.5	37.5	
Total Split (%)	68.8%	68.8%		68.8%	68.8%		31.3%	31.3%		31.3%	31.3%	
Maximum Green (s)	76.8	76.8		76.8	76.8		30.3	30.3		30.3	30.3	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	87.0	87.0		87.0	87.0		23.0	23.0		23.0	23.0	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
v/c Ratio	0.20	0.66		0.43	0.45		0.70	0.52		0.24	0.31	
Control Delay	1.9	3.7		21.5	8.1		60.6	37.8		41.8	17.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	1.9	3.7		21.5	8.1		60.6	37.8		41.8	17.0	
LOS	A	A		C	A		E	D		D	B	
Approach Delay		3.6			8.8			48.8			23.6	
Approach LOS		A			A			D			C	

### Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 10.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 81.3%  
 ICU Level of Service D  
 Analysis Period (min) 15

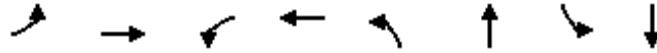
### Splits and Phases: 4: Holly Avenue & Derry Road



# Timings

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↶	↶↷	↶	↶↷	↶	↷	↶	↷
Traffic Volume (vph)	56	1594	55	1099	161	38	42	39
Future Volume (vph)	56	1594	55	1099	161	38	42	39
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.5	82.5	82.5	82.5	37.5	37.5	37.5	37.5
Total Split (%)	68.8%	68.8%	68.8%	68.8%	31.3%	31.3%	31.3%	31.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	-0.7	-0.7	-0.7	-0.7	-2.2	-2.2	-2.2	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	87.0	87.0	87.0	87.0	23.0	23.0	23.0	23.0
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.19	0.19	0.19	0.19
v/c Ratio	0.20	0.66	0.43	0.45	0.70	0.52	0.24	0.31
Control Delay	1.9	3.7	21.5	8.1	60.6	37.8	41.8	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	3.7	21.5	8.1	60.6	37.8	41.8	17.0
LOS	A	A	C	A	E	D	D	B
Approach Delay		3.6		8.8		48.8		23.6
Approach LOS		A		A		D		C

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 10.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 81.3%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 4: Holly Avenue & Derry Road



Phasings  
4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.5	82.5	82.5	82.5	37.5	37.5	37.5	37.5
Total Split (%)	68.8%	68.8%	68.8%	68.8%	31.3%	31.3%	31.3%	31.3%
Maximum Green (s)	76.8	76.8	76.8	76.8	30.3	30.3	30.3	30.3
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0
90th %ile Green (s)	77.5	77.5	77.5	77.5	29.6	29.6	29.6	29.6
90th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
70th %ile Green (s)	83.0	83.0	83.0	83.0	24.1	24.1	24.1	24.1
70th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
50th %ile Green (s)	86.4	86.4	86.4	86.4	20.7	20.7	20.7	20.7
50th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
30th %ile Green (s)	89.8	89.8	89.8	89.8	17.3	17.3	17.3	17.3
30th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
10th %ile Green (s)	94.9	94.9	94.9	94.9	12.2	12.2	12.2	12.2
10th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold

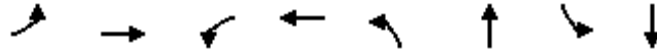
Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Control Type: Actuated-Coordinated

# Queues

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	1693	55	1120	161	171	42	116
v/c Ratio	0.20	0.66	0.43	0.45	0.70	0.52	0.24	0.31
Control Delay	1.9	3.7	21.5	8.1	60.6	37.8	41.8	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	3.7	21.5	8.1	60.6	37.8	41.8	17.0
Queue Length 50th (m)	0.7	12.9	4.5	49.4	35.8	28.0	8.5	7.7
Queue Length 95th (m)	m1.0	m13.1	21.6	81.0	54.3	45.5	17.4	21.5
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	278	2547	129	2489	325	447	247	500
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.66	0.43	0.45	0.50	0.38	0.17	0.23

### Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



# HCM Signalized Intersection Capacity Analysis

## 4: Holly Avenue & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	56	1594	99	55	1099	21	161	38	133	42	39	77
Future Volume (vph)	56	1594	99	55	1099	21	161	38	133	42	39	77
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1643	3510		1738	3433		1803	1550		1729	1642	
Flt Permitted	0.22	1.00		0.10	1.00		0.63	1.00		0.50	1.00	
Satd. Flow (perm)	384	3510		179	3433		1201	1550		915	1642	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	1594	99	55	1099	21	161	38	133	42	39	77
RTOR Reduction (vph)	0	3	0	0	1	0	0	32	0	0	62	0
Lane Group Flow (vph)	56	1690	0	55	1119	0	161	139	0	42	54	0
Confl. Peds. (#/hr)	2		1	1		2	2		6	6		2
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	86.3	86.3		86.3	86.3		20.8	20.8		20.8	20.8	
Effective Green, g (s)	87.0	87.0		87.0	87.0		23.0	23.0		23.0	23.0	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	278	2544		129	2488		230	297		175	314	
v/s Ratio Prot		c0.48			0.33			0.09			0.03	
v/s Ratio Perm	0.15			0.31			c0.13			0.05		
v/c Ratio	0.20	0.66		0.43	0.45		0.70	0.47		0.24	0.17	
Uniform Delay, d1	5.3	8.8		6.6	6.7		45.3	43.1		41.1	40.5	
Progression Factor	0.17	0.32		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.5		0.8	0.0		9.0	1.2		0.7	0.3	
Delay (s)	1.5	3.3		7.4	6.8		54.3	44.3		41.8	40.8	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		3.3			6.8			49.1			41.1	
Approach LOS		A			A			D			D	

### Intersection Summary

HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	510	483	150	377	83	155	715	138	50	837	100
Future Volume (vph)	130	510	483	150	377	83	155	715	138	50	837	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00				0.98	1.00		
Frt		0.927			0.973				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1659	3286	0	1722	3428	0	1674	3411	1541	1755	3380	1471
Flt Permitted	0.343			*0.250			0.204			0.333		
Satd. Flow (perm)	599	3286	0	453	3428	0	360	3411	1517	615	3380	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		212			21				138			168
Link Speed (k/h)		50			50			70				70
Link Distance (m)		455.0			858.9			517.1				1530.3
Travel Time (s)		32.8			61.8			26.6				78.7
Confl. Peds. (#/hr)	6					6			2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Adj. Flow (vph)	130	510	483	150	377	83	155	715	138	50	837	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	993	0	150	460	0	155	715	138	50	837	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

# Lanes, Volumes, Timings

## 6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023

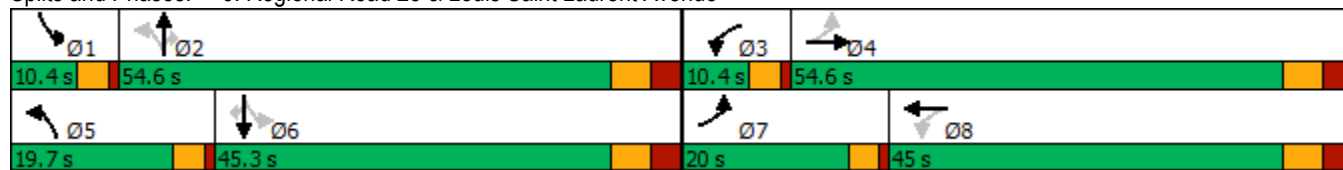


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	20.0	54.6		10.4	45.0		19.7	54.6	54.6	10.4	45.3	45.3
Total Split (%)	15.4%	42.0%		8.0%	34.6%		15.2%	42.0%	42.0%	8.0%	34.8%	34.8%
Maximum Green (s)	16.0	47.6		6.4	38.0		15.7	47.6	47.6	6.4	38.3	38.3
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	48.2	33.6		42.5	28.9		62.6	50.6	50.6	56.8	43.5	43.5
Actuated g/C Ratio	0.43	0.30		0.38	0.26		0.55	0.45	0.45	0.50	0.39	0.39
v/c Ratio	0.33	0.88		0.54	0.51		0.43	0.47	0.18	0.12	0.64	0.15
Control Delay	22.4	39.1		28.6	36.7		17.7	24.9	4.5	14.7	33.0	0.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	39.1		28.6	36.7		17.7	24.9	4.5	14.7	33.0	0.5
LOS	C	D		C	D		B	C	A	B	C	A
Approach Delay		37.2			34.7			21.0			28.8	
Approach LOS		D			C			C			C	

### Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	112.8
Natural Cycle:	85
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	30.2
Intersection LOS:	C
Intersection Capacity Utilization:	84.6%
ICU Level of Service:	E
Analysis Period (min):	15
* User Entered Value	

### Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Timings

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023

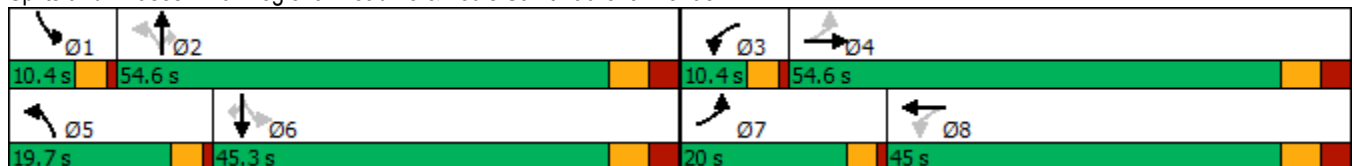


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	130	510	150	377	155	715	138	50	837	100
Future Volume (vph)	130	510	150	377	155	715	138	50	837	100
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	20.0	54.6	10.4	45.0	19.7	54.6	54.6	10.4	45.3	45.3
Total Split (%)	15.4%	42.0%	8.0%	34.6%	15.2%	42.0%	42.0%	8.0%	34.8%	34.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.0	-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0	1.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	48.2	33.6	42.5	28.9	62.6	50.6	50.6	56.8	43.5	43.5
Actuated g/C Ratio	0.43	0.30	0.38	0.26	0.55	0.45	0.45	0.50	0.39	0.39
v/c Ratio	0.33	0.88	0.54	0.51	0.43	0.47	0.18	0.12	0.64	0.15
Control Delay	22.4	39.1	28.6	36.7	17.7	24.9	4.5	14.7	33.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	39.1	28.6	36.7	17.7	24.9	4.5	14.7	33.0	0.5
LOS	C	D	C	D	B	C	A	B	C	A
Approach Delay		37.2		34.7		21.0			28.8	
Approach LOS		D		C		C			C	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 112.8  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 30.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 84.6%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Phasings

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	20.0	54.6	10.4	45.0	19.7	54.6	54.6	10.4	45.3	45.3
Total Split (%)	15.4%	42.0%	8.0%	34.6%	15.2%	42.0%	42.0%	8.0%	34.8%	34.8%
Maximum Green (s)	16.0	47.6	6.4	38.0	15.7	47.6	47.6	6.4	38.3	38.3
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2
Minimum Gap (s)	3.0	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0		7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0		16.0		18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0		0		0	0		0	0
90th %ile Green (s)	16.0	44.2	6.4	34.6	15.7	47.6	47.6	6.4	38.3	38.3
90th %ile Term Code	Max	Gap	Max	Hold	Max	MaxR	MaxR	Max	MaxR	MaxR
70th %ile Green (s)	12.5	37.1	6.4	31.0	13.3	47.6	47.6	6.4	40.7	40.7
70th %ile Term Code	Gap	Gap	Max	Hold	Gap	MaxR	MaxR	Max	Hold	Hold
50th %ile Green (s)	11.1	31.6	6.4	26.9	10.6	47.6	47.6	6.4	43.4	43.4
50th %ile Term Code	Gap	Gap	Max	Hold	Gap	MaxR	MaxR	Max	Hold	Hold
30th %ile Green (s)	9.6	27.4	6.4	24.2	9.0	47.6	47.6	6.2	44.8	44.8
30th %ile Term Code	Gap	Gap	Max	Hold	Gap	MaxR	MaxR	Gap	Hold	Hold
10th %ile Green (s)	7.4	20.2	6.4	19.2	7.4	49.7	49.7	0.0	38.3	38.3
10th %ile Term Code	Gap	Gap	Max	Hold	Gap	Hold	Hold	Skip	MaxR	MaxR

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 112.8  
 Control Type: Actuated-Uncoordinated  
 90th %ile Actuated Cycle: 126.6  
 70th %ile Actuated Cycle: 119.5  
 50th %ile Actuated Cycle: 114  
 30th %ile Actuated Cycle: 109.6  
 10th %ile Actuated Cycle: 94.3

Queues

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	993	150	460	155	715	138	50	837	100
v/c Ratio	0.33	0.88	0.54	0.51	0.43	0.47	0.18	0.12	0.64	0.15
Control Delay	22.4	39.1	28.6	36.7	17.7	24.9	4.5	14.7	33.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	39.1	28.6	36.7	17.7	24.9	4.5	14.7	33.0	0.5
Queue Length 50th (m)	17.9	90.4	20.8	44.4	15.9	58.6	0.0	4.8	77.4	0.0
Queue Length 95th (m)	30.0	115.6	33.8	63.0	33.1	90.0	12.5	12.8	123.5	0.2
Internal Link Dist (m)		431.0		834.9		493.1			1506.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	436	1577	277	1241	419	1530	756	406	1303	670
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.63	0.54	0.37	0.37	0.47	0.18	0.12	0.64	0.15

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	510	483	150	377	83	155	715	138	50	837	100
Future Volume (vph)	130	510	483	150	377	83	155	715	138	50	837	100
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1657	3286		1722	3429		1674	3411	1518	1754	3380	1471
Flt Permitted	0.34	1.00		0.25	1.00		0.20	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	598	3286		453	3429		359	3411	1518	616	3380	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	510	483	150	377	83	155	715	138	50	837	100
RTOR Reduction (vph)	0	149	0	0	16	0	0	0	77	0	0	61
Lane Group Flow (vph)	130	844	0	150	444	0	155	715	61	50	837	39
Confl. Peds. (#/hr)	6						6		2	2		
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	42.1	31.6		33.4	26.9		57.5	48.6	48.6	47.4	42.5	42.5
Effective Green, g (s)	45.1	33.6		39.4	28.9		60.5	50.6	50.6	53.4	44.5	44.5
Actuated g/C Ratio	0.40	0.30		0.35	0.25		0.53	0.45	0.45	0.47	0.39	0.39
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	369	971		263	872		353	1519	676	368	1324	576
v/s Ratio Prot	0.04	c0.26		c0.05	0.13		c0.05	0.21		0.01	c0.25	
v/s Ratio Perm	0.10			0.15			0.18		0.04	0.05		0.03
v/c Ratio	0.35	0.87		0.57	0.51		0.44	0.47	0.09	0.14	0.63	0.07
Uniform Delay, d1	22.8	37.9		26.5	36.3		15.7	22.1	18.2	16.6	27.9	21.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	8.1		3.0	0.5		0.9	1.0	0.3	0.2	2.3	0.2
Delay (s)	23.4	46.0		29.5	36.7		16.6	23.2	18.5	16.7	30.2	21.8
Level of Service	C	D		C	D		B	C	B	B	C	C
Approach Delay (s)		43.4			35.0			21.5			28.7	
Approach LOS		D			C			C			C	

Intersection Summary		
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.66	C
Actuated Cycle Length (s)	113.6	Sum of lost time (s)
Intersection Capacity Utilization	84.6%	12.0
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

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

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	182	39	103	219	105	58	933	87	129	1035	87
Future Volume (vph)	67	182	39	103	219	105	58	933	87	129	1035	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		1.00	0.99			1.00		1.00	1.00	
Frt		0.974			0.951			0.987			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1865	0	1807	1784	0	1825	3498	0	1789	3497	0
Flt Permitted	0.267			0.461			0.212			0.244		
Satd. Flow (perm)	500	1865	0	874	1784	0	407	3498	0	459	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			24			18			16	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Confl. Peds. (#/hr)	9		5	5		9	3		3	3		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Adj. Flow (vph)	67	182	39	103	219	105	58	933	87	129	1035	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	221	0	103	324	0	58	1020	0	129	1122	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



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

07/19/2023

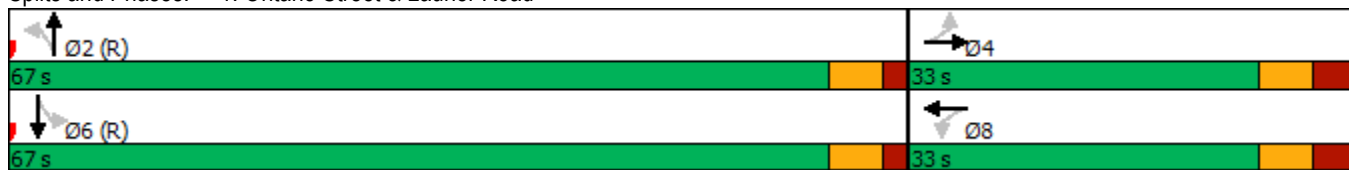


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		67.0	67.0		67.0	67.0	
Total Split (%)	33.0%	33.0%		33.0%	33.0%		67.0%	67.0%		67.0%	67.0%	
Maximum Green (s)	26.0	26.0		26.0	26.0		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	22.7	22.7		22.7	22.7		67.3	67.3		67.3	67.3	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.67	0.67		0.67	0.67	
v/c Ratio	0.59	0.51		0.52	0.76		0.21	0.43		0.42	0.48	
Control Delay	54.7	35.5		42.5	45.2		10.1	8.7		14.0	9.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	54.7	35.5		42.5	45.2		10.1	8.7		14.0	9.2	
LOS	D	D		D	D		B	A		B	A	
Approach Delay		39.9			44.5			8.8			9.7	
Approach LOS		D			D			A			A	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	17.1
Intersection LOS:	B
Intersection Capacity Utilization	88.0%
ICU Level of Service	E
Analysis Period (min)	15

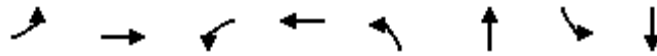
Splits and Phases: 1: Ontario Street & Laurier Road



# Timings

## 1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	67	182	103	219	58	933	129	1035
Future Volume (vph)	67	182	103	219	58	933	129	1035
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	27.0	27.0
Total Split (s)	33.0	33.0	33.0	33.0	67.0	67.0	67.0	67.0
Total Split (%)	33.0%	33.0%	33.0%	33.0%	67.0%	67.0%	67.0%	67.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	22.7	22.7	22.7	22.7	67.3	67.3	67.3	67.3
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.67	0.67	0.67	0.67
v/c Ratio	0.59	0.51	0.52	0.76	0.21	0.43	0.42	0.48
Control Delay	54.7	35.5	42.5	45.2	10.1	8.7	14.0	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	35.5	42.5	45.2	10.1	8.7	14.0	9.2
LOS	D	D	D	D	B	A	B	A
Approach Delay		39.9		44.5		8.8		9.7
Approach LOS		D		D		A		A

### Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 17.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 88.0%  
 ICU Level of Service E  
 Analysis Period (min) 15

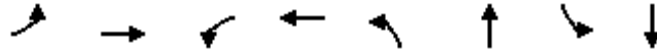
### Splits and Phases: 1: Ontario Street & Laurier Road



# Phasings

## 1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	27.0	27.0
Total Split (s)	33.0	33.0	33.0	33.0	67.0	67.0	67.0	67.0
Total Split (%)	33.0%	33.0%	33.0%	33.0%	67.0%	67.0%	67.0%	67.0%
Maximum Green (s)	26.0	26.0	26.0	26.0	61.0	61.0	61.0	61.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0
90th %ile Green (s)	26.0	26.0	26.0	26.0	61.0	61.0	61.0	61.0
90th %ile Term Code	Hold	Hold	Max	Max	Coord	Coord	Coord	Coord
70th %ile Green (s)	24.5	24.5	24.5	24.5	62.5	62.5	62.5	62.5
70th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord
50th %ile Green (s)	21.4	21.4	21.4	21.4	65.6	65.6	65.6	65.6
50th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord
30th %ile Green (s)	18.2	18.2	18.2	18.2	68.8	68.8	68.8	68.8
30th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord
10th %ile Green (s)	13.6	13.6	13.6	13.6	73.4	73.4	73.4	73.4
10th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord

### Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

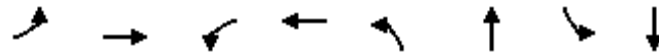
Offset: 42 (42%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Actuated-Coordinated

Queues

1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	221	103	324	58	1020	129	1122
v/c Ratio	0.59	0.51	0.52	0.76	0.21	0.43	0.42	0.48
Control Delay	54.7	35.5	42.5	45.2	10.1	8.7	14.0	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	35.5	42.5	45.2	10.1	8.7	14.0	9.2
Queue Length 50th (m)	11.6	35.3	17.4	54.3	3.9	42.8	10.4	49.4
Queue Length 95th (m)	25.2	54.1	32.2	79.5	11.5	63.9	27.8	73.3
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	140	530	244	516	273	2358	308	2357
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.42	0.42	0.63	0.21	0.43	0.42	0.48

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 1: Ontario Street & Laurier Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Traffic Volume (vph)	67	182	39	103	219	105	58	933	87	129	1035	87
Future Volume (vph)	67	182	39	103	219	105	58	933	87	129	1035	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1780	1864		1800	1785		1823	3499		1787	3498	
Flt Permitted	0.27	1.00		0.46	1.00		0.21	1.00		0.24	1.00	
Satd. Flow (perm)	500	1864		874	1785		408	3499		459	3498	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	182	39	103	219	105	58	933	87	129	1035	87
RTOR Reduction (vph)	0	9	0	0	19	0	0	6	0	0	5	0
Lane Group Flow (vph)	67	212	0	103	305	0	58	1014	0	129	1117	0
Confl. Peds. (#/hr)	9		5	5		9	3		3	3		3
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.7	20.7		20.7	20.7		66.3	66.3		66.3	66.3	
Effective Green, g (s)	22.7	22.7		22.7	22.7		67.3	67.3		67.3	67.3	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.67	0.67		0.67	0.67	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	113	423		198	405		274	2354		308	2354	
v/s Ratio Prot		0.11			c0.17			0.29			c0.32	
v/s Ratio Perm	0.13			0.12			0.14			0.28		
v/c Ratio	0.59	0.50		0.52	0.75		0.21	0.43		0.42	0.47	
Uniform Delay, d1	34.5	33.7		33.9	36.0		6.2	7.5		7.4	7.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.5	0.3		1.1	6.9		1.8	0.6		4.1	0.7	
Delay (s)	40.0	34.1		35.0	43.0		8.0	8.1		11.6	8.5	
Level of Service	D	C		D	D		A	A		B	A	
Approach Delay (s)		35.4			41.1			8.1			8.9	
Approach LOS		D			D			A			A	

### Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# Lanes, Volumes, Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	1016	120	170	1129	208	178	728	134	181	599	213
Future Volume (vph)	285	1016	120	170	1129	208	178	728	134	181	599	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00		0.99	1.00		0.99			0.99	1.00	1.00	
Frt			0.850			0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3614	1617	1807	3614	1633	1789	3476	1498	1807	3354	0
Flt Permitted	0.097			0.127			0.149			0.247		
Satd. Flow (perm)	181	3614	1594	241	3614	1612	281	3476	1479	470	3354	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			108			134			47
Link Speed (k/h)		60			60			50				50
Link Distance (m)		622.6			218.7			1530.3				235.1
Travel Time (s)		37.4			13.1			110.2				16.9
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Adj. Flow (vph)	285	1016	120	170	1129	208	178	728	134	181	599	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	1016	120	170	1129	208	178	728	134	181	812	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

# Lanes, Volumes, Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023

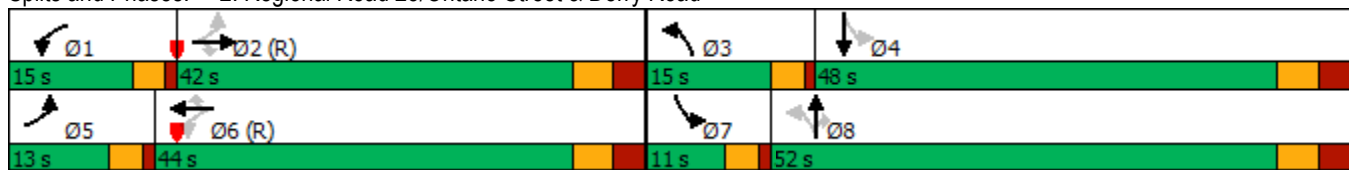


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7	
Total Split (s)	13.0	42.0	42.0	15.0	44.0	44.0	15.0	52.0	52.0	11.0	48.0	
Total Split (%)	10.8%	35.0%	35.0%	12.5%	36.7%	36.7%	12.5%	43.3%	43.3%	9.2%	40.0%	
Maximum Green (s)	9.0	35.3	35.3	11.0	37.3	37.3	11.0	45.3	45.3	7.0	41.3	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	61.7	44.0	44.0	56.5	39.0	39.0	55.1	40.1	40.1	50.4	36.4	
Actuated g/C Ratio	0.51	0.37	0.37	0.47	0.32	0.32	0.46	0.33	0.33	0.42	0.30	
v/c Ratio	0.83	0.77	0.18	0.58	0.96	0.35	0.59	0.63	0.23	0.59	0.77	
Control Delay	51.6	39.6	8.1	24.0	52.7	11.0	27.0	35.7	5.0	26.9	40.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	51.6	39.6	8.1	24.0	52.7	11.0	27.0	35.7	5.0	26.9	40.8	
LOS	D	D	A	C	D	B	C	D	A	C	D	
Approach Delay		39.3			43.7			30.3			38.3	
Approach LOS		D			D			C			D	

### Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	104 (87%), 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:	38.5
Intersection LOS:	D
Intersection Capacity Utilization:	95.4%
ICU Level of Service:	F
Analysis Period (min):	15

### Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



# Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023

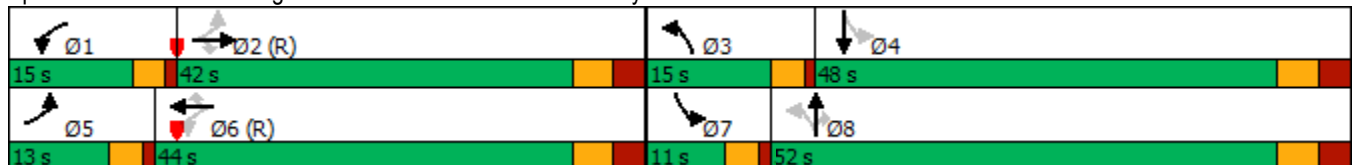


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑
Traffic Volume (vph)	285	1016	120	170	1129	208	178	728	134	181	599
Future Volume (vph)	285	1016	120	170	1129	208	178	728	134	181	599
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	13.0	42.0	42.0	15.0	44.0	44.0	15.0	52.0	52.0	11.0	48.0
Total Split (%)	10.8%	35.0%	35.0%	12.5%	36.7%	36.7%	12.5%	43.3%	43.3%	9.2%	40.0%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)	61.7	44.0	44.0	56.5	39.0	39.0	55.1	40.1	40.1	50.4	36.4
Actuated g/C Ratio	0.51	0.37	0.37	0.47	0.32	0.32	0.46	0.33	0.33	0.42	0.30
v/c Ratio	0.83	0.77	0.18	0.58	0.96	0.35	0.59	0.63	0.23	0.59	0.77
Control Delay	51.6	39.6	8.1	24.0	52.7	11.0	27.0	35.7	5.0	26.9	40.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	39.6	8.1	24.0	52.7	11.0	27.0	35.7	5.0	26.9	40.8
LOS	D	D	A	C	D	B	C	D	A	C	D
Approach Delay		39.3			43.7			30.3			38.3
Approach LOS		D			D			C			D

### Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 104 (87%), 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: 38.5	Intersection LOS: D
Intersection Capacity Utilization 95.4%	ICU Level of Service F
Analysis Period (min) 15	

### Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road





Phasings

2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	13.0	42.0	42.0	15.0	44.0	44.0	15.0	52.0	52.0	11.0	48.0
Total Split (%)	10.8%	35.0%	35.0%	12.5%	36.7%	36.7%	12.5%	43.3%	43.3%	9.2%	40.0%
Maximum Green (s)	9.0	35.3	35.3	11.0	37.3	37.3	11.0	45.3	45.3	7.0	41.3
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0
90th %ile Green (s)	9.0	35.3	35.3	11.0	37.3	37.3	11.0	45.3	45.3	7.0	41.3
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Max
70th %ile Green (s)	12.2	35.3	35.3	14.2	37.3	37.3	11.0	42.1	42.1	7.0	38.1
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Gap
50th %ile Green (s)	14.9	40.4	40.4	11.8	37.3	37.3	11.0	39.4	39.4	7.0	35.4
50th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Max	Hold	Hold	Max	Gap
30th %ile Green (s)	18.4	45.9	45.9	9.8	37.3	37.3	11.0	35.9	35.9	7.0	31.9
30th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Max	Hold	Hold	Max	Gap
10th %ile Green (s)	25.1	54.8	54.8	7.6	37.3	37.3	9.3	29.2	29.2	7.0	26.9
10th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Hold	Hold	Max	Gap

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated

# Queues

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	285	1016	120	170	1129	208	178	728	134	181	812
v/c Ratio	0.83	0.77	0.18	0.58	0.96	0.35	0.59	0.63	0.23	0.59	0.77
Control Delay	51.6	39.6	8.1	24.0	52.7	11.0	27.0	35.7	5.0	26.9	40.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	39.6	8.1	24.0	52.7	11.0	27.0	35.7	5.0	26.9	40.8
Queue Length 50th (m)	48.9	112.9	2.2	14.0	139.3	19.1	24.2	74.6	0.0	24.6	85.8
Queue Length 95th (m)	#119.6	#158.8	15.7	33.3	#182.6	24.5	34.7	86.9	12.0	35.2	100.7
Internal Link Dist (m)		598.6			194.7			1506.3			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	344	1326	652	308	1174	596	305	1361	660	308	1232
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	0.83	0.77	0.18	0.55	0.96	0.35	0.58	0.53	0.20	0.59	0.66

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	1016	120	170	1129	208	178	728	134	181	599	213
Future Volume (vph)	285	1016	120	170	1129	208	178	728	134	181	599	213
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1772	3614	1594	1807	3614	1612	1789	3476	1479	1807	3353	
Flt Permitted	0.10	1.00	1.00	0.13	1.00	1.00	0.15	1.00	1.00	0.25	1.00	
Satd. Flow (perm)	181	3614	1594	242	3614	1612	280	3476	1479	469	3353	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	285	1016	120	170	1129	208	178	728	134	181	599	213
RTOR Reduction (vph)	0	0	67	0	0	73	0	0	89	0	33	0
Lane Group Flow (vph)	285	1016	53	170	1129	135	178	728	45	181	779	0
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	57.2	42.3	42.3	48.2	37.3	37.3	49.1	38.4	38.4	41.7	34.7	
Effective Green, g (s)	60.2	44.0	44.0	54.2	39.0	39.0	52.4	40.1	40.1	47.7	36.4	
Actuated g/C Ratio	0.50	0.37	0.37	0.45	0.32	0.32	0.44	0.33	0.33	0.40	0.30	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	341	1325	584	290	1174	523	294	1161	494	297	1017	
v/s Ratio Prot	c0.13	0.28		0.07	c0.31		c0.07	0.21		c0.05	c0.23	
v/s Ratio Perm	0.29		0.03	0.20		0.08	0.19		0.03	0.19		
v/c Ratio	0.84	0.77	0.09	0.59	0.96	0.26	0.61	0.63	0.09	0.61	0.77	
Uniform Delay, d1	33.4	33.5	24.9	22.9	39.8	29.8	23.9	33.7	27.4	25.1	37.9	
Progression Factor	1.00	1.00	1.00	0.96	0.89	0.66	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.1	4.3	0.3	2.6	16.8	1.0	3.5	1.1	0.1	3.5	3.5	
Delay (s)	49.5	37.8	25.2	24.7	52.1	20.7	27.4	34.7	27.5	28.7	41.4	
Level of Service	D	D	C	C	D	C	C	C	C	C	D	
Approach Delay (s)		39.1			44.7			32.5			39.1	
Approach LOS		D			D			C			D	

### Intersection Summary

HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
3: Derry Road

07/19/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	1369	1618	20	19	24
Future Volume (vph)	10	1369	1618	20	19	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.925	
Flt Protected	0.950				0.978	
Satd. Flow (prot)	1825	3510	3607	0	1738	0
Flt Permitted	0.950				0.978	
Satd. Flow (perm)	1825	3510	3607	0	1738	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		218.7	493.3		86.5	
Travel Time (s)		13.1	29.6		6.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	1%	0%	0%	0%
Adj. Flow (vph)	10	1369	1618	20	19	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	1369	1638	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

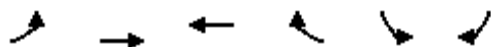
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.4%
Analysis Period (min)	15
	ICU Level of Service B

# HCM Unsignalized Intersection Capacity Analysis

## 3: Derry Road

07/19/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	1369	1618	20	19	24
Future Volume (Veh/h)	10	1369	1618	20	19	24
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	1369	1618	20	19	24
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (m)		219				
pX, platoon unblocked					0.75	
vC, conflicting volume	1640				2334	821
vC1, stage 1 conf vol					1630	
vC2, stage 2 conf vol					704	
vCu, unblocked vol	1640				2110	821
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	97				87	93
cM capacity (veh/h)	399				142	321
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	10	684	684	1079	559	43
Volume Left	10	0	0	0	0	19
Volume Right	0	0	0	0	20	24
cSH	399	1700	1700	1700	1700	206
Volume to Capacity	0.03	0.40	0.40	0.63	0.33	0.21
Queue Length 95th (m)	0.6	0.0	0.0	0.0	0.0	5.8
Control Delay (s)	14.2	0.0	0.0	0.0	0.0	27.0
Lane LOS	B					D
Approach Delay (s)	0.1			0.0		27.0
Approach LOS						D
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			55.4%		ICU Level of Service	B
Analysis Period (min)			15			

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1132	167	147	1391	52	165	71	77	34	74	51
Future Volume (vph)	57	1132	167	147	1391	52	165	71	77	34	74	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00				0.99		1.00		
Frt		0.981			0.995			0.922				0.939
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3508	0	1825	3597	0	1807	1718	0	1825	1772	0
Flt Permitted	0.142			0.174			0.614			0.561		
Satd. Flow (perm)	273	3508	0	334	3597	0	1168	1718	0	1077	1772	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			6			44				28
Link Speed (k/h)		60			60			50				50
Link Distance (m)		493.3			470.6			88.3				198.3
Travel Time (s)		29.6			28.2			6.4				14.3
Confl. Peds. (#/hr)			2	2					1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Adj. Flow (vph)	57	1132	167	147	1391	52	165	71	77	34	74	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1299	0	147	1443	0	165	148	0	34	125	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

# Lanes, Volumes, Timings

## 4: Holly Avenue & Derry Road

07/19/2023

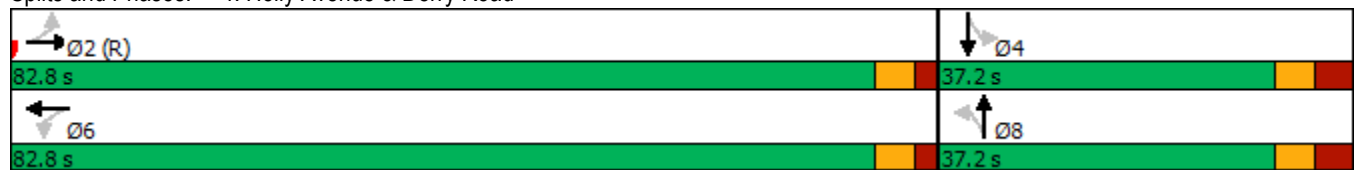


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.8	82.8		82.8	82.8		37.2	37.2		37.2	37.2	
Total Split (%)	69.0%	69.0%		69.0%	69.0%		31.0%	31.0%		31.0%	31.0%	
Maximum Green (s)	77.1	77.1		77.1	77.1		30.0	30.0		30.0	30.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	86.4	86.4		86.4	86.4		23.6	23.6		23.6	23.6	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
v/c Ratio	0.29	0.51		0.61	0.56		0.72	0.40		0.16	0.34	
Control Delay	13.3	14.0		24.6	9.7		61.7	30.8		38.8	32.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.3	14.0		24.6	9.7		61.7	30.8		38.8	32.7	
LOS	B	B		C	A		E	C		D	C	
Approach Delay		14.0			11.0			47.1			34.0	
Approach LOS		B			B			D			C	

### Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	44 (37%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	16.6
Intersection LOS:	B
Intersection Capacity Utilization:	86.7%
ICU Level of Service:	E
Analysis Period (min):	15

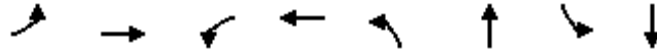
### Splits and Phases: 4: Holly Avenue & Derry Road



# Timings

## 4: Holly Avenue & Derry Road

07/19/2023

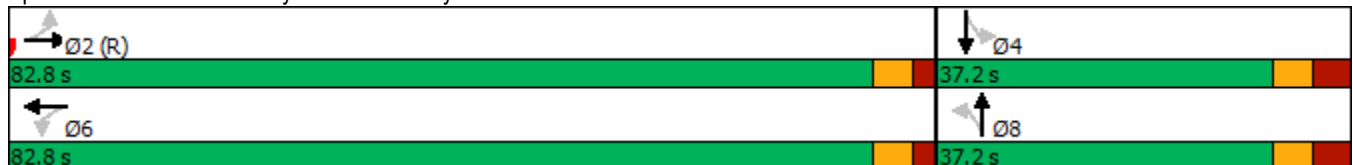


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↖↗	↖	↖↗	↖	↗	↖	↗
Traffic Volume (vph)	57	1132	147	1391	165	71	34	74
Future Volume (vph)	57	1132	147	1391	165	71	34	74
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.8	82.8	82.8	82.8	37.2	37.2	37.2	37.2
Total Split (%)	69.0%	69.0%	69.0%	69.0%	31.0%	31.0%	31.0%	31.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	-0.7	-0.7	-0.7	-0.7	-2.2	-2.2	-2.2	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	86.4	86.4	86.4	86.4	23.6	23.6	23.6	23.6
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.20	0.20	0.20	0.20
v/c Ratio	0.29	0.51	0.61	0.56	0.72	0.40	0.16	0.34
Control Delay	13.3	14.0	24.6	9.7	61.7	30.8	38.8	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	14.0	24.6	9.7	61.7	30.8	38.8	32.7
LOS	B	B	C	A	E	C	D	C
Approach Delay		14.0		11.0		47.1		34.0
Approach LOS		B		B		D		C

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 16.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 86.7%  
 ICU Level of Service E  
 Analysis Period (min) 15

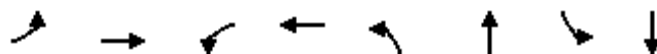
Splits and Phases: 4: Holly Avenue & Derry Road





Phasings  
4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.8	82.8	82.8	82.8	37.2	37.2	37.2	37.2
Total Split (%)	69.0%	69.0%	69.0%	69.0%	31.0%	31.0%	31.0%	31.0%
Maximum Green (s)	77.1	77.1	77.1	77.1	30.0	30.0	30.0	30.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0
90th %ile Green (s)	77.1	77.1	77.1	77.1	30.0	30.0	30.0	30.0
90th %ile Term Code	Coord	Coord	Coord	Coord	Max	Max	Hold	Hold
70th %ile Green (s)	82.1	82.1	82.1	82.1	25.0	25.0	25.0	25.0
70th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
50th %ile Green (s)	85.7	85.7	85.7	85.7	21.4	21.4	21.4	21.4
50th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
30th %ile Green (s)	89.2	89.2	89.2	89.2	17.9	17.9	17.9	17.9
30th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
10th %ile Green (s)	94.4	94.4	94.4	94.4	12.7	12.7	12.7	12.7
10th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold

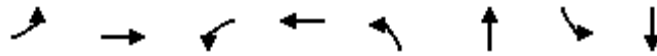
Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Control Type: Actuated-Coordinated

Queues

4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	1299	147	1443	165	148	34	125
v/c Ratio	0.29	0.51	0.61	0.56	0.72	0.40	0.16	0.34
Control Delay	13.3	14.0	24.6	9.7	61.7	30.8	38.8	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	14.0	24.6	9.7	61.7	30.8	38.8	32.7
Queue Length 50th (m)	6.9	138.5	15.3	73.6	36.7	21.1	6.7	19.6
Queue Length 95th (m)	m16.8	173.0	#59.6	116.4	55.8	36.9	14.5	33.7
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	196	2533	240	2591	313	493	288	495
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.51	0.61	0.56	0.53	0.30	0.12	0.25

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 4: Holly Avenue & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	57	1132	167	147	1391	52	165	71	77	34	74	51
Future Volume (vph)	57	1132	167	147	1391	52	165	71	77	34	74	51
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3507		1824	3596		1807	1718		1823	1772	
Flt Permitted	0.14	1.00		0.17	1.00		0.61	1.00		0.56	1.00	
Satd. Flow (perm)	273	3507		334	3596		1168	1718		1076	1772	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	1132	167	147	1391	52	165	71	77	34	74	51
RTOR Reduction (vph)	0	8	0	0	2	0	0	35	0	0	22	0
Lane Group Flow (vph)	57	1291	0	147	1441	0	165	113	0	34	103	0
Confl. Peds. (#/hr)			2	2					1	1		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.7	85.7		85.7	85.7		21.4	21.4		21.4	21.4	
Effective Green, g (s)	86.4	86.4		86.4	86.4		23.6	23.6		23.6	23.6	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	196	2525		240	2589		229	337		211	348	
v/s Ratio Prot		0.37			0.40			0.07			0.06	
v/s Ratio Perm	0.21			0.44			0.14			0.03		
v/c Ratio	0.29	0.51		0.61	0.56		0.72	0.33		0.16	0.29	
Uniform Delay, d1	5.9	7.4		8.4	7.9		45.1	41.4		40.0	41.1	
Progression Factor	1.20	1.65		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.8	0.6		3.2	0.1		10.6	0.6		0.4	0.5	
Delay (s)	9.9	12.8		11.7	8.0		55.7	42.0		40.3	41.6	
Level of Service	A	B		B	A		E	D		D	D	
Approach Delay (s)		12.7			8.3			49.3			41.3	
Approach LOS		B			A			D			D	

### Intersection Summary

HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	348	197	95	509	61	299	902	196	67	690	139
Future Volume (vph)	89	348	197	95	509	61	299	902	196	67	690	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00				0.99	1.00		
Frt		0.946			0.984				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3407	0	1772	3555	0	1789	3476	1570	1825	3476	1633
Flt Permitted	0.274			0.230			0.276			0.291		
Satd. Flow (perm)	511	3407	0	429	3555	0	520	3476	1549	559	3476	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		88			10				153			119
Link Speed (k/h)		50			50			70				70
Link Distance (m)		455.0			858.9			517.1				1530.3
Travel Time (s)		32.8			61.8			26.6				78.7
Confl. Peds. (#/hr)	1						1			1	1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Adj. Flow (vph)	89	348	197	95	509	61	299	902	196	67	690	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	545	0	95	570	0	299	902	196	67	690	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	11.9	45.0		13.9	47.0		23.6	48.5	48.5	22.6	47.5	47.5
Total Split (%)	9.2%	34.6%		10.7%	36.2%		18.2%	37.3%	37.3%	17.4%	36.5%	36.5%
Maximum Green (s)	7.9	38.0		9.9	40.0		19.6	41.5	41.5	18.6	40.5	40.5
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	37.9	23.2		39.9	26.8		68.5	55.6	55.6	57.1	42.9	42.9
Actuated g/C Ratio	0.34	0.21		0.36	0.24		0.62	0.50	0.50	0.52	0.39	0.39
v/c Ratio	0.30	0.70		0.32	0.66		0.53	0.52	0.23	0.17	0.51	0.20
Control Delay	26.3	38.7		26.5	41.7		14.5	21.8	6.0	11.6	29.0	7.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	38.7		26.5	41.7		14.5	21.8	6.0	11.6	29.0	7.3
LOS	C	D		C	D		B	C	A	B	C	A
Approach Delay		36.9			39.6			18.0			24.4	
Approach LOS		D			D			B			C	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	110.6
Natural Cycle:	85
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	26.9
Intersection LOS:	C
Intersection Capacity Utilization:	71.8%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Timings

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023

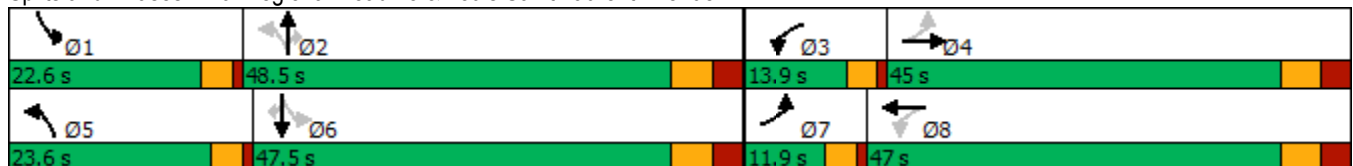


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↕	↘	↕	↘	↕	↗	↘	↕	↗
Traffic Volume (vph)	89	348	95	509	299	902	196	67	690	139
Future Volume (vph)	89	348	95	509	299	902	196	67	690	139
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	11.9	45.0	13.9	47.0	23.6	48.5	48.5	22.6	47.5	47.5
Total Split (%)	9.2%	34.6%	10.7%	36.2%	18.2%	37.3%	37.3%	17.4%	36.5%	36.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.0	-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0	1.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	37.9	23.2	39.9	26.8	68.5	55.6	55.6	57.1	42.9	42.9
Actuated g/C Ratio	0.34	0.21	0.36	0.24	0.62	0.50	0.50	0.52	0.39	0.39
v/c Ratio	0.30	0.70	0.32	0.66	0.53	0.52	0.23	0.17	0.51	0.20
Control Delay	26.3	38.7	26.5	41.7	14.5	21.8	6.0	11.6	29.0	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	38.7	26.5	41.7	14.5	21.8	6.0	11.6	29.0	7.3
LOS	C	D	C	D	B	C	A	B	C	A
Approach Delay		36.9		39.6		18.0			24.4	
Approach LOS		D		D		B			C	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 110.6  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 26.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 71.8%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Phasings

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	11.9	45.0	13.9	47.0	23.6	48.5	48.5	22.6	47.5	47.5
Total Split (%)	9.2%	34.6%	10.7%	36.2%	18.2%	37.3%	37.3%	17.4%	36.5%	36.5%
Maximum Green (s)	7.9	38.0	9.9	40.0	19.6	41.5	41.5	18.6	40.5	40.5
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2
Minimum Gap (s)	3.0	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0		7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0		16.0		18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0		0		0	0		0	0
90th %ile Green (s)	7.9	29.1	9.9	31.1	19.6	51.0	51.0	9.1	40.5	40.5
90th %ile Term Code	Max	Hold	Max	Gap	Max	Hold	Hold	Gap	MaxR	MaxR
70th %ile Green (s)	7.9	24.3	9.9	26.3	19.6	52.3	52.3	7.8	40.5	40.5
70th %ile Term Code	Max	Hold	Max	Gap	Max	Hold	Hold	Gap	MaxR	MaxR
50th %ile Green (s)	7.9	22.2	9.5	23.8	19.6	53.0	53.0	7.1	40.5	40.5
50th %ile Term Code	Max	Hold	Gap	Gap	Max	Hold	Hold	Gap	MaxR	MaxR
30th %ile Green (s)	7.9	21.1	8.2	21.4	17.2	51.2	51.2	6.5	40.5	40.5
30th %ile Term Code	Max	Hold	Gap	Gap	Gap	Hold	Hold	Gap	MaxR	MaxR
10th %ile Green (s)	0.0	11.2	6.5	21.7	12.6	57.1	57.1	0.0	40.5	40.5
10th %ile Term Code	Skip	Gap	Gap	Hold	Gap	Hold	Hold	Skip	MaxR	MaxR

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 110.6  
 Control Type: Actuated-Uncoordinated  
 90th %ile Actuated Cycle: 121.1  
 70th %ile Actuated Cycle: 116.3  
 50th %ile Actuated Cycle: 113.8  
 30th %ile Actuated Cycle: 109  
 10th %ile Actuated Cycle: 92.8

Queues

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	89	545	95	570	299	902	196	67	690	139
v/c Ratio	0.30	0.70	0.32	0.66	0.53	0.52	0.23	0.17	0.51	0.20
Control Delay	26.3	38.7	26.5	41.7	14.5	21.8	6.0	11.6	29.0	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	38.7	26.5	41.7	14.5	21.8	6.0	11.6	29.0	7.3
Queue Length 50th (m)	13.1	49.8	14.0	60.7	28.6	71.5	4.9	5.5	62.4	2.8
Queue Length 95th (m)	24.1	68.1	25.2	79.0	50.4	104.4	19.7	12.9	88.3	16.7
Internal Link Dist (m)		431.0		834.9		493.1			1506.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	301	1298	313	1367	583	1746	854	590	1347	705
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.42	0.30	0.42	0.51	0.52	0.23	0.11	0.51	0.20

Intersection Summary



# HCM Signalized Intersection Capacity Analysis

## 6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	348	197	95	509	61	299	902	196	67	690	139
Future Volume (vph)	89	348	197	95	509	61	299	902	196	67	690	139
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1772	3406		1772	3555		1789	3476	1549	1825	3476	1633
Flt Permitted	0.27	1.00		0.23	1.00		0.28	1.00	1.00	0.29	1.00	1.00
Satd. Flow (perm)	511	3406		429	3555		520	3476	1549	559	3476	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	348	197	95	509	61	299	902	196	67	690	139
RTOR Reduction (vph)	0	69	0	0	8	0	0	0	77	0	0	73
Lane Group Flow (vph)	89	476	0	95	562	0	299	902	119	67	690	66
Confl. Peds. (#/hr)	1						1		1	1		
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	28.2	22.1		33.6	24.8		63.4	53.6	53.6	47.6	41.8	41.8
Effective Green, g (s)	34.2	24.1		37.9	26.8		66.4	55.6	55.6	53.6	43.8	43.8
Actuated g/C Ratio	0.30	0.21		0.34	0.24		0.59	0.50	0.50	0.48	0.39	0.39
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	257	730		285	848		540	1720	766	366	1355	636
v/s Ratio Prot	c0.03	0.14		c0.03	c0.16		c0.10	c0.26		0.01	0.20	
v/s Ratio Perm	0.08			0.08			0.23		0.08	0.07		0.04
v/c Ratio	0.35	0.65		0.33	0.66		0.55	0.52	0.16	0.18	0.51	0.10
Uniform Delay, d1	29.0	40.3		26.9	38.7		12.6	19.3	15.5	16.0	26.1	21.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.6		0.7	2.0		1.2	1.1	0.4	0.2	1.4	0.3
Delay (s)	29.8	41.9		27.5	40.6		13.8	20.5	15.9	16.2	27.4	22.1
Level of Service	C	D		C	D		B	C	B	B	C	C
Approach Delay (s)		40.2			38.8			18.4			25.8	
Approach LOS		D			D			B			C	

Intersection Summary		
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.56	
Actuated Cycle Length (s)	112.3	Sum of lost time (s) 12.0
Intersection Capacity Utilization	71.8%	ICU Level of Service C
Analysis Period (min)	15	

c Critical Lane Group

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

Future Total 2022 Conditions - No Growth  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	145	59	75	156	91	39	1020	51	71	645	47
Future Volume (vph)	66	145	59	75	156	91	39	1020	51	71	645	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.957			0.945			0.993				0.990
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1826	0	1738	1744	0	1825	3482	0	1738	3392	0
Flt Permitted	0.385			0.480			0.389			0.203		
Satd. Flow (perm)	725	1826	0	878	1744	0	747	3482	0	371	3392	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			34			7			14	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Adj. Flow (vph)	66	145	59	75	156	91	39	1020	51	71	645	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	204	0	75	247	0	39	1071	0	71	692	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	

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

Future Total 2022 Conditions - No Growth  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		5.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		9.7	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		47.2	47.2		9.8	57.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		52.4%	52.4%		10.9%	63.3%	
Maximum Green (s)	26.0	26.0		26.0	26.0		41.2	41.2		5.1	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.7	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-3.7	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lead/Lag							Lag	Lag	Lead			
Lead-Lag Optimize?							Yes	Yes	Yes			
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	17.8	17.8		17.8	17.8		52.9	52.9		66.2	62.2	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.59	0.59		0.74	0.69	
v/c Ratio	0.46	0.54		0.43	0.66		0.09	0.52		0.17	0.29	
Control Delay	41.1	32.8		38.1	36.8		11.8	13.8		5.1	6.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.1	32.8		38.1	36.8		11.8	13.8		5.1	6.2	
LOS	D	C		D	D		B	B		A	A	
Approach Delay	34.9				37.1		13.7				6.1	
Approach LOS	C				D		B				A	

Intersection Summary

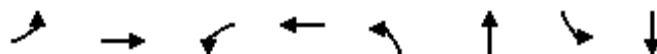
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 39 (43%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 16.7      Intersection LOS: B  
 Intersection Capacity Utilization 71.9%      ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



Queues  
1: Ontario Street & Laurier Road























Future Total 2022 Conditions - No Growth  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	204	75	247	39	1071	71	692
v/c Ratio	0.46	0.54	0.43	0.66	0.09	0.52	0.17	0.29
Control Delay	41.1	32.8	38.1	36.8	11.8	13.8	5.1	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	32.8	38.1	36.8	11.8	13.8	5.1	6.2
Queue Length 50th (m)	10.2	28.1	11.5	34.3	2.9	56.0	2.8	20.3
Queue Length 95th (m)	21.1	44.6	22.7	53.3	9.3	90.5	8.0	35.9
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	225	584	273	566	438	2049	429	2347
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.35	0.27	0.44	0.09	0.52	0.17	0.29
Intersection Summary								





























HCM Signalized Intersection Capacity Analysis  
1: Ontario Street & Laurier Road

Future Total 2022 Conditions - No Growth  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	145	59	75	156	91	39	1020	51	71	645	47
Future Volume (vph)	66	145	59	75	156	91	39	1020	51	71	645	47
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.94		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1825		1738	1743		1825	3481		1738	3392	
Flt Permitted	0.39	1.00		0.48	1.00		0.39	1.00		0.20	1.00	
Satd. Flow (perm)	725	1825		879	1743		746	3481		372	3392	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	145	59	75	156	91	39	1020	51	71	645	47
RTOR Reduction (vph)	0	19	0	0	27	0	0	3	0	0	4	0
Lane Group Flow (vph)	66	185	0	75	220	0	39	1068	0	71	688	0
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.8	15.8		15.8	15.8		51.0	51.0		61.2	61.2	
Effective Green, g (s)	17.8	17.8		17.8	17.8		52.0	52.0		64.9	62.2	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.58	0.58		0.72	0.69	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		4.7	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	143	360		173	344		431	2011		407	2344	
v/s Ratio Prot		0.10			c0.13			c0.31		0.02	c0.20	
v/s Ratio Perm	0.09			0.09			0.05			0.11		
v/c Ratio	0.46	0.51		0.43	0.64		0.09	0.53		0.17	0.29	
Uniform Delay, d1	31.9	32.2		31.7	33.1		8.5	11.6		4.8	5.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.5		0.6	2.9		0.4	1.0		0.2	0.3	
Delay (s)	32.7	32.7		32.3	36.0		8.9	12.6		5.0	5.7	
Level of Service	C	C		C	D		A	B		A	A	
Approach Delay (s)		32.7			35.1			12.5			5.6	
Approach LOS		C			D			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			15.5				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				11.0	
Intersection Capacity Utilization			71.9%				ICU Level of Service				C	
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions - No Growth  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	281	1257	198	285	607	181	152	585	201	156	490	127
Future Volume (vph)	281	1257	198	285	607	181	152	585	201	156	490	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.969	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3579	1570	1690	3476	1555	1789	3380	1570	1690	3164	0
Flt Permitted	0.362			0.085			0.214			0.298		
Satd. Flow (perm)	669	3579	1570	151	3476	1555	403	3380	1570	530	3164	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			179			201			27
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		622.6			218.7			223.1			235.1	
Travel Time (s)		37.4			13.1			16.1			16.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Adj. Flow (vph)	281	1257	198	285	607	181	152	585	201	156	490	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	281	1257	198	285	607	181	152	585	201	156	617	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

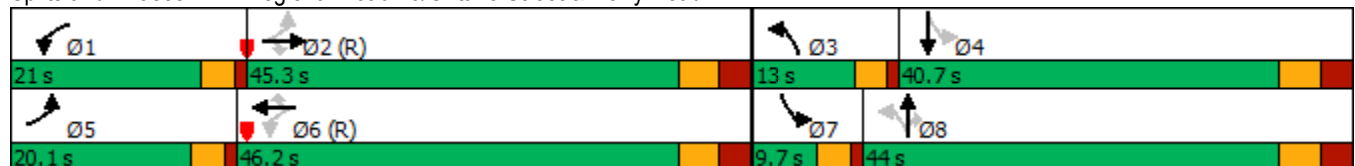
Future Total 2022 Conditions - No Growth  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
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	5.0
Minimum Split (s)	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7
Total Split (s)	20.1	45.3	45.3	21.0	46.2	46.2	13.0	44.0	44.0	9.7	40.7	40.7
Total Split (%)	16.8%	37.8%	37.8%	17.5%	38.5%	38.5%	10.8%	36.7%	36.7%	8.1%	33.9%	33.9%
Maximum Green (s)	16.1	38.6	38.6	17.0	39.5	39.5	9.0	37.3	37.3	5.7	34.0	34.0
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	66.2	45.0	45.0	71.0	48.9	48.9	47.0	33.3	33.3	42.8	30.1	30.1
Actuated g/C Ratio	0.55	0.38	0.38	0.59	0.41	0.41	0.39	0.28	0.28	0.36	0.25	0.25
v/c Ratio	0.54	0.94	0.30	0.80	0.43	0.24	0.52	0.62	0.35	0.57	0.76	0.76
Control Delay	17.0	50.9	14.7	41.4	32.0	9.0	29.8	40.5	5.8	32.8	45.8	45.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	50.9	14.7	41.4	32.0	9.0	29.8	40.5	5.8	32.8	45.8	45.8
LOS	B	D	B	D	C	A	C	D	A	C	D	D
Approach Delay		41.3			30.6			31.3			43.2	
Approach LOS		D			C			C			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 37.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 91.6%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Queues  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions - No Growth  
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	281	1257	198	285	607	181	152	585	201	156	617
v/c Ratio	0.54	0.94	0.30	0.80	0.43	0.24	0.52	0.62	0.35	0.57	0.76
Control Delay	17.0	50.9	14.7	41.4	32.0	9.0	29.8	40.5	5.8	32.8	45.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	50.9	14.7	41.4	32.0	9.0	29.8	40.5	5.8	32.8	45.8
Queue Length 50th (m)	30.6	~166.4	15.1	48.8	61.3	6.2	23.4	63.2	0.0	24.2	67.9
Queue Length 95th (m)	51.4	#210.6	34.1	#96.5	84.6	23.4	35.4	76.6	16.0	36.6	83.2
Internal Link Dist (m)		598.6			194.7			199.1			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	555	1342	655	367	1415	739	296	1098	645	272	960
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.94	0.30	0.78	0.43	0.24	0.51	0.53	0.31	0.57	0.64

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.



HCM Signalized Intersection Capacity Analysis  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions - No Growth  
AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	281	1257	198	285	607	181	152	585	201	156	490	127	
Future Volume (vph)	281	1257	198	285	607	181	152	585	201	156	490	127	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1755	3579	1570	1690	3476	1555	1789	3380	1570	1690	3164		
Flt Permitted	0.36	1.00	1.00	0.08	1.00	1.00	0.21	1.00	1.00	0.30	1.00		
Satd. Flow (perm)	669	3579	1570	150	3476	1555	404	3380	1570	531	3164		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	281	1257	198	285	607	181	152	585	201	156	490	127	
RTOR Reduction (vph)	0	0	66	0	0	106	0	0	145	0	20	0	
Lane Group Flow (vph)	281	1257	132	285	607	75	152	585	56	156	597	0	
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases	2		2	6		6	8		8	4			
Actuated Green, G (s)	57.5	43.3	43.3	65.1	47.1	47.1	40.5	31.6	31.6	34.1	28.4		
Effective Green, g (s)	63.5	45.0	45.0	68.3	48.8	48.8	44.3	33.3	33.3	40.1	30.1		
Actuated g/C Ratio	0.53	0.38	0.38	0.57	0.41	0.41	0.37	0.28	0.28	0.33	0.25		
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7		
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	509	1342	588	354	1413	632	286	937	435	261	793		
v/s Ratio Prot	0.08	c0.35		c0.14	0.17		c0.05	0.17		c0.04	c0.19		
v/s Ratio Perm	0.21		0.08	0.32		0.05	0.14		0.04	0.16			
v/c Ratio	0.55	0.94	0.22	0.81	0.43	0.12	0.53	0.62	0.13	0.60	0.75		
Uniform Delay, d1	16.1	36.1	25.6	33.9	25.6	22.2	27.4	37.9	32.5	29.8	41.5		
Progression Factor	1.00	1.00	1.00	0.85	1.14	1.96	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	1.3	13.5	0.9	11.8	0.9	0.4	1.9	1.3	0.1	3.7	4.1		
Delay (s)	17.4	49.6	26.5	40.8	30.2	43.9	29.3	39.2	32.6	33.5	45.6		
Level of Service	B	D	C	D	C	D	C	D	C	C	D		
Approach Delay (s)		41.8			35.3			36.2			43.1		
Approach LOS		D			D			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			39.3									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.80										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	12.0
Intersection Capacity Utilization			91.6%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													



















Lanes, Volumes, Timings  
3: East Site Access/Site Access & Derry Road

Future Total 2022 Conditions - No Growth  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1570	24	14	1177	16	39	0	71	18	0	4
Future Volume (vph)	20	1570	24	14	1177	16	39	0	71	18	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.998			0.913			0.975	
Flt Protected	0.950			0.950				0.983			0.961	
Satd. Flow (prot)	1643	3184	0	1610	3095	0	0	1521	0	0	1544	0
Flt Permitted	0.950			0.950				0.983			0.961	
Satd. Flow (perm)	1643	3184	0	1610	3095	0	0	1521	0	0	1544	0
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		218.7			493.3			109.4			86.5	
Travel Time (s)		13.1			29.6			7.9			6.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	0%	2%	6%	0%	2%	2%	2%	6%	0%	0%
Adj. Flow (vph)	20	1570	24	14	1177	16	39	0	71	18	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	1594	0	14	1193	0	0	110	0	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane					Yes							
Headway Factor	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
<b>Intersection Summary</b>												
Area Type:	CBD											
Control Type:	Unsignalized											
Intersection Capacity Utilization	62.6%						ICU Level of Service B					
Analysis Period (min)	15											





















HCM Unsignalized Intersection Capacity Analysis  
3: East Site Access/Site Access & Derry Road

Future Total 2022 Conditions - No Growth  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1570	24	14	1177	16	39	0	71	18	0	4
Future Volume (Veh/h)	20	1570	24	14	1177	16	39	0	71	18	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	1570	24	14	1177	16	39	0	71	18	0	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (m)		219										
pX, platoon unblocked				0.65			0.65	0.65	0.65	0.65	0.65	
vC, conflicting volume	1193			1594			2242	2843	797	2109	2847	596
vC1, stage 1 conf vol							1622	1622		1213	1213	
vC2, stage 2 conf vol							620	1221		896	1634	
vCu, unblocked vol	1193			846			1840	2760	0	1635	2766	596
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.6	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	97			97			77	100	90	89	100	99
cM capacity (veh/h)	592			513			169	150	708	169	152	451
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	20	1047	547	14	785	408	110	22				
Volume Left	20	0	0	14	0	0	39	18				
Volume Right	0	0	24	0	0	16	71	4				
cSH	592	1700	1700	513	1700	1700	332	191				
Volume to Capacity	0.03	0.62	0.32	0.03	0.46	0.24	0.33	0.12				
Queue Length 95th (m)	0.8	0.0	0.0	0.6	0.0	0.0	10.7	2.9				
Control Delay (s)	11.3	0.0	0.0	12.2	0.0	0.0	21.1	26.3				
Lane LOS	B			B			C	D				
Approach Delay (s)	0.1			0.1			21.1	26.3				
Approach LOS							C	D				
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			62.6%		ICU Level of Service			B				
Analysis Period (min)			15									

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions - No Growth  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1495	108	55	969	21	161	34	133	42	35	77
Future Volume (vph)	56	1495	108	55	969	21	161	34	133	42	35	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.997			0.881			0.897	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1644	3511	0	1738	3434	0	1807	1572	0	1738	1655	0
Flt Permitted	0.262			0.113			0.641			0.510		
Satd. Flow (perm)	453	3511	0	207	3434	0	1219	1572	0	933	1655	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			4			49			77	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Adj. Flow (vph)	56	1495	108	55	969	21	161	34	133	42	35	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	1603	0	55	990	0	161	167	0	42	112	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions - No Growth  
AM Peak Hour

	↗		→		↘		↖		←		↗		↖		↑		↘		↓		↖	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR										
Permitted Phases	2			6			8			4												
Detector Phase	2	2		6	6		8	8		4	4											
Switch Phase																						
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0											
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2											
Total Split (s)	82.5	82.5		82.5	82.5		37.5	37.5		37.5	37.5											
Total Split (%)	68.8%	68.8%		68.8%	68.8%		31.3%	31.3%		31.3%	31.3%											
Maximum Green (s)	76.8	76.8		76.8	76.8		30.3	30.3		30.3	30.3											
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7											
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5											
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2											
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0											
Lead/Lag																						
Lead-Lag Optimize?																						
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0											
Recall Mode	C-Max	C-Max		None	None		None	None		None	None											
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0											
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0											
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0											
Act Effct Green (s)	87.2	87.2		87.2	87.2		22.8	22.8		22.8	22.8											
Actuated g/C Ratio	0.73	0.73		0.73	0.73		0.19	0.19		0.19	0.19											
v/c Ratio	0.17	0.63		0.37	0.40		0.70	0.50		0.24	0.30											
Control Delay	2.2	3.9		16.7	7.5		60.4	34.1		41.9	16.2											
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0											
Total Delay	2.2	3.9		16.7	7.5		60.4	34.1		41.9	16.2											
LOS	A	A		B	A		E	C		D	B											
Approach Delay		3.8			8.0			47.0			23.2											
Approach LOS		A			A			D			C											

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 10.6  
 Intersection Capacity Utilization 77.4%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service D

Splits and Phases: 4: Holly Avenue & Derry Road



Queues  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions - No Growth  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	1603	55	990	161	167	42	112
v/c Ratio	0.17	0.63	0.37	0.40	0.70	0.50	0.24	0.30
Control Delay	2.2	3.9	16.7	7.5	60.4	34.1	41.9	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.2	3.9	16.7	7.5	60.4	34.1	41.9	16.2
Queue Length 50th (m)	0.8	12.3	4.2	41.0	35.8	24.8	8.5	6.9
Queue Length 95th (m)	m1.4	m23.0	17.6	67.6	54.3	42.1	17.4	20.3
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	329	2555	150	2497	330	461	252	504
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.63	0.37	0.40	0.49	0.36	0.17	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.












HCM Signalized Intersection Capacity Analysis  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions - No Growth  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1495	108	55	969	21	161	34	133	42	35	77
Future Volume (vph)	56	1495	108	55	969	21	161	34	133	42	35	77
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1644	3510		1738	3433		1807	1571		1738	1655	
Flt Permitted	0.26	1.00		0.11	1.00		0.64	1.00		0.51	1.00	
Satd. Flow (perm)	453	3510		207	3433		1220	1571		934	1655	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	1495	108	55	969	21	161	34	133	42	35	77
RTOR Reduction (vph)	0	3	0	0	1	0	0	40	0	0	62	0
Lane Group Flow (vph)	56	1600	0	55	989	0	161	127	0	42	50	0
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	86.5	86.5		86.5	86.5		20.6	20.6		20.6	20.6	
Effective Green, g (s)	87.2	87.2		87.2	87.2		22.8	22.8		22.8	22.8	
Actuated g/C Ratio	0.73	0.73		0.73	0.73		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	329	2550		150	2494		231	298		177	314	
v/s Ratio Prot		c0.46			0.29			0.08			0.03	
v/s Ratio Perm	0.12			0.27			c0.13			0.04		
v/c Ratio	0.17	0.63		0.37	0.40		0.70	0.43		0.24	0.16	
Uniform Delay, d1	5.1	8.2		6.1	6.3		45.4	42.8		41.2	40.6	
Progression Factor	0.22	0.34		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.7		0.6	0.0		8.8	1.0		0.7	0.2	
Delay (s)	1.8	3.5		6.7	6.3		54.2	43.8		41.9	40.8	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		3.5			6.4			48.9			41.1	
Approach LOS		A			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			10.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			77.4%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
5: Regional Road 25 & West Site Access










Future Total 2022 Conditions - No Growth  
AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	62	876	16	0	973
Future Volume (vph)	0	62	876	16	0	973
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Fr <sub>t</sub>		0.865	0.997			
Fl <sub>t</sub> Protected						
Satd. Flow (prot)	0	1629	3568	0	0	3579
Fl <sub>t</sub> Permitted						
Satd. Flow (perm)	0	1629	3568	0	0	3579
Link Speed (k/h)	50		50			70
Link Distance (m)	173.8		1307.3			223.1
Travel Time (s)	12.5		94.1			11.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	62	876	16	0	973
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	62	892	0	0	973
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	35.2%		ICU Level of Service A			
Analysis Period (min)	15					

























HCM Unsignalized Intersection Capacity Analysis  
5: Regional Road 25 & West Site Access

Future Total 2022 Conditions - No Growth  
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	62	876	16	0	973
Future Volume (Veh/h)	0	62	876	16	0	973
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	62	876	16	0	973
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	223					
pX, platoon unblocked	0.86					
vC, conflicting volume	1370	446				892
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1096	446				892
tC, single (s)	6.8	6.9				4.1
tC, 2 stage (s)						
tF (s)	3.5	3.3				2.2
p0 queue free %	100	89				100
cM capacity (veh/h)	178	560				756
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	62	584	308	486	486	
Volume Left	0	0	0	0	0	
Volume Right	62	0	16	0	0	
cSH	560	1700	1700	1700	1700	
Volume to Capacity	0.11	0.34	0.18	0.29	0.29	
Queue Length 95th (m)	2.8	0.0	0.0	0.0	0.0	
Control Delay (s)	12.2	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	12.2	0.0				0.0
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization			35.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions - No Growth  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	452	483	150	334	83	155	634	138	50	754	100
Future Volume (vph)	130	452	483	150	334	83	155	634	138	50	754	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.923			0.970				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1659	3270	0	1722	3431	0	1674	3411	1541	1755	3380	1471
Flt Permitted	0.391			0.131			0.235			0.373		
Satd. Flow (perm)	683	3270	0	237	3431	0	414	3411	1541	689	3380	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		234			25				138			168
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1307.3	
Travel Time (s)		32.8			61.8			26.6			67.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Adj. Flow (vph)	130	452	483	150	334	83	155	634	138	50	754	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	935	0	150	417	0	155	634	138	50	754	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

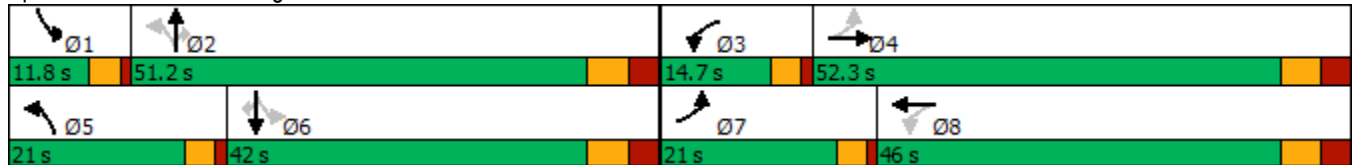
Future Total 2022 Conditions - No Growth  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	21.0	52.3		14.7	46.0		21.0	51.2	51.2	11.8	42.0	42.0
Total Split (%)	16.2%	40.2%		11.3%	35.4%		16.2%	39.4%	39.4%	9.1%	32.3%	32.3%
Maximum Green (s)	17.0	45.3		10.7	39.0		17.0	44.2	44.2	7.8	35.0	35.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-0.2	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	6.8	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	47.7	30.4		46.5	29.5		60.0	47.3	45.5	54.9	40.9	40.9
Actuated g/C Ratio	0.43	0.28		0.42	0.27		0.54	0.43	0.41	0.50	0.37	0.37
v/c Ratio	0.31	0.87		0.55	0.45		0.40	0.43	0.19	0.11	0.60	0.15
Control Delay	20.9	38.3		28.2	33.3		17.7	25.6	5.1	15.1	32.7	0.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	38.3		28.2	33.3		17.7	25.6	5.1	15.1	32.7	0.6
LOS	C	D		C	C		B	C	A	B	C	A
Approach Delay		36.2			31.9			21.2			28.1	
Approach LOS		D			C			C			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 110.4  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 29.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 80.8%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions - No Growth  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	935	150	417	155	634	138	50	754	100
v/c Ratio	0.31	0.87	0.55	0.45	0.40	0.43	0.19	0.11	0.60	0.15
Control Delay	20.9	38.3	28.2	33.3	17.7	25.6	5.1	15.1	32.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	38.3	28.2	33.3	17.7	25.6	5.1	15.1	32.7	0.6
Queue Length 50th (m)	17.0	80.5	19.8	37.5	16.4	52.3	0.0	5.0	69.1	0.0
Queue Length 95th (m)	29.0	106.1	34.9	54.2	33.8	81.0	13.2	13.0	110.4	0.2
Internal Link Dist (m)		431.0		834.9		493.1			1283.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	478	1552	287	1306	456	1462	716	454	1251	650
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.60	0.52	0.32	0.34	0.43	0.19	0.11	0.60	0.15
Intersection Summary										























HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions - No Growth  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	452	483	150	334	83	155	634	138	50	754	100
Future Volume (vph)	130	452	483	150	334	83	155	634	138	50	754	100
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	6.8	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1659	3268		1722	3431		1674	3411	1541	1755	3380	1471
Flt Permitted	0.39	1.00		0.13	1.00		0.24	1.00	1.00	0.37	1.00	1.00
Satd. Flow (perm)	683	3268		238	3431		415	3411	1541	688	3380	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	452	483	150	334	83	155	634	138	50	754	100
RTOR Reduction (vph)	0	170	0	0	18	0	0	0	81	0	0	62
Lane Group Flow (vph)	130	765	0	150	399	0	155	634	57	50	754	38
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	39.2	28.4		37.4	27.5		54.8	45.3	45.3	45.3	39.8	39.8
Effective Green, g (s)	45.2	30.4		43.4	29.5		57.8	47.3	45.5	51.3	41.8	41.8
Actuated g/C Ratio	0.41	0.27		0.39	0.27		0.52	0.43	0.41	0.46	0.38	0.38
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	399	894		265	911		374	1452	631	399	1271	553
v/s Ratio Prot	c0.04	c0.23		c0.07	0.12		c0.05	0.19		0.01	c0.22	
v/s Ratio Perm	0.09			0.16			0.16		0.04	0.05		0.03
v/c Ratio	0.33	0.86		0.57	0.44		0.41	0.44	0.09	0.13	0.59	0.07
Uniform Delay, d1	21.5	38.3		25.7	33.9		15.5	22.5	20.1	16.6	27.8	22.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	7.8		2.8	0.3		0.7	1.0	0.3	0.1	2.0	0.2
Delay (s)	22.0	46.1		28.4	34.2		16.3	23.5	20.4	16.8	29.9	22.4
Level of Service	C	D		C	C		B	C	C	B	C	C
Approach Delay (s)		43.1			32.7			21.8			28.3	
Approach LOS		D			C			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			111.1				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			80.8%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

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

Future Total 2022 Conditions - No Growth  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	165	39	103	198	105	58	865	87	129	951	87
Future Volume (vph)	67	165	39	103	198	105	58	865	87	129	951	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.971			0.948			0.986			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1865	0	1807	1791	0	1825	3504	0	1789	3501	0
Flt Permitted	0.288			0.485			0.240			0.269		
Satd. Flow (perm)	542	1865	0	923	1791	0	461	3504	0	507	3501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			27			20			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Adj. Flow (vph)	67	165	39	103	198	105	58	865	87	129	951	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	204	0	103	303	0	58	952	0	129	1038	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

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

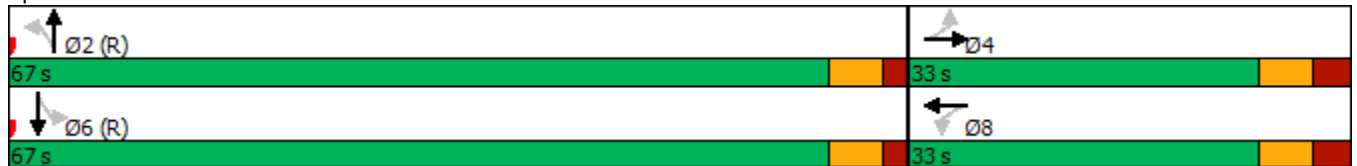
Future Total 2022 Conditions - No Growth  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		67.0	67.0		67.0	67.0	
Total Split (%)	33.0%	33.0%		33.0%	33.0%		67.0%	67.0%		67.0%	67.0%	
Maximum Green (s)	26.0	26.0		26.0	26.0		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	21.7	21.7		21.7	21.7		68.3	68.3		68.3	68.3	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.68	0.68		0.68	0.68	
v/c Ratio	0.57	0.49		0.52	0.74		0.18	0.40		0.37	0.43	
Control Delay	53.2	35.4		42.7	43.9		9.0	7.9		11.9	8.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	53.2	35.4		42.7	43.9		9.0	7.9		11.9	8.3	
LOS	D	D		D	D		A	A		B	A	
Approach Delay		39.8			43.6			8.0			8.7	
Approach LOS		D			D			A			A	

Intersection Summary

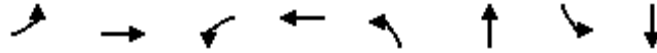
Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 16.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 83.4%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



Queues  
1: Ontario Street & Laurier Road

Future Total 2022 Conditions - No Growth  
PM Peak Hour

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	204	103	303	58	952	129	1038
v/c Ratio	0.57	0.49	0.52	0.74	0.18	0.40	0.37	0.43
Control Delay	53.2	35.4	42.7	43.9	9.0	7.9	11.9	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.2	35.4	42.7	43.9	9.0	7.9	11.9	8.3
Queue Length 50th (m)	11.6	32.6	17.6	50.1	3.7	36.7	9.5	41.7
Queue Length 95th (m)	24.6	49.8	31.8	72.9	11.0	58.1	25.7	65.4
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	151	530	258	520	314	2400	346	2397
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.38	0.40	0.58	0.18	0.40	0.37	0.43
<b>Intersection Summary</b>								































HCM Signalized Intersection Capacity Analysis  
1: Ontario Street & Laurier Road

Future Total 2022 Conditions - No Growth  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	165	39	103	198	105	58	865	87	129	951	87
Future Volume (vph)	67	165	39	103	198	105	58	865	87	129	951	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1866		1807	1791		1825	3505		1789	3502	
Flt Permitted	0.29	1.00		0.48	1.00		0.24	1.00		0.27	1.00	
Satd. Flow (perm)	542	1866		922	1791		462	3505		506	3502	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	165	39	103	198	105	58	865	87	129	951	87
RTOR Reduction (vph)	0	9	0	0	21	0	0	6	0	0	6	0
Lane Group Flow (vph)	67	195	0	103	282	0	58	946	0	129	1032	0
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.7	19.7		19.7	19.7		67.3	67.3		67.3	67.3	
Effective Green, g (s)	21.7	21.7		21.7	21.7		68.3	68.3		68.3	68.3	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.68	0.68		0.68	0.68	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	117	404		200	388		315	2393		345	2391	
v/s Ratio Prot		0.10			c0.16			0.27			c0.29	
v/s Ratio Perm	0.12			0.11			0.13			0.25		
v/c Ratio	0.57	0.48		0.52	0.73		0.18	0.40		0.37	0.43	
Uniform Delay, d1	35.0	34.2		34.5	36.4		5.7	6.9		6.7	7.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.2	0.3		0.9	5.7		1.3	0.5		3.1	0.6	
Delay (s)	39.2	34.6		35.4	42.0		7.0	7.4		9.8	7.7	
Level of Service	D	C		D	D		A	A		A	A	
Approach Delay (s)		35.7			40.4			7.4			7.9	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			15.0				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			83.4%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions - No Growth  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	285	915	120	185	979	208	188	643	153	237	518	213
Future Volume (vph)	285	915	120	185	979	208	188	643	153	237	518	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.956	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3614	1617	1807	3614	1633	1789	3476	1498	1807	3351	0
Flt Permitted	0.104			0.191			0.168			0.253		
Satd. Flow (perm)	194	3614	1617	363	3614	1633	316	3476	1498	481	3351	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			125			153			56
Link Speed (k/h)		60			60			50				50
Link Distance (m)		622.6			218.7			217.4				235.1
Travel Time (s)		37.4			13.1			15.7				16.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Adj. Flow (vph)	285	915	120	185	979	208	188	643	153	237	518	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	915	120	185	979	208	188	643	153	237	731	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7		4

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

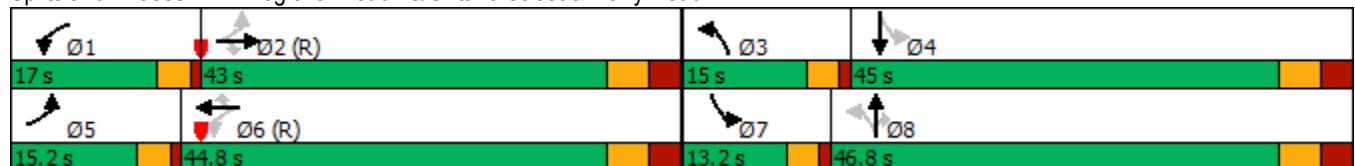
Future Total 2022 Conditions - No Growth  
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
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	5.0
Minimum Split (s)	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7
Total Split (s)	15.2	43.0	43.0	17.0	44.8	44.8	15.0	46.8	46.8	13.2	45.0	
Total Split (%)	12.7%	35.8%	35.8%	14.2%	37.3%	37.3%	12.5%	39.0%	39.0%	11.0%	37.5%	
Maximum Green (s)	11.2	36.3	36.3	13.0	38.1	38.1	11.0	40.1	40.1	9.2	38.3	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	65.3	46.5	46.5	59.3	40.9	40.9	51.9	34.7	34.7	49.4	33.2	
Actuated g/C Ratio	0.54	0.39	0.39	0.49	0.34	0.34	0.43	0.29	0.29	0.41	0.28	
v/c Ratio	0.77	0.65	0.17	0.52	0.80	0.33	0.62	0.64	0.28	0.71	0.76	
Control Delay	42.3	34.5	7.7	16.8	39.9	11.8	29.7	39.7	5.7	34.3	41.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.3	34.5	7.7	16.8	39.9	11.8	29.7	39.7	5.7	34.3	41.5	
LOS	D	C	A	B	D	B	C	D	A	C	D	
Approach Delay		33.7			32.5			32.5			39.8	
Approach LOS		C			C			C			D	

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  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 34.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 89.4%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Queues  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions - No Growth  
PM Peak Hour



























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	285	915	120	185	979	208	188	643	153	237	731
v/c Ratio	0.77	0.65	0.17	0.52	0.80	0.33	0.62	0.64	0.28	0.71	0.76
Control Delay	42.3	34.5	7.7	16.8	39.9	11.8	29.7	39.7	5.7	34.3	41.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	34.5	7.7	16.8	39.9	11.8	29.7	39.7	5.7	34.3	41.5
Queue Length 50th (m)	44.9	93.2	2.1	24.8	114.4	16.9	27.4	69.2	0.0	35.6	77.0
Queue Length 95th (m)	#108.3	128.2	15.5	34.0	139.4	36.2	38.7	81.2	13.8	48.3	91.0
Internal Link Dist (m)		598.6			194.7			193.4			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	371	1399	691	381	1230	638	308	1210	621	332	1154
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.65	0.17	0.49	0.80	0.33	0.61	0.53	0.25	0.71	0.63

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions - No Growth  
PM Peak Hour




















													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	285	915	120	185	979	208	188	643	153	237	518	213	
Future Volume (vph)	285	915	120	185	979	208	188	643	153	237	518	213	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1772	3614	1617	1807	3614	1633	1789	3476	1498	1807	3352		
Flt Permitted	0.10	1.00	1.00	0.19	1.00	1.00	0.17	1.00	1.00	0.25	1.00		
Satd. Flow (perm)	194	3614	1617	364	3614	1633	315	3476	1498	480	3352		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	285	915	120	185	979	208	188	643	153	237	518	213	
RTOR Reduction (vph)	0	0	65	0	0	83	0	0	109	0	41	0	
Lane Group Flow (vph)	285	915	55	185	979	126	188	643	44	237	690	0	
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases	2		2	6		6	8		8	4			
Actuated Green, G (s)	60.3	44.7	44.7	50.7	39.1	39.1	43.9	33.1	33.1	40.7	31.5		
Effective Green, g (s)	63.3	46.4	46.4	56.7	40.8	40.8	49.3	34.8	34.8	46.7	33.2		
Actuated g/C Ratio	0.53	0.39	0.39	0.47	0.34	0.34	0.41	0.29	0.29	0.39	0.28		
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7		
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	367	1397	625	347	1228	555	298	1008	434	321	927		
v/s Ratio Prot	c0.13	0.25		0.06	c0.27		c0.07	0.18		c0.07	0.21		
v/s Ratio Perm	0.28		0.03	0.19		0.08	0.19		0.03	c0.21			
v/c Ratio	0.78	0.65	0.09	0.53	0.80	0.23	0.63	0.64	0.10	0.74	0.74		
Uniform Delay, d1	29.7	30.2	23.4	20.2	35.9	28.3	25.5	37.1	31.2	26.8	39.5		
Progression Factor	1.00	1.00	1.00	0.79	0.96	0.87	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	9.9	2.4	0.3	1.4	4.9	0.8	4.3	1.3	0.1	8.6	3.3		
Delay (s)	39.6	32.6	23.6	17.3	39.3	25.4	29.8	38.4	31.3	35.4	42.8		
Level of Service	D	C	C	B	D	C	C	D	C	D	D		
Approach Delay (s)		33.3			34.2			35.7			41.0		
Approach LOS		C			C			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			35.7									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.75										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	12.0
Intersection Capacity Utilization			89.4%									ICU Level of Service	E
Analysis Period (min)			15										
c	Critical Lane Group												

Lanes, Volumes, Timings




















Future Total 2022 Conditions - No Growth

3: East Site Access/Commercial Access & Derry Road

PM Peak Hour





















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1223	72	40	1401	20	15	0	42	19	0	24
Future Volume (vph)	10	1223	72	40	1401	20	15	0	42	19	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.998			0.901			0.925	
Flt Protected	0.950			0.950				0.987			0.978	
Satd. Flow (prot)	1825	3489	0	1789	3607	0	0	1675	0	0	1738	0
Flt Permitted	0.950			0.950				0.987			0.978	
Satd. Flow (perm)	1825	3489	0	1789	3607	0	0	1675	0	0	1738	0
Link Speed (k/h)		60			60			48			48	
Link Distance (m)		218.7			493.3			111.9			86.5	
Travel Time (s)		13.1			29.6			8.4			6.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	0%	2%	1%	0%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	10	1223	72	40	1401	20	15	0	42	19	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1295	0	40	1421	0	0	57	0	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	50.3%						ICU Level of Service A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis Future Total 2022 Conditions - No Growth  
 3: East Site Access/Commercial Access & Derry Road PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1223	72	40	1401	20	15	0	42	19	0	24
Future Volume (Veh/h)	10	1223	72	40	1401	20	15	0	42	19	0	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	1223	72	40	1401	20	15	0	42	19	0	24
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (m)		219										
pX, platoon unblocked				0.79			0.79	0.79	0.79	0.79	0.79	
vC, conflicting volume	1421			1295			2084	2780	648	2164	2806	710
vC1, stage 1 conf vol							1279	1279		1491	1491	
vC2, stage 2 conf vol							804	1501		674	1315	
vCu, unblocked vol	1421			840			1839	2721	20	1942	2754	710
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			94			92	100	95	84	100	94
cM capacity (veh/h)	485			624			188	136	831	119	138	380
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	10	815	480	40	934	487	57	43				
Volume Left	10	0	0	40	0	0	15	19				
Volume Right	0	0	72	0	0	20	42	24				
cSH	485	1700	1700	624	1700	1700	438	193				
Volume to Capacity	0.02	0.48	0.28	0.06	0.55	0.29	0.13	0.22				
Queue Length 95th (m)	0.5	0.0	0.0	1.6	0.0	0.0	3.4	6.3				
Control Delay (s)	12.6	0.0	0.0	11.2	0.0	0.0	14.4	29.0				
Lane LOS	B			B			B	D				
Approach Delay (s)	0.1			0.3			14.4	29.0				
Approach LOS							B	D				
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			50.3%		ICU Level of Service			A				
Analysis Period (min)			15									

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions - No Growth  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1055	172	147	1245	52	165	64	77	34	67	51
Future Volume (vph)	57	1055	172	147	1245	52	165	64	77	34	67	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979			0.994			0.918			0.935	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3513	0	1825	3594	0	1807	1724	0	1825	1766	0
Flt Permitted	0.175			0.192			0.629			0.576		
Satd. Flow (perm)	336	3513	0	369	3594	0	1196	1724	0	1107	1766	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			7			49			31	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Adj. Flow (vph)	57	1055	172	147	1245	52	165	64	77	34	67	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1227	0	147	1297	0	165	141	0	34	118	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	



Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions - No Growth  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.8	82.8		82.8	82.8		37.2	37.2		37.2	37.2	
Total Split (%)	69.0%	69.0%		69.0%	69.0%		31.0%	31.0%		31.0%	31.0%	
Maximum Green (s)	77.1	77.1		77.1	77.1		30.0	30.0		30.0	30.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	86.6	86.6		86.6	86.6		23.4	23.4		23.4	23.4	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
v/c Ratio	0.24	0.48		0.55	0.50		0.71	0.38		0.16	0.32	
Control Delay	4.0	3.7		19.7	8.8		60.8	28.3		38.9	30.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.0	3.7		19.7	8.8		60.8	28.3		38.9	30.9	
LOS	A	A		B	A		E	C		D	C	
Approach Delay		3.7			9.9			45.8			32.7	
Approach LOS		A			A			D			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 11.9  
 Intersection Capacity Utilization 82.7%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service E

Splits and Phases: 4: Holly Avenue & Derry Road



Queues  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions - No Growth  
PM Peak Hour

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	1227	147	1297	165	141	34	118
v/c Ratio	0.24	0.48	0.55	0.50	0.71	0.38	0.16	0.32
Control Delay	4.0	3.7	19.7	8.8	60.8	28.3	38.9	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	3.7	19.7	8.8	60.8	28.3	38.9	30.9
Queue Length 50th (m)	0.9	9.2	14.1	61.3	36.7	18.6	6.7	17.5
Queue Length 95th (m)	m1.9	14.2	46.7	98.1	55.4	33.8	14.5	31.2
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	242	2545	266	2596	320	498	297	496
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.48	0.55	0.50	0.52	0.28	0.11	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.












HCM Signalized Intersection Capacity Analysis  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions - No Growth  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	57	1055	172	147	1245	52	165	64	77	34	67	51
Future Volume (vph)	57	1055	172	147	1245	52	165	64	77	34	67	51
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3513		1825	3594		1807	1725		1825	1766	
Flt Permitted	0.18	1.00		0.19	1.00		0.63	1.00		0.58	1.00	
Satd. Flow (perm)	336	3513		369	3594		1197	1725		1106	1766	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	1055	172	147	1245	52	165	64	77	34	67	51
RTOR Reduction (vph)	0	9	0	0	2	0	0	39	0	0	25	0
Lane Group Flow (vph)	57	1218	0	147	1295	0	165	102	0	34	93	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.9	85.9		85.9	85.9		21.2	21.2		21.2	21.2	
Effective Green, g (s)	86.6	86.6		86.6	86.6		23.4	23.4		23.4	23.4	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	242	2535		266	2593		233	336		215	344	
v/s Ratio Prot		0.35			0.36			0.06			0.05	
v/s Ratio Perm	0.17			0.40			0.14			0.03		
v/c Ratio	0.24	0.48		0.55	0.50		0.71	0.30		0.16	0.27	
Uniform Delay, d1	5.6	7.1		7.7	7.3		45.1	41.3		40.1	41.0	
Progression Factor	0.27	0.41		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.5		1.4	0.1		9.4	0.5		0.3	0.4	
Delay (s)	3.4	3.5		9.1	7.3		54.6	41.8		40.5	41.5	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		3.4			7.5			48.7			41.2	
Approach LOS		A			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			11.4				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)				10.0	
Intersection Capacity Utilization			82.7%				ICU Level of Service				E	
Analysis Period (min)			15									
c Critical Lane Group												












Lanes, Volumes, Timings  
5: Regional Road 25 & West Site Access

Future Total 2022 Conditions - No Growth  
PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	44	940	48	0	823
Future Volume (vph)	0	44	940	48	0	823
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Fr <sub>t</sub>		0.865	0.993			
Fl <sub>t</sub> Protected						
Satd. Flow (prot)	0	1629	3553	0	0	3579
Fl <sub>t</sub> Permitted						
Satd. Flow (perm)	0	1629	3553	0	0	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	118.0		1312.9			217.4
Travel Time (s)	8.5		67.5			11.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	44	940	48	0	823
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	44	988	0	0	823
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	37.5%		ICU Level of Service A			
Analysis Period (min)	15					























HCM Unsignalized Intersection Capacity Analysis  
5: Regional Road 25 & West Site Access

Future Total 2022 Conditions - No Growth  
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	0	44	940	48	0	823
Future Volume (Veh/h)	0	44	940	48	0	823
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	44	940	48	0	823
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	217					
pX, platoon unblocked	0.84					
vC, conflicting volume	1376	494			988	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1075	494			988	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	92			100	
cM capacity (veh/h)	181	521			695	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	44	627	361	412	412	
Volume Left	0	0	0	0	0	
Volume Right	44	0	48	0	0	
cSH	521	1700	1700	1700	1700	
Volume to Capacity	0.08	0.37	0.21	0.24	0.24	
Queue Length 95th (m)	2.1	0.0	0.0	0.0	0.0	
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	12.5	0.0			0.0	
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			37.5%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions - No Growth  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	308	197	95	451	61	299	827	196	67	615	139
Future Volume (vph)	89	308	197	95	451	61	299	827	196	67	615	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		50.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.941			0.982				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3388	0	1772	3553	0	1789	3476	1570	1825	3476	1633
Flt Permitted	0.316			0.252			0.328			0.320		
Satd. Flow (perm)	589	3388	0	470	3553	0	618	3476	1570	615	3476	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		113			12				167			134
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1312.9	
Travel Time (s)		32.8			61.8			26.6			67.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Adj. Flow (vph)	89	308	197	95	451	61	299	827	196	67	615	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	505	0	95	512	0	299	827	196	67	615	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

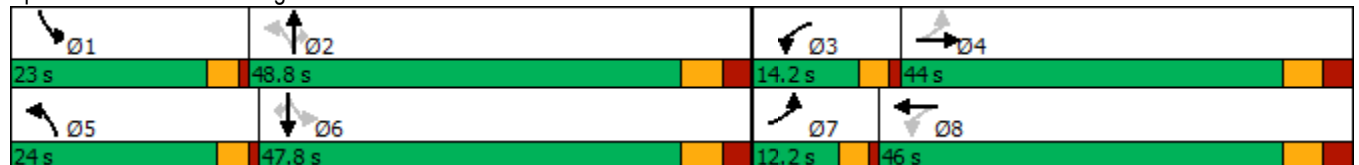
Future Total 2022 Conditions - No Growth  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	12.2	44.0		14.2	46.0		24.0	48.8	48.8	23.0	47.8	47.8
Total Split (%)	9.4%	33.8%		10.9%	35.4%		18.5%	37.5%	37.5%	17.7%	36.8%	36.8%
Maximum Green (s)	8.2	37.0		10.2	39.0		20.0	41.8	41.8	19.0	40.8	40.8
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	36.0	21.1		37.7	24.5		66.8	53.9	53.9	57.4	43.2	43.2
Actuated g/C Ratio	0.34	0.20		0.35	0.23		0.63	0.50	0.50	0.54	0.40	0.40
v/c Ratio	0.28	0.67		0.31	0.62		0.51	0.47	0.22	0.15	0.44	0.19
Control Delay	25.8	35.1		26.2	40.6		13.2	20.1	4.9	10.6	25.9	5.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	35.1		26.2	40.6		13.2	20.1	4.9	10.6	25.9	5.4
LOS	C	D		C	D		B	C	A	B	C	A
Approach Delay		33.7			38.4			16.3			21.2	
Approach LOS		C			D			B			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 106.8  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 24.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 68.7%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions - No Growth  
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	89	505	95	512	299	827	196	67	615	139
v/c Ratio	0.28	0.67	0.31	0.62	0.51	0.47	0.22	0.15	0.44	0.19
Control Delay	25.8	35.1	26.2	40.6	13.2	20.1	4.9	10.6	25.9	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	35.1	26.2	40.6	13.2	20.1	4.9	10.6	25.9	5.4
Queue Length 50th (m)	12.4	40.0	13.3	51.0	27.0	61.1	3.2	5.2	49.2	0.6
Queue Length 95th (m)	24.3	60.0	25.7	71.1	48.1	90.3	16.8	12.4	75.8	13.8
Internal Link Dist (m)		431.0		834.9		493.1			1288.9	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	325	1320	329	1384	641	1754	875	633	1406	740
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.38	0.29	0.37	0.47	0.47	0.22	0.11	0.44	0.19
Intersection Summary										

























HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions - No Growth  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	308	197	95	451	61	299	827	196	67	615	139
Future Volume (vph)	89	308	197	95	451	61	299	827	196	67	615	139
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1772	3389		1772	3554		1789	3476	1570	1825	3476	1633
Flt Permitted	0.32	1.00		0.25	1.00		0.33	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	589	3389		470	3554		617	3476	1570	615	3476	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	308	197	95	451	61	299	827	196	67	615	139
RTOR Reduction (vph)	0	90	0	0	9	0	0	0	84	0	0	79
Lane Group Flow (vph)	89	415	0	95	503	0	299	827	112	67	615	60
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	26.2	19.9		31.2	22.4		61.7	51.9	51.9	48.0	42.2	42.2
Effective Green, g (s)	32.2	21.9		35.7	24.4		64.7	53.9	53.9	54.0	44.2	44.2
Actuated g/C Ratio	0.30	0.20		0.33	0.23		0.60	0.50	0.50	0.50	0.41	0.41
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	276	684		296	799		568	1728	780	404	1417	665
v/s Ratio Prot	c0.03	0.12		c0.03	c0.14		c0.09	c0.24		0.01	0.18	
v/s Ratio Perm	0.07			0.07			0.22		0.07	0.07		0.04
v/c Ratio	0.32	0.61		0.32	0.63		0.53	0.48	0.14	0.17	0.43	0.09
Uniform Delay, d1	28.5	39.3		26.4	37.9		11.3	18.0	14.8	14.2	23.1	19.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	1.0		0.6	1.6		0.9	1.0	0.4	0.2	1.0	0.3
Delay (s)	29.2	40.4		27.0	39.5		12.2	18.9	15.1	14.4	24.1	20.0
Level of Service	C	D		C	D		B	B	B	B	C	B
Approach Delay (s)		38.7			37.5			16.8			22.6	
Approach LOS		D			D			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			108.4				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			68.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

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

Future Total 2022 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	160	59	75	172	91	39	1119	51	71	739	47
Future Volume (vph)	66	160	59	75	172	91	39	1119	51	71	739	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.960			0.948			0.993			0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1831	0	1738	1751	0	1825	3482	0	1738	3394	0
Flt Permitted	0.365			0.458			0.354			0.171		
Satd. Flow (perm)	687	1831	0	838	1751	0	680	3482	0	313	3394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			31			7			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Adj. Flow (vph)	66	160	59	75	172	91	39	1119	51	71	739	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	219	0	75	263	0	39	1170	0	71	786	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	

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

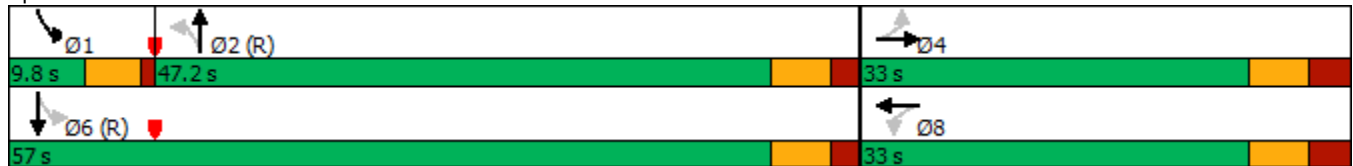
Future Total 2022 Conditions  
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		8		2		6					
Detector Phase	4	4	8		8	2		2	1		6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0		10.0	15.0		15.0	5.0		15.0	
Minimum Split (s)	33.0	33.0	33.0		33.0	27.0		27.0	9.7		27.0	
Total Split (s)	33.0	33.0	33.0		33.0	47.2		47.2	9.8		57.0	
Total Split (%)	36.7%	36.7%	36.7%		36.7%	52.4%		52.4%	10.9%		63.3%	
Maximum Green (s)	26.0	26.0	26.0		26.0	41.2		41.2	5.1		51.0	
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0		4.0	3.7		4.0	
All-Red Time (s)	3.0	3.0	3.0		3.0	2.0		2.0	1.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0		-2.0	-1.0		-1.0	-3.7		-1.0	
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0		5.0	1.0		5.0	
Lead/Lag							Lag	Lag	Lead			
Lead-Lag Optimize?							Yes	Yes	Yes			
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0	3.0		2.0	
Recall Mode	None	None	None		None	C-Max		C-Max	None		C-Max	
Walk Time (s)	7.0	7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)	19.0	19.0	19.0		19.0	14.0		14.0	14.0		14.0	
Pedestrian Calls (#/hr)	0	0	0		0	0		0	0		0	
Act Effct Green (s)	18.6	18.6	18.6		18.6	52.2		52.2	65.4		61.4	
Actuated g/C Ratio	0.21	0.21	0.21		0.21	0.58		0.58	0.73		0.68	
v/c Ratio	0.47	0.55	0.43		0.68	0.10		0.58	0.18		0.34	
Control Delay	40.8	33.4	37.5		37.5	12.6		15.2	5.6		6.9	
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0		0.0	
Total Delay	40.8	33.4	37.5		37.5	12.6		15.2	5.6		6.9	
LOS	D	C	D		D	B		B	A		A	
Approach Delay	35.1		37.5		15.1		6.8					
Approach LOS	D		D		B		A					

Intersection Summary

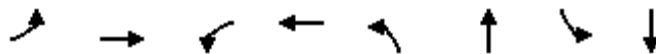
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 39 (43%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 17.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 75.5%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



Queues  
1: Ontario Street & Laurier Road























Future Total 2022 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	219	75	263	39	1170	71	786
v/c Ratio	0.47	0.55	0.43	0.68	0.10	0.58	0.18	0.34
Control Delay	40.8	33.4	37.5	37.5	12.6	15.2	5.6	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	33.4	37.5	37.5	12.6	15.2	5.6	6.9
Queue Length 50th (m)	10.1	30.8	11.4	37.2	3.0	65.7	2.9	25.1
Queue Length 95th (m)	21.0	47.5	22.4	56.6	9.6	104.8	8.3	43.5
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	213	584	260	566	393	2021	390	2319
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.38	0.29	0.46	0.10	0.58	0.18	0.34
Intersection Summary								

























HCM Signalized Intersection Capacity Analysis  
1: Ontario Street & Laurier Road

Future Total 2022 Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	160	59	75	172	91	39	1119	51	71	739	47
Future Volume (vph)	66	160	59	75	172	91	39	1119	51	71	739	47
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1830		1738	1751		1825	3484		1738	3394	
Flt Permitted	0.37	1.00		0.46	1.00		0.35	1.00		0.17	1.00	
Satd. Flow (perm)	688	1830		838	1751		680	3484		312	3394	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	160	59	75	172	91	39	1119	51	71	739	47
RTOR Reduction (vph)	0	17	0	0	25	0	0	3	0	0	4	0
Lane Group Flow (vph)	66	202	0	75	238	0	39	1167	0	71	782	0
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.6	16.6		16.6	16.6		50.2	50.2		60.4	60.4	
Effective Green, g (s)	18.6	18.6		18.6	18.6		51.2	51.2		64.1	61.4	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.57	0.57		0.71	0.68	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		4.7	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	142	378		173	361		386	1982		367	2315	
v/s Ratio Prot		0.11			c0.14			c0.33		0.02	c0.23	
v/s Ratio Perm	0.10			0.09			0.06			0.12		
v/c Ratio	0.46	0.54		0.43	0.66		0.10	0.59		0.19	0.34	
Uniform Delay, d1	31.3	31.8		31.1	32.8		8.9	12.6		5.6	5.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.7		0.6	3.5		0.5	1.3		0.3	0.4	
Delay (s)	32.2	32.6		31.7	36.3		9.4	13.9		5.9	6.3	
Level of Service	C	C		C	D		A	B		A	A	
Approach Delay (s)		32.5			35.3			13.7			6.3	
Approach LOS		C			D			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			16.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			11.0			
Intersection Capacity Utilization			75.5%			ICU Level of Service				D		
Analysis Period (min)			15									
c	Critical Lane Group											

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	1428	225	326	694	209	173	675	228	178	565	145
Future Volume (vph)	319	1428	225	326	694	209	173	675	228	178	565	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.969	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3579	1570	1690	3476	1555	1789	3380	1570	1690	3164	0
Flt Permitted	0.282			0.086			0.176			0.237		
Satd. Flow (perm)	521	3579	1570	153	3476	1555	331	3380	1570	422	3164	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			180			228			27
Link Speed (k/h)		60			60			50				50
Link Distance (m)		622.6			218.7			223.1				235.1
Travel Time (s)		37.4			13.1			16.1				16.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Adj. Flow (vph)	319	1428	225	326	694	209	173	675	228	178	565	145
Shared Lane Traffic (%)												
Lane Group Flow (vph)	319	1428	225	326	694	209	173	675	228	178	710	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7		4

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

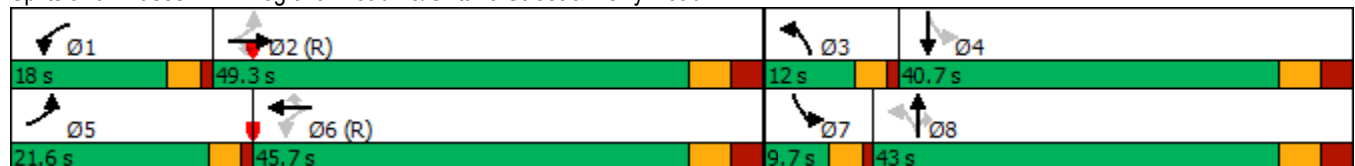
Future Total 2022 Conditions  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
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	5.0
Minimum Split (s)	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7
Total Split (s)	21.6	49.3	49.3	18.0	45.7	45.7	12.0	43.0	43.0	9.7	40.7	40.7
Total Split (%)	18.0%	41.1%	41.1%	15.0%	38.1%	38.1%	10.0%	35.8%	35.8%	8.1%	33.9%	33.9%
Maximum Green (s)	17.6	42.6	42.6	14.0	39.0	39.0	8.0	36.3	36.3	5.7	34.0	34.0
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	65.6	44.3	44.3	66.9	45.8	45.8	48.7	35.0	35.0	45.4	32.7	32.7
Actuated g/C Ratio	0.55	0.37	0.37	0.56	0.38	0.38	0.41	0.29	0.29	0.38	0.27	0.27
v/c Ratio	0.67	1.08	0.35	0.96	0.52	0.30	0.65	0.69	0.37	0.71	0.81	0.81
Control Delay	21.5	86.4	15.7	68.0	34.7	10.5	34.6	41.3	5.6	40.7	46.7	46.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	86.4	15.7	68.0	34.7	10.5	34.6	41.3	5.6	40.7	46.7	46.7
LOS	C	F	B	E	C	B	C	D	A	D	D	D
Approach Delay		67.8			39.4			32.7			45.5	
Approach LOS		E			D			C			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 125  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.08  
 Intersection Signal Delay: 49.9  
 Intersection LOS: D  
 Intersection Capacity Utilization 102.4%  
 ICU Level of Service G  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Queues  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	319	1428	225	326	694	209	173	675	228	178	710
v/c Ratio	0.67	1.08	0.35	0.96	0.52	0.30	0.65	0.69	0.37	0.71	0.81
Control Delay	21.5	86.4	15.7	68.0	34.7	10.5	34.6	41.3	5.6	40.7	46.7
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	21.5	86.4	15.7	68.0	34.7	10.5	34.6	41.3	5.6	40.7	46.7
Queue Length 50th (m)	38.2	~197.8	18.9	~67.4	75.8	11.5	25.8	72.5	0.0	26.8	77.7
Queue Length 95th (m)	57.8	#239.9	38.8	#130.5	97.8	29.7	40.6	91.1	17.2	#43.5	98.5
Internal Link Dist (m)		598.6			194.7			199.1			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	505	1321	646	341	1326	704	268	1070	652	251	960
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	0.63	1.08	0.35	0.96	0.52	0.30	0.65	0.63	0.35	0.71	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.





















HCM Signalized Intersection Capacity Analysis  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	1428	225	326	694	209	173	675	228	178	565	145
Future Volume (vph)	319	1428	225	326	694	209	173	675	228	178	565	145
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	3579	1570	1690	3476	1555	1789	3380	1570	1690	3165	
Flt Permitted	0.28	1.00	1.00	0.09	1.00	1.00	0.18	1.00	1.00	0.24	1.00	
Satd. Flow (perm)	522	3579	1570	153	3476	1555	331	3380	1570	422	3165	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	319	1428	225	326	694	209	173	675	228	178	565	145
RTOR Reduction (vph)	0	0	67	0	0	111	0	0	162	0	20	0
Lane Group Flow (vph)	319	1428	158	326	694	98	173	675	67	178	690	0
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	58.1	42.6	42.6	61.1	44.1	44.1	41.3	33.3	33.3	36.7	31.0	
Effective Green, g (s)	64.1	44.3	44.3	66.6	45.8	45.8	46.0	35.0	35.0	42.7	32.7	
Actuated g/C Ratio	0.53	0.37	0.37	0.55	0.38	0.38	0.38	0.29	0.29	0.36	0.27	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	468	1321	579	341	1326	593	260	985	457	242	862	
v/s Ratio Prot	0.10	c0.40		c0.16	0.20		c0.06	0.20		c0.05	c0.22	
v/s Ratio Perm	0.26		0.10	0.37		0.06	0.19		0.04	0.21		
v/c Ratio	0.68	1.08	0.27	0.96	0.52	0.16	0.67	0.69	0.15	0.74	0.80	
Uniform Delay, d1	17.1	37.9	26.6	37.7	28.7	24.5	27.2	37.6	31.4	29.4	40.6	
Progression Factor	1.00	1.00	1.00	0.84	1.11	1.54	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.1	49.8	1.2	35.1	1.4	0.6	6.3	2.0	0.1	11.0	5.4	
Delay (s)	21.1	87.6	27.7	66.8	33.2	38.2	33.5	39.6	31.6	40.4	46.0	
Level of Service	C	F	C	E	C	D	C	D	C	D	D	
Approach Delay (s)		70.0			42.9			36.9			44.9	
Approach LOS		E			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			52.4								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)	12.0
Intersection Capacity Utilization			102.4%								ICU Level of Service	G
Analysis Period (min)			15									
c Critical Lane Group												



















Lanes, Volumes, Timings  
3: East Site Access/Site Access & Derry Road

Future Total 2022 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1786	24	14	1356	16	39	0	71	18	0	4
Future Volume (vph)	20	1786	24	14	1356	16	39	0	71	18	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.998			0.913			0.975	
Flt Protected	0.950			0.950				0.983			0.961	
Satd. Flow (prot)	1643	3184	0	1610	3095	0	0	1521	0	0	1544	0
Flt Permitted	0.950			0.950				0.983			0.961	
Satd. Flow (perm)	1643	3184	0	1610	3095	0	0	1521	0	0	1544	0
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		218.7			493.3			109.4			86.5	
Travel Time (s)		13.1			29.6			7.9			6.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	0%	2%	6%	0%	2%	2%	2%	6%	0%	0%
Adj. Flow (vph)	20	1786	24	14	1356	16	39	0	71	18	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	1810	0	14	1372	0	0	110	0	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane					Yes							
Headway Factor	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
<b>Intersection Summary</b>												
Area Type:	CBD											
Control Type:	Unsignalized											
Intersection Capacity Utilization	69.3%						ICU Level of Service C					
Analysis Period (min)	15											





















HCM Unsignalized Intersection Capacity Analysis  
3: East Site Access/Site Access & Derry Road

Future Total 2022 Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1786	24	14	1356	16	39	0	71	18	0	4
Future Volume (Veh/h)	20	1786	24	14	1356	16	39	0	71	18	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	1786	24	14	1356	16	39	0	71	18	0	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (m)		219										
pX, platoon unblocked				0.64			0.64	0.64	0.64	0.64	0.64	
vC, conflicting volume	1372			1810			2548	3238	905	2396	3242	686
vC1, stage 1 conf vol							1838	1838		1392	1392	
vC2, stage 2 conf vol							710	1400		1004	1850	
vCu, unblocked vol	1372			1136			2292	3373	0	2054	3379	686
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.6	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	96			96			65	100	90	86	100	99
cM capacity (veh/h)	507			390			113	111	692	131	111	395
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	20	1191	619	14	904	468	110	22				
Volume Left	20	0	0	14	0	0	39	18				
Volume Right	0	0	24	0	0	16	71	4				
cSH	507	1700	1700	390	1700	1700	245	149				
Volume to Capacity	0.04	0.70	0.36	0.04	0.53	0.28	0.45	0.15				
Queue Length 95th (m)	0.9	0.0	0.0	0.8	0.0	0.0	16.4	3.8				
Control Delay (s)	12.4	0.0	0.0	14.6	0.0	0.0	31.1	33.4				
Lane LOS	B			B			D	D				
Approach Delay (s)	0.1			0.1			31.1	33.4				
Approach LOS							D	D				
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			69.3%		ICU Level of Service			C				
Analysis Period (min)			15									

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1689	108	55	1113	21	161	38	133	42	39	77
Future Volume (vph)	56	1689	108	55	1113	21	161	38	133	42	39	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991			0.997			0.883			0.900	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1644	3514	0	1738	3434	0	1807	1572	0	1738	1657	0
Flt Permitted	0.218			0.082			0.632			0.503		
Satd. Flow (perm)	377	3514	0	150	3434	0	1202	1572	0	920	1657	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			3			32			77	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Adj. Flow (vph)	56	1689	108	55	1113	21	161	38	133	42	39	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	1797	0	55	1134	0	161	171	0	42	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions  
AM Peak Hour

	↖		→		↘		↙		←		↗		↖		↑		↘		↓		↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR										
Permitted Phases	2			6			8			4												
Detector Phase	2	2		6	6		8	8		4	4											
Switch Phase																						
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0											
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2											
Total Split (s)	82.5	82.5		82.5	82.5		37.5	37.5		37.5	37.5											
Total Split (%)	68.8%	68.8%		68.8%	68.8%		31.3%	31.3%		31.3%	31.3%											
Maximum Green (s)	76.8	76.8		76.8	76.8		30.3	30.3		30.3	30.3											
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7											
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5											
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2											
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0											
Lead/Lag																						
Lead-Lag Optimize?																						
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0											
Recall Mode	C-Max	C-Max		None	None		None	None		None	None											
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0											
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0											
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0											
Act Effct Green (s)	87.0	87.0		87.0	87.0		23.0	23.0		23.0	23.0											
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19											
v/c Ratio	0.21	0.70		0.51	0.46		0.70	0.52		0.24	0.31											
Control Delay	2.3	5.1		30.6	8.2		60.6	39.7		41.8	16.9											
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0											
Total Delay	2.3	5.1		30.6	8.2		60.6	39.7		41.8	16.9											
LOS	A	A		C	A		E	D		D	B											
Approach Delay		5.0			9.2			49.9			23.6											
Approach LOS		A			A			D			C											

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 11.5      Intersection LOS: B  
 Intersection Capacity Utilization 81.1%      ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 4: Holly Avenue & Derry Road



Queues  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	1797	55	1134	161	171	42	116
v/c Ratio	0.21	0.70	0.51	0.46	0.70	0.52	0.24	0.31
Control Delay	2.3	5.1	30.6	8.2	60.6	39.7	41.8	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	5.1	30.6	8.2	60.6	39.7	41.8	16.9
Queue Length 50th (m)	0.9	19.2	4.9	50.4	35.8	29.6	8.5	7.7
Queue Length 95th (m)	m1.2	m18.9	#30.0	82.2	54.3	46.9	17.3	21.5
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	273	2551	108	2491	325	449	249	504
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.70	0.51	0.46	0.50	0.38	0.17	0.23

Intersection Summary























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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.












HCM Signalized Intersection Capacity Analysis  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	56	1689	108	55	1113	21	161	38	133	42	39	77
Future Volume (vph)	56	1689	108	55	1113	21	161	38	133	42	39	77
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.88		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1644	3514		1738	3435		1807	1573		1738	1658	
Flt Permitted	0.22	1.00		0.08	1.00		0.63	1.00		0.50	1.00	
Satd. Flow (perm)	377	3514		149	3435		1203	1573		920	1658	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	1689	108	55	1113	21	161	38	133	42	39	77
RTOR Reduction (vph)	0	3	0	0	1	0	0	26	0	0	62	0
Lane Group Flow (vph)	56	1794	0	55	1133	0	161	145	0	42	54	0
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	86.3	86.3		86.3	86.3		20.8	20.8		20.8	20.8	
Effective Green, g (s)	87.0	87.0		87.0	87.0		23.0	23.0		23.0	23.0	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	273	2547		108	2490		230	301		176	317	
v/s Ratio Prot		c0.51			0.33			0.09			0.03	
v/s Ratio Perm	0.15			0.37			c0.13			0.05		
v/c Ratio	0.21	0.70		0.51	0.46		0.70	0.48		0.24	0.17	
Uniform Delay, d1	5.3	9.3		7.2	6.8		45.3	43.2		41.1	40.5	
Progression Factor	0.22	0.42		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.7		1.4	0.0		9.0	1.2		0.7	0.3	
Delay (s)	1.8	4.6		8.6	6.8		54.3	44.4		41.8	40.8	
Level of Service	A	A		A	A		D	D		D	D	
Approach Delay (s)		4.5			6.9			49.2			41.0	
Approach LOS		A			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			11.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			81.1%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
5: Regional Road 25 & West Site Access












Future Total 2022 Conditions  
AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	62	1014	16	0	1116
Future Volume (vph)	0	62	1014	16	0	1116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Fr <sub>t</sub>		0.865	0.998			
Fl <sub>t</sub> Protected						
Satd. Flow (prot)	0	1629	3571	0	0	3579
Fl <sub>t</sub> Permitted						
Satd. Flow (perm)	0	1629	3571	0	0	3579
Link Speed (k/h)	50		50			70
Link Distance (m)	173.8		1307.3			223.1
Travel Time (s)	12.5		94.1			11.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	62	1014	16	0	1116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	62	1030	0	0	1116
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	39.0%		ICU Level of Service A			
Analysis Period (min)	15					

























HCM Unsignalized Intersection Capacity Analysis  
5: Regional Road 25 & West Site Access

Future Total 2022 Conditions  
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	0	62	1014	16	0	1116
Future Volume (Veh/h)	0	62	1014	16	0	1116
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	62	1014	16	0	1116
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	223					
pX, platoon unblocked	0.83					
vC, conflicting volume	1580	515	1030			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1281	515	1030			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	88	100			
cM capacity (veh/h)	130	505	670			
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	62	676	354	558	558	
Volume Left	0	0	0	0	0	
Volume Right	62	0	16	0	0	
cSH	505	1700	1700	1700	1700	
Volume to Capacity	0.12	0.40	0.21	0.33	0.33	
Queue Length 95th (m)	3.2	0.0	0.0	0.0	0.0	
Control Delay (s)	13.1	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	13.1	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay	0.4					
Intersection Capacity Utilization	39.0%			ICU Level of Service		A
Analysis Period (min)	15					

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	510	483	150	377	83	155	731	138	50	862	100
Future Volume (vph)	130	510	483	150	377	83	155	731	138	50	862	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.927			0.973				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1659	3286	0	1722	3442	0	1674	3411	1541	1755	3380	1471
Flt Permitted	0.359			0.118			0.183			0.316		
Satd. Flow (perm)	627	3286	0	214	3442	0	323	3411	1541	584	3380	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		203			21				138			168
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1307.3	
Travel Time (s)		32.8			61.8			26.6			67.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Adj. Flow (vph)	130	510	483	150	377	83	155	731	138	50	862	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	993	0	150	460	0	155	731	138	50	862	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

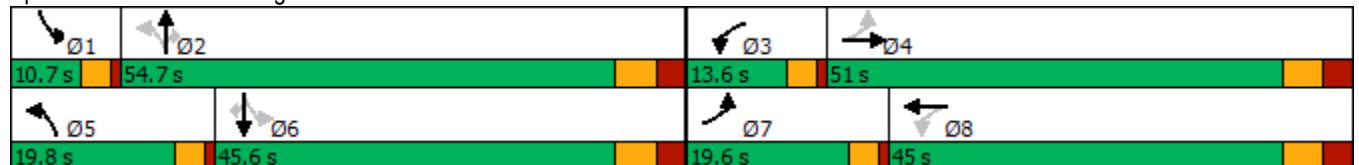
Future Total 2022 Conditions  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	19.6	51.0		13.6	45.0		19.8	54.7	54.7	10.7	45.6	45.6
Total Split (%)	15.1%	39.2%		10.5%	34.6%		15.2%	42.1%	42.1%	8.2%	35.1%	35.1%
Maximum Green (s)	15.6	44.0		9.6	38.0		15.8	47.7	47.7	6.7	38.6	38.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-0.2	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	6.8	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	51.5	34.7		49.2	32.9		63.0	50.8	49.0	57.2	43.7	43.7
Actuated g/C Ratio	0.44	0.30		0.42	0.28		0.54	0.43	0.42	0.49	0.37	0.37
v/c Ratio	0.33	0.89		0.60	0.47		0.46	0.49	0.19	0.13	0.68	0.15
Control Delay	21.7	41.7		33.2	35.0		20.0	27.3	5.0	16.2	36.1	0.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	41.7		33.2	35.0		20.0	27.3	5.0	16.2	36.1	0.5
LOS	C	D		C	C		B	C	A	B	D	A
Approach Delay		39.4			34.5			23.2			31.6	
Approach LOS		D			C			C			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 117  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 32.1  
 Intersection LOS: C  
 Intersection Capacity Utilization 85.3%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	993	150	460	155	731	138	50	862	100
v/c Ratio	0.33	0.89	0.60	0.47	0.46	0.49	0.19	0.13	0.68	0.15
Control Delay	21.7	41.7	33.2	35.0	20.0	27.3	5.0	16.2	36.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	41.7	33.2	35.0	20.0	27.3	5.0	16.2	36.1	0.5
Queue Length 50th (m)	18.0	96.2	21.0	44.5	17.6	65.5	0.0	5.3	87.1	0.0
Queue Length 95th (m)	30.0	122.1	39.1	62.2	34.8	96.3	13.2	13.3	132.3	0.0
Internal Link Dist (m)		431.0		834.9		493.1			1283.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	444	1427	254	1206	393	1480	725	385	1262	654
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.70	0.59	0.38	0.39	0.49	0.19	0.13	0.68	0.15
Intersection Summary										























HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	510	483	150	377	83	155	731	138	50	862	100
Future Volume (vph)	130	510	483	150	377	83	155	731	138	50	862	100
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	6.8	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1659	3286		1722	3442		1674	3411	1541	1755	3380	1471
Flt Permitted	0.36	1.00		0.12	1.00		0.18	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	627	3286		214	3442		323	3411	1541	583	3380	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	510	483	150	377	83	155	731	138	50	862	100
RTOR Reduction (vph)	0	143	0	0	15	0	0	0	81	0	0	62
Lane Group Flow (vph)	130	850	0	150	445	0	155	731	57	50	862	38
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	43.6	32.6		40.2	30.9		57.9	48.8	48.8	47.8	42.7	42.7
Effective Green, g (s)	48.9	34.6		46.2	32.9		60.9	50.8	49.0	53.8	44.7	44.7
Actuated g/C Ratio	0.42	0.29		0.39	0.28		0.52	0.43	0.42	0.46	0.38	0.38
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	382	965		241	961		329	1470	640	346	1282	558
v/s Ratio Prot	c0.04	c0.26		c0.06	0.13		c0.06	0.21		0.01	c0.26	
v/s Ratio Perm	0.10			0.18			0.19		0.04	0.06		0.03
v/c Ratio	0.34	0.88		0.62	0.46		0.47	0.50	0.09	0.14	0.67	0.07
Uniform Delay, d1	22.3	39.6		27.5	35.1		17.6	24.3	20.9	18.1	30.4	23.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	9.2		4.9	0.4		1.1	1.2	0.3	0.2	2.8	0.2
Delay (s)	22.8	48.8		32.4	35.5		18.7	25.5	21.1	18.3	33.3	23.5
Level of Service	C	D		C	D		B	C	C	B	C	C
Approach Delay (s)		45.8			34.7			23.9			31.6	
Approach LOS		D			C			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			34.2				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			117.8				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			85.3%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

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

Future Total 2022 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	182	39	103	219	105	58	948	87	129	1091	87
Future Volume (vph)	67	182	39	103	219	105	58	948	87	129	1091	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.974			0.951			0.987			0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1871	0	1807	1797	0	1825	3506	0	1789	3507	0
Flt Permitted	0.265			0.460			0.197			0.239		
Satd. Flow (perm)	499	1871	0	875	1797	0	378	3506	0	450	3507	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			24			18			15	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Adj. Flow (vph)	67	182	39	103	219	105	58	948	87	129	1091	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	221	0	103	324	0	58	1035	0	129	1178	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

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

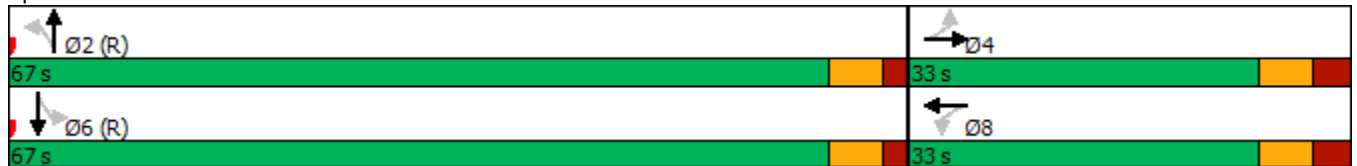
Future Total 2022 Conditions  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		67.0	67.0		67.0	67.0	
Total Split (%)	33.0%	33.0%		33.0%	33.0%		67.0%	67.0%		67.0%	67.0%	
Maximum Green (s)	26.0	26.0		26.0	26.0		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	22.6	22.6		22.6	22.6		67.4	67.4		67.4	67.4	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.67	0.67		0.67	0.67	
v/c Ratio	0.59	0.51		0.52	0.76		0.23	0.44		0.43	0.50	
Control Delay	55.4	35.5		42.6	45.0		10.5	8.7		14.2	9.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.4	35.5		42.6	45.0		10.5	8.7		14.2	9.4	
LOS	E	D		D	D		B	A		B	A	
Approach Delay		40.1			44.4			8.8			9.9	
Approach LOS		D			D			A			A	

Intersection Summary

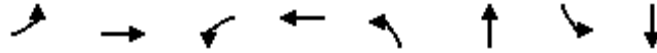
Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 17.0  
 Intersection Capacity Utilization 88.4%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service E

Splits and Phases: 1: Ontario Street & Laurier Road



Queues  
1: Ontario Street & Laurier Road

Future Total 2022 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	221	103	324	58	1035	129	1178
v/c Ratio	0.59	0.51	0.52	0.76	0.23	0.44	0.43	0.50
Control Delay	55.4	35.5	42.6	45.0	10.5	8.7	14.2	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	35.5	42.6	45.0	10.5	8.7	14.2	9.4
Queue Length 50th (m)	11.6	35.4	17.4	54.3	4.0	43.6	10.4	53.0
Queue Length 95th (m)	25.3	54.0	32.2	79.3	11.9	65.3	28.3	78.4
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	139	531	245	520	254	2367	303	2367
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.42	0.42	0.62	0.23	0.44	0.43	0.50
<b>Intersection Summary</b>								



























HCM Signalized Intersection Capacity Analysis  
1: Ontario Street & Laurier Road

Future Total 2022 Conditions  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	182	39	103	219	105	58	948	87	129	1091	87
Future Volume (vph)	67	182	39	103	219	105	58	948	87	129	1091	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1870		1807	1798		1825	3508		1789	3507	
Flt Permitted	0.27	1.00		0.46	1.00		0.20	1.00		0.24	1.00	
Satd. Flow (perm)	499	1870		875	1798		378	3508		451	3507	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	182	39	103	219	105	58	948	87	129	1091	87
RTOR Reduction (vph)	0	9	0	0	19	0	0	6	0	0	5	0
Lane Group Flow (vph)	67	212	0	103	305	0	58	1029	0	129	1173	0
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.6	20.6		20.6	20.6		66.4	66.4		66.4	66.4	
Effective Green, g (s)	22.6	22.6		22.6	22.6		67.4	67.4		67.4	67.4	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.67	0.67		0.67	0.67	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	112	422		197	406		254	2364		303	2363	
v/s Ratio Prot		0.11			c0.17			0.29			c0.33	
v/s Ratio Perm	0.13			0.12			0.15			0.29		
v/c Ratio	0.60	0.50		0.52	0.75		0.23	0.44		0.43	0.50	
Uniform Delay, d1	34.6	33.8		34.0	36.1		6.3	7.5		7.5	8.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	0.3		1.2	6.8		2.1	0.6		4.3	0.7	
Delay (s)	40.3	34.1		35.1	42.9		8.4	8.1		11.8	8.7	
Level of Service	D	C		D	D		A	A		B	A	
Approach Delay (s)		35.6			41.1			8.1			9.0	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			15.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			88.4%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	1032	120	185	1129	208	188	743	153	237	599	213
Future Volume (vph)	285	1032	120	185	1129	208	188	743	153	237	599	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3614	1617	1807	3614	1633	1789	3476	1498	1807	3366	0
Flt Permitted	0.092			0.119			0.147			0.206		
Satd. Flow (perm)	172	3614	1617	226	3614	1633	277	3476	1498	392	3366	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			110			153			46
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		622.6			218.7			217.4			235.1	
Travel Time (s)		37.4			13.1			15.7			16.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Adj. Flow (vph)	285	1032	120	185	1129	208	188	743	153	237	599	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	1032	120	185	1129	208	188	743	153	237	812	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

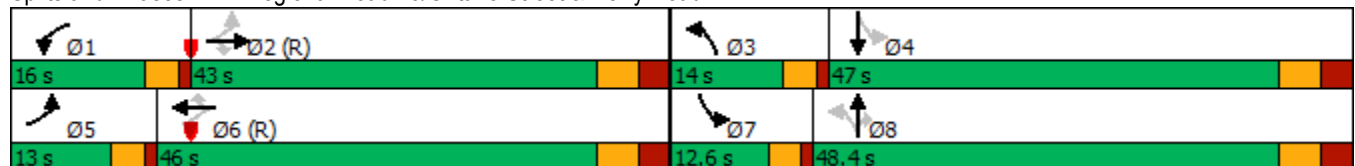
Future Total 2022 Conditions  
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
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	5.0
Minimum Split (s)	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7
Total Split (s)	13.0	43.0	43.0	16.0	46.0	46.0	14.0	48.4	48.4	12.6	47.0	
Total Split (%)	10.8%	35.8%	35.8%	13.3%	38.3%	38.3%	11.7%	40.3%	40.3%	10.5%	39.2%	
Maximum Green (s)	9.0	36.3	36.3	12.0	39.3	39.3	10.0	41.7	41.7	8.6	40.3	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	62.3	44.5	44.5	58.6	41.0	41.0	54.1	37.5	37.5	51.7	36.1	
Actuated g/C Ratio	0.52	0.37	0.37	0.49	0.34	0.34	0.45	0.31	0.31	0.43	0.30	
v/c Ratio	0.87	0.77	0.18	0.62	0.91	0.33	0.66	0.68	0.27	0.78	0.78	
Control Delay	57.8	39.3	7.9	22.5	46.2	11.7	30.9	39.2	5.4	38.9	41.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	57.8	39.3	7.9	22.5	46.2	11.7	30.9	39.2	5.4	38.9	41.3	
LOS	E	D	A	C	D	B	C	D	A	D	D	
Approach Delay		40.4			38.6			33.0			40.7	
Approach LOS		D			D			C			D	

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  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 38.3      Intersection LOS: D  
 Intersection Capacity Utilization 95.8%      ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Queues  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions  
PM Peak Hour



























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	285	1032	120	185	1129	208	188	743	153	237	812
v/c Ratio	0.87	0.77	0.18	0.62	0.91	0.33	0.66	0.68	0.27	0.78	0.78
Control Delay	57.8	39.3	7.9	22.5	46.2	11.7	30.9	39.2	5.4	38.9	41.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	39.3	7.9	22.5	46.2	11.7	30.9	39.2	5.4	38.9	41.3
Queue Length 50th (m)	49.7	115.0	2.2	24.4	136.3	18.5	26.2	79.3	0.0	34.0	85.9
Queue Length 95th (m)	#120.5	#159.0	15.5	39.0	#174.4	34.9	38.5	93.8	13.4	#51.1	102.2
Internal Link Dist (m)		598.6			194.7			193.4			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	328	1340	666	318	1234	630	288	1257	639	305	1208
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	0.77	0.18	0.58	0.91	0.33	0.65	0.59	0.24	0.78	0.67

Intersection Summary

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




















HCM Signalized Intersection Capacity Analysis  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2022 Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	1032	120	185	1129	208	188	743	153	237	599	213
Future Volume (vph)	285	1032	120	185	1129	208	188	743	153	237	599	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1772	3614	1617	1807	3614	1633	1789	3476	1498	1807	3365	
Flt Permitted	0.09	1.00	1.00	0.12	1.00	1.00	0.15	1.00	1.00	0.21	1.00	
Satd. Flow (perm)	172	3614	1617	227	3614	1633	277	3476	1498	392	3365	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	285	1032	120	185	1129	208	188	743	153	237	599	213
RTOR Reduction (vph)	0	0	67	0	0	72	0	0	105	0	32	0
Lane Group Flow (vph)	285	1032	53	185	1129	136	188	743	48	237	780	0
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	57.7	42.8	42.8	50.7	39.3	39.3	45.7	35.8	35.8	43.1	34.5	
Effective Green, g (s)	61.2	44.5	44.5	56.7	41.0	41.0	51.4	37.5	37.5	49.1	36.2	
Actuated g/C Ratio	0.51	0.37	0.37	0.47	0.34	0.34	0.43	0.31	0.31	0.41	0.30	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	326	1340	599	296	1234	557	281	1086	468	297	1015	
v/s Ratio Prot	c0.13	0.29		0.07	c0.31		c0.07	0.21		c0.08	c0.23	
v/s Ratio Perm	0.31		0.03	0.22		0.08	0.21		0.03	0.25		
v/c Ratio	0.87	0.77	0.09	0.62	0.91	0.24	0.67	0.68	0.10	0.80	0.77	
Uniform Delay, d1	34.3	33.2	24.6	22.3	37.8	28.4	24.8	36.1	29.3	25.8	38.1	
Progression Factor	1.00	1.00	1.00	0.80	0.93	0.77	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	21.9	4.3	0.3	3.5	10.5	0.9	5.9	1.8	0.1	13.8	3.5	
Delay (s)	56.2	37.6	24.9	21.3	45.7	22.7	30.7	37.9	29.4	39.7	41.6	
Level of Service	E	D	C	C	D	C	C	D	C	D	D	
Approach Delay (s)		40.2			39.6			35.4			41.2	
Approach LOS		D			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			39.2		HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)			12.0				
Intersection Capacity Utilization			95.8%		ICU Level of Service			F				
Analysis Period (min)			15									
c Critical Lane Group												




















Lanes, Volumes, Timings  
3: East Site Access/Commercial Access & Derry Road

Future Total 2022 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1388	72	40	1618	20	15	0	42	19	0	24
Future Volume (vph)	10	1388	72	40	1618	20	15	0	42	19	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.998			0.901			0.925	
Flt Protected	0.950			0.950				0.987			0.978	
Satd. Flow (prot)	1825	3492	0	1789	3607	0	0	1675	0	0	1738	0
Flt Permitted	0.950			0.950				0.987			0.978	
Satd. Flow (perm)	1825	3492	0	1789	3607	0	0	1675	0	0	1738	0
Link Speed (k/h)		60			60			48			48	
Link Distance (m)		218.7			493.3			111.9			86.5	
Travel Time (s)		13.1			29.6			8.4			6.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	0%	2%	1%	0%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	10	1388	72	40	1618	20	15	0	42	19	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1460	0	40	1638	0	0	57	0	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	56.3%						ICU Level of Service B					
Analysis Period (min)	15											





















HCM Unsignalized Intersection Capacity Analysis  
 3: East Site Access/Commercial Access & Derry Road

Future Total 2022 Conditions  
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1388	72	40	1618	20	15	0	42	19	0	24
Future Volume (Veh/h)	10	1388	72	40	1618	20	15	0	42	19	0	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	1388	72	40	1618	20	15	0	42	19	0	24
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (m)		219										
pX, platoon unblocked				0.74			0.74	0.74	0.74	0.74	0.74	0.74
vC, conflicting volume	1638			1460			2357	3162	730	2464	3188	819
vC1, stage 1 conf vol							1444	1444		1708	1708	
vC2, stage 2 conf vol							913	1718		756	1480	
vCu, unblocked vol	1638			929			2135	3218	0	2279	3253	819
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			93			90	100	95	78	100	93
cM capacity (veh/h)	401			544			154	105	806	86	107	323
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	10	925	535	40	1079	559	57	43				
Volume Left	10	0	0	40	0	0	15	19				
Volume Right	0	0	72	0	0	20	42	24				
cSH	401	1700	1700	544	1700	1700	381	146				
Volume to Capacity	0.02	0.54	0.31	0.07	0.63	0.33	0.15	0.29				
Queue Length 95th (m)	0.6	0.0	0.0	1.8	0.0	0.0	4.0	8.7				
Control Delay (s)	14.2	0.0	0.0	12.1	0.0	0.0	16.1	39.6				
Lane LOS	B			B			C	E				
Approach Delay (s)	0.1			0.3			16.1	39.6				
Approach LOS							C	E				
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			56.3%		ICU Level of Service			B				
Analysis Period (min)			15									

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1188	172	147	1431	52	165	71	77	34	74	51
Future Volume (vph)	57	1188	172	147	1431	52	165	71	77	34	74	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.981			0.995			0.922			0.939	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3519	0	1825	3597	0	1807	1730	0	1825	1772	0
Flt Permitted	0.134			0.160			0.614			0.561		
Satd. Flow (perm)	257	3519	0	307	3597	0	1168	1730	0	1078	1772	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			6			44			28	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Adj. Flow (vph)	57	1188	172	147	1431	52	165	71	77	34	74	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1360	0	147	1483	0	165	148	0	34	125	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	



Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions  
PM Peak Hour

	↗		→		↘		↙		←		↖		↗		↑		↘		↓		↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR										
Permitted Phases	2			6			8			4												
Detector Phase	2	2		6	6		8	8		4	4											
Switch Phase																						
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0											
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2											
Total Split (s)	82.8	82.8		82.8	82.8		37.2	37.2		37.2	37.2											
Total Split (%)	69.0%	69.0%		69.0%	69.0%		31.0%	31.0%		31.0%	31.0%											
Maximum Green (s)	77.1	77.1		77.1	77.1		30.0	30.0		30.0	30.0											
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7											
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5											
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2											
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0											
Lead/Lag																						
Lead-Lag Optimize?																						
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0											
Recall Mode	C-Max	C-Max		None	None		None	None		None	None											
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0											
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0											
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0											
Act Effct Green (s)	86.4	86.4		86.4	86.4		23.6	23.6		23.6	23.6											
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20											
v/c Ratio	0.31	0.54		0.67	0.57		0.72	0.39		0.16	0.34											
Control Delay	6.7	3.8		29.7	9.9		61.7	30.7		38.8	32.7											
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0											
Total Delay	6.7	3.8		29.7	9.9		61.7	30.7		38.8	32.7											
LOS	A	A		C	A		E	C		D	C											
Approach Delay		3.9			11.7			47.1			34.0											
Approach LOS		A			B			D			C											

Intersection Summary

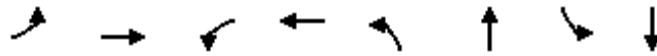
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 12.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 87.9%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 4: Holly Avenue & Derry Road



Queues  
4: Holly Avenue & Derry Road

Future Total 2022 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	1360	147	1483	165	148	34	125
v/c Ratio	0.31	0.54	0.67	0.57	0.72	0.39	0.16	0.34
Control Delay	6.7	3.8	29.7	9.9	61.7	30.7	38.8	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	3.8	29.7	9.9	61.7	30.7	38.8	32.7
Queue Length 50th (m)	1.0	11.5	16.5	77.0	36.7	21.1	6.7	19.6
Queue Length 95th (m)	m1.8	17.0	#63.9	121.8	55.8	36.9	14.5	33.7
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	185	2541	221	2591	313	496	289	495
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.54	0.67	0.57	0.53	0.30	0.12	0.25

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis












## 4: Holly Avenue & Derry Road

Future Total 2022 Conditions  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1188	172	147	1431	52	165	71	77	34	74	51
Future Volume (vph)	57	1188	172	147	1431	52	165	71	77	34	74	51
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3519		1825	3596		1807	1730		1825	1772	
Flt Permitted	0.13	1.00		0.16	1.00		0.61	1.00		0.56	1.00	
Satd. Flow (perm)	258	3519		307	3596		1168	1730		1077	1772	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	1188	172	147	1431	52	165	71	77	34	74	51
RTOR Reduction (vph)	0	8	0	0	2	0	0	35	0	0	22	0
Lane Group Flow (vph)	57	1352	0	147	1481	0	165	113	0	34	103	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.7	85.7		85.7	85.7		21.4	21.4		21.4	21.4	
Effective Green, g (s)	86.4	86.4		86.4	86.4		23.6	23.6		23.6	23.6	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	2533		221	2589		229	340		211	348	
v/s Ratio Prot		0.38			0.41			0.07			0.06	
v/s Ratio Perm	0.22			c0.48			c0.14			0.03		
v/c Ratio	0.31	0.53		0.67	0.57		0.72	0.33		0.16	0.29	
Uniform Delay, d1	6.0	7.6		9.0	8.0		45.1	41.4		40.0	41.1	
Progression Factor	0.38	0.38		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	0.6		5.7	0.2		10.6	0.6		0.4	0.5	
Delay (s)	5.5	3.5		14.8	8.2		55.7	42.0		40.3	41.6	
Level of Service	A	A		B	A		E	D		D	D	
Approach Delay (s)		3.6			8.8			49.2			41.3	
Approach LOS		A			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			11.8				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)				10.0	
Intersection Capacity Utilization			87.9%				ICU Level of Service				E	
Analysis Period (min)			15									
c Critical Lane Group												












Lanes, Volumes, Timings  
5: Regional Road 25 & West Site Access

Future Total 2022 Conditions  
PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	44	1040	48	0	904
Future Volume (vph)	0	44	1040	48	0	904
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.993			
Flt Protected						
Satd. Flow (prot)	0	1629	3553	0	0	3579
Flt Permitted						
Satd. Flow (perm)	0	1629	3553	0	0	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	118.0		1312.9			217.4
Travel Time (s)	8.5		67.5			11.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	44	1040	48	0	904
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	44	1088	0	0	904
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	40.3%		ICU Level of Service A			
Analysis Period (min)	15					























HCM Unsignalized Intersection Capacity Analysis  
5: Regional Road 25 & West Site Access

Future Total 2022 Conditions  
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	0	44	1040	48	0	904
Future Volume (Veh/h)	0	44	1040	48	0	904
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	44	1040	48	0	904
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	217					
pX, platoon unblocked	0.82					
vC, conflicting volume	1516	544			1088	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1181	544			1088	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	91			100	
cM capacity (veh/h)	149	483			637	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	44	693	395	452	452	
Volume Left	0	0	0	0	0	
Volume Right	44	0	48	0	0	
cSH	483	1700	1700	1700	1700	
Volume to Capacity	0.09	0.41	0.23	0.27	0.27	
Queue Length 95th (m)	2.3	0.0	0.0	0.0	0.0	
Control Delay (s)	13.2	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	13.2	0.0			0.0	
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			40.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	348	197	95	509	61	299	950	196	67	705	139
Future Volume (vph)	89	348	197	95	509	61	299	950	196	67	705	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		50.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.946			0.984				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3407	0	1772	3560	0	1789	3476	1570	1825	3476	1633
Flt Permitted	0.277			0.235			0.273			0.256		
Satd. Flow (perm)	517	3407	0	438	3560	0	514	3476	1570	492	3476	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		88			10				145			117
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1312.9	
Travel Time (s)		32.8			61.8			26.6			67.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Adj. Flow (vph)	89	348	197	95	509	61	299	950	196	67	705	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	545	0	95	570	0	299	950	196	67	705	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

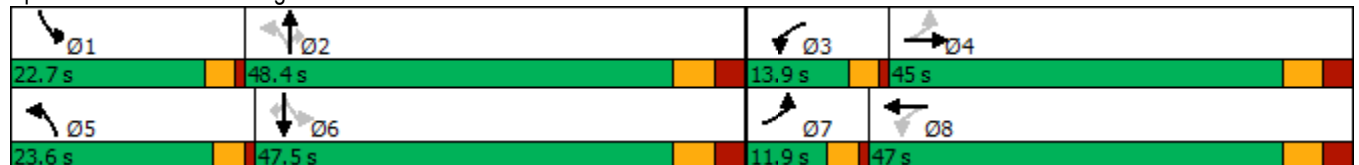
Future Total 2022 Conditions  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	11.9	45.0		13.9	47.0		23.6	48.4	48.4	22.7	47.5	47.5
Total Split (%)	9.2%	34.6%		10.7%	36.2%		18.2%	37.2%	37.2%	17.5%	36.5%	36.5%
Maximum Green (s)	7.9	38.0		9.9	40.0		19.6	41.4	41.4	18.7	40.5	40.5
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	37.7	23.0		39.6	26.5		66.7	53.8	53.8	57.2	42.9	42.9
Actuated g/C Ratio	0.35	0.21		0.36	0.24		0.61	0.50	0.50	0.53	0.40	0.40
v/c Ratio	0.29	0.69		0.31	0.65		0.56	0.55	0.23	0.17	0.51	0.19
Control Delay	25.6	37.8		25.8	40.8		15.0	22.5	6.6	11.6	28.2	7.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	37.8		25.8	40.8		15.0	22.5	6.6	11.6	28.2	7.4
LOS	C	D		C	D		B	C	A	B	C	A
Approach Delay		36.1			38.6			18.8			23.8	
Approach LOS		D			D			B			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 108.5  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 26.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 72.2%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	89	545	95	570	299	950	196	67	705	139
v/c Ratio	0.29	0.69	0.31	0.65	0.56	0.55	0.23	0.17	0.51	0.19
Control Delay	25.6	37.8	25.8	40.8	15.0	22.5	6.6	11.6	28.2	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	37.8	25.8	40.8	15.0	22.5	6.6	11.6	28.2	7.4
Queue Length 50th (m)	12.4	47.6	13.3	58.1	28.3	76.1	5.8	5.5	60.3	2.9
Queue Length 95th (m)	24.1	68.1	25.2	79.0	50.2	111.4	21.1	12.8	90.5	17.0
Internal Link Dist (m)		431.0		834.9		493.1			1288.9	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	307	1323	320	1397	583	1722	851	569	1374	716
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.41	0.30	0.41	0.51	0.55	0.23	0.12	0.51	0.19
Intersection Summary										



HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2022 Conditions  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	348	197	95	509	61	299	950	196	67	705	139
Future Volume (vph)	89	348	197	95	509	61	299	950	196	67	705	139
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1772	3406		1772	3560		1789	3476	1570	1825	3476	1633
Flt Permitted	0.28	1.00		0.23	1.00		0.27	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	517	3406		437	3560		514	3476	1570	492	3476	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	348	197	95	509	61	299	950	196	67	705	139
RTOR Reduction (vph)	0	69	0	0	8	0	0	0	74	0	0	70
Lane Group Flow (vph)	89	476	0	95	562	0	299	950	122	67	705	69
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	28.0	21.9		33.2	24.5		61.6	51.8	51.8	47.6	41.8	41.8
Effective Green, g (s)	34.0	23.9		37.6	26.5		64.6	53.8	53.8	53.6	43.8	43.8
Actuated g/C Ratio	0.31	0.22		0.34	0.24		0.59	0.49	0.49	0.49	0.40	0.40
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	263	738		290	856		518	1696	766	345	1381	649
v/s Ratio Prot	c0.03	0.14		c0.03	c0.16		c0.10	c0.27		0.02	0.20	
v/s Ratio Perm	0.08			0.08			0.24		0.08	0.08		0.04
v/c Ratio	0.34	0.65		0.33	0.66		0.58	0.56	0.16	0.19	0.51	0.11
Uniform Delay, d1	28.2	39.3		26.1	37.8		12.7	19.9	15.6	15.3	25.1	20.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.5		0.7	1.8		1.6	1.3	0.4	0.3	1.4	0.3
Delay (s)	28.9	40.7		26.7	39.6		14.2	21.2	16.1	15.6	26.4	21.2
Level of Service	C	D		C	D		B	C	B	B	C	C
Approach Delay (s)		39.1			37.7			19.1			24.8	
Approach LOS		D			D			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			27.4				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			110.2				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			72.2%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

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

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	177	59	75	190	91	39	1202	51	71	830	47
Future Volume (vph)	66	177	59	75	190	91	39	1202	51	71	830	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	0.99			1.00				
Frt		0.962			0.951			0.994				0.992
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1827	0	1738	1748	0	1825	3483	0	1738	3396	0
Flt Permitted	0.347			0.436			0.324			0.146		
Satd. Flow (perm)	652	1827	0	796	1748	0	622	3483	0	267	3396	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			28			6				11
Link Speed (k/h)		50			50			50				50
Link Distance (m)		315.0			196.8			235.1				311.8
Travel Time (s)		22.7			14.2			16.9				22.4
Confl. Peds. (#/hr)	4		3	3		4			2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Adj. Flow (vph)	66	177	59	75	190	91	39	1202	51	71	830	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	236	0	75	281	0	39	1253	0	71	877	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

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

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		5.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		9.7	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		47.2	47.2		9.8	57.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		52.4%	52.4%		10.9%	63.3%	
Maximum Green (s)	26.0	26.0		26.0	26.0		41.2	41.2		5.8	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-3.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	19.6	19.6		19.6	19.6		51.8	51.8		64.4	60.4	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.58	0.58		0.72	0.67	
v/c Ratio	0.47	0.57		0.43	0.70		0.11	0.62		0.21	0.38	
Control Delay	40.1	33.5		36.8	38.0		12.9	16.2		6.3	7.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.1	33.5		36.8	38.0		12.9	16.2		6.3	7.8	
LOS	D	C		D	D		B	B		A	A	
Approach Delay		35.0			37.8			16.1			7.6	
Approach LOS		C			D			B			A	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 39 (43%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 18.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 79.6%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



# Timings

## 1: Ontario Street & Laurier Road

07/19/2023

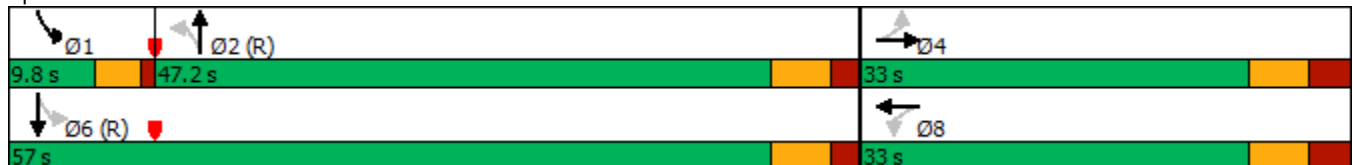


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↕	↖	↕
Traffic Volume (vph)	66	177	75	190	39	1202	71	830
Future Volume (vph)	66	177	75	190	39	1202	71	830
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	5.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	9.7	27.0
Total Split (s)	33.0	33.0	33.0	33.0	47.2	47.2	9.8	57.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	52.4%	52.4%	10.9%	63.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-1.0	-3.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	1.0	5.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	19.6	19.6	19.6	19.6	51.8	51.8	64.4	60.4
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.58	0.58	0.72	0.67
v/c Ratio	0.47	0.57	0.43	0.70	0.11	0.62	0.21	0.38
Control Delay	40.1	33.5	36.8	38.0	12.9	16.2	6.3	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	33.5	36.8	38.0	12.9	16.2	6.3	7.8
LOS	D	C	D	D	B	B	A	A
Approach Delay		35.0		37.8		16.1		7.6
Approach LOS		C		D		B		A

### Intersection Summary

Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 39 (43%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 18.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 79.6%  
 ICU Level of Service D  
 Analysis Period (min) 15

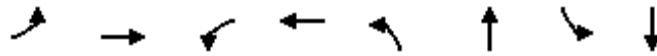
### Splits and Phases: 1: Ontario Street & Laurier Road



# Phasings

## 1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	5.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	9.7	27.0
Total Split (s)	33.0	33.0	33.0	33.0	47.2	47.2	9.8	57.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	52.4%	52.4%	10.9%	63.3%
Maximum Green (s)	26.0	26.0	26.0	26.0	41.2	41.2	5.8	51.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	1.0	2.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0
90th %ile Green (s)	24.5	24.5	24.5	24.5	41.2	41.2	7.3	52.5
90th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Max	Coord
70th %ile Green (s)	20.5	20.5	20.5	20.5	45.3	45.3	7.2	56.5
70th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Gap	Coord
50th %ile Green (s)	17.7	17.7	17.7	17.7	48.8	48.8	6.5	59.3
50th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	14.7	14.7	14.7	14.7	52.3	52.3	6.0	62.3
30th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Gap	Coord
10th %ile Green (s)	10.5	10.5	10.5	10.5	66.5	66.5	0.0	66.5
10th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Skip	Coord

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

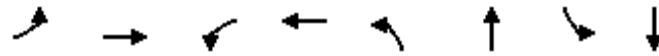
Offset: 39 (43%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Actuated-Coordinated

Queues

1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	236	75	281	39	1253	71	877
v/c Ratio	0.47	0.57	0.43	0.70	0.11	0.62	0.21	0.38
Control Delay	40.1	33.5	36.8	38.0	12.9	16.2	6.3	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	33.5	36.8	38.0	12.9	16.2	6.3	7.8
Queue Length 50th (m)	10.0	33.5	11.3	40.5	3.0	74.0	3.1	30.6
Queue Length 95th (m)	20.9	50.6	22.3	60.2	9.8	116.1	8.7	52.1
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	202	581	247	563	358	2007	347	2283
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.41	0.30	0.50	0.11	0.62	0.20	0.38

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 1: Ontario Street & Laurier Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Traffic Volume (vph)	66	177	59	75	190	91	39	1202	51	71	830	47
Future Volume (vph)	66	177	59	75	190	91	39	1202	51	71	830	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	1828		1735	1749		1825	3482		1738	3396	
Flt Permitted	0.35	1.00		0.44	1.00		0.32	1.00		0.15	1.00	
Satd. Flow (perm)	652	1828		797	1749		622	3482		267	3396	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	177	59	75	190	91	39	1202	51	71	830	47
RTOR Reduction (vph)	0	15	0	0	22	0	0	3	0	0	4	0
Lane Group Flow (vph)	66	221	0	75	259	0	39	1250	0	71	873	0
Confl. Peds. (#/hr)	4		3	3		4			2	2		
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.6	17.6		17.6	17.6		50.0	50.0		59.4	59.4	
Effective Green, g (s)	19.6	19.6		19.6	19.6		51.0	51.0		62.4	60.4	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.57	0.57		0.69	0.67	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		4.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	141	398		173	380		352	1973		322	2279	
v/s Ratio Prot		0.12			c0.15			c0.36		0.02	c0.26	
v/s Ratio Perm	0.10			0.09			0.06			0.13		
v/c Ratio	0.47	0.56		0.43	0.68		0.11	0.63		0.22	0.38	
Uniform Delay, d1	30.7	31.3		30.4	32.3		9.0	13.2		6.7	6.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	1.0		0.6	4.0		0.6	1.6		0.3	0.5	
Delay (s)	31.6	32.3		31.0	36.3		9.7	14.7		7.1	7.0	
Level of Service	C	C		C	D		A	B		A	A	
Approach Delay (s)		32.1			35.2			14.6			7.0	
Approach LOS		C			D			B			A	

### Intersection Summary

HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# Lanes, Volumes, Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	364	1620	256	349	787	235	188	759	226	184	651	167
Future Volume (vph)	364	1620	256	349	787	235	188	759	226	184	651	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00		0.99			0.98	1.00		0.98	1.00	1.00	
Frt			0.850			0.850			0.850		0.969	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3579	1570	1690	3476	1555	1789	3380	1570	1690	3155	0
Flt Permitted	0.208			0.089			0.137			0.199		
Satd. Flow (perm)	384	3579	1550	158	3476	1527	258	3380	1545	354	3155	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			182			226			27
Link Speed (k/h)		60			60			50				50
Link Distance (m)		622.6			218.7			1530.3				235.1
Travel Time (s)		37.4			13.1			110.2				16.9
Confl. Peds. (#/hr)	6		1	1		6	2		4	4		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Adj. Flow (vph)	364	1620	256	349	787	235	188	759	226	184	651	167
Shared Lane Traffic (%)												
Lane Group Flow (vph)	364	1620	256	349	787	235	188	759	226	184	818	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0



# Lanes, Volumes, Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	SBR
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7	
Total Split (s)	19.0	49.3	49.3	17.0	47.3	47.3	12.0	43.7	43.7	10.0	41.7	
Total Split (%)	15.8%	41.1%	41.1%	14.2%	39.4%	39.4%	10.0%	36.4%	36.4%	8.3%	34.8%	
Maximum Green (s)	15.0	42.6	42.6	13.0	40.6	40.6	8.0	37.0	37.0	6.0	35.0	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	65.8	44.3	44.3	64.3	43.4	43.4	51.3	37.3	37.3	48.3	35.3	
Actuated g/C Ratio	0.55	0.37	0.37	0.54	0.36	0.36	0.43	0.31	0.31	0.40	0.29	
v/c Ratio	0.87	1.23	0.40	1.14	0.63	0.35	0.75	0.72	0.36	0.76	0.86	
Control Delay	39.7	142.9	18.0	121.3	36.8	11.9	41.7	41.1	5.4	44.2	49.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	39.7	142.9	18.0	121.3	36.8	11.9	41.7	41.1	5.4	44.2	49.2	
LOS	D	F	B	F	D	B	D	D	A	D	D	
Approach Delay		111.9			54.1			34.3			48.3	
Approach LOS		F			D			C			D	

### Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 125  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.23  
 Intersection Signal Delay: 71.4  
 Intersection LOS: E  
 Intersection Capacity Utilization 113.3%  
 ICU Level of Service H  
 Analysis Period (min) 15

### Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



# Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023

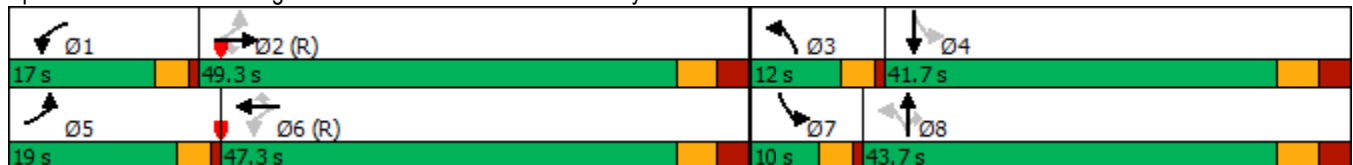


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗↗	↘	↘	↗↗	↘	↘	↗↗	↘	↘	↗↗
Traffic Volume (vph)	364	1620	256	349	787	235	188	759	226	184	651
Future Volume (vph)	364	1620	256	349	787	235	188	759	226	184	651
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	19.0	49.3	49.3	17.0	47.3	47.3	12.0	43.7	43.7	10.0	41.7
Total Split (%)	15.8%	41.1%	41.1%	14.2%	39.4%	39.4%	10.0%	36.4%	36.4%	8.3%	34.8%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)	65.8	44.3	44.3	64.3	43.4	43.4	51.3	37.3	37.3	48.3	35.3
Actuated g/C Ratio	0.55	0.37	0.37	0.54	0.36	0.36	0.43	0.31	0.31	0.40	0.29
v/c Ratio	0.87	1.23	0.40	1.14	0.63	0.35	0.75	0.72	0.36	0.76	0.86
Control Delay	39.7	142.9	18.0	121.3	36.8	11.9	41.7	41.1	5.4	44.2	49.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	142.9	18.0	121.3	36.8	11.9	41.7	41.1	5.4	44.2	49.2
LOS	D	F	B	F	D	B	D	D	A	D	D
Approach Delay		111.9			54.1			34.3			48.3
Approach LOS		F			D			C			D

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 125  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.23  
 Intersection Signal Delay: 71.4  
 Intersection LOS: E  
 Intersection Capacity Utilization 113.3%  
 ICU Level of Service H  
 Analysis Period (min) 15

### Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Phasings

2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	19.0	49.3	49.3	17.0	47.3	47.3	12.0	43.7	43.7	10.0	41.7
Total Split (%)	15.8%	41.1%	41.1%	14.2%	39.4%	39.4%	10.0%	36.4%	36.4%	8.3%	34.8%
Maximum Green (s)	15.0	42.6	42.6	13.0	40.6	40.6	8.0	37.0	37.0	6.0	35.0
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0
90th %ile Green (s)	15.0	42.6	42.6	13.0	40.6	40.6	8.0	37.0	37.0	6.0	35.0
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Max	Max	Max	Max
70th %ile Green (s)	15.0	42.6	42.6	13.0	40.6	40.6	8.0	37.0	37.0	6.0	35.0
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Max	Max	Max	Max
50th %ile Green (s)	15.0	42.6	42.6	13.0	40.6	40.6	8.0	37.0	37.0	6.0	35.0
50th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Max
30th %ile Green (s)	16.0	42.6	42.6	14.0	40.6	40.6	8.0	36.0	36.0	6.0	34.0
30th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Gap
10th %ile Green (s)	15.4	42.6	42.6	19.0	46.2	46.2	8.0	31.0	31.0	6.0	29.0
10th %ile Term Code	Gap	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Gap

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated

# Queues

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	364	1620	256	349	787	235	188	759	226	184	818
v/c Ratio	0.87	1.23	0.40	1.14	0.63	0.35	0.75	0.72	0.36	0.76	0.86
Control Delay	39.7	142.9	18.0	121.3	36.8	11.9	41.7	41.1	5.4	44.2	49.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	142.9	18.0	121.3	36.8	11.9	41.7	41.1	5.4	44.2	49.2
Queue Length 50th (m)	47.3	~247.4	24.8	~86.8	88.1	15.7	27.2	81.9	0.0	26.7	91.4
Queue Length 95th (m)	#96.8	#289.9	46.9	#145.4	111.0	36.9	#53.1	103.5	16.8	#44.0	116.4
Internal Link Dist (m)		598.6			194.7			1506.3			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	419	1321	639	306	1257	668	250	1090	651	242	983
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	1.23	0.40	1.14	0.63	0.35	0.75	0.70	0.35	0.76	0.83

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	364	1620	256	349	787	235	188	759	226	184	651	167
Future Volume (vph)	364	1620	256	349	787	235	188	759	226	184	651	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1754	3579	1550	1690	3476	1527	1789	3380	1545	1690	3156	
Flt Permitted	0.21	1.00	1.00	0.09	1.00	1.00	0.14	1.00	1.00	0.20	1.00	
Satd. Flow (perm)	384	3579	1550	159	3476	1527	257	3380	1545	354	3156	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	364	1620	256	349	787	235	188	759	226	184	651	167
RTOR Reduction (vph)	0	0	67	0	0	116	0	0	156	0	19	0
Lane Group Flow (vph)	364	1620	189	349	787	119	188	759	70	184	799	0
Confl. Peds. (#/hr)	6		1	1		6	2		4	4		2
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	57.9	42.6	42.6	56.1	41.7	41.7	43.6	35.6	35.6	39.6	33.6	
Effective Green, g (s)	63.9	44.3	44.3	62.1	43.4	43.4	48.6	37.3	37.3	45.6	35.3	
Actuated g/C Ratio	0.53	0.37	0.37	0.52	0.36	0.36	0.41	0.31	0.31	0.38	0.29	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	413	1321	572	304	1257	552	244	1050	480	234	928	
v/s Ratio Prot	c0.13	c0.45		c0.17	0.23		c0.07	0.22		c0.06	c0.25	
v/s Ratio Perm	0.33		0.12	0.43		0.08	0.24		0.05	0.24		
v/c Ratio	0.88	1.23	0.33	1.15	0.63	0.22	0.77	0.72	0.15	0.79	0.86	
Uniform Delay, d1	19.9	37.9	27.2	37.9	31.6	26.5	26.7	36.8	29.9	27.6	40.0	
Progression Factor	1.00	1.00	1.00	0.83	1.08	1.41	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.2	108.8	1.5	95.3	2.1	0.8	13.9	2.5	0.1	15.8	8.2	
Delay (s)	39.1	146.6	28.7	126.8	36.2	38.1	40.7	39.2	30.0	43.5	48.3	
Level of Service	D	F	C	F	D	D	D	D	C	D	D	
Approach Delay (s)		115.7			59.6			37.7			47.4	
Approach LOS		F			E			D			D	

### Intersection Summary

HCM 2000 Control Delay	74.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	113.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

# Lanes, Volumes, Timings

## 3: Derry Road

07/19/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	20	2003	1564	16	18	4
Future Volume (vph)	20	2003	1564	16	18	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.975	
Flt Protected	0.950				0.961	
Satd. Flow (prot)	1825	3544	3439	0	1716	0
Flt Permitted	0.950				0.961	
Satd. Flow (perm)	1825	3544	3439	0	1716	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		218.7	493.3		86.5	
Travel Time (s)		13.1	29.6		6.2	
Confl. Peds. (#/hr)	8			8		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	6%	0%	6%	0%
Adj. Flow (vph)	20	2003	1564	16	18	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	2003	1580	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

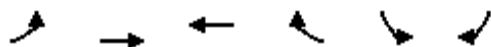
### Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.4%
Analysis Period (min)	15
	ICU Level of Service C

# HCM Unsignalized Intersection Capacity Analysis

## 3: Derry Road

07/19/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	2003	1564	16	18	4
Future Volume (Veh/h)	20	2003	1564	16	18	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	2003	1564	16	18	4
Pedestrians					8	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (m)		219				
pX, platoon unblocked					0.64	
vC, conflicting volume	1588				2622	798
vC1, stage 1 conf vol					1580	
vC2, stage 2 conf vol					1042	
vCu, unblocked vol	1588				2407	798
tC, single (s)	4.1				6.9	6.9
tC, 2 stage (s)					5.9	
tF (s)	2.2				3.6	3.3
p0 queue free %	95				87	99
cM capacity (veh/h)	416				139	331
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	20	1002	1002	1043	537	22
Volume Left	20	0	0	0	0	18
Volume Right	0	0	0	0	16	4
cSH	416	1700	1700	1700	1700	156
Volume to Capacity	0.05	0.59	0.59	0.61	0.32	0.14
Queue Length 95th (m)	1.1	0.0	0.0	0.0	0.0	3.7
Control Delay (s)	14.1	0.0	0.0	0.0	0.0	31.9
Lane LOS	B					D
Approach Delay (s)	0.1			0.0		31.9
Approach LOS						D
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			65.4%		ICU Level of Service	C
Analysis Period (min)			15			

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1819	99	55	1266	21	161	41	133	42	43	77
Future Volume (vph)	56	1819	99	55	1266	21	161	41	133	42	43	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		1.00	0.99		0.99	0.99	
Frt		0.992			0.998			0.885			0.904	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1644	3513	0	1738	3436	0	1807	1550	0	1738	1645	0
Flt Permitted	0.178			0.065			0.623			0.497		
Satd. Flow (perm)	308	3513	0	119	3436	0	1183	1550	0	905	1645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			3			23			74	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Confl. Peds. (#/hr)	2		1	1		2	2		6	6		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Adj. Flow (vph)	56	1819	99	55	1266	21	161	41	133	42	43	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	1918	0	55	1287	0	161	174	0	42	120	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



# Lanes, Volumes, Timings

## 4: Holly Avenue & Derry Road

07/19/2023

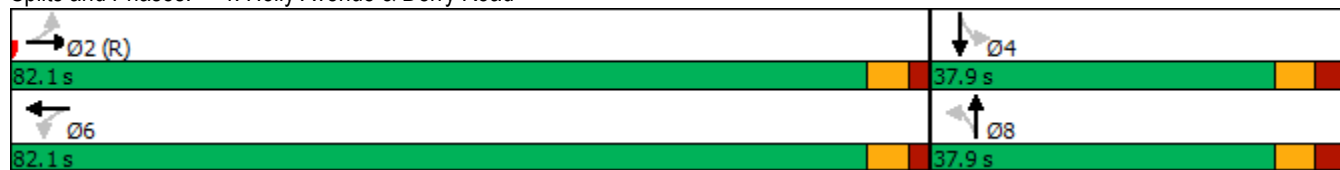


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.1	82.1		82.1	82.1		37.9	37.9		37.9	37.9	
Total Split (%)	68.4%	68.4%		68.4%	68.4%		31.6%	31.6%		31.6%	31.6%	
Maximum Green (s)	76.4	76.4		76.4	76.4		30.7	30.7		30.7	30.7	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	86.9	86.9		86.9	86.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
v/c Ratio	0.25	0.75		0.64	0.52		0.71	0.55		0.24	0.32	
Control Delay	1.6	6.2		50.5	9.0		61.2	43.2		41.8	18.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	1.6	6.2		50.5	9.0		61.2	43.2		41.8	18.5	
LOS	A	A		D	A		E	D		D	B	
Approach Delay		6.1			10.7			51.9			24.5	
Approach LOS		A			B			D			C	

### Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 12.5      Intersection LOS: B  
 Intersection Capacity Utilization 87.7%      ICU Level of Service E  
 Analysis Period (min) 15

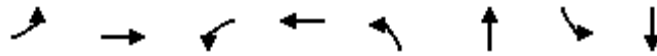
Splits and Phases: 4: Holly Avenue & Derry Road



# Timings

## 4: Holly Avenue & Derry Road

07/19/2023

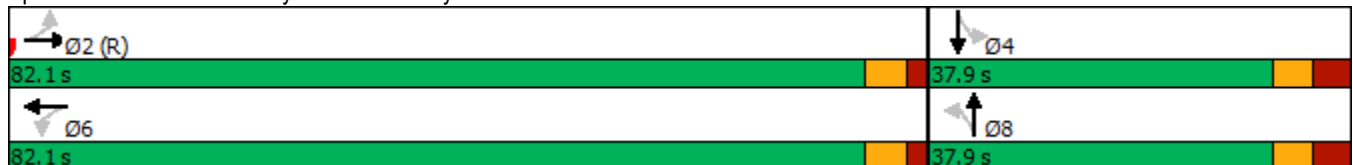


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↗	↗↘	↖	↖↗	↖	↘	↖	↘
Traffic Volume (vph)	56	1819	55	1266	161	41	42	43
Future Volume (vph)	56	1819	55	1266	161	41	42	43
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.1	82.1	82.1	82.1	37.9	37.9	37.9	37.9
Total Split (%)	68.4%	68.4%	68.4%	68.4%	31.6%	31.6%	31.6%	31.6%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	-0.7	-0.7	-0.7	-0.7	-2.2	-2.2	-2.2	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	86.9	86.9	86.9	86.9	23.1	23.1	23.1	23.1
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.19	0.19	0.19	0.19
v/c Ratio	0.25	0.75	0.64	0.52	0.71	0.55	0.24	0.32
Control Delay	1.6	6.2	50.5	9.0	61.2	43.2	41.8	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.6	6.2	50.5	9.0	61.2	43.2	41.8	18.5
LOS	A	A	D	A	E	D	D	B
Approach Delay		6.1		10.7		51.9		24.5
Approach LOS		A		B		D		C

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 12.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 87.7%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 4: Holly Avenue & Derry Road



Phasings  
4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.1	82.1	82.1	82.1	37.9	37.9	37.9	37.9
Total Split (%)	68.4%	68.4%	68.4%	68.4%	31.6%	31.6%	31.6%	31.6%
Maximum Green (s)	76.4	76.4	76.4	76.4	30.7	30.7	30.7	30.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0
90th %ile Green (s)	77.3	77.3	77.3	77.3	29.8	29.8	29.8	29.8
90th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
70th %ile Green (s)	82.9	82.9	82.9	82.9	24.2	24.2	24.2	24.2
70th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
50th %ile Green (s)	86.3	86.3	86.3	86.3	20.8	20.8	20.8	20.8
50th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
30th %ile Green (s)	89.7	89.7	89.7	89.7	17.4	17.4	17.4	17.4
30th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
10th %ile Green (s)	94.8	94.8	94.8	94.8	12.3	12.3	12.3	12.3
10th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Control Type: Actuated-Coordinated

# Queues

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	1918	55	1287	161	174	42	120
v/c Ratio	0.25	0.75	0.64	0.52	0.71	0.55	0.24	0.32
Control Delay	1.6	6.2	50.5	9.0	61.2	43.2	41.8	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.6	6.2	50.5	9.0	61.2	43.2	41.8	18.5
Queue Length 50th (m)	0.7	42.2	5.8	61.7	35.8	32.4	8.5	9.1
Queue Length 95th (m)	m0.9	m14.6	#35.0	100.1	54.3	49.9	17.3	23.1
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	223	2546	86	2489	324	441	248	504
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.75	0.64	0.52	0.50	0.39	0.17	0.24

### Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 4: Holly Avenue & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	56	1819	99	55	1266	21	161	41	133	42	43	77
Future Volume (vph)	56	1819	99	55	1266	21	161	41	133	42	43	77
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1643	3514		1738	3434		1803	1551		1729	1645	
Flt Permitted	0.18	1.00		0.06	1.00		0.62	1.00		0.50	1.00	
Satd. Flow (perm)	308	3514		118	3434		1183	1551		904	1645	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	1819	99	55	1266	21	161	41	133	42	43	77
RTOR Reduction (vph)	0	2	0	0	1	0	0	19	0	0	60	0
Lane Group Flow (vph)	56	1916	0	55	1286	0	161	155	0	42	60	0
Confl. Peds. (#/hr)	2		1	1		2	2		6	6		2
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	86.2	86.2		86.2	86.2		20.9	20.9		20.9	20.9	
Effective Green, g (s)	86.9	86.9		86.9	86.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	223	2544		85	2486		227	298		174	316	
v/s Ratio Prot		c0.55			0.37			0.10			0.04	
v/s Ratio Perm	0.18			0.47			c0.14			0.05		
v/c Ratio	0.25	0.75		0.65	0.52		0.71	0.52		0.24	0.19	
Uniform Delay, d1	5.6	10.0		8.6	7.3		45.3	43.5		41.0	40.6	
Progression Factor	0.17	0.52		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		12.0	0.1		9.7	1.6		0.7	0.3	
Delay (s)	1.2	5.4		20.6	7.4		55.0	45.1		41.8	40.9	
Level of Service	A	A		C	A		E	D		D	D	
Approach Delay (s)		5.3			7.9			49.9			41.1	
Approach LOS		A			A			D			D	

### Intersection Summary

HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	576	483	150	425	83	155	827	138	50	963	100
Future Volume (vph)	130	576	483	150	425	83	155	827	138	50	963	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00				0.98	1.00		
Frt		0.932			0.975				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1659	3306	0	1722	3437	0	1674	3411	1541	1755	3380	1471
Flt Permitted	0.316			*0.250			0.148			0.265		
Satd. Flow (perm)	552	3306	0	453	3437	0	261	3411	1517	489	3380	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		185			18				134			168
Link Speed (k/h)		50			50			70				70
Link Distance (m)		455.0			858.9			517.1			1530.3	
Travel Time (s)		32.8			61.8			26.6			78.7	
Confl. Peds. (#/hr)	6					6			2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Adj. Flow (vph)	130	576	483	150	425	83	155	827	138	50	963	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1059	0	150	508	0	155	827	138	50	963	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023

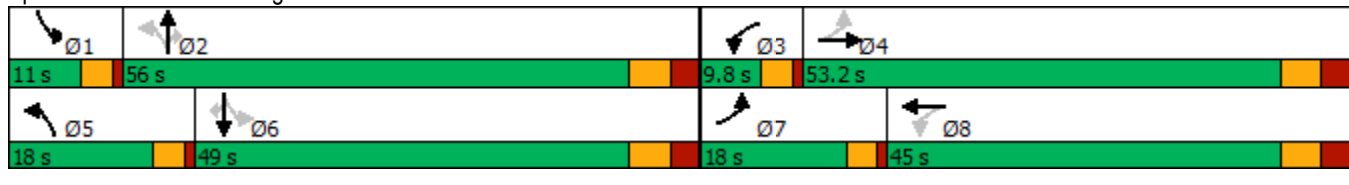


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	18.0	53.2		9.8	45.0		18.0	56.0	56.0	11.0	49.0	49.0
Total Split (%)	13.8%	40.9%		7.5%	34.6%		13.8%	43.1%	43.1%	8.5%	37.7%	37.7%
Maximum Green (s)	14.0	46.2		5.8	38.0		14.0	49.0	49.0	7.0	42.0	42.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	51.7	37.8		45.6	32.7		64.9	52.5	52.5	59.3	45.7	45.7
Actuated g/C Ratio	0.44	0.32		0.38	0.28		0.55	0.44	0.44	0.50	0.39	0.39
v/c Ratio	0.35	0.90		0.56	0.53		0.50	0.55	0.19	0.14	0.74	0.15
Control Delay	23.0	42.3		29.9	37.4		20.7	28.0	5.1	15.8	37.3	0.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	42.3		29.9	37.4		20.7	28.0	5.1	15.8	37.3	0.5
LOS	C	D		C	D		C	C	A	B	D	A
Approach Delay		40.2			35.6			24.2			33.0	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	118.6
Natural Cycle:	85
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.90
Intersection Signal Delay:	33.1
Intersection LOS:	C
Intersection Capacity Utilization:	89.9%
ICU Level of Service:	E
Analysis Period (min):	15
* User Entered Value	

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Timings

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023

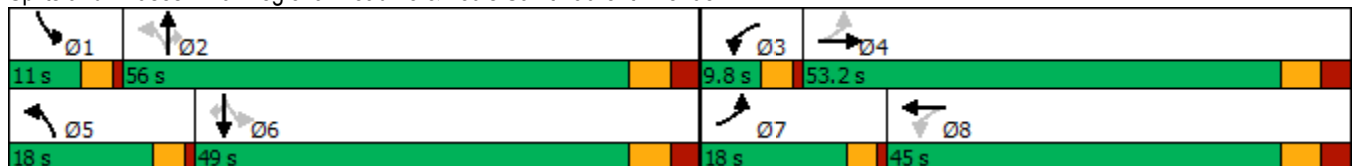


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↕	↘	↕	↘	↕	↗	↘	↕	↗
Traffic Volume (vph)	130	576	150	425	155	827	138	50	963	100
Future Volume (vph)	130	576	150	425	155	827	138	50	963	100
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	18.0	53.2	9.8	45.0	18.0	56.0	56.0	11.0	49.0	49.0
Total Split (%)	13.8%	40.9%	7.5%	34.6%	13.8%	43.1%	43.1%	8.5%	37.7%	37.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.0	-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0	1.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	51.7	37.8	45.6	32.7	64.9	52.5	52.5	59.3	45.7	45.7
Actuated g/C Ratio	0.44	0.32	0.38	0.28	0.55	0.44	0.44	0.50	0.39	0.39
v/c Ratio	0.35	0.90	0.56	0.53	0.50	0.55	0.19	0.14	0.74	0.15
Control Delay	23.0	42.3	29.9	37.4	20.7	28.0	5.1	15.8	37.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	42.3	29.9	37.4	20.7	28.0	5.1	15.8	37.3	0.5
LOS	C	D	C	D	C	C	A	B	D	A
Approach Delay		40.2		35.6		24.2			33.0	
Approach LOS		D		D		C			C	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 118.6  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 33.1  
 Intersection LOS: C  
 Intersection Capacity Utilization 89.9%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue





Phasings

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	18.0	53.2	9.8	45.0	18.0	56.0	56.0	11.0	49.0	49.0
Total Split (%)	13.8%	40.9%	7.5%	34.6%	13.8%	43.1%	43.1%	8.5%	37.7%	37.7%
Maximum Green (s)	14.0	46.2	5.8	38.0	14.0	49.0	49.0	7.0	42.0	42.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2
Minimum Gap (s)	3.0	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0		7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0		16.0		18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0		0		0	0		0	0
90th %ile Green (s)	14.0	46.2	5.8	38.0	14.0	49.0	49.0	7.0	42.0	42.0
90th %ile Term Code	Max	Max	Max	Hold	Max	MaxR	MaxR	Max	MaxR	MaxR
70th %ile Green (s)	12.8	42.2	5.8	35.2	14.0	49.0	49.0	7.0	42.0	42.0
70th %ile Term Code	Gap	Gap	Max	Hold	Max	MaxR	MaxR	Max	MaxR	MaxR
50th %ile Green (s)	11.2	37.2	5.8	31.8	11.3	49.0	49.0	7.0	44.7	44.7
50th %ile Term Code	Gap	Gap	Max	Hold	Gap	MaxR	MaxR	Max	Hold	Hold
30th %ile Green (s)	9.7	31.5	5.8	27.6	9.3	49.0	49.0	6.3	46.0	46.0
30th %ile Term Code	Gap	Gap	Max	Hold	Gap	MaxR	MaxR	Gap	Hold	Hold
10th %ile Green (s)	7.6	24.0	5.8	22.2	7.6	53.6	53.6	0.0	42.0	42.0
10th %ile Term Code	Gap	Gap	Max	Hold	Gap	Hold	Hold	Skip	MaxR	MaxR

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 118.6  
 Control Type: Actuated-Uncoordinated  
 90th %ile Actuated Cycle: 130  
 70th %ile Actuated Cycle: 126  
 50th %ile Actuated Cycle: 121  
 30th %ile Actuated Cycle: 114.6  
 10th %ile Actuated Cycle: 101.4

Queues

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	1059	150	508	155	827	138	50	963	100
v/c Ratio	0.35	0.90	0.56	0.53	0.50	0.55	0.19	0.14	0.74	0.15
Control Delay	23.0	42.3	29.9	37.4	20.7	28.0	5.1	15.8	37.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	42.3	29.9	37.4	20.7	28.0	5.1	15.8	37.3	0.5
Queue Length 50th (m)	18.5	106.5	21.5	51.7	17.7	77.6	0.5	5.3	102.2	0.0
Queue Length 95th (m)	30.8	133.7	34.8	70.2	33.8	109.7	13.4	13.0	146.6	0.0
Internal Link Dist (m)		431.0		834.9		493.1			1506.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	400	1463	269	1180	346	1508	745	354	1302	670
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.72	0.56	0.43	0.45	0.55	0.19	0.14	0.74	0.15

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	576	483	150	425	83	155	827	138	50	963	100
Future Volume (vph)	130	576	483	150	425	83	155	827	138	50	963	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1658	3304		1722	3440		1674	3411	1518	1755	3380	1471
Flt Permitted	0.32	1.00		0.25	1.00		0.15	1.00	1.00	0.27	1.00	1.00
Satd. Flow (perm)	551	3304		453	3440		260	3411	1518	489	3380	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	576	483	150	425	83	155	827	138	50	963	100
RTOR Reduction (vph)	0	126	0	0	13	0	0	0	75	0	0	61
Lane Group Flow (vph)	130	933	0	150	495	0	155	827	63	50	963	39
Confl. Peds. (#/hr)	6						6		2	2		
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	45.6	35.8		36.5	30.7		59.8	50.5	50.5	50.0	44.7	44.7
Effective Green, g (s)	48.6	37.8		42.5	32.7		62.8	52.5	52.5	56.0	46.7	46.7
Actuated g/C Ratio	0.41	0.32		0.36	0.27		0.53	0.44	0.44	0.47	0.39	0.39
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	353	1045		254	942		303	1499	667	317	1321	575
v/s Ratio Prot	0.04	c0.28		c0.04	0.14		c0.06	0.24		0.01	c0.28	
v/s Ratio Perm	0.11			0.17			0.21		0.04	0.06		0.03
v/c Ratio	0.37	0.89		0.59	0.53		0.51	0.55	0.09	0.16	0.73	0.07
Uniform Delay, d1	23.4	38.9		27.1	36.8		18.4	24.7	19.6	17.8	31.0	22.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	9.6		3.6	0.5		1.5	1.5	0.3	0.2	3.6	0.2
Delay (s)	24.0	48.4		30.8	37.3		19.8	26.2	19.8	18.1	34.5	23.0
Level of Service	C	D		C	D		B	C	B	B	C	C
Approach Delay (s)		45.8			35.8			24.5			32.7	
Approach LOS		D			D			C			C	

### Intersection Summary

HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	119.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

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

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	201	39	103	241	105	58	1024	87	129	1197	87
Future Volume (vph)	67	201	39	103	241	105	58	1024	87	129	1197	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	0.99			1.00		1.00	1.00	
Frt		0.976			0.954			0.988			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1870	0	1807	1792	0	1825	3502	0	1789	3504	0
Flt Permitted	0.244			0.435			0.166			0.213		
Satd. Flow (perm)	457	1870	0	824	1792	0	319	3502	0	401	3504	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			22			17			14	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Confl. Peds. (#/hr)	9		5	5		9	3		3	3		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Adj. Flow (vph)	67	201	39	103	241	105	58	1024	87	129	1197	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	240	0	103	346	0	58	1111	0	129	1284	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

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

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		67.0	67.0		67.0	67.0	
Total Split (%)	33.0%	33.0%		33.0%	33.0%		67.0%	67.0%		67.0%	67.0%	
Maximum Green (s)	26.0	26.0		26.0	26.0		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	23.6	23.6		23.6	23.6		66.4	66.4		66.4	66.4	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.66	0.66		0.66	0.66	
v/c Ratio	0.63	0.53		0.53	0.79		0.27	0.48		0.48	0.55	
Control Delay	58.8	35.7		42.8	46.3		12.6	9.5		17.5	10.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	58.8	35.7		42.8	46.3		12.6	9.5		17.5	10.5	
LOS	E	D		D	D		B	A		B	B	
Approach Delay		40.8			45.5			9.7			11.2	
Approach LOS		D			D			A			B	

Intersection Summary

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 18.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 93.3%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



# Timings

## 1: Ontario Street & Laurier Road

07/19/2023

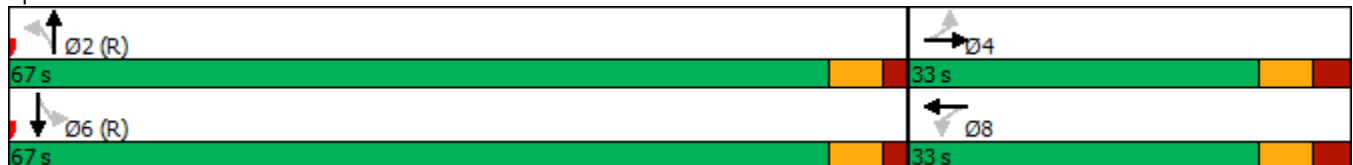


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↕	↖	↕
Traffic Volume (vph)	67	201	103	241	58	1024	129	1197
Future Volume (vph)	67	201	103	241	58	1024	129	1197
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	27.0	27.0
Total Split (s)	33.0	33.0	33.0	33.0	67.0	67.0	67.0	67.0
Total Split (%)	33.0%	33.0%	33.0%	33.0%	67.0%	67.0%	67.0%	67.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	23.6	23.6	23.6	23.6	66.4	66.4	66.4	66.4
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.66	0.66	0.66	0.66
v/c Ratio	0.63	0.53	0.53	0.79	0.27	0.48	0.48	0.55
Control Delay	58.8	35.7	42.8	46.3	12.6	9.5	17.5	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	35.7	42.8	46.3	12.6	9.5	17.5	10.5
LOS	E	D	D	D	B	A	B	B
Approach Delay		40.8		45.5		9.7		11.2
Approach LOS		D		D		A		B

### Intersection Summary

Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 18.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 93.3%  
 ICU Level of Service F  
 Analysis Period (min) 15

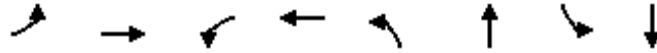
### Splits and Phases: 1: Ontario Street & Laurier Road



# Phasings

## 1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	27.0	27.0
Total Split (s)	33.0	33.0	33.0	33.0	67.0	67.0	67.0	67.0
Total Split (%)	33.0%	33.0%	33.0%	33.0%	67.0%	67.0%	67.0%	67.0%
Maximum Green (s)	26.0	26.0	26.0	26.0	61.0	61.0	61.0	61.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0
90th %ile Green (s)	26.0	26.0	26.0	26.0	61.0	61.0	61.0	61.0
90th %ile Term Code	Max	Max	Max	Max	Coord	Coord	Coord	Coord
70th %ile Green (s)	25.7	25.7	25.7	25.7	61.3	61.3	61.3	61.3
70th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord
50th %ile Green (s)	22.6	22.6	22.6	22.6	64.4	64.4	64.4	64.4
50th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord
30th %ile Green (s)	19.3	19.3	19.3	19.3	67.7	67.7	67.7	67.7
30th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord
10th %ile Green (s)	14.6	14.6	14.6	14.6	72.4	72.4	72.4	72.4
10th %ile Term Code	Hold	Hold	Gap	Gap	Coord	Coord	Coord	Coord

### Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

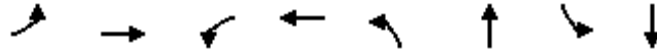
Offset: 42 (42%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Actuated-Coordinated

# Queues

## 1: Ontario Street & Laurier Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	240	103	346	58	1111	129	1284
v/c Ratio	0.63	0.53	0.53	0.79	0.27	0.48	0.48	0.55
Control Delay	58.8	35.7	42.8	46.3	12.6	9.5	17.5	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	35.7	42.8	46.3	12.6	9.5	17.5	10.5
Queue Length 50th (m)	11.5	38.5	17.3	58.5	4.3	50.7	11.5	63.5
Queue Length 95th (m)	#28.0	59.0	32.8	86.1	13.0	72.1	32.0	89.5
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	127	530	230	517	211	2329	266	2329
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.45	0.45	0.67	0.27	0.48	0.48	0.55

### Intersection Summary

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



# HCM Signalized Intersection Capacity Analysis

## 1: Ontario Street & Laurier Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Traffic Volume (vph)	67	201	39	103	241	105	58	1024	87	129	1197	87
Future Volume (vph)	67	201	39	103	241	105	58	1024	87	129	1197	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1781	1869		1800	1793		1824	3503		1787	3504	
Flt Permitted	0.24	1.00		0.44	1.00		0.17	1.00		0.21	1.00	
Satd. Flow (perm)	458	1869		825	1793		319	3503		402	3504	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	201	39	103	241	105	58	1024	87	129	1197	87
RTOR Reduction (vph)	0	8	0	0	17	0	0	6	0	0	5	0
Lane Group Flow (vph)	67	232	0	103	329	0	58	1105	0	129	1279	0
Confl. Peds. (#/hr)	9		5	5		9	3		3	3		3
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.6	21.6		21.6	21.6		65.4	65.4		65.4	65.4	
Effective Green, g (s)	23.6	23.6		23.6	23.6		66.4	66.4		66.4	66.4	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.66	0.66		0.66	0.66	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	108	441		194	423		211	2325		266	2326	
v/s Ratio Prot		0.12			c0.18			0.32			c0.37	
v/s Ratio Perm	0.15			0.12			0.18			0.32		
v/c Ratio	0.62	0.53		0.53	0.78		0.27	0.48		0.48	0.55	
Uniform Delay, d1	34.2	33.3		33.4	35.8		6.9	8.2		8.3	8.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.7	0.5		1.4	8.0		3.2	0.7		6.2	0.9	
Delay (s)	41.9	33.9		34.8	43.8		10.1	8.9		14.5	9.8	
Level of Service	D	C		C	D		B	A		B	A	
Approach Delay (s)		35.6			41.7			9.0			10.3	
Approach LOS		D			D			A			B	

### Intersection Summary

HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	1151	152	228	1303	208	236	844	180	243	693	213
Future Volume (vph)	285	1151	152	228	1303	208	236	844	180	243	693	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor			0.99			0.99			0.99	1.00	1.00	
Frt			0.850			0.850			0.850		0.965	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3614	1617	1807	3614	1633	1789	3476	1498	1807	3367	0
Flt Permitted	0.095			0.093			0.125			0.180		
Satd. Flow (perm)	177	3614	1594	177	3614	1612	235	3476	1479	342	3367	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			106			179			38
Link Speed (k/h)		60			60			50				50
Link Distance (m)		622.6			218.7			1530.3				235.1
Travel Time (s)		37.4			13.1			110.2				16.9
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Adj. Flow (vph)	285	1151	152	228	1303	208	236	844	180	243	693	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	1151	152	228	1303	208	236	844	180	243	906	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings  
 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023

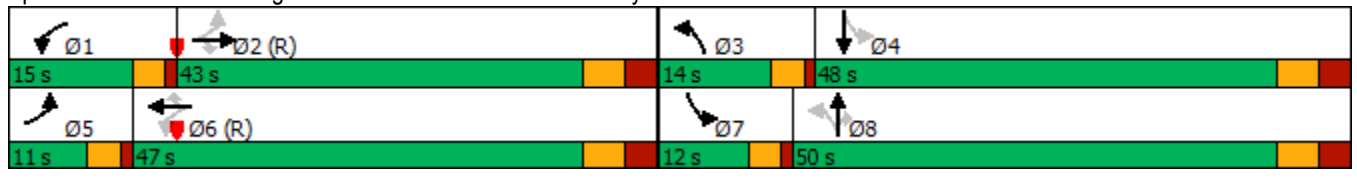


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7	
Total Split (s)	11.0	43.0	43.0	15.0	47.0	47.0	14.0	50.0	50.0	12.0	48.0	
Total Split (%)	9.2%	35.8%	35.8%	12.5%	39.2%	39.2%	11.7%	41.7%	41.7%	10.0%	40.0%	
Maximum Green (s)	7.0	36.3	36.3	11.0	40.3	40.3	10.0	43.3	43.3	8.0	41.3	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	57.3	40.8	40.8	59.1	42.0	42.0	57.3	41.3	41.3	54.3	39.3	
Actuated g/C Ratio	0.48	0.34	0.34	0.49	0.35	0.35	0.48	0.34	0.34	0.45	0.33	
v/c Ratio	1.07	0.94	0.25	0.79	1.03	0.33	0.84	0.71	0.29	0.84	0.80	
Control Delay	107.1	53.9	11.6	43.8	64.7	9.1	48.9	37.4	4.9	45.5	41.1	
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	107.1	53.9	11.6	43.8	64.7	9.1	48.9	37.4	4.9	45.5	41.1	
LOS	F	D	B	D	E	A	D	D	A	D	D	
Approach Delay		59.4			55.3			34.9			42.1	
Approach LOS		E			E			C			D	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	115
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.07
Intersection Signal Delay:	49.3
Intersection LOS:	D
Intersection Capacity Utilization	106.0%
ICU Level of Service	G
Analysis Period (min)	15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



# Timings

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023

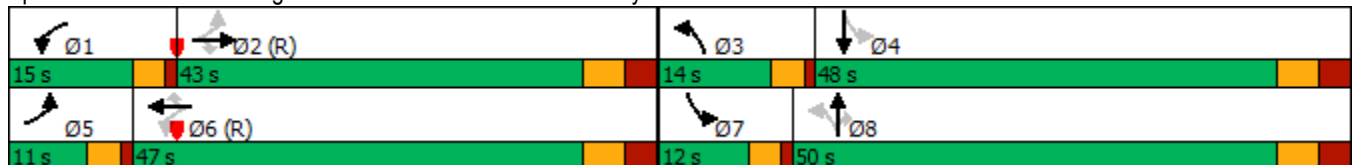


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗↗	↘	↘	↗↗	↘	↘	↗↗	↘	↘	↗↗
Traffic Volume (vph)	285	1151	152	228	1303	208	236	844	180	243	693
Future Volume (vph)	285	1151	152	228	1303	208	236	844	180	243	693
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	11.0	43.0	43.0	15.0	47.0	47.0	14.0	50.0	50.0	12.0	48.0
Total Split (%)	9.2%	35.8%	35.8%	12.5%	39.2%	39.2%	11.7%	41.7%	41.7%	10.0%	40.0%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)	57.3	40.8	40.8	59.1	42.0	42.0	57.3	41.3	41.3	54.3	39.3
Actuated g/C Ratio	0.48	0.34	0.34	0.49	0.35	0.35	0.48	0.34	0.34	0.45	0.33
v/c Ratio	1.07	0.94	0.25	0.79	1.03	0.33	0.84	0.71	0.29	0.84	0.80
Control Delay	107.1	53.9	11.6	43.8	64.7	9.1	48.9	37.4	4.9	45.5	41.1
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	107.1	53.9	11.6	43.8	64.7	9.1	48.9	37.4	4.9	45.5	41.1
LOS	F	D	B	D	E	A	D	D	A	D	D
Approach Delay		59.4			55.3			34.9			42.1
Approach LOS		E			E			C			D

### Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 49.3	Intersection LOS: D
Intersection Capacity Utilization 106.0%	ICU Level of Service G
Analysis Period (min) 15	

### Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Phasings

2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7
Total Split (s)	11.0	43.0	43.0	15.0	47.0	47.0	14.0	50.0	50.0	12.0	48.0
Total Split (%)	9.2%	35.8%	35.8%	12.5%	39.2%	39.2%	11.7%	41.7%	41.7%	10.0%	40.0%
Maximum Green (s)	7.0	36.3	36.3	11.0	40.3	40.3	10.0	43.3	43.3	8.0	41.3
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0
90th %ile Green (s)	7.0	36.3	36.3	11.0	40.3	40.3	10.0	43.3	43.3	8.0	41.3
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Max	Max	Max	Max
70th %ile Green (s)	7.0	36.3	36.3	11.0	40.3	40.3	10.0	43.3	43.3	8.0	41.3
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Max
50th %ile Green (s)	9.7	36.3	36.3	13.7	40.3	40.3	10.0	40.6	40.6	8.0	38.6
50th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Hold	Hold	Max	Gap
30th %ile Green (s)	12.5	39.1	39.1	13.7	40.3	40.3	10.0	37.8	37.8	8.0	35.8
30th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Max	Hold	Hold	Max	Gap
10th %ile Green (s)	17.5	47.4	47.4	10.4	40.3	40.3	10.0	32.8	32.8	8.0	30.8
10th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Max	Hold	Hold	Max	Gap

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated

Queues

2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	285	1151	152	228	1303	208	236	844	180	243	906
v/c Ratio	1.07	0.94	0.25	0.79	1.03	0.33	0.84	0.71	0.29	0.84	0.80
Control Delay	107.1	53.9	11.6	43.8	64.7	9.1	48.9	37.4	4.9	45.5	41.1
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	107.1	53.9	11.6	43.8	64.7	9.1	48.9	37.4	4.9	45.5	41.1
Queue Length 50th (m)	~63.1	~143.8	7.6	28.0	~174.0	14.4	32.1	88.8	0.2	33.0	96.9
Queue Length 95th (m)	#127.1	#190.5	23.2	#76.4	#216.5	18.1	#71.2	106.8	14.3	#62.1	117.1
Internal Link Dist (m)		598.6			194.7			1506.3			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	267	1228	611	292	1264	633	280	1303	666	288	1230
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.94	0.25	0.78	1.03	0.33	0.84	0.65	0.27	0.84	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.

# HCM Signalized Intersection Capacity Analysis

## 2: Regional Road 25/Ontario Street & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	1151	152	228	1303	208	236	844	180	243	693	213
Future Volume (vph)	285	1151	152	228	1303	208	236	844	180	243	693	213
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1772	3614	1594	1807	3614	1612	1789	3476	1479	1807	3366	
Flt Permitted	0.10	1.00	1.00	0.09	1.00	1.00	0.12	1.00	1.00	0.18	1.00	
Satd. Flow (perm)	178	3614	1594	177	3614	1612	235	3476	1479	342	3366	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	285	1151	152	228	1303	208	236	844	180	243	693	213
RTOR Reduction (vph)	0	0	70	0	0	69	0	0	117	0	26	0
Lane Group Flow (vph)	285	1151	82	228	1303	139	236	844	63	243	880	0
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	49.7	39.0	39.0	52.3	40.3	40.3	49.6	39.6	39.6	45.6	37.6	
Effective Green, g (s)	55.7	40.7	40.7	58.0	42.0	42.0	54.6	41.3	41.3	51.6	39.3	
Actuated g/C Ratio	0.46	0.34	0.34	0.48	0.35	0.35	0.46	0.34	0.34	0.43	0.33	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	264	1225	540	289	1264	564	275	1196	509	281	1102	
v/s Ratio Prot	c0.12	0.32		c0.10	c0.36		c0.09	0.24		c0.08	0.26	
v/s Ratio Perm	0.38		0.05	0.28		0.09	0.30		0.04	c0.29		
v/c Ratio	1.08	0.94	0.15	0.79	1.03	0.25	0.86	0.71	0.12	0.86	0.80	
Uniform Delay, d1	35.9	38.5	27.6	30.8	39.0	27.7	25.0	34.1	26.9	24.9	36.8	
Progression Factor	1.00	1.00	1.00	1.02	0.85	0.58	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	78.2	14.8	0.6	11.0	31.1	0.8	22.3	1.9	0.1	23.1	4.1	
Delay (s)	114.1	53.3	28.2	42.6	64.4	16.8	47.3	36.0	27.1	48.0	40.9	
Level of Service	F	D	C	D	E	B	D	D	C	D	D	
Approach Delay (s)		61.8			55.9			36.8			42.4	
Approach LOS		E			E			D			D	

Intersection Summary		
HCM 2000 Control Delay	50.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.95	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	106.0%	12.0
Analysis Period (min)	15	ICU Level of Service
		G

c Critical Lane Group

Lanes, Volumes, Timings  
3: Derry Road

07/19/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	1561	1870	20	19	24
Future Volume (vph)	10	1561	1870	20	19	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.925	
Flt Protected	0.950				0.978	
Satd. Flow (prot)	1825	3510	3607	0	1738	0
Flt Permitted	0.950				0.978	
Satd. Flow (perm)	1825	3510	3607	0	1738	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		218.7	493.3		86.5	
Travel Time (s)		13.1	29.6		6.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	1%	0%	0%	0%
Adj. Flow (vph)	10	1561	1870	20	19	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	1561	1890	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

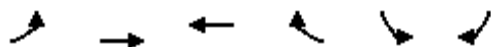
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.3%
Analysis Period (min)	15
	ICU Level of Service B



# HCM Unsignalized Intersection Capacity Analysis

## 3: Derry Road

07/19/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	1561	1870	20	19	24
Future Volume (Veh/h)	10	1561	1870	20	19	24
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	1561	1870	20	19	24
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (m)		219				
pX, platoon unblocked					0.69	
vC, conflicting volume	1892				2682	947
vC1, stage 1 conf vol					1882	
vC2, stage 2 conf vol					800	
vCu, unblocked vol	1892				2537	947
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	97				82	91
cM capacity (veh/h)	319				104	265
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	10	780	780	1247	643	43
Volume Left	10	0	0	0	0	19
Volume Right	0	0	0	0	20	24
cSH	319	1700	1700	1700	1700	157
Volume to Capacity	0.03	0.46	0.46	0.73	0.38	0.27
Queue Length 95th (m)	0.7	0.0	0.0	0.0	0.0	8.0
Control Delay (s)	16.6	0.0	0.0	0.0	0.0	36.3
Lane LOS	C					E
Approach Delay (s)	0.1			0.0		36.3
Approach LOS						E
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			62.3%		ICU Level of Service	B
Analysis Period (min)			15			

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1285	167	147	1607	52	165	78	77	34	82	51
Future Volume (vph)	57	1285	167	147	1607	52	165	78	77	34	82	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						0.99		1.00		
Frt		0.983			0.995			0.925				0.942
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3516	0	1825	3597	0	1807	1722	0	1825	1777	0
Flt Permitted	0.102			0.140			0.596			0.546		
Satd. Flow (perm)	196	3516	0	269	3597	0	1134	1722	0	1048	1777	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			5			40				26
Link Speed (k/h)		60			60			50				50
Link Distance (m)		493.3			470.6			88.3				198.3
Travel Time (s)		29.6			28.2			6.4				14.3
Confl. Peds. (#/hr)			2	2					1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Adj. Flow (vph)	57	1285	167	147	1607	52	165	78	77	34	82	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1452	0	147	1659	0	165	155	0	34	133	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

# Lanes, Volumes, Timings

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.8	82.8		82.8	82.8		37.2	37.2		37.2	37.2	
Total Split (%)	69.0%	69.0%		69.0%	69.0%		31.0%	31.0%		31.0%	31.0%	
Maximum Green (s)	77.1	77.1		77.1	77.1		30.0	30.0		30.0	30.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	86.2	86.2		86.2	86.2		23.8	23.8		23.8	23.8	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
v/c Ratio	0.41	0.57		0.76	0.64		0.73	0.41		0.16	0.36	
Control Delay	18.4	12.6		42.1	11.2		63.2	32.7		38.8	34.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.4	12.6		42.1	11.2		63.2	32.7		38.8	34.2	
LOS	B	B		D	B		E	C		D	C	
Approach Delay		12.8			13.7			48.4			35.1	
Approach LOS		B			B			D			D	

### Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 17.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 93.0%  
 ICU Level of Service F  
 Analysis Period (min) 15

### Splits and Phases: 4: Holly Avenue & Derry Road



# Timings

## 4: Holly Avenue & Derry Road

07/19/2023

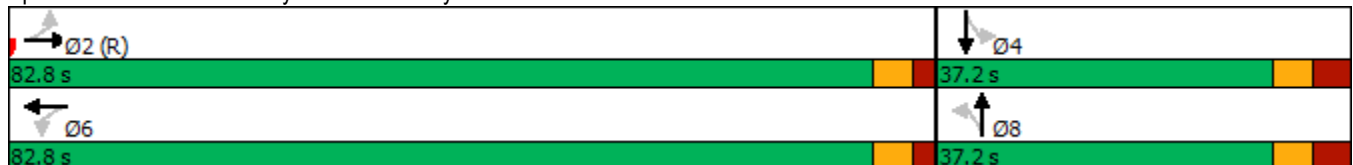


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕
Traffic Volume (vph)	57	1285	147	1607	165	78	34	82
Future Volume (vph)	57	1285	147	1607	165	78	34	82
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.8	82.8	82.8	82.8	37.2	37.2	37.2	37.2
Total Split (%)	69.0%	69.0%	69.0%	69.0%	31.0%	31.0%	31.0%	31.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	-0.7	-0.7	-0.7	-0.7	-2.2	-2.2	-2.2	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	86.2	86.2	86.2	86.2	23.8	23.8	23.8	23.8
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.20	0.20	0.20	0.20
v/c Ratio	0.41	0.57	0.76	0.64	0.73	0.41	0.16	0.36
Control Delay	18.4	12.6	42.1	11.2	63.2	32.7	38.8	34.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.4	12.6	42.1	11.2	63.2	32.7	38.8	34.2
LOS	B	B	D	B	E	C	D	C
Approach Delay		12.8		13.7		48.4		35.1
Approach LOS		B		B		D		D

### Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 17.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 93.0%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 4: Holly Avenue & Derry Road



Phasings  
4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.7	31.7	31.7	31.7	37.2	37.2	37.2	37.2
Total Split (s)	82.8	82.8	82.8	82.8	37.2	37.2	37.2	37.2
Total Split (%)	69.0%	69.0%	69.0%	69.0%	31.0%	31.0%	31.0%	31.0%
Maximum Green (s)	77.1	77.1	77.1	77.1	30.0	30.0	30.0	30.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	2.0	2.0	2.0	3.5	3.5	3.5	3.5
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	19.0	19.0	19.0	19.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0
90th %ile Green (s)	77.1	77.1	77.1	77.1	30.0	30.0	30.0	30.0
90th %ile Term Code	Coord	Coord	Coord	Coord	Max	Max	Hold	Hold
70th %ile Green (s)	81.7	81.7	81.7	81.7	25.4	25.4	25.4	25.4
70th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
50th %ile Green (s)	85.3	85.3	85.3	85.3	21.8	21.8	21.8	21.8
50th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
30th %ile Green (s)	89.0	89.0	89.0	89.0	18.1	18.1	18.1	18.1
30th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold
10th %ile Green (s)	94.2	94.2	94.2	94.2	12.9	12.9	12.9	12.9
10th %ile Term Code	Coord	Coord	Coord	Coord	Gap	Gap	Hold	Hold

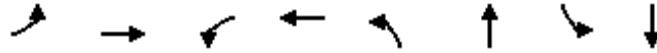
Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Control Type: Actuated-Coordinated

# Queues

## 4: Holly Avenue & Derry Road

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	1452	147	1659	165	155	34	133
v/c Ratio	0.41	0.57	0.76	0.64	0.73	0.41	0.16	0.36
Control Delay	18.4	12.6	42.1	11.2	63.2	32.7	38.8	34.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.4	12.6	42.1	11.2	63.2	32.7	38.8	34.2
Queue Length 50th (m)	4.6	154.1	19.2	95.5	36.7	23.5	6.7	21.6
Queue Length 95th (m)	m13.8	m188.1	#70.0	148.3	56.3	39.5	14.6	36.3
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	140	2531	193	2584	304	491	281	495
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.57	0.76	0.64	0.54	0.32	0.12	0.27

### Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 4: Holly Avenue & Derry Road

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1285	167	147	1607	52	165	78	77	34	82	51
Future Volume (vph)	57	1285	167	147	1607	52	165	78	77	34	82	51
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.93		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3515		1824	3598		1807	1723		1823	1778	
Flt Permitted	0.10	1.00		0.14	1.00		0.60	1.00		0.55	1.00	
Satd. Flow (perm)	195	3515		269	3598		1134	1723		1048	1778	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	1285	167	147	1607	52	165	78	77	34	82	51
RTOR Reduction (vph)	0	7	0	0	1	0	0	32	0	0	21	0
Lane Group Flow (vph)	57	1445	0	147	1658	0	165	123	0	34	112	0
Confl. Peds. (#/hr)			2	2					1	1		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.5	85.5		85.5	85.5		21.6	21.6		21.6	21.6	
Effective Green, g (s)	86.2	86.2		86.2	86.2		23.8	23.8		23.8	23.8	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	140	2524		193	2584		224	341		207	352	
v/s Ratio Prot		0.41			0.46			0.07			0.06	
v/s Ratio Perm	0.29			c0.55			c0.15			0.03		
v/c Ratio	0.41	0.57		0.76	0.64		0.74	0.36		0.16	0.32	
Uniform Delay, d1	6.7	8.1		10.5	8.8		45.2	41.5		39.9	41.2	
Progression Factor	1.24	1.35		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.5	0.5		14.7	0.4		11.9	0.7		0.4	0.5	
Delay (s)	12.8	11.4		25.2	9.2		57.0	42.2		40.2	41.7	
Level of Service	B	B		C	A		E	D		D	D	
Approach Delay (s)		11.5			10.5			49.8			41.4	
Approach LOS		B			B			D			D	

### Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	392	197	95	575	61	299	1044	196	67	794	139
Future Volume (vph)	89	392	197	95	575	61	299	1044	196	67	794	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					1.00				0.99			
Frt		0.950			0.986				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3422	0	1772	3562	0	1789	3476	1570	1825	3476	1633
Flt Permitted	0.210			0.213			0.228			0.214		
Satd. Flow (perm)	392	3422	0	397	3562	0	429	3476	1549	411	3476	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		70			9				136			108
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1530.3	
Travel Time (s)		32.8			61.8			26.6			78.7	
Confl. Peds. (#/hr)	1						1		1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Adj. Flow (vph)	89	392	197	95	575	61	299	1044	196	67	794	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	589	0	95	636	0	299	1044	196	67	794	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	11.0	45.0		13.0	47.0		21.0	51.0	51.0	21.0	51.0	51.0
Total Split (%)	8.5%	34.6%		10.0%	36.2%		16.2%	39.2%	39.2%	16.2%	39.2%	39.2%
Maximum Green (s)	7.0	38.0		9.0	40.0		17.0	44.0	44.0	17.0	44.0	44.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	41.1	27.1		43.3	28.6		70.8	57.6	57.6	60.5	46.1	46.1
Actuated g/C Ratio	0.35	0.23		0.37	0.25		0.61	0.50	0.50	0.52	0.40	0.40
v/c Ratio	0.35	0.69		0.34	0.72		0.61	0.61	0.23	0.20	0.58	0.19
Control Delay	27.5	40.2		27.1	44.5		17.3	24.9	7.6	12.5	30.4	8.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	40.2		27.1	44.5		17.3	24.9	7.6	12.5	30.4	8.2
LOS	C	D		C	D		B	C	A	B	C	A
Approach Delay		38.5			42.3			21.2			26.1	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	116.3
Natural Cycle:	85
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	29.3
Intersection LOS:	C
Intersection Capacity Utilization:	76.3%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Timings

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	89	392	95	575	299	1044	196	67	794	139
Future Volume (vph)	89	392	95	575	299	1044	196	67	794	139
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	11.0	45.0	13.0	47.0	21.0	51.0	51.0	21.0	51.0	51.0
Total Split (%)	8.5%	34.6%	10.0%	36.2%	16.2%	39.2%	39.2%	16.2%	39.2%	39.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0	-3.0	-2.0	-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0	1.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	41.1	27.1	43.3	28.6	70.8	57.6	57.6	60.5	46.1	46.1
Actuated g/C Ratio	0.35	0.23	0.37	0.25	0.61	0.50	0.50	0.52	0.40	0.40
v/c Ratio	0.35	0.69	0.34	0.72	0.61	0.61	0.23	0.20	0.58	0.19
Control Delay	27.5	40.2	27.1	44.5	17.3	24.9	7.6	12.5	30.4	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	40.2	27.1	44.5	17.3	24.9	7.6	12.5	30.4	8.2
LOS	C	D	C	D	B	C	A	B	C	A
Approach Delay		38.5		42.3		21.2			26.1	
Approach LOS		D		D		C			C	

Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 116.3  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 29.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 76.3%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



# Phasings

## 6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0	9.7	30.0	9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	11.0	45.0	13.0	47.0	21.0	51.0	51.0	21.0	51.0	51.0
Total Split (%)	8.5%	34.6%	10.0%	36.2%	16.2%	39.2%	39.2%	16.2%	39.2%	39.2%
Maximum Green (s)	7.0	38.0	9.0	40.0	17.0	44.0	44.0	17.0	44.0	44.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	1.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	3.0	3.0	3.0	3.2	3.2	3.0	3.2	3.2
Minimum Gap (s)	3.0	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0		7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0		16.0		18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0		0		0	0		0	0
90th %ile Green (s)	7.0	33.2	9.0	35.2	17.0	51.7	51.7	9.3	44.0	44.0
90th %ile Term Code	Max	Hold	Max	Gap	Max	Hold	Hold	Gap	MaxR	MaxR
70th %ile Green (s)	7.0	28.0	9.0	30.0	17.0	53.0	53.0	8.0	44.0	44.0
70th %ile Term Code	Max	Hold	Max	Gap	Max	Hold	Hold	Gap	MaxR	MaxR
50th %ile Green (s)	7.0	24.3	9.0	26.3	17.0	53.8	53.8	7.2	44.0	44.0
50th %ile Term Code	Max	Hold	Max	Gap	Max	Hold	Hold	Gap	MaxR	MaxR
30th %ile Green (s)	7.0	22.2	8.4	23.6	17.0	54.5	54.5	6.5	44.0	44.0
30th %ile Term Code	Max	Hold	Gap	Gap	Max	Hold	Hold	Gap	MaxR	MaxR
10th %ile Green (s)	6.6	18.9	6.6	18.9	14.9	62.9	62.9	0.0	44.0	44.0
10th %ile Term Code	Gap	Hold	Gap	Gap	Gap	Hold	Hold	Skip	MaxR	MaxR

### Intersection Summary

Cycle Length: 130  
 Actuated Cycle Length: 116.3  
 Control Type: Actuated-Uncoordinated  
 90th %ile Actuated Cycle: 125.2  
 70th %ile Actuated Cycle: 120  
 50th %ile Actuated Cycle: 116.3  
 30th %ile Actuated Cycle: 113.6  
 10th %ile Actuated Cycle: 106.4

Queues

6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	89	589	95	636	299	1044	196	67	794	139
v/c Ratio	0.35	0.69	0.34	0.72	0.61	0.61	0.23	0.20	0.58	0.19
Control Delay	27.5	40.2	27.1	44.5	17.3	24.9	7.6	12.5	30.4	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	40.2	27.1	44.5	17.3	24.9	7.6	12.5	30.4	8.2
Queue Length 50th (m)	13.3	57.9	14.2	69.4	29.8	90.4	7.2	5.8	73.5	4.3
Queue Length 95th (m)	24.0	76.6	25.4	88.7	53.6	132.8	23.5	13.7	104.6	18.4
Internal Link Dist (m)		431.0		834.9		493.1			1506.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	257	1226	290	1295	495	1720	835	491	1378	713
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.48	0.33	0.49	0.60	0.61	0.23	0.14	0.58	0.19

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue

07/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	392	197	95	575	61	299	1044	196	67	794	139
Future Volume (vph)	89	392	197	95	575	61	299	1044	196	67	794	139
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1772	3421		1772	3561		1789	3476	1549	1825	3476	1633
Flt Permitted	0.21	1.00		0.21	1.00		0.23	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	392	3421		396	3561		429	3476	1549	411	3476	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	392	197	95	575	61	299	1044	196	67	794	139
RTOR Reduction (vph)	0	54	0	0	7	0	0	0	69	0	0	65
Lane Group Flow (vph)	89	535	0	95	629	0	299	1044	127	67	794	74
Confl. Peds. (#/hr)	1						1		1	1		
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	32.0	25.1		35.0	26.6		65.5	55.5	55.5	50.9	44.9	44.9
Effective Green, g (s)	38.0	27.1		40.5	28.6		68.5	57.5	57.5	56.9	46.9	46.9
Actuated g/C Ratio	0.32	0.23		0.35	0.24		0.59	0.49	0.49	0.49	0.40	0.40
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	244	792		271	870		478	1708	761	308	1393	654
v/s Ratio Prot	c0.03	0.16		c0.03	c0.18		c0.10	c0.30		0.02	0.23	
v/s Ratio Perm	0.09			0.09			0.26		0.08	0.09		0.05
v/c Ratio	0.36	0.68		0.35	0.72		0.63	0.61	0.17	0.22	0.57	0.11
Uniform Delay, d1	29.0	40.9		27.5	40.6		14.4	21.6	16.5	16.6	27.2	22.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	1.8		0.8	3.0		2.6	1.6	0.5	0.4	1.7	0.4
Delay (s)	29.9	42.8		28.3	43.6		16.9	23.3	17.0	16.9	28.9	22.4
Level of Service	C	D		C	D		B	C	B	B	C	C
Approach Delay (s)		41.1			41.6			21.2			27.2	
Approach LOS		D			D			C			C	























Intersection Summary

HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	117.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

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

Future Total 2027 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	177	59	75	190	91	39	1228	51	71	849	47
Future Volume (vph)	66	177	59	75	190	91	39	1228	51	71	849	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.962			0.951			0.994			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1834	0	1738	1757	0	1825	3486	0	1738	3396	0
Flt Permitted	0.345			0.435			0.318			0.138		
Satd. Flow (perm)	650	1834	0	796	1757	0	611	3486	0	252	3396	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			28			6			10	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Adj. Flow (vph)	66	177	59	75	190	91	39	1228	51	71	849	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	236	0	75	281	0	39	1279	0	71	896	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	

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

Future Total 2027 Conditions  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		5.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		9.7	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		47.2	47.2		9.8	57.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		52.4%	52.4%		10.9%	63.3%	
Maximum Green (s)	26.0	26.0		26.0	26.0		41.2	41.2		5.1	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.7	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-3.7	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	19.5	19.5		19.5	19.5		51.4	51.4		64.5	60.5	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.57	0.57		0.72	0.67	
v/c Ratio	0.47	0.57		0.44	0.70		0.11	0.64		0.21	0.39	
Control Delay	40.3	33.5		36.9	38.0		13.2	16.8		6.3	7.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.3	33.5		36.9	38.0		13.2	16.8		6.3	7.8	
LOS	D	C		D	D		B	B		A	A	
Approach Delay		35.0			37.7			16.7			7.7	
Approach LOS		D			D			B			A	

Intersection Summary

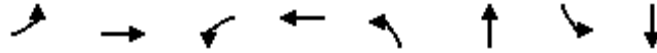
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 39 (43%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 18.2 Intersection LOS: B  
 Intersection Capacity Utilization 79.4% ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



Queues  
1: Ontario Street & Laurier Road

Future Total 2027 Conditions  
AM Peak Hour

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	236	75	281	39	1279	71	896
v/c Ratio	0.47	0.57	0.44	0.70	0.11	0.64	0.21	0.39
Control Delay	40.3	33.5	36.9	38.0	13.2	16.8	6.3	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	33.5	36.9	38.0	13.2	16.8	6.3	7.8
Queue Length 50th (m)	10.0	33.6	11.3	40.5	3.1	77.8	3.1	31.4
Queue Length 95th (m)	20.9	50.6	22.3	60.2	9.8	119.7	8.7	53.3
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	202	583	247	565	349	1994	346	2285
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.40	0.30	0.50	0.11	0.64	0.21	0.39
Intersection Summary								































HCM Signalized Intersection Capacity Analysis  
1: Ontario Street & Laurier Road

Future Total 2027 Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	177	59	75	190	91	39	1228	51	71	849	47
Future Volume (vph)	66	177	59	75	190	91	39	1228	51	71	849	47
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1835		1738	1758		1825	3486		1738	3396	
Flt Permitted	0.35	1.00		0.43	1.00		0.32	1.00		0.14	1.00	
Satd. Flow (perm)	650	1835		796	1758		610	3486		253	3396	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	177	59	75	190	91	39	1228	51	71	849	47
RTOR Reduction (vph)	0	15	0	0	22	0	0	3	0	0	3	0
Lane Group Flow (vph)	66	221	0	75	259	0	39	1276	0	71	893	0
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.5	17.5		17.5	17.5		49.5	49.5		59.5	59.5	
Effective Green, g (s)	19.5	19.5		19.5	19.5		50.5	50.5		63.2	60.5	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.56	0.56		0.70	0.67	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		4.7	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	140	397		172	380		342	1956		326	2282	
v/s Ratio Prot		0.12			c0.15			c0.37		0.02	c0.26	
v/s Ratio Perm	0.10			0.09			0.06			0.13		
v/c Ratio	0.47	0.56		0.44	0.68		0.11	0.65		0.22	0.39	
Uniform Delay, d1	30.8	31.4		30.5	32.4		9.3	13.7		6.8	6.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	1.0		0.6	4.0		0.7	1.7		0.3	0.5	
Delay (s)	31.7	32.4		31.1	36.4		9.9	15.4		7.1	7.1	
Level of Service	C	C		C	D		A	B		A	A	
Approach Delay (s)		32.2			35.3			15.2			7.1	
Approach LOS		C			D			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			16.7				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			11.0		
Intersection Capacity Utilization			79.4%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2027 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	364	1625	256	374	795	241	197	779	259	203	651	167
Future Volume (vph)	364	1625	256	374	795	241	197	779	259	203	651	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.969	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3579	1570	1690	3476	1555	1789	3380	1570	1690	3164	0
Flt Permitted	0.216			0.087			0.133			0.184		
Satd. Flow (perm)	399	3579	1570	155	3476	1555	250	3380	1570	327	3164	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			182			248			27
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		622.6			218.7			223.1			235.1	
Travel Time (s)		37.4			13.1			16.1			16.9	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Adj. Flow (vph)	364	1625	256	374	795	241	197	779	259	203	651	167
Shared Lane Traffic (%)												
Lane Group Flow (vph)	364	1625	256	374	795	241	197	779	259	203	818	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2027 Conditions  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
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	5.0
Minimum Split (s)	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	
Total Split (s)	17.8	50.0	50.0	17.0	49.2	49.2	12.0	43.0	43.0	10.0	41.0	
Total Split (%)	14.8%	41.7%	41.7%	14.2%	41.0%	41.0%	10.0%	35.8%	35.8%	8.3%	34.2%	
Maximum Green (s)	13.8	43.3	43.3	13.0	42.5	42.5	8.0	36.3	36.3	6.0	34.3	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	66.2	45.0	45.0	65.7	44.9	44.9	50.9	36.9	36.9	47.9	34.9	
Actuated g/C Ratio	0.55	0.38	0.38	0.55	0.37	0.37	0.42	0.31	0.31	0.40	0.29	
v/c Ratio	0.88	1.21	0.39	1.23	0.61	0.35	0.80	0.75	0.40	0.88	0.87	
Control Delay	40.1	136.2	17.6	156.9	35.0	11.6	47.0	42.5	6.3	60.4	50.1	
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	40.1	136.2	17.6	156.9	35.0	11.6	47.0	42.5	6.3	60.4	50.1	
LOS	D	F	B	F	C	B	D	D	A	E	D	
Approach Delay		107.1			63.3			35.6			52.1	
Approach LOS		F			E			D			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 125  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.23  
 Intersection Signal Delay: 72.2  
 Intersection LOS: E  
 Intersection Capacity Utilization 114.9%  
 ICU Level of Service H  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Queues  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2027 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	364	1625	256	374	795	241	197	779	259	203	818
v/c Ratio	0.88	1.21	0.39	1.23	0.61	0.35	0.80	0.75	0.40	0.88	0.87
Control Delay	40.1	136.2	17.6	156.9	35.0	11.6	47.0	42.5	6.3	60.4	50.1
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	40.1	136.2	17.6	156.9	35.0	11.6	47.0	42.5	6.3	60.4	50.1
Queue Length 50th (m)	46.6	~246.0	24.5	~98.2	86.3	16.4	29.0	85.4	1.8	30.3	92.2
Queue Length 95th (m)	#95.4	#288.3	46.3	#157.3	110.0	37.5	#60.2	107.8	20.1	#60.4	117.2
Internal Link Dist (m)		598.6			194.7			199.1			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	415	1342	655	303	1299	695	247	1070	666	232	968
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.21	0.39	1.23	0.61	0.35	0.80	0.73	0.39	0.88	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

























Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.




















HCM Signalized Intersection Capacity Analysis  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2027 Conditions  
AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	364	1625	256	374	795	241	197	779	259	203	651	167	
Future Volume (vph)	364	1625	256	374	795	241	197	779	259	203	651	167	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1755	3579	1570	1690	3476	1555	1789	3380	1570	1690	3165		
Flt Permitted	0.22	1.00	1.00	0.09	1.00	1.00	0.13	1.00	1.00	0.18	1.00		
Satd. Flow (perm)	399	3579	1570	154	3476	1555	251	3380	1570	328	3165		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	364	1625	256	374	795	241	197	779	259	203	651	167	
RTOR Reduction (vph)	0	0	66	0	0	114	0	0	172	0	19	0	
Lane Group Flow (vph)	364	1625	190	374	795	127	197	779	87	203	799	0	
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases	2		2	6		6	8		8	4			
Actuated Green, G (s)	57.5	43.3	43.3	57.3	43.2	43.2	43.2	35.2	35.2	39.2	33.2		
Effective Green, g (s)	63.5	45.0	45.0	63.3	44.9	44.9	48.2	36.9	36.9	45.2	34.9		
Actuated g/C Ratio	0.53	0.38	0.38	0.53	0.37	0.37	0.40	0.31	0.31	0.38	0.29		
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7		
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	405	1342	588	300	1300	581	241	1039	482	225	920		
v/s Ratio Prot	c0.13	c0.45		c0.18	0.23		c0.07	0.23		c0.07	0.25		
v/s Ratio Perm	0.35		0.12	0.48		0.08	0.25		0.06	c0.27			
v/c Ratio	0.90	1.21	0.32	1.25	0.61	0.22	0.82	0.75	0.18	0.90	0.87		
Uniform Delay, d1	19.8	37.5	26.7	38.2	30.5	25.6	27.2	37.4	30.5	30.4	40.4		
Progression Factor	1.00	1.00	1.00	0.84	1.07	1.38	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	21.9	102.1	1.5	133.6	1.9	0.8	18.9	3.0	0.2	34.7	8.7		
Delay (s)	41.7	139.6	28.1	165.6	34.4	36.0	46.2	40.4	30.7	65.1	49.1		
Level of Service	D	F	C	F	C	D	D	D	C	E	D		
Approach Delay (s)		111.0			69.5			39.3			52.3		
Approach LOS		F			E			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			76.0									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.06										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	12.0
Intersection Capacity Utilization			114.9%									ICU Level of Service	H
Analysis Period (min)			15										
c Critical Lane Group													




















Lanes, Volumes, Timings  
3: East Site Access/Site Access & Derry Road

Future Total 2027 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	2036	24	14	1564	16	39	0	71	18	0	4
Future Volume (vph)	20	2036	24	14	1564	16	39	0	71	18	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.998			0.913				0.975
Flt Protected	0.950			0.950				0.983				0.961
Satd. Flow (prot)	1643	3184	0	1610	3095	0	0	1521	0	0	1544	0
Flt Permitted	0.950			0.950				0.983				0.961
Satd. Flow (perm)	1643	3184	0	1610	3095	0	0	1521	0	0	1544	0
Link Speed (k/h)		60			60			50				50
Link Distance (m)		218.7			493.3			109.4				86.5
Travel Time (s)		13.1			29.6			7.9				6.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	0%	2%	6%	0%	2%	2%	2%	6%	0%	0%
Adj. Flow (vph)	20	2036	24	14	1564	16	39	0	71	18	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	2060	0	14	1580	0	0	110	0	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		1.6			1.6			1.6				1.6
Two way Left Turn Lane					Yes							
Headway Factor	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop				Stop
<b>Intersection Summary</b>												
Area Type:	CBD											
Control Type:	Unsignalized											
Intersection Capacity Utilization	76.9%						ICU Level of Service D					
Analysis Period (min)	15											





















HCM Unsignalized Intersection Capacity Analysis  
 3: East Site Access/Site Access & Derry Road

Future Total 2027 Conditions  
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	2036	24	14	1564	16	39	0	71	18	0	4
Future Volume (Veh/h)	20	2036	24	14	1564	16	39	0	71	18	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	2036	24	14	1564	16	39	0	71	18	0	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (m)		219										
pX, platoon unblocked				0.63			0.63	0.63	0.63	0.63	0.63	
vC, conflicting volume	1580			2060			2902	3696	1030	2729	3700	790
vC1, stage 1 conf vol							2088	2088		1600	1600	
vC2, stage 2 conf vol							814	1608		1129	2100	
vCu, unblocked vol	1580			1514			2845	4100	0	2572	4106	790
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.6	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	95			95			41	100	90	81	100	99
cM capacity (veh/h)	422			277			67	76	686	96	73	337
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	20	1357	703	14	1043	537	110	22				
Volume Left	20	0	0	14	0	0	39	18				
Volume Right	0	0	24	0	0	16	71	4				
cSH	422	1700	1700	277	1700	1700	159	110				
Volume to Capacity	0.05	0.80	0.41	0.05	0.61	0.32	0.69	0.20				
Queue Length 95th (m)	1.1	0.0	0.0	1.2	0.0	0.0	30.7	5.4				
Control Delay (s)	14.0	0.0	0.0	18.7	0.0	0.0	66.8	45.7				
Lane LOS	B			C			F	E				
Approach Delay (s)	0.1			0.2			66.8	45.7				
Approach LOS							F	E				
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			76.9%		ICU Level of Service			D				
Analysis Period (min)			15									

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road













Future Total 2027 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1914	108	55	1280	21	161	41	133	42	43	77
Future Volume (vph)	56	1914	108	55	1280	21	161	41	133	42	43	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.998			0.885			0.904	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1644	3517	0	1738	3437	0	1807	1573	0	1738	1661	0
Flt Permitted	0.175			0.051			0.623			0.497		
Satd. Flow (perm)	303	3517	0	93	3437	0	1185	1573	0	909	1661	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			3			19			74	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Adj. Flow (vph)	56	1914	108	55	1280	21	161	41	133	42	43	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	2022	0	55	1301	0	161	174	0	42	120	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	



Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2027 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.5	82.5		82.5	82.5		37.5	37.5		37.5	37.5	
Total Split (%)	68.8%	68.8%		68.8%	68.8%		31.3%	31.3%		31.3%	31.3%	
Maximum Green (s)	76.8	76.8		76.8	76.8		30.3	30.3		30.3	30.3	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	86.9	86.9		86.9	86.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
v/c Ratio	0.26	0.79		0.82	0.52		0.71	0.55		0.24	0.32	
Control Delay	1.9	6.7		91.6	9.0		61.1	44.1		41.8	18.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	1.9	6.7		91.6	9.0		61.1	44.1		41.8	18.4	
LOS	A	A		F	A		E	D		D	B	
Approach Delay	6.6			12.4			52.3			24.5		
Approach LOS	A			B			D			C		

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 13.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 87.5%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 4: Holly Avenue & Derry Road



Queues  
4: Holly Avenue & Derry Road

Future Total 2027 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	2022	55	1301	161	174	42	120
v/c Ratio	0.26	0.79	0.82	0.52	0.71	0.55	0.24	0.32
Control Delay	1.9	6.7	91.6	9.0	61.1	44.1	41.8	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	6.7	91.6	9.0	61.1	44.1	41.8	18.4
Queue Length 50th (m)	0.8	43.3	7.7	62.6	35.8	33.2	8.5	9.1
Queue Length 95th (m)	m1.2	m19.5	#25.0	101.6	54.3	50.7	17.3	23.1
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	219	2549	67	2489	320	439	246	503
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.79	0.82	0.52	0.50	0.40	0.17	0.24

Intersection Summary

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

























Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis












## 4: Holly Avenue & Derry Road

Future Total 2027 Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	56	1914	108	55	1280	21	161	41	133	42	43	77
Future Volume (vph)	56	1914	108	55	1280	21	161	41	133	42	43	77
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1644	3517		1738	3436		1807	1574		1738	1660	
Flt Permitted	0.17	1.00		0.05	1.00		0.62	1.00		0.50	1.00	
Satd. Flow (perm)	302	3517		94	3436		1186	1574		909	1660	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	1914	108	55	1280	21	161	41	133	42	43	77
RTOR Reduction (vph)	0	3	0	0	1	0	0	15	0	0	60	0
Lane Group Flow (vph)	56	2019	0	55	1300	0	161	159	0	42	60	0
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	86.2	86.2		86.2	86.2		20.9	20.9		20.9	20.9	
Effective Green, g (s)	86.9	86.9		86.9	86.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	218	2546		68	2488		228	302		174	319	
v/s Ratio Prot		0.57			0.38			0.10			0.04	
v/s Ratio Perm	0.19			0.58			0.14			0.05		
v/c Ratio	0.26	0.79		0.81	0.52		0.71	0.53		0.24	0.19	
Uniform Delay, d1	5.6	10.7		11.0	7.3		45.3	43.5		41.0	40.6	
Progression Factor	0.21	0.51		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.2		46.5	0.1		9.6	1.6		0.7	0.3	
Delay (s)	1.4	5.7		57.5	7.4		54.8	45.2		41.8	40.9	
Level of Service	A	A		E	A		D	D		D	D	
Approach Delay (s)		5.6			9.5			49.8			41.1	
Approach LOS		A			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			87.5%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												












Lanes, Volumes, Timings  
5: Regional Road 25 & West Site Access

Future Total 2027 Conditions  
AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	62	1173	16	0	1281
Future Volume (vph)	0	62	1173	16	0	1281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.998			
Flt Protected						
Satd. Flow (prot)	0	1629	3571	0	0	3579
Flt Permitted						
Satd. Flow (perm)	0	1629	3571	0	0	3579
Link Speed (k/h)	50		50			70
Link Distance (m)	173.8		1307.3			223.1
Travel Time (s)	12.5		94.1			11.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	62	1173	16	0	1281
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	62	1189	0	0	1281
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.4%		ICU Level of Service A			
Analysis Period (min)	15					























HCM Unsignalized Intersection Capacity Analysis  
5: Regional Road 25 & West Site Access

Future Total 2027 Conditions  
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	0	62	1173	16	0	1281
Future Volume (Veh/h)	0	62	1173	16	0	1281
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	62	1173	16	0	1281
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	223					
pX, platoon unblocked	0.79					
vC, conflicting volume	1822	594	1189			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1506	594	1189			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	86	100			
cM capacity (veh/h)	88	448	583			
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	62	782	407	640	640	
Volume Left	0	0	0	0	0	
Volume Right	62	0	16	0	0	
cSH	448	1700	1700	1700	1700	
Volume to Capacity	0.14	0.46	0.24	0.38	0.38	
Queue Length 95th (m)	3.6	0.0	0.0	0.0	0.0	
Control Delay (s)	14.3	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	14.3	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization			43.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2027 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	576	483	150	425	83	155	843	138	50	988	100
Future Volume (vph)	130	576	483	150	425	83	155	843	138	50	988	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.932			0.975				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1659	3306	0	1722	3450	0	1674	3411	1541	1755	3380	1471
Flt Permitted	0.326			0.110			0.131			0.256		
Satd. Flow (perm)	569	3306	0	199	3450	0	231	3411	1541	473	3380	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		180			18				134			168
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1307.3	
Travel Time (s)		32.8			61.8			26.6			67.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Adj. Flow (vph)	130	576	483	150	425	83	155	843	138	50	988	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1059	0	150	508	0	155	843	138	50	988	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

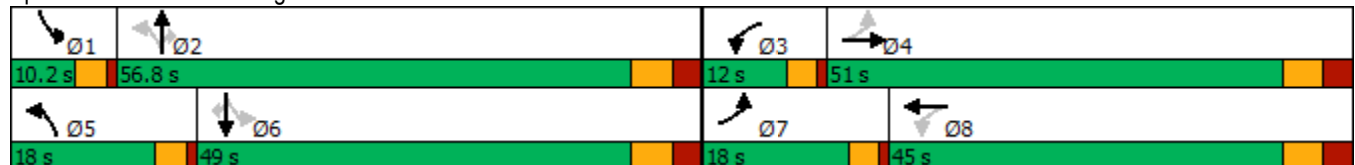
Future Total 2027 Conditions  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	18.0	51.0		12.0	45.0		18.0	56.8	56.8	10.2	49.0	49.0
Total Split (%)	13.8%	39.2%		9.2%	34.6%		13.8%	43.7%	43.7%	7.8%	37.7%	37.7%
Maximum Green (s)	14.0	44.0		8.0	38.0		14.0	49.8	49.8	6.2	42.0	42.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-0.2	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	6.8	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	54.0	38.2		50.4	35.3		64.9	53.0	51.2	58.8	45.7	45.7
Actuated g/C Ratio	0.45	0.31		0.42	0.29		0.54	0.44	0.42	0.48	0.38	0.38
v/c Ratio	0.34	0.91		0.68	0.50		0.53	0.57	0.19	0.15	0.78	0.15
Control Delay	22.6	44.8		40.1	36.4		23.0	29.1	5.3	16.7	39.9	0.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	44.8		40.1	36.4		23.0	29.1	5.3	16.7	39.9	0.5
LOS	C	D		D	D		C	C	A	B	D	A
Approach Delay		42.4			37.2			25.3			35.4	
Approach LOS		D			D			C			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 121.3  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 34.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 90.6%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2027 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	1059	150	508	155	843	138	50	988	100
v/c Ratio	0.34	0.91	0.68	0.50	0.53	0.57	0.19	0.15	0.78	0.15
Control Delay	22.6	44.8	40.1	36.4	23.0	29.1	5.3	16.7	39.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	44.8	40.1	36.4	23.0	29.1	5.3	16.7	39.9	0.5
Queue Length 50th (m)	18.5	110.3	21.5	51.7	18.9	82.7	0.6	5.7	111.2	0.0
Queue Length 95th (m)	30.8	138.3	#47.4	70.2	34.5	111.1	13.5	13.0	151.7	0.0
Internal Link Dist (m)		431.0		834.9		493.1			1283.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	408	1372	221	1159	327	1491	727	327	1273	659
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.77	0.68	0.44	0.47	0.57	0.19	0.15	0.78	0.15

Intersection Summary

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

























HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2027 Conditions  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	576	483	150	425	83	155	843	138	50	988	100
Future Volume (vph)	130	576	483	150	425	83	155	843	138	50	988	100
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	6.8	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1659	3304		1722	3451		1674	3411	1541	1755	3380	1471
Flt Permitted	0.33	1.00		0.11	1.00		0.13	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	570	3304		200	3451		231	3411	1541	473	3380	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	576	483	150	425	83	155	843	138	50	988	100
RTOR Reduction (vph)	0	124	0	0	13	0	0	0	78	0	0	62
Lane Group Flow (vph)	130	935	0	150	495	0	155	843	60	50	988	38
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	47.2	36.2		41.4	33.3		59.8	51.0	51.0	49.4	44.6	44.6
Effective Green, g (s)	51.3	38.2		47.4	35.3		62.8	53.0	51.2	55.4	46.6	46.6
Actuated g/C Ratio	0.42	0.31		0.39	0.29		0.51	0.43	0.42	0.45	0.38	0.38
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	364	1033		216	997		286	1480	646	296	1289	561
v/s Ratio Prot	c0.04	c0.28		c0.06	0.14		c0.06	0.25		0.01	c0.29	
v/s Ratio Perm	0.11			0.21			0.22		0.04	0.07		0.03
v/c Ratio	0.36	0.91		0.69	0.50		0.54	0.57	0.09	0.17	0.77	0.07
Uniform Delay, d1	22.9	40.2		29.2	36.0		20.0	26.0	21.4	19.3	33.0	24.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	10.9		9.3	0.4		2.1	1.6	0.3	0.3	4.4	0.2
Delay (s)	23.5	51.1		38.5	36.4		22.1	27.6	21.7	19.6	37.4	24.2
Level of Service	C	D		D	D		C	C	C	B	D	C
Approach Delay (s)		48.1			36.9			26.1			35.5	
Approach LOS		D			D			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			36.8				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			122.1				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			90.6%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

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

Future Total 2027 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	201	39	103	241	105	58	1039	87	129	1253	87
Future Volume (vph)	67	201	39	103	241	105	58	1039	87	129	1253	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.976			0.954			0.988			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1875	0	1807	1804	0	1825	3509	0	1789	3511	0
Flt Permitted	0.244			0.435			0.153			0.209		
Satd. Flow (perm)	460	1875	0	827	1804	0	294	3509	0	394	3511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			22			16			13	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Adj. Flow (vph)	67	201	39	103	241	105	58	1039	87	129	1253	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	240	0	103	346	0	58	1126	0	129	1340	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

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

Future Total 2027 Conditions  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		67.0	67.0		67.0	67.0	
Total Split (%)	33.0%	33.0%		33.0%	33.0%		67.0%	67.0%		67.0%	67.0%	
Maximum Green (s)	26.0	26.0		26.0	26.0		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	23.6	23.6		23.6	23.6		66.4	66.4		66.4	66.4	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.66	0.66		0.66	0.66	
v/c Ratio	0.62	0.53		0.53	0.78		0.30	0.48		0.49	0.57	
Control Delay	58.5	35.8		42.7	46.1		13.6	9.6		17.9	10.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	58.5	35.8		42.7	46.1		13.6	9.6		17.9	10.9	
LOS	E	D		D	D		B	A		B	B	
Approach Delay		40.7			45.3			9.8			11.5	
Approach LOS		D			D			A			B	

Intersection Summary

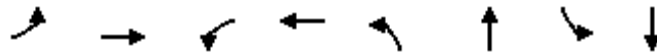
Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 18.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 94.0%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



Queues  
1: Ontario Street & Laurier Road

Future Total 2027 Conditions  
PM Peak Hour

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	240	103	346	58	1126	129	1340
v/c Ratio	0.62	0.53	0.53	0.78	0.30	0.48	0.49	0.57
Control Delay	58.5	35.8	42.7	46.1	13.6	9.6	17.9	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	35.8	42.7	46.1	13.6	9.6	17.9	10.9
Queue Length 50th (m)	11.5	38.6	17.3	58.5	4.3	51.6	11.5	67.9
Queue Length 95th (m)	#27.8	58.9	32.8	85.8	13.7	73.4	32.7	95.6
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	128	532	231	520	195	2335	261	2336
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.45	0.45	0.67	0.30	0.48	0.49	0.57

Intersection Summary

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





























HCM Signalized Intersection Capacity Analysis  
1: Ontario Street & Laurier Road

Future Total 2027 Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	201	39	103	241	105	58	1039	87	129	1253	87
Future Volume (vph)	67	201	39	103	241	105	58	1039	87	129	1253	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1874		1807	1805		1825	3511		1789	3511	
Flt Permitted	0.24	1.00		0.44	1.00		0.15	1.00		0.21	1.00	
Satd. Flow (perm)	460	1874		828	1805		293	3511		394	3511	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	201	39	103	241	105	58	1039	87	129	1253	87
RTOR Reduction (vph)	0	8	0	0	17	0	0	5	0	0	4	0
Lane Group Flow (vph)	67	232	0	103	329	0	58	1121	0	129	1336	0
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.6	21.6		21.6	21.6		65.4	65.4		65.4	65.4	
Effective Green, g (s)	23.6	23.6		23.6	23.6		66.4	66.4		66.4	66.4	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.66	0.66		0.66	0.66	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	108	442		195	425		194	2331		261	2331	
v/s Ratio Prot		0.12			c0.18			0.32			c0.38	
v/s Ratio Perm	0.15			0.12			0.20			0.33		
v/c Ratio	0.62	0.53		0.53	0.77		0.30	0.48		0.49	0.57	
Uniform Delay, d1	34.2	33.3		33.3	35.7		7.0	8.3		8.4	9.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.7	0.5		1.2	7.8		3.9	0.7		6.6	1.0	
Delay (s)	41.9	33.8		34.5	43.5		11.0	9.0		15.0	10.1	
Level of Service	D	C		C	D		B	A		B	B	
Approach Delay (s)		35.6			41.5			9.1			10.6	
Approach LOS		D			D			A			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			16.4				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			94.0%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2027 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	285	1167	152	243	1303	208	246	859	199	299	693	213
Future Volume (vph)	285	1167	152	243	1303	208	246	859	199	299	693	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt			0.850			0.850			0.850		0.965	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3614	1617	1807	3614	1633	1789	3476	1498	1807	3377	0
Flt Permitted	0.096			0.093			0.121			0.169		
Satd. Flow (perm)	179	3614	1617	177	3614	1633	228	3476	1498	321	3377	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143			106			185			37
Link Speed (k/h)		60			60			50				50
Link Distance (m)		622.6			218.7			217.4				235.1
Travel Time (s)		37.4			13.1			15.7				16.9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Adj. Flow (vph)	285	1167	152	243	1303	208	246	859	199	299	693	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	1167	152	243	1303	208	246	859	199	299	906	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7		4

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

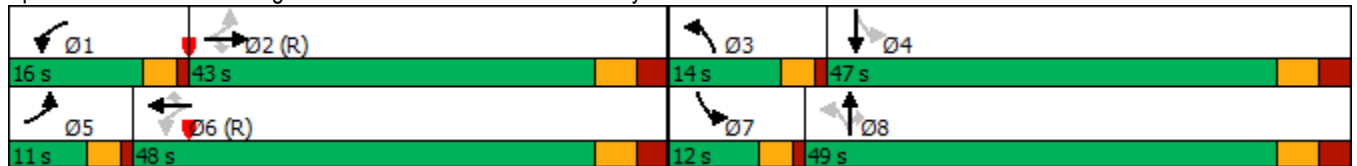
Future Total 2027 Conditions  
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
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	5.0
Minimum Split (s)	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7
Total Split (s)	11.0	43.0	43.0	16.0	48.0	48.0	14.0	49.0	49.0	12.0	47.0	47.0
Total Split (%)	9.2%	35.8%	35.8%	13.3%	40.0%	40.0%	11.7%	40.8%	40.8%	10.0%	39.2%	39.2%
Maximum Green (s)	7.0	36.3	36.3	12.0	41.3	41.3	10.0	42.3	42.3	8.0	40.3	40.3
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	56.9	40.6	40.6	59.9	43.0	43.0	56.8	40.8	40.8	53.8	38.8	38.8
Actuated g/C Ratio	0.47	0.34	0.34	0.50	0.36	0.36	0.47	0.34	0.34	0.45	0.32	0.32
v/c Ratio	1.10	0.95	0.24	0.81	1.01	0.32	0.89	0.73	0.32	1.07	0.81	0.81
Control Delay	115.4	56.7	6.7	40.5	58.6	9.7	57.2	38.5	6.0	97.3	42.0	42.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.4	56.7	6.7	40.5	58.6	9.7	57.2	38.5	6.0	97.3	42.0	42.0
LOS	F	E	A	D	E	A	E	D	A	F	D	D
Approach Delay		62.4			50.3			37.1			55.7	
Approach LOS		E			D			D			E	

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
Maximum v/c Ratio:	1.10
Intersection Signal Delay:	51.8
Intersection LOS:	D
Intersection Capacity Utilization:	107.1%
ICU Level of Service:	G
Analysis Period (min):	15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Queues  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2027 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	285	1167	152	243	1303	208	246	859	199	299	906
v/c Ratio	1.10	0.95	0.24	0.81	1.01	0.32	0.89	0.73	0.32	1.07	0.81
Control Delay	115.4	56.7	6.7	40.5	58.6	9.7	57.2	38.5	6.0	97.3	42.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.4	56.7	6.7	40.5	58.6	9.7	57.2	38.5	6.0	97.3	42.0
Queue Length 50th (m)	~65.8	~153.4	1.5	38.2	~164.8	18.5	35.7	91.1	2.2	~47.1	97.1
Queue Length 95th (m)	#126.7	#194.8	16.0	#81.2	#212.8	26.9	#79.1	110.9	17.2	#100.0	118.7
Internal Link Dist (m)		598.6			194.7			193.4			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	260	1222	641	304	1295	653	277	1274	666	280	1206
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.95	0.24	0.80	1.01	0.32	0.89	0.67	0.30	1.07	0.75

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.






















HCM Signalized Intersection Capacity Analysis  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2027 Conditions  
PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	285	1167	152	243	1303	208	246	859	199	299	693	213	
Future Volume (vph)	285	1167	152	243	1303	208	246	859	199	299	693	213	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1772	3614	1617	1807	3614	1633	1789	3476	1498	1807	3376		
Flt Permitted	0.10	1.00	1.00	0.09	1.00	1.00	0.12	1.00	1.00	0.17	1.00		
Satd. Flow (perm)	178	3614	1617	178	3614	1633	228	3476	1498	321	3376		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	285	1167	152	243	1303	208	246	859	199	299	693	213	
RTOR Reduction (vph)	0	0	95	0	0	68	0	0	122	0	25	0	
Lane Group Flow (vph)	285	1167	57	243	1303	140	246	859	77	299	881	0	
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases	2		2	6		6	8		8	4			
Actuated Green, G (s)	49.0	38.8	38.8	54.0	41.3	41.3	49.1	39.1	39.1	45.1	37.1		
Effective Green, g (s)	55.0	40.5	40.5	58.5	43.0	43.0	54.1	40.8	40.8	51.1	38.8		
Actuated g/C Ratio	0.46	0.34	0.34	0.49	0.36	0.36	0.45	0.34	0.34	0.43	0.32		
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7		
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	256	1219	545	299	1295	585	271	1181	509	272	1091		
v/s Ratio Prot	c0.12	0.32		c0.11	0.36		c0.10	0.25		c0.10	0.26		
v/s Ratio Perm	c0.39		0.04	0.29		0.09	0.31		0.05	c0.37			
v/c Ratio	1.11	0.96	0.11	0.81	1.01	0.24	0.91	0.73	0.15	1.10	0.81		
Uniform Delay, d1	35.5	38.9	27.3	32.0	38.5	27.0	27.4	34.7	27.6	28.2	37.2		
Progression Factor	1.00	1.00	1.00	0.81	0.89	0.65	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	90.1	17.4	0.4	12.7	23.9	0.8	31.3	2.3	0.1	83.8	4.5		
Delay (s)	125.6	56.3	27.7	38.7	58.1	18.3	58.7	37.0	27.7	111.9	41.7		
Level of Service	F	E	C	D	E	B	E	D	C	F	D		
Approach Delay (s)		65.9			50.7			39.7			59.1		
Approach LOS		E			D			D			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			54.1									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.09										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	12.0
Intersection Capacity Utilization			107.1%									ICU Level of Service	G
Analysis Period (min)			15										
c Critical Lane Group													























Lanes, Volumes, Timings  
3: East Site Access/Commercial Access & Derry Road

Future Total 2027 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1580	72	40	1870	20	15	0	42	19	0	24
Future Volume (vph)	10	1580	72	40	1870	20	15	0	42	19	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.998			0.901			0.925	
Flt Protected	0.950			0.950				0.987			0.978	
Satd. Flow (prot)	1825	3491	0	1789	3607	0	0	1675	0	0	1738	0
Flt Permitted	0.950			0.950				0.987			0.978	
Satd. Flow (perm)	1825	3491	0	1789	3607	0	0	1675	0	0	1738	0
Link Speed (k/h)		60			60			48			48	
Link Distance (m)		218.7			493.3			111.9			86.5	
Travel Time (s)		13.1			29.6			8.4			6.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	0%	2%	1%	0%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	10	1580	72	40	1870	20	15	0	42	19	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1652	0	40	1890	0	0	57	0	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	63.3%						ICU Level of Service B					
Analysis Period (min)	15											





















HCM Unsignalized Intersection Capacity Analysis  
 3: East Site Access/Commercial Access & Derry Road

Future Total 2027 Conditions  
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (veh/h)	10	1580	72	40	1870	20	15	0	42	19	0	24
Future Volume (Veh/h)	10	1580	72	40	1870	20	15	0	42	19	0	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	1580	72	40	1870	20	15	0	42	19	0	24
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (m)		219										
pX, platoon unblocked				0.68			0.68	0.68	0.68	0.68	0.68	
vC, conflicting volume	1890			1652			2675	3606	826	2812	3632	945
vC1, stage 1 conf vol							1636	1636		1960	1960	
vC2, stage 2 conf vol							1039	1970		852	1672	
vCu, unblocked vol	1890			1026			2524	3887	0	2725	3925	945
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			91			88	100	94	68	100	91
cM capacity (veh/h)	321			459			121	77	741	59	80	267
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	10	1053	599	40	1247	643	57	43				
Volume Left	10	0	0	40	0	0	15	19				
Volume Right	0	0	72	0	0	20	42	24				
cSH	321	1700	1700	459	1700	1700	316	105				
Volume to Capacity	0.03	0.62	0.35	0.09	0.73	0.38	0.18	0.41				
Queue Length 95th (m)	0.7	0.0	0.0	2.2	0.0	0.0	4.9	13.0				
Control Delay (s)	16.6	0.0	0.0	13.6	0.0	0.0	18.9	61.6				
Lane LOS	C			B			C	F				
Approach Delay (s)	0.1			0.3			18.9	61.6				
Approach LOS							C	F				
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			63.3%		ICU Level of Service			B				
Analysis Period (min)			15									

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2027 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1341	172	147	1647	52	165	78	77	34	82	51
Future Volume (vph)	57	1341	172	147	1647	52	165	78	77	34	82	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.983			0.995			0.925			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3526	0	1825	3597	0	1807	1733	0	1825	1777	0
Flt Permitted	0.095			0.128			0.596			0.546		
Satd. Flow (perm)	183	3526	0	246	3597	0	1134	1733	0	1049	1777	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			5			40			26	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Adj. Flow (vph)	57	1341	172	147	1647	52	165	78	77	34	82	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1513	0	147	1699	0	165	155	0	34	133	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	



Queues  
4: Holly Avenue & Derry Road

Future Total 2027 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	1513	147	1699	165	155	34	133
v/c Ratio	0.44	0.60	0.84	0.66	0.73	0.41	0.16	0.36
Control Delay	11.8	4.0	54.8	11.5	63.2	32.6	38.8	34.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	4.0	54.8	11.5	63.2	32.6	38.8	34.2
Queue Length 50th (m)	1.1	14.3	21.6	99.9	36.7	23.4	6.7	21.6
Queue Length 95th (m)	m1.4	m16.1	#73.6	155.1	56.3	39.5	14.6	36.3
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	131	2538	176	2584	304	494	281	495
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.60	0.84	0.66	0.54	0.31	0.12	0.27

Intersection Summary

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























Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis












## 4: Holly Avenue & Derry Road

Future Total 2027 Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	57	1341	172	147	1647	52	165	78	77	34	82	51
Future Volume (vph)	57	1341	172	147	1647	52	165	78	77	34	82	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.93		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3525		1825	3598		1807	1734		1825	1778	
Flt Permitted	0.09	1.00		0.13	1.00		0.60	1.00		0.55	1.00	
Satd. Flow (perm)	182	3525		246	3598		1134	1734		1049	1778	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	1341	172	147	1647	52	165	78	77	34	82	51
RTOR Reduction (vph)	0	7	0	0	1	0	0	32	0	0	21	0
Lane Group Flow (vph)	57	1506	0	147	1698	0	165	123	0	34	112	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.5	85.5		85.5	85.5		21.6	21.6		21.6	21.6	
Effective Green, g (s)	86.2	86.2		86.2	86.2		23.8	23.8		23.8	23.8	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	130	2532		176	2584		224	343		208	352	
v/s Ratio Prot		0.43			0.47			0.07			0.06	
v/s Ratio Perm	0.31			c0.60			c0.15			0.03		
v/c Ratio	0.44	0.59		0.84	0.66		0.74	0.36		0.16	0.32	
Uniform Delay, d1	6.9	8.3		11.9	9.0		45.2	41.5		39.9	41.2	
Progression Factor	0.57	0.38		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	0.5		26.5	0.5		11.9	0.6		0.4	0.5	
Delay (s)	9.0	3.7		38.4	9.5		57.0	42.2		40.2	41.7	
Level of Service	A	A		D	A		E	D		D	D	
Approach Delay (s)		3.8			11.8			49.8			41.4	
Approach LOS		A			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.0				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			93.8%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
5: Regional Road 25 & West Site Access












Future Total 2027 Conditions  
PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	44	1260	48	0	1088
Future Volume (vph)	0	44	1260	48	0	1088
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.994			
Flt Protected						
Satd. Flow (prot)	0	1629	3557	0	0	3579
Flt Permitted						
Satd. Flow (perm)	0	1629	3557	0	0	3579
Link Speed (k/h)	50		70			70
Link Distance (m)	118.0		1312.9			217.4
Travel Time (s)	8.5		67.5			11.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	44	1260	48	0	1088
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	44	1308	0	0	1088
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	46.4%		ICU Level of Service A			
Analysis Period (min)	15					

























HCM Unsignalized Intersection Capacity Analysis  
5: Regional Road 25 & West Site Access

Future Total 2027 Conditions  
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	0	44	1260	48	0	1088
Future Volume (Veh/h)	0	44	1260	48	0	1088
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	44	1260	48	0	1088
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	217					
pX, platoon unblocked	0.78					
vC, conflicting volume	1828	654			1308	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1504	654			1308	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	89			100	
cM capacity (veh/h)	88	409			525	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	
Volume Total	44	840	468	544	544	
Volume Left	0	0	0	0	0	
Volume Right	44	0	48	0	0	
cSH	409	1700	1700	1700	1700	
Volume to Capacity	0.11	0.49	0.28	0.32	0.32	
Queue Length 95th (m)	2.7	0.0	0.0	0.0	0.0	
Control Delay (s)	14.9	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	14.9	0.0			0.0	
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			46.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2027 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	392	197	95	575	61	299	1092	196	67	809	139
Future Volume (vph)	89	392	197	95	575	61	299	1092	196	67	809	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		50.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.950			0.986				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3422	0	1772	3567	0	1789	3476	1570	1825	3476	1633
Flt Permitted	0.236			0.212			0.227			0.188		
Satd. Flow (perm)	440	3422	0	395	3567	0	428	3476	1570	361	3476	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		70			9				130			106
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1312.9	
Travel Time (s)		32.8			61.8			26.6			67.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Adj. Flow (vph)	89	392	197	95	575	61	299	1092	196	67	809	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	589	0	95	636	0	299	1092	196	67	809	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

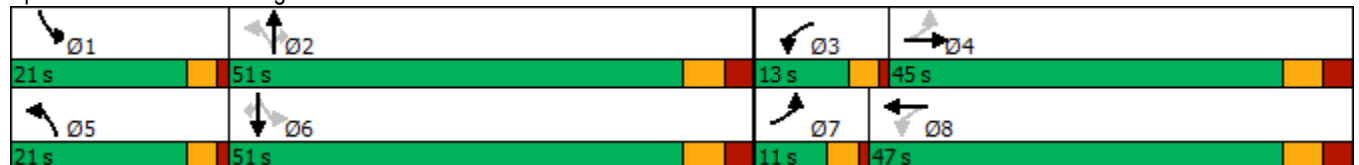
Future Total 2027 Conditions  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	11.0	45.0		13.0	47.0		21.0	51.0	51.0	21.0	51.0	51.0
Total Split (%)	8.5%	34.6%		10.0%	36.2%		16.2%	39.2%	39.2%	16.2%	39.2%	39.2%
Maximum Green (s)	7.0	38.0		9.0	40.0		17.0	44.0	44.0	17.0	44.0	44.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	39.7	25.7		42.1	29.6		69.6	56.5	56.5	60.7	46.4	46.4
Actuated g/C Ratio	0.35	0.23		0.37	0.26		0.61	0.50	0.50	0.53	0.41	0.41
v/c Ratio	0.33	0.71		0.33	0.68		0.62	0.63	0.23	0.21	0.57	0.19
Control Delay	26.8	40.5		26.8	41.9		17.6	25.3	8.1	12.6	29.4	8.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	40.5		26.8	41.9		17.6	25.3	8.1	12.6	29.4	8.5
LOS	C	D		C	D		B	C	A	B	C	A
Approach Delay		38.7			39.9			21.7			25.5	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 113.7  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 28.9      Intersection LOS: C  
 Intersection Capacity Utilization 76.7%      ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue



























Future Total 2027 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	89	589	95	636	299	1092	196	67	809	139
v/c Ratio	0.33	0.71	0.33	0.68	0.62	0.63	0.23	0.21	0.57	0.19
Control Delay	26.8	40.5	26.8	41.9	17.6	25.3	8.1	12.6	29.4	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	40.5	26.8	41.9	17.6	25.3	8.1	12.6	29.4	8.5
Queue Length 50th (m)	13.2	57.7	14.1	69.1	29.7	96.2	7.9	5.8	74.7	4.5
Queue Length 95th (m)	24.0	76.6	25.4	88.7	53.6	141.3	24.6	13.7	107.0	18.8
Internal Link Dist (m)		431.0		834.9		493.1			1288.9	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	272	1258	292	1333	503	1726	845	478	1417	728
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.47	0.33	0.48	0.59	0.63	0.23	0.14	0.57	0.19
Intersection Summary										























HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2027 Conditions  
PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 			 			 		
Traffic Volume (vph)	89	392	197	95	575	61	299	1092	196	67	809	139	
Future Volume (vph)	89	392	197	95	575	61	299	1092	196	67	809	139	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1772	3421		1772	3565		1789	3476	1570	1825	3476	1633	
Flt Permitted	0.24	1.00		0.21	1.00		0.23	1.00	1.00	0.19	1.00	1.00	
Satd. Flow (perm)	440	3421		396	3565		427	3476	1570	362	3476	1633	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	89	392	197	95	575	61	299	1092	196	67	809	139	
RTOR Reduction (vph)	0	54	0	0	7	0	0	0	66	0	0	62	
Lane Group Flow (vph)	89	535	0	95	629	0	299	1092	130	67	809	77	
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4			8			2		2	6		6	
Actuated Green, G (s)	30.0	24.6		35.8	27.5		64.5	54.5	54.5	51.4	45.4	45.4	
Effective Green, g (s)	36.0	26.6		39.9	29.5		67.5	56.5	56.5	57.4	47.4	47.4	
Actuated g/C Ratio	0.31	0.23		0.35	0.26		0.58	0.49	0.49	0.50	0.41	0.41	
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0	
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2	
Lane Grp Cap (vph)	234	788		271	911		463	1701	768	294	1427	670	
v/s Ratio Prot	c0.03	0.16		c0.03	c0.18		c0.10	c0.31		0.02	0.23		
v/s Ratio Perm	0.09			0.09			0.28		0.08	0.10		0.05	
v/c Ratio	0.38	0.68		0.35	0.69		0.65	0.64	0.17	0.23	0.57	0.11	
Uniform Delay, d1	29.4	40.5		27.1	38.8		14.3	21.9	16.4	16.0	26.1	21.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	1.8		0.8	2.3		3.1	1.9	0.5	0.4	1.6	0.3	
Delay (s)	30.5	42.3		27.9	41.1		17.4	23.8	16.9	16.4	27.8	21.4	
Level of Service	C	D		C	D		B	C	B	B	C	C	
Approach Delay (s)		40.8			39.4			21.7			26.1		
Approach LOS		D			D			C			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			29.3	HCM 2000 Level of Service						C			
HCM 2000 Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			115.4	Sum of lost time (s)						12.0			
Intersection Capacity Utilization			76.7%	ICU Level of Service						D			
Analysis Period (min)			15										
c	Critical Lane Group												

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

Future Background 2031 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	191	59	75	206	91	39	1297	51	71	930	47
Future Volume (vph)	66	191	59	75	206	91	39	1297	51	71	930	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	1.00			1.00				
Frt		0.965			0.954			0.994				0.993
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1833	0	1738	1755	0	1825	3483	0	1738	3398	0
Flt Permitted	0.330			0.420			0.293			0.120		
Satd. Flow (perm)	620	1833	0	767	1755	0	563	3483	0	220	3398	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			26			6			10	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Confl. Peds. (#/hr)	4		3	3		4			2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Adj. Flow (vph)	66	191	59	75	206	91	39	1297	51	71	930	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	250	0	75	297	0	39	1348	0	71	977	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

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

Future Background 2031 Conditions  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		5.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		9.7	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		47.2	47.2		9.8	57.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		52.4%	52.4%		10.9%	63.3%	
Maximum Green (s)	26.0	26.0		26.0	26.0		41.2	41.2		5.8	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-3.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	20.4	20.4		20.4	20.4		51.1	51.1		63.6	59.6	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.57	0.57		0.71	0.66	
v/c Ratio	0.47	0.58		0.43	0.71		0.12	0.68		0.23	0.43	
Control Delay	39.8	33.4		36.1	38.2		13.5	17.8		6.9	8.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.8	33.4		36.1	38.2		13.5	17.8		6.9	8.6	
LOS	D	C		D	D		B	B		A	A	
Approach Delay		34.7			37.8			17.7			8.5	
Approach LOS		C			D			B			A	

Intersection Summary

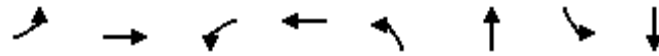
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 39 (43%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 18.7      Intersection LOS: B  
 Intersection Capacity Utilization 83.0%      ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



Queues  
1: Ontario Street & Laurier Road

Future Background 2031 Conditions  
AM Peak Hour

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	250	75	297	39	1348	71	977
v/c Ratio	0.47	0.58	0.43	0.71	0.12	0.68	0.23	0.43
Control Delay	39.8	33.4	36.1	38.2	13.5	17.8	6.9	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	33.4	36.1	38.2	13.5	17.8	6.9	8.6
Queue Length 50th (m)	9.9	35.8	11.2	43.4	3.1	85.4	3.2	36.8
Queue Length 95th (m)	20.8	53.0	22.1	63.1	10.0	130.2	9.0	61.8
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	192	582	238	563	319	1981	314	2252
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.43	0.32	0.53	0.12	0.68	0.23	0.43

Intersection Summary



HCM Signalized Intersection Capacity Analysis  
1: Ontario Street & Laurier Road

























Future Background 2031 Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	191	59	75	206	91	39	1297	51	71	930	47
Future Volume (vph)	66	191	59	75	206	91	39	1297	51	71	930	47
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1785	1833		1735	1755		1825	3484		1738	3397	
Flt Permitted	0.33	1.00		0.42	1.00		0.29	1.00		0.12	1.00	
Satd. Flow (perm)	621	1833		766	1755		563	3484		219	3397	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	191	59	75	206	91	39	1297	51	71	930	47
RTOR Reduction (vph)	0	14	0	0	20	0	0	3	0	0	3	0
Lane Group Flow (vph)	66	236	0	75	277	0	39	1345	0	71	974	0
Confl. Peds. (#/hr)	4		3	3		4			2	2		
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.4	18.4		18.4	18.4		49.4	49.4		58.6	58.6	
Effective Green, g (s)	20.4	20.4		20.4	20.4		50.4	50.4		61.6	59.6	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.56	0.56		0.68	0.66	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		4.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	140	415		173	397		315	1951		288	2249	
v/s Ratio Prot		0.13			c0.16			c0.39		0.02	c0.29	
v/s Ratio Perm	0.11			0.10			0.07			0.15		
v/c Ratio	0.47	0.57		0.43	0.70		0.12	0.69		0.25	0.43	
Uniform Delay, d1	30.1	30.9		29.8	32.0		9.4	14.2		7.9	7.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	1.1		0.6	4.3		0.8	2.0		0.4	0.6	
Delay (s)	31.0	32.0		30.5	36.2		10.2	16.2		8.4	7.8	
Level of Service	C	C		C	D		B	B		A	A	
Approach Delay (s)		31.8			35.1			16.0			7.8	
Approach LOS		C			D			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.2				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			11.0		
Intersection Capacity Utilization			83.0%				ICU Level of Service				E	
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Background 2031 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	364	1620	285	393	880	265	211	855	254	207	730	186
Future Volume (vph)	364	1620	285	393	880	265	211	855	254	207	730	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00		0.99			0.98	1.00		0.98	1.00	1.00	
Frt			0.850			0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	3579	1570	1690	3476	1555	1789	3380	1570	1690	3158	0
Flt Permitted	0.157			0.092			0.103			0.155		
Satd. Flow (perm)	290	3579	1550	164	3476	1527	194	3380	1545	275	3158	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			168			253			27
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		622.6			218.7			1530.3			235.1	
Travel Time (s)		37.4			13.1			110.2			16.9	
Confl. Peds. (#/hr)	6		1	1		6	2		4	4		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Adj. Flow (vph)	364	1620	285	393	880	265	211	855	254	207	730	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	364	1620	285	393	880	265	211	855	254	207	916	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Background 2031 Conditions  
AM Peak Hour

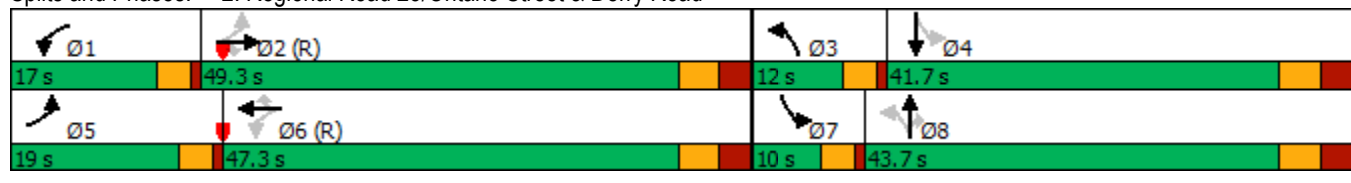


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	SBR
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7	
Total Split (s)	19.0	49.3	49.3	17.0	47.3	47.3	12.0	43.7	43.7	10.0	41.7	
Total Split (%)	15.8%	41.1%	41.1%	14.2%	39.4%	39.4%	10.0%	36.4%	36.4%	8.3%	34.8%	
Maximum Green (s)	15.0	42.6	42.6	13.0	40.6	40.6	8.0	37.0	37.0	6.0	35.0	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	65.4	44.3	44.3	62.4	42.3	42.3	52.6	38.6	38.6	49.6	36.6	
Actuated g/C Ratio	0.54	0.37	0.37	0.52	0.35	0.35	0.44	0.32	0.32	0.41	0.30	
v/c Ratio	0.96	1.23	0.45	1.36	0.72	0.41	0.91	0.79	0.38	0.94	0.93	
Control Delay	62.3	142.9	19.9	205.4	39.1	14.0	68.6	43.1	5.4	74.1	56.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.3	142.9	19.9	205.4	39.1	14.0	68.6	43.1	5.4	74.1	56.3	
LOS	E	F	B	F	D	B	E	D	A	E	E	
Approach Delay		114.5			77.2			40.0			59.6	
Approach LOS		F			E			D			E	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 125  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.36  
 Intersection Signal Delay: 79.7  
 Intersection LOS: E  
 Intersection Capacity Utilization 119.6%  
 ICU Level of Service H  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Queues  
2: Regional Road 25/Ontario Street & Derry Road

Future Background 2031 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	364	1620	285	393	880	265	211	855	254	207	916
v/c Ratio	0.96	1.23	0.45	1.36	0.72	0.41	0.91	0.79	0.38	0.94	0.93
Control Delay	62.3	142.9	19.9	205.4	39.1	14.0	68.6	43.1	5.4	74.1	56.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.3	142.9	19.9	205.4	39.1	14.0	68.6	43.1	5.4	74.1	56.3
Queue Length 50th (m)	56.6	~247.4	30.7	~107.3	101.7	22.5	32.7	95.7	0.2	30.6	107.3
Queue Length 95th (m)	#115.6	#289.9	54.8	#164.4	127.0	46.8	#77.8	119.8	17.9	#71.6	#146.8
Internal Link Dist (m)		598.6			194.7			1506.3			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	379	1321	639	290	1225	647	231	1090	669	220	984
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	1.23	0.45	1.36	0.72	0.41	0.91	0.78	0.38	0.94	0.93

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.

HCM Signalized Intersection Capacity Analysis  
2: Regional Road 25/Ontario Street & Derry Road

Future Background 2031 Conditions  
AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	364	1620	285	393	880	265	211	855	254	207	730	186	
Future Volume (vph)	364	1620	285	393	880	265	211	855	254	207	730	186	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1755	3579	1550	1690	3476	1527	1789	3380	1545	1690	3156		
Flt Permitted	0.16	1.00	1.00	0.09	1.00	1.00	0.10	1.00	1.00	0.16	1.00		
Satd. Flow (perm)	290	3579	1550	163	3476	1527	194	3380	1545	276	3156		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	364	1620	285	393	880	265	211	855	254	207	730	186	
RTOR Reduction (vph)	0	0	67	0	0	109	0	0	172	0	19	0	
Lane Group Flow (vph)	364	1620	218	393	880	156	211	855	82	207	897	0	
Confl. Peds. (#/hr)	6		1	1		6	2		4	4		2	
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases	2		2	6		6	8		8	4			
Actuated Green, G (s)	57.7	42.6	42.6	53.7	40.6	40.6	44.9	36.9	36.9	40.9	34.9		
Effective Green, g (s)	62.7	44.3	44.3	59.7	42.3	42.3	49.9	38.6	38.6	46.9	36.6		
Actuated g/C Ratio	0.52	0.37	0.37	0.50	0.35	0.35	0.42	0.32	0.32	0.39	0.31		
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7		
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	372	1321	572	285	1225	538	226	1087	496	213	962		
v/s Ratio Prot	c0.15	0.45		c0.18	0.25		c0.09	0.25		c0.07	0.28		
v/s Ratio Perm	0.36		0.14	c0.50		0.10	0.30		0.05	c0.31			
v/c Ratio	0.98	1.23	0.38	1.38	0.72	0.29	0.93	0.79	0.17	0.97	0.93		
Uniform Delay, d1	27.9	37.9	27.8	37.3	33.7	28.0	29.8	37.0	29.2	30.3	40.5		
Progression Factor	1.00	1.00	1.00	0.83	1.05	1.15	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	40.5	108.8	1.9	188.5	3.2	1.2	41.6	3.8	0.2	53.3	15.3		
Delay (s)	68.4	146.6	29.7	219.5	38.6	33.4	71.4	40.8	29.3	83.7	55.8		
Level of Service	E	F	C	F	D	C	E	D	C	F	E		
Approach Delay (s)		119.4			84.0			43.5			60.9		
Approach LOS		F			F			D			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			84.1									HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.18										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	12.0
Intersection Capacity Utilization			119.6%									ICU Level of Service	H
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings  
3: Derry Road

Future Background 2031 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	20	2232	1754	16	18	4
Future Volume (vph)	20	2232	1754	16	18	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.999		0.975	
Flt Protected	0.950				0.961	
Satd. Flow (prot)	1825	3544	3442	0	1716	0
Flt Permitted	0.950				0.961	
Satd. Flow (perm)	1825	3544	3442	0	1716	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		218.7	493.3		86.5	
Travel Time (s)		13.1	29.6		6.2	
Confl. Peds. (#/hr)	8			8		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	6%	0%	6%	0%
Adj. Flow (vph)	20	2232	1754	16	18	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	2232	1770	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	71.7%
Analysis Period (min)	15
	ICU Level of Service C

# HCM Unsignalized Intersection Capacity Analysis

## 3: Derry Road





















Future Background 2031 Conditions  
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	2232	1754	16	18	4
Future Volume (Veh/h)	20	2232	1754	16	18	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	2232	1754	16	18	4
Pedestrians					8	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage (veh)			2			
Upstream signal (m)		219				
pX, platoon unblocked					0.64	
vC, conflicting volume	1778				2926	893
vC1, stage 1 conf vol					1770	
vC2, stage 2 conf vol					1156	
vCu, unblocked vol	1778				2884	893
tC, single (s)	4.1				6.9	6.9
tC, 2 stage (s)					5.9	
tF (s)	2.2				3.6	3.3
p0 queue free %	94				84	99
cM capacity (veh/h)	352				109	286
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	20	1116	1116	1169	601	22
Volume Left	20	0	0	0	0	18
Volume Right	0	0	0	0	16	4
cSH	352	1700	1700	1700	1700	123
Volume to Capacity	0.06	0.66	0.66	0.69	0.35	0.18
Queue Length 95th (m)	1.4	0.0	0.0	0.0	0.0	4.7
Control Delay (s)	15.9	0.0	0.0	0.0	0.0	40.5
Lane LOS	C					E
Approach Delay (s)	0.1			0.0		40.5
Approach LOS						E
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			71.7%		ICU Level of Service	C
Analysis Period (min)			15			

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Background 2031 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	2025	99	55	1418	21	161	45	133	42	46	77
Future Volume (vph)	56	2025	99	55	1418	21	161	45	133	42	46	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		1.00	0.99		0.99	0.99	
Frt		0.993			0.998			0.888			0.906	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1644	3517	0	1738	3436	0	1807	1553	0	1738	1647	0
Flt Permitted	0.144			0.046			0.617			0.490		
Satd. Flow (perm)	249	3517	0	84	3436	0	1171	1553	0	892	1647	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			2			15			56	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Confl. Peds. (#/hr)	2		1	1		2	2		6	6		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Adj. Flow (vph)	56	2025	99	55	1418	21	161	45	133	42	46	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	2124	0	55	1439	0	161	178	0	42	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Background 2031 Conditions  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.1	82.1		82.1	82.1		37.9	37.9		37.9	37.9	
Total Split (%)	68.4%	68.4%		68.4%	68.4%		31.6%	31.6%		31.6%	31.6%	
Maximum Green (s)	76.4	76.4		76.4	76.4		30.7	30.7		30.7	30.7	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	86.7	86.7		86.7	86.7		23.3	23.3		23.3	23.3	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
v/c Ratio	0.31	0.83		0.92	0.58		0.71	0.57		0.24	0.34	
Control Delay	2.3	8.5		119.9	10.0		61.3	46.1		41.8	23.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.3	8.5		119.9	10.0		61.3	46.1		41.8	23.9	
LOS	A	A		F	A		E	D		D	C	
Approach Delay		8.3			14.0			53.3			28.5	
Approach LOS		A			B			D			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 14.8  
 Intersection Capacity Utilization 93.5%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service F

Splits and Phases: 4: Holly Avenue & Derry Road



Queues  
4: Holly Avenue & Derry Road

Future Background 2031 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	2124	55	1439	161	178	42	123
v/c Ratio	0.31	0.83	0.92	0.58	0.71	0.57	0.24	0.34
Control Delay	2.3	8.5	119.9	10.0	61.3	46.1	41.8	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	8.5	119.9	10.0	61.3	46.1	41.8	23.9
Queue Length 50th (m)	1.0	64.1	9.2	74.6	35.8	35.1	8.4	13.4
Queue Length 95th (m)	m1.4	m219.4	#27.9	120.7	54.3	52.6	17.3	27.8
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	180	2544	60	2484	321	436	244	492
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.83	0.92	0.58	0.50	0.41	0.17	0.25

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis  
4: Holly Avenue & Derry Road

Future Background 2031 Conditions  
AM Peak Hour

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	56	2025	99	55	1418	21	161	45	133	42	46	77
Future Volume (vph)	56	2025	99	55	1418	21	161	45	133	42	46	77
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1644	3517		1738	3435		1803	1553		1729	1647	
Flt Permitted	0.14	1.00		0.05	1.00		0.62	1.00		0.49	1.00	
Satd. Flow (perm)	248	3517		84	3435		1172	1553		891	1647	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	2025	99	55	1418	21	161	45	133	42	46	77
RTOR Reduction (vph)	0	2	0	0	1	0	0	12	0	0	45	0
Lane Group Flow (vph)	56	2122	0	55	1438	0	161	166	0	42	78	0
Confl. Peds. (#/hr)	2		1	1		2	2		6	6		2
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	86.0	86.0		86.0	86.0		21.1	21.1		21.1	21.1	
Effective Green, g (s)	86.7	86.7		86.7	86.7		23.3	23.3		23.3	23.3	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	179	2541		60	2481		227	301		173	319	
v/s Ratio Prot		0.60			0.42			0.11			0.05	
v/s Ratio Perm	0.23			0.65			0.14			0.05		
v/c Ratio	0.31	0.84		0.92	0.58		0.71	0.55		0.24	0.24	
Uniform Delay, d1	6.0	11.6		13.7	8.0		45.2	43.6		40.9	40.9	
Progression Factor	0.21	0.57		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.3		84.8	0.2		9.7	2.2		0.7	0.4	
Delay (s)	1.6	7.0		98.5	8.2		54.9	45.8		41.6	41.3	
Level of Service	A	A		F	A		D	D		D	D	
Approach Delay (s)		6.9			11.5			50.1			41.4	
Approach LOS		A			B			D			D	

Intersection Summary		
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.86	B
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	93.5%	10.0
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Background 2031 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	634	483	150	469	83	155	929	138	50	1077	100
Future Volume (vph)	130	634	483	150	469	83	155	929	138	50	1077	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00				1.00				0.98	1.00		
Frt		0.935			0.977				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1659	3318	0	1722	3446	0	1674	3411	1541	1755	3380	1471
Flt Permitted	0.295			*0.250			0.096			0.210		
Satd. Flow (perm)	513	3318	0	453	3446	0	169	3411	1517	388	3380	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		169			16				134			168
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1530.3	
Travel Time (s)		32.8			61.8			26.6			78.7	
Confl. Peds. (#/hr)	6					6			2	2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Adj. Flow (vph)	130	634	483	150	469	83	155	929	138	50	1077	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1117	0	150	552	0	155	929	138	50	1077	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Background 2031 Conditions  
AM Peak Hour

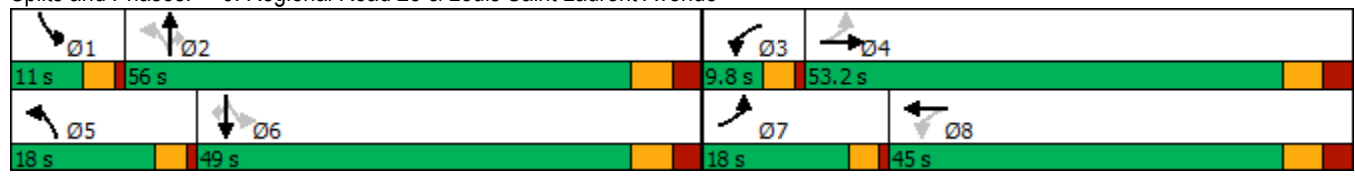


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	18.0	53.2		9.8	45.0		18.0	56.0	56.0	11.0	49.0	49.0
Total Split (%)	13.8%	40.9%		7.5%	34.6%		13.8%	43.1%	43.1%	8.5%	37.7%	37.7%
Maximum Green (s)	14.0	46.2		5.8	38.0		14.0	49.0	49.0	7.0	42.0	42.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	54.5	40.6		48.4	35.5		64.9	52.4	52.4	59.2	45.5	45.5
Actuated g/C Ratio	0.45	0.33		0.40	0.29		0.53	0.43	0.43	0.49	0.37	0.37
v/c Ratio	0.36	0.91		0.55	0.54		0.58	0.63	0.19	0.17	0.85	0.15
Control Delay	22.8	44.6		29.1	37.4		29.3	31.2	5.1	17.0	43.9	0.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	44.6		29.1	37.4		29.3	31.2	5.1	17.0	43.9	0.5
LOS	C	D		C	D		C	C	A	B	D	A
Approach Delay		42.3			35.6			28.0			39.2	
Approach LOS		D			D			C			D	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	121.4
Natural Cycle:	85
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.91
Intersection Signal Delay:	36.4
Intersection LOS:	D
Intersection Capacity Utilization:	94.7%
ICU Level of Service:	F
Analysis Period (min):	15
* User Entered Value	

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Background 2031 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	1117	150	552	155	929	138	50	1077	100
v/c Ratio	0.36	0.91	0.55	0.54	0.58	0.63	0.19	0.17	0.85	0.15
Control Delay	22.8	44.6	29.1	37.4	29.3	31.2	5.1	17.0	43.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	44.6	29.1	37.4	29.3	31.2	5.1	17.0	43.9	0.5
Queue Length 50th (m)	18.5	118.7	21.5	57.4	19.0	96.0	0.6	5.7	127.1	0.0
Queue Length 95th (m)	30.8	147.3	34.8	77.1	42.0	127.2	13.4	13.0	#182.9	0.0
Internal Link Dist (m)		431.0		834.9		493.1			1506.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	392	1427	273	1160	302	1473	731	304	1267	656
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.78	0.55	0.48	0.51	0.63	0.19	0.16	0.85	0.15

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue























Future Background 2031 Conditions  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	634	483	150	469	83	155	929	138	50	1077	100
Future Volume (vph)	130	634	483	150	469	83	155	929	138	50	1077	100
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1658	3318		1722	3448		1674	3411	1518	1755	3380	1471
Flt Permitted	0.29	1.00		0.25	1.00		0.10	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	514	3318		453	3448		170	3411	1518	388	3380	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	634	483	150	469	83	155	929	138	50	1077	100
RTOR Reduction (vph)	0	113	0	0	11	0	0	0	77	0	0	62
Lane Group Flow (vph)	130	1004	0	150	541	0	155	929	61	50	1077	38
Confl. Peds. (#/hr)	6						6			2	2	
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	48.5	38.7		39.3	33.5		59.7	50.4	50.4	49.7	44.4	44.4
Effective Green, g (s)	51.5	40.7		45.3	35.5		62.7	52.4	52.4	55.7	46.4	46.4
Actuated g/C Ratio	0.42	0.33		0.37	0.29		0.51	0.43	0.43	0.46	0.38	0.38
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	347	1105		259	1001		263	1462	650	269	1283	558
v/s Ratio Prot	0.04	c0.30		c0.04	0.16		c0.07	0.27		0.01	c0.32	
v/s Ratio Perm	0.11			0.17			0.23		0.04	0.07		0.03
v/c Ratio	0.37	0.91		0.58	0.54		0.59	0.64	0.09	0.19	0.84	0.07
Uniform Delay, d1	23.0	39.0		26.5	36.5		21.8	27.4	20.8	19.6	34.5	24.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	10.6		3.1	0.6		3.4	2.1	0.3	0.3	6.7	0.2
Delay (s)	23.7	49.6		29.6	37.1		25.1	29.5	21.1	20.0	41.2	24.4
Level of Service	C	D		C	D		C	C	C	B	D	C
Approach Delay (s)		46.9			35.5			28.0			39.0	
Approach LOS		D			D			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			37.6				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			122.2				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			94.7%				ICU Level of Service			F		
Analysis Period (min)			15									

c Critical Lane Group

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

Future Background 2031 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	218	39	103	261	105	58	1103	87	129	1345	87
Future Volume (vph)	67	218	39	103	261	105	58	1103	87	129	1345	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	0.99			1.00		1.00	1.00	
Frt		0.977			0.957			0.989			0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1872	0	1807	1799	0	1825	3505	0	1789	3508	0
Flt Permitted	0.223			0.412			0.130			0.189		
Satd. Flow (perm)	418	1872	0	781	1799	0	250	3505	0	356	3508	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			20			15			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			235.1			311.8	
Travel Time (s)		22.7			14.2			16.9			22.4	
Confl. Peds. (#/hr)	9		5	5		9	3		3	3		3
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Adj. Flow (vph)	67	218	39	103	261	105	58	1103	87	129	1345	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	257	0	103	366	0	58	1190	0	129	1432	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	





Queues  
1: Ontario Street & Laurier Road

Future Background 2031 Conditions  
PM Peak Hour

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	257	103	366	58	1190	129	1432
v/c Ratio	0.66	0.56	0.54	0.81	0.35	0.52	0.55	0.62
Control Delay	64.3	36.1	43.4	47.7	16.7	10.3	22.1	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.3	36.1	43.4	47.7	16.7	10.3	22.1	11.9
Queue Length 50th (m)	11.5	41.4	17.1	62.4	4.8	58.5	12.7	79.1
Queue Length 95th (m)	#30.2	63.4	33.3	92.3	15.6	79.7	37.6	106.8
Internal Link Dist (m)		291.0		172.8		211.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	117	530	218	518	164	2306	233	2307
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.48	0.47	0.71	0.35	0.52	0.55	0.62

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
1: Ontario Street & Laurier Road

























Future Background 2031 Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	218	39	103	261	105	58	1103	87	129	1345	87
Future Volume (vph)	67	218	39	103	261	105	58	1103	87	129	1345	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1781	1872		1801	1798		1824	3505		1788	3508	
Flt Permitted	0.22	1.00		0.41	1.00		0.13	1.00		0.19	1.00	
Satd. Flow (perm)	418	1872		781	1798		250	3505		356	3508	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	218	39	103	261	105	58	1103	87	129	1345	87
RTOR Reduction (vph)	0	7	0	0	15	0	0	5	0	0	4	0
Lane Group Flow (vph)	67	250	0	103	351	0	58	1185	0	129	1428	0
Confl. Peds. (#/hr)	9		5	5		9	3		3	3		3
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.3	22.3		22.3	22.3		64.7	64.7		64.7	64.7	
Effective Green, g (s)	24.3	24.3		24.3	24.3		65.7	65.7		65.7	65.7	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.66	0.66		0.66	0.66	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	101	454		189	436		164	2302		233	2304	
v/s Ratio Prot		0.13			c0.20			0.34			c0.41	
v/s Ratio Perm	0.16			0.13			0.23			0.36		
v/c Ratio	0.66	0.55		0.54	0.80		0.35	0.51		0.55	0.62	
Uniform Delay, d1	34.2	33.1		33.0	35.6		7.7	8.9		9.2	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.0	0.8		1.7	9.8		5.9	0.8		9.2	1.3	
Delay (s)	46.1	33.9		34.7	45.4		13.5	9.7		18.4	11.2	
Level of Service	D	C		C	D		B	A		B	B	
Approach Delay (s)		36.4			43.1			9.9			11.8	
Approach LOS		D			D			A			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.4				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			98.2%				ICU Level of Service			F		
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Background 2031 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	1275	168	257	1462	208	265	950	203	274	778	213
Future Volume (vph)	285	1275	168	257	1462	208	265	950	203	274	778	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor			0.99			0.99	1.00		0.99	1.00	1.00	
Frt			0.850			0.850			0.850		0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3614	1617	1807	3614	1633	1789	3476	1498	1807	3376	0
Flt Permitted	0.099			0.097			0.100			0.140		
Satd. Flow (perm)	185	3614	1594	185	3614	1612	188	3476	1479	266	3376	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			106			166			32
Link Speed (k/h)		60			60			50				50
Link Distance (m)		622.6			218.7			1530.3				235.1
Travel Time (s)		37.4			13.1			110.2				16.9
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Adj. Flow (vph)	285	1275	168	257	1462	208	265	950	203	274	778	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	1275	168	257	1462	208	265	950	203	274	991	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Background 2031 Conditions  
PM Peak Hour

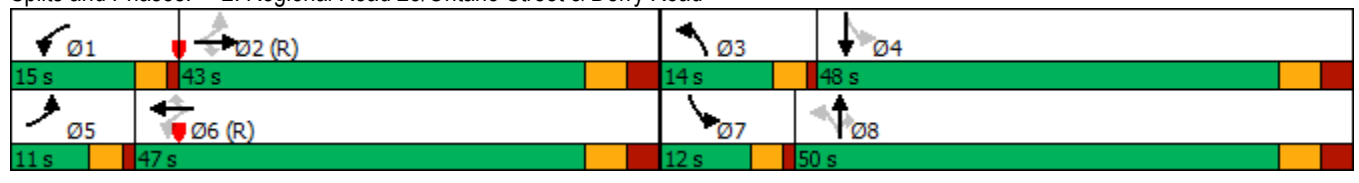


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.0	40.7	40.7	10.0	40.7	40.7	10.0	41.7	41.7	10.0	41.7	
Total Split (s)	11.0	43.0	43.0	15.0	47.0	47.0	14.0	50.0	50.0	12.0	48.0	
Total Split (%)	9.2%	35.8%	35.8%	12.5%	39.2%	39.2%	11.7%	41.7%	41.7%	10.0%	40.0%	
Maximum Green (s)	7.0	36.3	36.3	11.0	40.3	40.3	10.0	43.3	43.3	8.0	41.3	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		28.0	28.0		28.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	55.1	39.0	39.0	58.7	42.0	42.0	58.9	42.9	42.9	55.9	40.9	
Actuated g/C Ratio	0.46	0.32	0.32	0.49	0.35	0.35	0.49	0.36	0.36	0.47	0.34	
v/c Ratio	1.16	1.09	0.28	0.87	1.16	0.33	1.00	0.76	0.32	1.04	0.85	
Control Delay	139.4	91.5	13.4	53.9	109.5	9.2	85.0	38.6	7.7	89.5	43.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	139.4	91.5	13.4	53.9	109.5	9.2	85.0	38.6	7.7	89.5	43.0	
LOS	F	F	B	D	F	A	F	D	A	F	D	
Approach Delay		91.8			91.2			42.9			53.1	
Approach LOS		F			F			D			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 115  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.16  
 Intersection Signal Delay: 73.0  
 Intersection LOS: E  
 Intersection Capacity Utilization 114.2%  
 ICU Level of Service H  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Queues  
2: Regional Road 25/Ontario Street & Derry Road

Future Background 2031 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	285	1275	168	257	1462	208	265	950	203	274	991
v/c Ratio	1.16	1.09	0.28	0.87	1.16	0.33	1.00	0.76	0.32	1.04	0.85
Control Delay	139.4	91.5	13.4	53.9	109.5	9.2	85.0	38.6	7.7	89.5	43.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.4	91.5	13.4	53.9	109.5	9.2	85.0	38.6	7.7	89.5	43.0
Queue Length 50th (m)	~71.8	~181.2	10.3	39.5	~215.6	11.9	44.0	100.3	5.5	~40.4	106.7
Queue Length 95th (m)	#125.6	#223.0	27.3	m#90.8	#254.7	m17.4	#97.7	124.2	21.5	#95.1	133.1
Internal Link Dist (m)		598.6			194.7			1506.3			211.1
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	245	1175	590	294	1264	633	265	1303	658	264	1230
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	1.09	0.28	0.87	1.16	0.33	1.00	0.73	0.31	1.04	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis  
2: Regional Road 25/Ontario Street & Derry Road

Future Background 2031 Conditions  
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	285	1275	168	257	1462	208	265	950	203	274	778	213
Future Volume (vph)	285	1275	168	257	1462	208	265	950	203	274	778	213
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1772	3614	1594	1807	3614	1612	1789	3476	1479	1807	3376	
Flt Permitted	0.10	1.00	1.00	0.10	1.00	1.00	0.10	1.00	1.00	0.14	1.00	
Satd. Flow (perm)	185	3614	1594	184	3614	1612	188	3476	1479	265	3376	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	285	1275	168	257	1462	208	265	950	203	274	778	213
RTOR Reduction (vph)	0	0	72	0	0	69	0	0	107	0	21	0
Lane Group Flow (vph)	285	1275	96	257	1462	139	265	950	96	274	970	0
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	46.4	37.3	37.3	52.4	40.3	40.3	51.2	41.2	41.2	47.2	39.2	
Effective Green, g (s)	52.4	39.0	39.0	56.4	42.0	42.0	56.2	42.9	42.9	53.2	40.9	
Actuated g/C Ratio	0.44	0.32	0.32	0.47	0.35	0.35	0.47	0.36	0.36	0.44	0.34	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	240	1174	518	290	1264	564	261	1242	528	258	1150	
v/s Ratio Prot	c0.12	0.35		c0.11	c0.40		c0.11	0.27		c0.10	0.29	
v/s Ratio Perm	0.40		0.06	0.30		0.09	0.36		0.07	c0.37		
v/c Ratio	1.19	1.09	0.19	0.89	1.16	0.25	1.02	0.76	0.18	1.06	0.84	
Uniform Delay, d1	34.3	40.5	29.1	33.6	39.0	27.7	33.3	34.1	26.5	25.8	36.6	
Progression Factor	1.00	1.00	1.00	1.06	0.85	0.59	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	118.3	52.9	0.8	20.9	77.7	0.8	59.7	2.9	0.2	73.4	5.8	
Delay (s)	152.6	93.4	29.9	56.6	110.7	17.1	93.0	37.0	26.7	99.2	42.4	
Level of Service	F	F	C	E	F	B	F	D	C	F	D	
Approach Delay (s)		97.0			93.4			46.0			54.7	
Approach LOS		F			F			D			D	

Intersection Summary

HCM 2000 Control Delay	76.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
3: Derry Road

Future Background 2031 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	1736	2101	20	19	24
Future Volume (vph)	10	1736	2101	20	19	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.999		0.925	
Flt Protected	0.950				0.978	
Satd. Flow (prot)	1825	3510	3611	0	1738	0
Flt Permitted	0.950				0.978	
Satd. Flow (perm)	1825	3510	3611	0	1738	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		218.7	493.3		86.5	
Travel Time (s)		13.1	29.6		6.2	
Confl. Peds. (#/hr)	2			2		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	1%	0%	0%	0%
Adj. Flow (vph)	10	1736	2101	20	19	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	1736	2121	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.7	3.7		3.7	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane			Yes			
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	68.7%
Analysis Period (min)	15
	ICU Level of Service C



# HCM Unsignalized Intersection Capacity Analysis

## 3: Derry Road





















Future Background 2031 Conditions  
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	1736	2101	20	19	24
Future Volume (Veh/h)	10	1736	2101	20	19	24
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	1736	2101	20	19	24
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh			2			
Upstream signal (m)		219				
pX, platoon unblocked					0.68	
vC, conflicting volume	2123				3001	1062
vC1, stage 1 conf vol					2113	
vC2, stage 2 conf vol					888	
vCu, unblocked vol	2123				3001	1062
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				76	89
cM capacity (veh/h)	260				78	222
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	10	868	868	1401	720	43
Volume Left	10	0	0	0	0	19
Volume Right	0	0	0	0	20	24
cSH	260	1700	1700	1700	1700	122
Volume to Capacity	0.04	0.51	0.51	0.82	0.42	0.35
Queue Length 95th (m)	0.9	0.0	0.0	0.0	0.0	10.8
Control Delay (s)	19.4	0.0	0.0	0.0	0.0	49.8
Lane LOS	C					E
Approach Delay (s)	0.1			0.0		49.8
Approach LOS						E
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			68.7%		ICU Level of Service	C
Analysis Period (min)			15			

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Background 2031 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1426	167	147	1804	52	165	84	77	34	88	51
Future Volume (vph)	57	1426	167	147	1804	52	165	84	77	34	88	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						0.99		1.00		
Frt		0.984			0.996			0.928			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	3519	0	1825	3601	0	1807	1727	0	1825	1782	0
Flt Permitted	0.071			0.113			0.584			0.534		
Satd. Flow (perm)	136	3519	0	217	3601	0	1111	1727	0	1025	1782	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			5			38			24	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Confl. Peds. (#/hr)			2	2					1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Adj. Flow (vph)	57	1426	167	147	1804	52	165	84	77	34	88	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1593	0	147	1856	0	165	161	0	34	139	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Background 2031 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4		4
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0		10.0
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2		37.2
Total Split (s)	82.8	82.8		82.8	82.8		37.2	37.2		37.2		37.2
Total Split (%)	69.0%	69.0%		69.0%	69.0%		31.0%	31.0%		31.0%		31.0%
Maximum Green (s)	77.1	77.1		77.1	77.1		30.0	30.0		30.0		30.0
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7		3.7
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5		3.5
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2		-2.2
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0		5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0		3.0
Recall Mode	C-Max	C-Max		None	None		None	None		None		None
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0		7.0
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0		23.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0		0
Act Effct Green (s)	86.0	86.0		86.0	86.0		24.0	24.0		24.0		24.0
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20		0.20
v/c Ratio	0.59	0.63		0.95	0.72		0.74	0.43		0.17		0.37
Control Delay	28.5	12.9		82.3	13.0		64.2	33.9		38.8		35.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0		0.0
Total Delay	28.5	12.9		82.3	13.0		64.2	33.9		38.8		35.3
LOS	C	B		F	B		E	C		D		D
Approach Delay		13.4			18.1			49.2				36.0
Approach LOS		B			B			D				D

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	44 (37%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	140
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.95
Intersection Signal Delay:	19.5
Intersection LOS:	B
Intersection Capacity Utilization:	98.7%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 4: Holly Avenue & Derry Road



Queues  
4: Holly Avenue & Derry Road

Future Background 2031 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	1593	147	1856	165	161	34	139
v/c Ratio	0.59	0.63	0.95	0.72	0.74	0.43	0.17	0.37
Control Delay	28.5	12.9	82.3	13.0	64.2	33.9	38.8	35.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	12.9	82.3	13.0	64.2	33.9	38.8	35.3
Queue Length 50th (m)	3.3	180.2	27.2	119.7	36.8	25.2	6.7	23.3
Queue Length 95th (m)	m8.2	m178.2	#45.1	184.8	56.5	41.8	14.6	38.5
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	97	2527	155	2582	298	491	275	495
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.63	0.95	0.72	0.55	0.33	0.12	0.28

Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 4: Holly Avenue & Derry Road

Future Background 2031 Conditions  
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	57	1426	167	147	1804	52	165	84	77	34	88	51
Future Volume (vph)	57	1426	167	147	1804	52	165	84	77	34	88	51
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.93		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3520		1825	3600		1807	1727		1823	1782	
Flt Permitted	0.07	1.00		0.11	1.00		0.58	1.00		0.53	1.00	
Satd. Flow (perm)	136	3520		216	3600		1110	1727		1025	1782	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	1426	167	147	1804	52	165	84	77	34	88	51
RTOR Reduction (vph)	0	6	0	0	1	0	0	30	0	0	19	0
Lane Group Flow (vph)	57	1587	0	147	1855	0	165	131	0	34	120	0
Confl. Peds. (#/hr)			2	2					1	1		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.3	85.3		85.3	85.3		21.8	21.8		21.8	21.8	
Effective Green, g (s)	86.0	86.0		86.0	86.0		24.0	24.0		24.0	24.0	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	97	2522		154	2580		222	345		205	356	
v/s Ratio Prot		0.45			0.52			0.08			0.07	
v/s Ratio Perm	0.42			0.68			0.15			0.03		
v/c Ratio	0.59	0.63		0.95	0.72		0.74	0.38		0.17	0.34	
Uniform Delay, d1	8.3	8.8		15.2	9.9		45.1	41.5		39.7	41.2	
Progression Factor	1.33	1.29		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.9	0.3		58.1	0.8		12.6	0.7		0.4	0.6	
Delay (s)	17.9	11.6		73.4	10.7		57.7	42.2		40.1	41.7	
Level of Service	B	B		E	B		E	D		D	D	
Approach Delay (s)		11.9			15.3			50.1			41.4	
Approach LOS		B			B			D			D	

### Intersection Summary

HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Background 2031 Conditions  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	432	197	95	633	61	299	1174	196	67	889	139
Future Volume (vph)	89	432	197	95	633	61	299	1174	196	67	889	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00				1.00				0.99			
Frt		0.953			0.987				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3433	0	1772	3566	0	1789	3476	1570	1825	3476	1633
Flt Permitted	0.188			0.203			0.182			0.151		
Satd. Flow (perm)	350	3433	0	379	3566	0	343	3476	1549	290	3476	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			8				121			101
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1530.3	
Travel Time (s)		32.8			61.8			26.6			78.7	
Confl. Peds. (#/hr)	1					1			1	1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Adj. Flow (vph)	89	432	197	95	633	61	299	1174	196	67	889	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	629	0	95	694	0	299	1174	196	67	889	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Background 2031 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	11.0	45.0		13.0	47.0		21.0	51.0	51.0	21.0	51.0	51.0
Total Split (%)	8.5%	34.6%		10.0%	36.2%		16.2%	39.2%	39.2%	16.2%	39.2%	39.2%
Maximum Green (s)	7.0	38.0		9.0	40.0		17.0	44.0	44.0	17.0	44.0	44.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	43.6	29.6		45.8	31.1		69.9	56.6	56.6	60.6	46.2	46.2
Actuated g/C Ratio	0.37	0.25		0.39	0.26		0.59	0.48	0.48	0.51	0.39	0.39
v/c Ratio	0.36	0.69		0.34	0.73		0.69	0.70	0.24	0.24	0.65	0.20
Control Delay	27.1	40.5		26.4	44.2		23.8	28.8	9.4	14.1	33.2	9.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	40.5		26.4	44.2		23.8	28.8	9.4	14.1	33.2	9.5
LOS	C	D		C	D		C	C	A	B	C	A
Approach Delay		38.8			42.0			25.7			29.0	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 117.9  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 31.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 80.5%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Background 2031 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	89	629	95	694	299	1174	196	67	889	139
v/c Ratio	0.36	0.69	0.34	0.73	0.69	0.70	0.24	0.24	0.65	0.20
Control Delay	27.1	40.5	26.4	44.2	23.8	28.8	9.4	14.1	33.2	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	40.5	26.4	44.2	23.8	28.8	9.4	14.1	33.2	9.5
Queue Length 50th (m)	13.3	64.6	14.2	77.5	32.2	113.9	9.6	6.2	89.6	5.6
Queue Length 95th (m)	23.9	84.0	25.2	97.8	65.1	163.4	27.4	14.4	124.4	20.3
Internal Link Dist (m)		431.0		834.9		493.1			1506.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	250	1208	290	1280	449	1668	806	432	1362	701
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.52	0.33	0.54	0.67	0.70	0.24	0.16	0.65	0.20

Intersection Summary

























HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Background 2031 Conditions  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	432	197	95	633	61	299	1174	196	67	889	139
Future Volume (vph)	89	432	197	95	633	61	299	1174	196	67	889	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1772	3434		1772	3565		1789	3476	1549	1825	3476	1633
Flt Permitted	0.19	1.00		0.20	1.00		0.18	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	350	3434		379	3565		343	3476	1549	290	3476	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	432	197	95	633	61	299	1174	196	67	889	139
RTOR Reduction (vph)	0	44	0	0	6	0	0	0	63	0	0	61
Lane Group Flow (vph)	89	585	0	95	688	0	299	1174	133	67	889	78
Confl. Peds. (#/hr)	1						1		1	1		
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	34.5	27.6		37.5	29.1		64.7	54.6	54.6	51.2	45.1	45.1
Effective Green, g (s)	40.5	29.6		43.0	31.1		67.7	56.6	56.6	57.2	47.1	47.1
Actuated g/C Ratio	0.34	0.25		0.36	0.26		0.57	0.48	0.48	0.48	0.40	0.40
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	238	856		271	934		422	1657	738	257	1379	647
v/s Ratio Prot	c0.03	0.17		c0.03	c0.19		c0.11	c0.34		0.02	0.26	
v/s Ratio Perm	0.10			0.09			0.29		0.09	0.11		0.05
v/c Ratio	0.37	0.68		0.35	0.74		0.71	0.71	0.18	0.26	0.64	0.12
Uniform Delay, d1	28.3	40.3		26.7	40.1		16.9	24.5	17.8	18.1	29.0	22.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	1.8		0.8	3.1		5.4	2.6	0.5	0.5	2.3	0.4
Delay (s)	29.3	42.1		27.5	43.1		22.3	27.1	18.3	18.7	31.4	23.1
Level of Service	C	D		C	D		C	C	B	B	C	C
Approach Delay (s)		40.5			41.2			25.2			29.5	
Approach LOS		D			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			118.7				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			80.5%				ICU Level of Service			D		
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 1: Ontario Street & Laurier Road AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	191	59	75	206	91	39	1323	51	71	957	47
Future Volume (vph)	66	191	59	75	206	91	39	1323	51	71	957	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.965			0.954			0.994			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1840	0	1738	1764	0	1825	3486	0	1738	3398	0
Flt Permitted	0.330			0.420			0.285			0.114		
Satd. Flow (perm)	622	1840	0	768	1764	0	548	3486	0	209	3398	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			26			6			9	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			104.1			311.8	
Travel Time (s)		22.7			14.2			7.5			22.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Adj. Flow (vph)	66	191	59	75	206	91	39	1323	51	71	957	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	250	0	75	297	0	39	1374	0	71	1004	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 1: Ontario Street & Laurier Road AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		5.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		9.7	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		47.3	47.3		9.7	57.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		52.6%	52.6%		10.8%	63.3%	
Maximum Green (s)	26.0	26.0		26.0	26.0		41.3	41.3		5.7	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-3.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	20.4	20.4		20.4	20.4		51.2	51.2		63.6	59.6	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.57	0.57		0.71	0.66	
v/c Ratio	0.47	0.58		0.43	0.71		0.13	0.69		0.23	0.45	
Control Delay	39.8	33.4		36.2	38.1		13.6	18.1		7.0	8.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.8	33.4		36.2	38.1		13.6	18.1		7.0	8.7	
LOS	D	C		D	D		B	B		A	A	
Approach Delay		34.7			37.7			18.0			8.6	
Approach LOS		C			D			B			A	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 18.8 Intersection LOS: B  
 Intersection Capacity Utilization 82.9% ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road

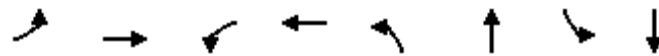


## Queues

## Future Total 2031 Conditions - Right In Right Out East Site Access

## 1: Ontario Street &amp; Laurier Road

AM Peak Hour





































Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	250	75	297	39	1374	71	1004
v/c Ratio	0.47	0.58	0.43	0.71	0.13	0.69	0.23	0.45
Control Delay	39.8	33.4	36.2	38.1	13.6	18.1	7.0	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	33.4	36.2	38.1	13.6	18.1	7.0	8.7
Queue Length 50th (m)	9.9	35.8	11.2	43.3	3.1	88.2	3.2	38.3
Queue Length 95th (m)	20.8	53.0	22.1	63.0	10.0	134.0	9.0	64.2
Internal Link Dist (m)		291.0		172.8		80.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	193	584	238	566	311	1985	306	2254
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.43	0.32	0.52	0.13	0.69	0.23	0.45
Intersection Summary								

HCM Signalized Intersection Capacity Analysis Conditions - Right In Right Out East Site Access  
 1: Ontario Street & Laurier Road AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	191	59	75	206	91	39	1323	51	71	957	47
Future Volume (vph)	66	191	59	75	206	91	39	1323	51	71	957	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1839		1738	1764		1825	3488		1738	3398	
Flt Permitted	0.33	1.00		0.42	1.00		0.29	1.00		0.11	1.00	
Satd. Flow (perm)	622	1839		768	1764		548	3488		208	3398	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	191	59	75	206	91	39	1323	51	71	957	47
RTOR Reduction (vph)	0	14	0	0	20	0	0	3	0	0	3	0
Lane Group Flow (vph)	66	236	0	75	277	0	39	1371	0	71	1001	0
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.4	18.4		18.4	18.4		49.4	49.4		58.6	58.6	
Effective Green, g (s)	20.4	20.4		20.4	20.4		50.4	50.4		61.6	59.6	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.56	0.56		0.68	0.66	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		4.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	140	416		174	399		306	1953		281	2250	
v/s Ratio Prot		0.13			c0.16			c0.39		0.02	c0.29	
v/s Ratio Perm	0.11			0.10			0.07			0.15		
v/c Ratio	0.47	0.57		0.43	0.69		0.13	0.70		0.25	0.44	
Uniform Delay, d1	30.1	30.9		29.8	31.9		9.4	14.4		8.2	7.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	1.1		0.6	4.2		0.9	2.1		0.5	0.6	
Delay (s)	31.0	31.9		30.5	36.1		10.2	16.5		8.7	7.9	
Level of Service	C	C		C	D		B	B		A	A	
Approach Delay (s)		31.8			35.0			16.3			8.0	
Approach LOS		C			C			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.2									B
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			90.0							11.0		
Intersection Capacity Utilization			82.9%									E
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 2: Regional Road 25/Ontario Street & Derry Road AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  			  	  
Traffic Volume (vph)	404	1806	285	393	880	265	228	881	287	234	730	186
Future Volume (vph)	404	1806	285	393	880	265	228	881	287	234	730	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	5142	1570	1690	4995	1555	1789	4856	1570	1690	4550	0
Flt Permitted	0.234			0.089			0.148			0.215		
Satd. Flow (perm)	432	5142	1570	158	4995	1555	279	4856	1570	382	4550	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			113			183			287		51	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		622.6			218.7			223.1			131.0	
Travel Time (s)		37.4			13.1			16.1			9.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Adj. Flow (vph)	404	1806	285	393	880	265	228	881	287	234	730	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	404	1806	285	393	880	265	228	881	287	234	916	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 2: Regional Road 25/Ontario Street & Derry Road AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
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	5.0
Minimum Split (s)	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7	9.7	37.0	
Total Split (s)	22.0	48.0	48.0	21.0	47.0	47.0	14.0	41.0	41.0	10.0	37.0	
Total Split (%)	18.3%	40.0%	40.0%	17.5%	39.2%	39.2%	11.7%	34.2%	34.2%	8.3%	30.8%	
Maximum Green (s)	18.0	41.3	41.3	17.0	40.3	40.3	10.0	34.3	34.3	6.0	30.3	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		23.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	67.9	43.0	43.0	68.0	43.7	43.7	48.4	34.4	34.4	43.4	30.4	
Actuated g/C Ratio	0.57	0.36	0.36	0.57	0.36	0.36	0.40	0.29	0.29	0.36	0.25	
v/c Ratio	0.85	0.98	0.45	1.08	0.48	0.39	0.83	0.63	0.44	0.99	0.77	
Control Delay	34.4	55.1	19.8	99.0	33.7	14.4	49.9	39.4	5.9	87.2	43.9	
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	34.4	55.1	19.8	99.0	33.7	14.4	49.9	39.4	5.9	87.2	43.9	
LOS	C	E	B	F	C	B	D	D	A	F	D	
Approach Delay		47.7			47.1			34.2			52.7	
Approach LOS		D			D			C			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 125  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.08  
 Intersection Signal Delay: 45.6 Intersection LOS: D  
 Intersection Capacity Utilization 102.6% ICU Level of Service G  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



## Queues

## Future Total 2031 Conditions - Right In Right Out East Site Access

## 2: Regional Road 25/Ontario Street &amp; Derry Road

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	404	1806	285	393	880	265	228	881	287	234	916
v/c Ratio	0.85	0.98	0.45	1.08	0.48	0.39	0.83	0.63	0.44	0.99	0.77
Control Delay	34.4	55.1	19.8	99.0	33.7	14.4	49.9	39.4	5.9	87.2	43.9
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	34.4	55.1	19.8	99.0	33.7	14.4	49.9	39.4	5.9	87.2	43.9
Queue Length 50th (m)	51.0	152.8	29.8	~94.4	65.4	20.5	35.3	64.9	0.0	36.7	68.3
Queue Length 95th (m)	#99.1	#188.2	54.1	#155.3	79.9	44.3	#70.8	79.1	19.3	#75.6	84.2
Internal Link Dist (m)		598.6			194.7			199.1			107.0
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	482	1842	635	365	1819	682	275	1456	671	236	1250
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	0.84	0.98	0.45	1.08	0.48	0.39	0.83	0.61	0.43	0.99	0.73

## 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.



HCM Signalized Intersection Capacity Analysis Conditions - Right In Right Out East Site Access  
 2: Regional Road 25/Ontario Street & Derry Road AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  			  	  
Traffic Volume (vph)	404	1806	285	393	880	265	228	881	287	234	730	186
Future Volume (vph)	404	1806	285	393	880	265	228	881	287	234	730	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	5142	1570	1690	4995	1555	1789	4856	1570	1690	4548	
Flt Permitted	0.23	1.00	1.00	0.09	1.00	1.00	0.15	1.00	1.00	0.22	1.00	
Satd. Flow (perm)	432	5142	1570	158	4995	1555	279	4856	1570	383	4548	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	404	1806	285	393	880	265	228	881	287	234	730	186
RTOR Reduction (vph)	0	0	73	0	0	116	0	0	205	0	38	0
Lane Group Flow (vph)	404	1806	212	393	880	149	228	881	82	234	878	0
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	59.2	41.3	41.3	60.6	42.0	42.0	42.7	32.7	32.7	34.7	28.7	
Effective Green, g (s)	65.2	43.0	43.0	66.6	43.7	43.7	45.7	34.4	34.4	40.7	30.4	
Actuated g/C Ratio	0.54	0.36	0.36	0.55	0.36	0.36	0.38	0.29	0.29	0.34	0.25	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	465	1842	562	363	1819	566	269	1392	450	227	1152	
v/s Ratio Prot	0.15	c0.35		c0.19	0.18		c0.09	0.18		c0.08	0.19	
v/s Ratio Perm	0.32		0.14	0.41		0.10	0.23		0.05	c0.27		
v/c Ratio	0.87	0.98	0.38	1.08	0.48	0.26	0.85	0.63	0.18	1.03	0.76	
Uniform Delay, d1	17.9	38.1	28.6	38.3	29.4	26.8	28.3	37.3	32.2	34.9	41.5	
Progression Factor	1.00	1.00	1.00	0.86	1.09	1.35	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.7	16.8	1.9	69.8	0.9	1.1	21.2	0.9	0.2	68.0	3.0	
Delay (s)	33.7	54.9	30.5	102.8	33.1	37.4	49.4	38.2	32.4	102.9	44.5	
Level of Service	C	D	C	F	C	D	D	D	C	F	D	
Approach Delay (s)		48.7			51.6			38.9			56.4	
Approach LOS		D			D			D			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			48.6									D
HCM 2000 Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			120.0								12.0	
Intersection Capacity Utilization			102.6%									G
Analysis Period (min)			15									
c Critical Lane Group												























Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 3: East Site Access/Site Access & Derry Road AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	2265	32	0	1754	16	0	0	96	18	0	4
Future Volume (vph)	20	2265	32	0	1754	16	0	0	96	18	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.999				0.865		0.975	
Flt Protected	0.950										0.961	
Satd. Flow (prot)	1643	4575	0	0	4451	0	0	0	1466	0	1544	0
Flt Permitted	0.950										0.961	
Satd. Flow (perm)	1643	4575	0	0	4451	0	0	0	1466	0	1544	0
Link Speed (k/h)		60			60				50		50	
Link Distance (m)		218.7			493.3				109.4		86.5	
Travel Time (s)		13.1			29.6				7.9		6.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	0%	2%	6%	0%	2%	2%	2%	6%	0%	0%
Adj. Flow (vph)	20	2265	32	0	1754	16	0	0	96	18	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	2297	0	0	1770	0	0	0	96	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7				0.0		0.0	
Link Offset(m)		0.0			0.0				0.0		0.0	
Crosswalk Width(m)		1.6			1.6				1.6		1.6	
Two way Left Turn Lane					Yes							
Headway Factor	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
<b>Intersection Summary</b>												
Area Type:	CBD											
Control Type:	Unsignalized											
Intersection Capacity Utilization	69.4%						ICU Level of Service C					
Analysis Period (min)	15											

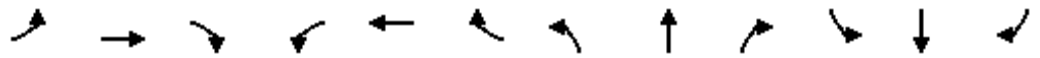
HCM Unsignalized Intersection Capacity Analysis  
 3: East Site Access/Site Access & Derry Road AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	2265	32	0	1754	16	0	0	96	18	0	4
Future Volume (Veh/h)	20	2265	32	0	1754	16	0	0	96	18	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	2265	32	0	1754	16	0	0	96	18	0	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (m)		219										
pX, platoon unblocked				0.66			0.66	0.66	0.66	0.66	0.66	
vC, conflicting volume	1770			2297			2910	4091	771	2653	4099	593
vC1, stage 1 conf vol							2321	2321		1762	1762	
vC2, stage 2 conf vol							589	1770		891	2337	
vCu, unblocked vol	1770			1163			2091	3881	0	1703	3893	593
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.6	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	94			100			100	100	87	78	100	99
cM capacity (veh/h)	357			394			115	87	716	81	97	454
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1			
Volume Total	20	906	906	485	702	702	367	96	22			
Volume Left	20	0	0	0	0	0	0	0	18			
Volume Right	0	0	0	32	0	0	16	96	4			
cSH	357	1700	1700	1700	1700	1700	1700	716	95			
Volume to Capacity	0.06	0.53	0.53	0.29	0.41	0.41	0.22	0.13	0.23			
Queue Length 95th (m)	1.3	0.0	0.0	0.0	0.0	0.0	0.0	3.5	6.3			
Control Delay (s)	15.7	0.0	0.0	0.0	0.0	0.0	0.0	10.8	53.7			
Lane LOS	C							B	F			
Approach Delay (s)	0.1				0.0			10.8	53.7			
Approach LOS								B	F			
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			69.4%		ICU Level of Service				C			
Analysis Period (min)			15									

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 4: Holly Avenue & Derry Road AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	56	2128	125	55	1418	21	161	45	133	42	46	77
Future Volume (vph)	56	2128	125	55	1418	21	161	45	133	42	46	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.998			0.888			0.906	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1644	5054	0	1738	4939	0	1807	1575	0	1738	1662	0
Flt Permitted	0.156			0.053			0.617			0.489		
Satd. Flow (perm)	270	5054	0	97	4939	0	1174	1575	0	895	1662	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			4			12			58	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Adj. Flow (vph)	56	2128	125	55	1418	21	161	45	133	42	46	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	2253	0	55	1439	0	161	178	0	42	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 4: Holly Avenue & Derry Road AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.5	82.5		82.5	82.5		37.5	37.5		37.5	37.5	
Total Split (%)	68.8%	68.8%		68.8%	68.8%		31.3%	31.3%		31.3%	31.3%	
Maximum Green (s)	76.8	76.8		76.8	76.8		30.3	30.3		30.3	30.3	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	86.8	86.8		86.8	86.8		23.2	23.2		23.2	23.2	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
v/c Ratio	0.29	0.62		0.79	0.40		0.71	0.57		0.24	0.33	
Control Delay	3.6	2.7		83.3	7.5		61.3	46.7		41.7	23.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.6	2.7		83.3	7.5		61.3	46.7		41.7	23.3	
LOS	A	A		F	A		E	D		D	C	
Approach Delay		2.7			10.3			53.6			28.0	
Approach LOS		A			B			D			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 10.3 Intersection LOS: B  
 Intersection Capacity Utilization 77.9% ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 4: Holly Avenue & Derry Road

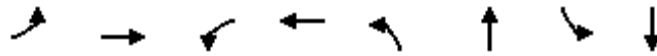


## Queues

## Future Total 2031 Conditions - Right In Right Out East Site Access

## 4: Holly Avenue &amp; Derry Road

AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	2253	55	1439	161	178	42	123
v/c Ratio	0.29	0.62	0.79	0.40	0.71	0.57	0.24	0.33
Control Delay	3.6	2.7	83.3	7.5	61.3	46.7	41.7	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.6	2.7	83.3	7.5	61.3	46.7	41.7	23.3
Queue Length 50th (m)	1.1	15.0	7.3	42.4	35.8	35.7	8.5	13.0
Queue Length 95th (m)	m1.4	m17.5	#23.8	66.3	54.3	53.1	17.3	27.3
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	195	3658	70	3571	317	435	242	492
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.62	0.79	0.40	0.51	0.41	0.17	0.25





















## Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis Conditions - Right In Right Out East Site Access  
 4: Holly Avenue & Derry Road AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	2128	125	55	1418	21	161	45	133	42	46	77
Future Volume (vph)	56	2128	125	55	1418	21	161	45	133	42	46	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1644	5052		1738	4938		1807	1575		1738	1662	
Flt Permitted	0.16	1.00		0.05	1.00		0.62	1.00		0.49	1.00	
Satd. Flow (perm)	269	5052		97	4938		1173	1575		894	1662	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	2128	125	55	1418	21	161	45	133	42	46	77
RTOR Reduction (vph)	0	4	0	0	1	0	0	10	0	0	47	0
Lane Group Flow (vph)	56	2249	0	55	1438	0	161	168	0	42	76	0
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	86.1	86.1		86.1	86.1		21.0	21.0		21.0	21.0	
Effective Green, g (s)	86.8	86.8		86.8	86.8		23.2	23.2		23.2	23.2	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	194	3654		70	3571		226	304		172	321	
v/s Ratio Prot		0.45			0.29			0.11			0.05	
v/s Ratio Perm	0.21			0.57			0.14			0.05		
v/c Ratio	0.29	0.62		0.79	0.40		0.71	0.55		0.24	0.24	
Uniform Delay, d1	5.8	8.3		10.6	6.5		45.3	43.7		41.0	40.9	
Progression Factor	0.21	0.25		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.4		40.0	0.0		10.1	2.2		0.7	0.4	
Delay (s)	3.0	2.5		50.6	6.5		55.4	45.9		41.7	41.3	
Level of Service	A	A		D	A		E	D		D	D	
Approach Delay (s)		2.5			8.1			50.4			41.4	
Approach LOS		A			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			9.7				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			77.9%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 5: Regional Road 25 & West Site Access AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕↕↕↔			↕↕↕
Traffic Volume (vph)	0	76	1320	22	0	1408
Future Volume (vph)	0	76	1320	22	0	1408
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Frt		0.865	0.998			
Flt Protected						
Satd. Flow (prot)	0	1629	5132	0	0	5142
Flt Permitted						
Satd. Flow (perm)	0	1629	5132	0	0	5142
Link Speed (k/h)	50		50			70
Link Distance (m)	173.8		1307.3			223.1
Travel Time (s)	12.5		94.1			11.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	76	1320	22	0	1408
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	76	1342	0	0	1408
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

**Intersection Summary**























Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.4%
Analysis Period (min)	15
	ICU Level of Service A



HCM Unsignalized Intersection Capacity Analysis  
 5: Regional Road 25 & West Site Access  
 AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations		↗	↕↕↕			↕↕↕	
Traffic Volume (veh/h)	0	76	1320	22	0	1408	
Future Volume (Veh/h)	0	76	1320	22	0	1408	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	0	76	1320	22	0	1408	
<b>Pedestrians</b>							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage veh							
Upstream signal (m)	223						
pX, platoon unblocked	0.86						
vC, conflicting volume	1800	451			1342		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1344	451			1342		
tC, single (s)	6.8	6.9			4.1		
tC, 2 stage (s)							
tF (s)	3.5	3.3			2.2		
p0 queue free %	100	86			100		
cM capacity (veh/h)	122	556			509		
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>NB 3</b>	<b>SB 1</b>	<b>SB 2</b>	<b>SB 3</b>
Volume Total	76	528	528	286	469	469	469
Volume Left	0	0	0	0	0	0	0
Volume Right	76	0	0	22	0	0	0
cSH	556	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.14	0.31	0.31	0.17	0.28	0.28	0.28
Queue Length 95th (m)	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	12.5	0.0			0.0		
Approach LOS	B						
<b>Intersection Summary</b>							
Average Delay			0.3				
Intersection Capacity Utilization			37.4%	ICU Level of Service	A		
Analysis Period (min)			15				

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 6: Regional Road 25 & Louis Saint Laurent Avenue AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	634	483	150	469	83	155	951	138	50	1077	100
Future Volume (vph)	130	634	483	150	469	83	155	951	138	50	1077	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Frt		0.935			0.977				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1659	3318	0	1722	3457	0	1674	4902	1541	1755	4856	1471
Flt Permitted	0.309			0.117			0.157			0.234		
Satd. Flow (perm)	540	3318	0	212	3457	0	277	4902	1541	432	4856	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		193			18				138			134
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1307.3	
Travel Time (s)		32.8			61.8			26.6			67.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Adj. Flow (vph)	130	634	483	150	469	83	155	951	138	50	1077	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1117	0	150	552	0	155	951	138	50	1077	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

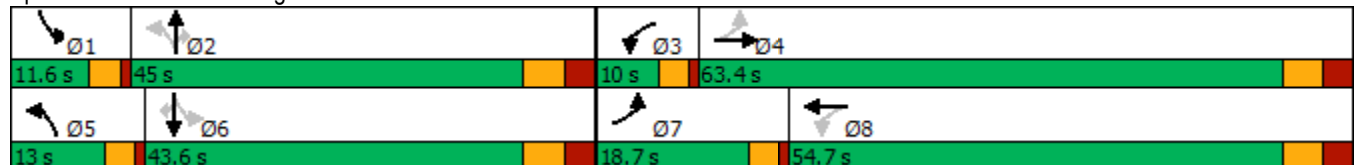
Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 6: Regional Road 25 & Louis Saint Laurent Avenue AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	18.7	63.4		10.0	54.7		13.0	45.0	45.0	11.6	43.6	43.6
Total Split (%)	14.4%	48.8%		7.7%	42.1%		10.0%	34.6%	34.6%	8.9%	33.5%	33.5%
Maximum Green (s)	14.7	56.4		6.0	47.7		9.0	38.0	38.0	7.6	36.6	36.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	51.4	37.4		46.1	33.1		55.8	43.1	43.1	52.7	38.8	38.8
Actuated g/C Ratio	0.47	0.34		0.42	0.30		0.51	0.39	0.39	0.48	0.36	0.36
v/c Ratio	0.33	0.89		0.70	0.52		0.53	0.49	0.20	0.15	0.62	0.16
Control Delay	18.5	36.9		38.1	32.2		23.1	27.9	5.4	17.0	32.2	2.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	36.9		38.1	32.2		23.1	27.9	5.4	17.0	32.2	2.7
LOS	B	D		D	C		C	C	A	B	C	A
Approach Delay		34.9			33.5			24.8			29.2	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 109.2  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 30.3 Intersection LOS: C  
 Intersection Capacity Utilization 85.7% ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2031 Conditions - Right In Right Out East Site Access

AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	1117	150	552	155	951	138	50	1077	100
v/c Ratio	0.33	0.89	0.70	0.52	0.53	0.49	0.20	0.15	0.62	0.16
Control Delay	18.5	36.9	38.1	32.2	23.1	27.9	5.4	17.0	32.2	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	36.9	38.1	32.2	23.1	27.9	5.4	17.0	32.2	2.7
Queue Length 50th (m)	15.4	99.6	17.9	49.2	17.2	57.1	0.0	5.2	69.1	0.0
Queue Length 95th (m)	26.1	125.8	#44.0	67.7	35.2	83.1	13.6	13.7	98.4	6.2
Internal Link Dist (m)		431.0		834.9		493.1			1283.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	436	1874	214	1592	295	1932	690	340	1726	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.60	0.70	0.35	0.53	0.49	0.20	0.15	0.62	0.16























Intersection Summary

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

HCM Signalized Intersection Capacity Analysis Conditions - Right In Right Out East Site Access  
 6: Regional Road 25 & Louis Saint Laurent Avenue AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	634	483	150	469	83	155	951	138	50	1077	100
Future Volume (vph)	130	634	483	150	469	83	155	951	138	50	1077	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1659	3318		1722	3459		1674	4902	1541	1755	4856	1471
Flt Permitted	0.31	1.00		0.12	1.00		0.16	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	539	3318		213	3459		277	4902	1541	433	4856	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	634	483	150	469	83	155	951	138	50	1077	100
RTOR Reduction (vph)	0	127	0	0	13	0	0	0	84	0	0	64
Lane Group Flow (vph)	130	990	0	150	539	0	155	951	54	50	1077	36
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	45.4	35.4		37.1	31.1		49.9	41.0	41.0	43.1	37.6	37.6
Effective Green, g (s)	48.4	37.4		43.1	33.1		53.5	43.0	43.0	49.1	39.6	39.6
Actuated g/C Ratio	0.44	0.34		0.39	0.30		0.49	0.39	0.39	0.45	0.36	0.36
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	372	1129		207	1041		286	1917	602	295	1749	530
v/s Ratio Prot	0.04	c0.30		c0.06	0.16		c0.06	0.19		0.01	c0.22	
v/s Ratio Perm	0.11			0.23			0.20		0.04	0.06		0.02
v/c Ratio	0.35	0.88		0.72	0.52		0.54	0.50	0.09	0.17	0.62	0.07
Uniform Delay, d1	19.3	34.1		25.9	31.8		17.7	25.3	21.1	17.6	28.9	23.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	7.6		11.9	0.4		2.1	0.9	0.3	0.3	1.6	0.2
Delay (s)	19.9	41.7		37.8	32.2		19.8	26.2	21.4	17.9	30.5	23.3
Level of Service	B	D		D	C		B	C	C	B	C	C
Approach Delay (s)		39.4			33.4			24.9			29.4	
Approach LOS		D			C			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.6									C
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			109.9							12.0		
Intersection Capacity Utilization			85.7%									E
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 1: Ontario Street & Laurier Road PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	218	39	103	261	105	58	1118	87	129	1425	87
Future Volume (vph)	67	218	39	103	261	105	58	1118	87	129	1425	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.977			0.957			0.989			0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1877	0	1807	1810	0	1825	3512	0	1789	3514	0
Flt Permitted	0.223			0.412			0.113			0.185		
Satd. Flow (perm)	420	1877	0	784	1810	0	217	3512	0	348	3514	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			20			15			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			113.2			311.8	
Travel Time (s)		22.7			14.2			8.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Adj. Flow (vph)	67	218	39	103	261	105	58	1118	87	129	1425	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	257	0	103	366	0	58	1205	0	129	1512	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 1: Ontario Street & Laurier Road PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		67.0	67.0		67.0	67.0	
Total Split (%)	33.0%	33.0%		33.0%	33.0%		67.0%	67.0%		67.0%	67.0%	
Maximum Green (s)	26.0	26.0		26.0	26.0		61.0	61.0		61.0	61.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	24.3	24.3		24.3	24.3		65.7	65.7		65.7	65.7	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.66	0.66		0.66	0.66	
v/c Ratio	0.66	0.56		0.54	0.81		0.41	0.52		0.57	0.65	
Control Delay	64.3	36.2		43.4	47.5		20.5	10.3		23.0	12.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	64.3	36.2		43.4	47.5		20.5	10.3		23.0	12.5	
LOS	E	D		D	D		C	B		C	B	
Approach Delay		42.0			46.6			10.8			13.4	
Approach LOS		D			D			B			B	

Intersection Summary

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 42 (42%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 19.2 Intersection LOS: B  
 Intersection Capacity Utilization 99.8% ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road

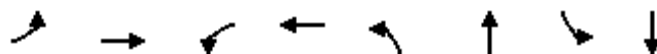


## Queues

## Future Total 2031 Conditions - Right In Right Out East Site Access

## 1: Ontario Street &amp; Laurier Road

PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	257	103	366	58	1205	129	1512
v/c Ratio	0.66	0.56	0.54	0.81	0.41	0.52	0.57	0.65
Control Delay	64.3	36.2	43.4	47.5	20.5	10.3	23.0	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.3	36.2	43.4	47.5	20.5	10.3	23.0	12.5
Queue Length 50th (m)	11.5	41.5	17.2	62.4	4.9	59.3	12.8	86.1
Queue Length 95th (m)	#30.1	63.3	33.3	92.0	18.2	81.1	#39.6	117.1
Internal Link Dist (m)		291.0		172.8		89.2		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	117	532	219	521	142	2314	228	2314
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.48	0.47	0.70	0.41	0.52	0.57	0.65

































## Intersection Summary

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

Queue shown is maximum after two cycles.



Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 2: Regional Road 25/Ontario Street & Derry Road PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  			  	
Traffic Volume (vph)	285	1291	168	257	1462	208	275	965	222	354	778	213
Future Volume (vph)	285	1291	168	257	1462	208	275	965	222	354	778	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	5193	1617	1807	5193	1633	1789	4995	1498	1807	4865	0
Flt Permitted	0.100			0.102			0.185			0.152		
Satd. Flow (perm)	187	5193	1617	194	5193	1633	348	4995	1498	289	4865	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			116			222		63	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		622.6			218.7			217.4			121.9	
Travel Time (s)		37.4			13.1			15.7			8.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Adj. Flow (vph)	285	1291	168	257	1462	208	275	965	222	354	778	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	1291	168	257	1462	208	275	965	222	354	991	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	

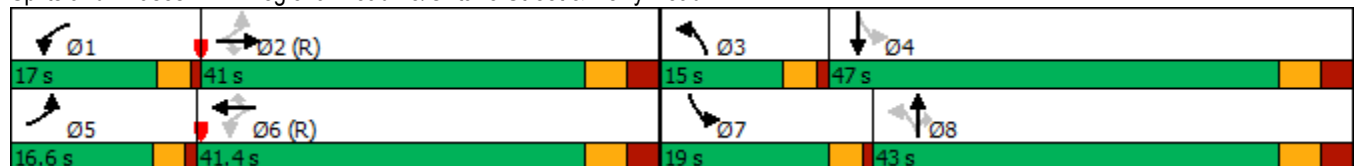
Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 2: Regional Road 25/Ontario Street & Derry Road PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
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	5.0
Minimum Split (s)	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7
Total Split (s)	16.6	41.0	41.0	17.0	41.4	41.4	15.0	43.0	43.0	19.0	47.0	47.0
Total Split (%)	13.8%	34.2%	34.2%	14.2%	34.5%	34.5%	12.5%	35.8%	35.8%	15.8%	39.2%	39.2%
Maximum Green (s)	12.6	34.3	34.3	13.0	34.7	34.7	11.0	36.3	36.3	15.0	40.3	40.3
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	60.1	39.0	39.0	58.7	37.8	37.8	52.1	34.1	34.1	57.1	38.1	38.1
Actuated g/C Ratio	0.50	0.32	0.32	0.49	0.32	0.32	0.43	0.28	0.28	0.48	0.32	0.32
v/c Ratio	0.86	0.76	0.28	0.80	0.89	0.35	0.86	0.68	0.38	0.97	0.62	0.62
Control Delay	54.7	40.7	13.9	41.9	42.4	10.8	47.4	40.5	5.9	68.2	34.0	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	40.7	13.9	41.9	42.4	10.8	47.4	40.5	5.9	68.2	34.0	34.0
LOS	D	D	B	D	D	B	D	D	A	E	C	C
Approach Delay		40.4			38.9			36.5			43.0	
Approach LOS		D			D			D			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 39.6 Intersection LOS: D  
 Intersection Capacity Utilization 97.3% ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



## Queues

## Future Total 2031 Conditions - Right In Right Out East Site Access

## 2: Regional Road 25/Ontario Street &amp; Derry Road

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	285	1291	168	257	1462	208	275	965	222	354	991
v/c Ratio	0.86	0.76	0.28	0.80	0.89	0.35	0.86	0.68	0.38	0.97	0.62
Control Delay	54.7	40.7	13.9	41.9	42.4	10.8	47.4	40.5	5.9	68.2	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	40.7	13.9	41.9	42.4	10.8	47.4	40.5	5.9	68.2	34.0
Queue Length 50th (m)	49.5	103.5	10.6	30.3	124.0	17.7	38.5	73.3	0.0	59.1	67.4
Queue Length 95th (m)	#105.9	121.8	28.0	#83.2	#151.2	28.9	#75.8	85.0	16.9	#114.1	78.7
Internal Link Dist (m)		598.6			194.7			193.4			97.9
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	332	1688	597	326	1635	593	319	1581	626	365	1743
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.76	0.28	0.79	0.89	0.35	0.86	0.61	0.35	0.97	0.57

## Intersection Summary


















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

Queue shown is maximum after two cycles.























Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 3: East Site Access/Commercial Access & Derry Road PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1755	96	0	2101	20	0	0	57	19	0	24
Future Volume (vph)	10	1755	96	0	2101	20	0	0	57	19	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.999				0.865		0.925	
Flt Protected	0.950										0.978	
Satd. Flow (prot)	1825	5013	0	0	5188	0	0	0	1629	0	1738	0
Flt Permitted	0.950										0.978	
Satd. Flow (perm)	1825	5013	0	0	5188	0	0	0	1629	0	1738	0
Link Speed (k/h)		60			60				48		48	
Link Distance (m)		218.7			493.3			111.9			86.5	
Travel Time (s)		13.1			29.6			8.4			6.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	0%	2%	1%	0%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	10	1755	96	0	2101	20	0	0	57	19	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1851	0	0	2121	0	0	0	57	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	52.9%						ICU Level of Service A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis Conditions - Right In Right Out East Site Access  
 3: East Site Access/Commercial Access & Derry Road PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1755	96	0	2101	20	0	0	57	19	0	24
Future Volume (Veh/h)	10	1755	96	0	2101	20	0	0	57	19	0	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	1755	96	0	2101	20	0	0	57	19	0	24
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (m)		219										
pX, platoon unblocked				0.78			0.78	0.78	0.78	0.78	0.78	
vC, conflicting volume	2121			1851			2547	3944	633	2773	3982	710
vC1, stage 1 conf vol							1823	1823		2111	2111	
vC2, stage 2 conf vol							724	2121		662	1871	
vCu, unblocked vol	2121			1098			1993	3786	0	2282	3835	710
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	93	64	100	94
cM capacity (veh/h)	261			492			155	71	844	52	81	380
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1			
Volume Total	10	702	702	447	840	840	440	57	43			
Volume Left	10	0	0	0	0	0	0	0	19			
Volume Right	0	0	0	96	0	0	20	57	24			
cSH	261	1700	1700	1700	1700	1700	1700	844	101			
Volume to Capacity	0.04	0.41	0.41	0.26	0.49	0.49	0.26	0.07	0.43			
Queue Length 95th (m)	0.9	0.0	0.0	0.0	0.0	0.0	0.0	1.6	13.6			
Control Delay (s)	19.4	0.0	0.0	0.0	0.0	0.0	0.0	9.6	65.1			
Lane LOS	C							A	F			
Approach Delay (s)	0.1				0.0			9.6	65.1			
Approach LOS								A	F			
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			52.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 4: Holly Avenue & Derry Road PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	57	1487	182	147	1804	52	165	84	77	34	88	51
Future Volume (vph)	57	1487	182	147	1804	52	165	84	77	34	88	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.996			0.928			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	5070	0	1825	5173	0	1807	1737	0	1825	1782	0
Flt Permitted	0.091			0.116			0.584			0.534		
Satd. Flow (perm)	175	5070	0	223	5173	0	1111	1737	0	1026	1782	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			7			38			24	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Adj. Flow (vph)	57	1487	182	147	1804	52	165	84	77	34	88	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1669	0	147	1856	0	165	161	0	34	139	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 4: Holly Avenue & Derry Road PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.8	82.8		82.8	82.8		37.2	37.2		37.2	37.2	
Total Split (%)	69.0%	69.0%		69.0%	69.0%		31.0%	31.0%		31.0%	31.0%	
Maximum Green (s)	77.1	77.1		77.1	77.1		30.0	30.0		30.0	30.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	86.0	86.0		86.0	86.0		24.0	24.0		24.0	24.0	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
v/c Ratio	0.46	0.46		0.92	0.50		0.74	0.43		0.17	0.37	
Control Delay	24.8	9.4		75.1	8.7		64.2	33.8		38.8	35.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.8	9.4		75.1	8.7		64.2	33.8		38.8	35.3	
LOS	C	A		E	A		E	C		D	D	
Approach Delay		9.9			13.6			49.2			36.0	
Approach LOS		A			B			D			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 15.8 Intersection LOS: B  
 Intersection Capacity Utilization 82.7% ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 4: Holly Avenue & Derry Road

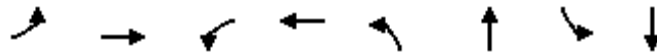


## Queues

## Future Total 2031 Conditions - Right In Right Out East Site Access

## 4: Holly Avenue &amp; Derry Road

PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	1669	147	1856	165	161	34	139
v/c Ratio	0.46	0.46	0.92	0.50	0.74	0.43	0.17	0.37
Control Delay	24.8	9.4	75.1	8.7	64.2	33.8	38.8	35.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	9.4	75.1	8.7	64.2	33.8	38.8	35.3
Queue Length 50th (m)	10.2	109.5	25.7	62.8	36.8	25.2	6.7	23.3
Queue Length 95th (m)	m10.6	m126.4	#43.2	92.4	56.5	41.7	14.6	38.5
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	125	3643	159	3709	298	493	275	495
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.46	0.92	0.50	0.55	0.33	0.12	0.28

## Intersection Summary

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 5: Regional Road 25 & West Site Access PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕↕↕↕			↕↕↕
Traffic Volume (vph)	0	44	1418	64	0	1203
Future Volume (vph)	0	44	1418	64	0	1203
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Frt		0.865	0.994			
Flt Protected						
Satd. Flow (prot)	0	1629	5111	0	0	5142
Flt Permitted						
Satd. Flow (perm)	0	1629	5111	0	0	5142
Link Speed (k/h)	50		70			70
Link Distance (m)	118.0		1312.9			217.4
Travel Time (s)	8.5		67.5			11.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	44	1418	64	0	1203
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	44	1482	0	0	1203
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

**Intersection Summary**























Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
 5: Regional Road 25 & West Site Access PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations		↗	↑↑↑	↘		↑↑↑	
Traffic Volume (veh/h)	0	44	1418	64	0	1203	
Future Volume (Veh/h)	0	44	1418	64	0	1203	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	0	44	1418	64	0	1203	
<b>Pedestrians</b>							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage veh							
Upstream signal (m)	217						
pX, platoon unblocked	0.86						
vC, conflicting volume	1851	505	1482				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1420	505	1482				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	100	91	100				
cM capacity (veh/h)	110	513	450				
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>NB 3</b>	<b>SB 1</b>	<b>SB 2</b>	<b>SB 3</b>
Volume Total	44	567	567	348	401	401	401
Volume Left	0	0	0	0	0	0	0
Volume Right	44	0	0	64	0	0	0
cSH	513	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.09	0.33	0.33	0.20	0.24	0.24	0.24
Queue Length 95th (m)	2.1	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	12.7	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	12.7	0.0	0.0				
Approach LOS	B						
<b>Intersection Summary</b>							
Average Delay	0.2						
Intersection Capacity Utilization	38.8%			ICU Level of Service			A
Analysis Period (min)	15						

Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
 6: Regional Road 25 & Louis Saint Laurent Avenue PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	432	197	95	633	61	299	1238	196	67	889	139
Future Volume (vph)	89	432	197	95	633	61	299	1238	196	67	889	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		15.0	20.0		50.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Frt		0.953			0.987				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3433	0	1772	3570	0	1789	4995	1570	1825	4995	1633
Flt Permitted	0.218			0.217			0.227			0.187		
Satd. Flow (perm)	407	3433	0	405	3570	0	428	4995	1570	359	4995	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65			9				149			128
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1312.9	
Travel Time (s)		32.8			61.8			26.6			67.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Adj. Flow (vph)	89	432	197	95	633	61	299	1238	196	67	889	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	629	0	95	694	0	299	1238	196	67	889	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

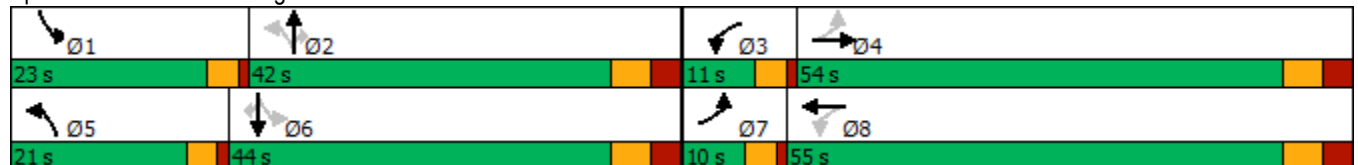
Lanes, Volumes, Timings Future Total 2031 Conditions - Right In Right Out East Site Access  
6: Regional Road 25 & Louis Saint Laurent Avenue PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	10.0	54.0		11.0	55.0		21.0	42.0	42.0	23.0	44.0	44.0
Total Split (%)	7.7%	41.5%		8.5%	42.3%		16.2%	32.3%	32.3%	17.7%	33.8%	33.8%
Maximum Green (s)	6.0	47.0		7.0	48.0		17.0	35.0	35.0	19.0	37.0	37.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	40.0	26.9		41.9	30.2		62.9	49.9	49.9	53.6	39.3	39.3
Actuated g/C Ratio	0.37	0.25		0.39	0.28		0.59	0.47	0.47	0.50	0.37	0.37
v/c Ratio	0.33	0.69		0.33	0.68		0.61	0.53	0.24	0.21	0.48	0.20
Control Delay	23.9	36.2		23.8	38.0		17.8	23.2	7.0	13.2	28.3	6.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	36.2		23.8	38.0		17.8	23.2	7.0	13.2	28.3	6.6
LOS	C	D		C	D		B	C	A	B	C	A
Approach Delay		34.6			36.3			20.5			24.6	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 106.9  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 26.7 Intersection LOS: C  
 Intersection Capacity Utilization 73.1% ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2031 Conditions - Right In Right Out East Site Access

PM Peak Hour

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	89	629	95	694	299	1238	196	67	889	139
v/c Ratio	0.33	0.69	0.33	0.68	0.61	0.53	0.24	0.21	0.48	0.20
Control Delay	23.9	36.2	23.8	38.0	17.8	23.2	7.0	13.2	28.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	36.2	23.8	38.0	17.8	23.2	7.0	13.2	28.3	6.6
Queue Length 50th (m)	11.9	57.0	12.7	69.8	30.0	69.7	5.6	5.8	53.9	1.5
Queue Length 95th (m)	22.0	75.3	23.2	89.4	53.4	97.7	21.6	13.8	73.9	15.1
Internal Link Dist (m)		431.0		834.9		493.1			1288.9	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	268	1620	287	1687	508	2329	811	515	1836	681
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.39	0.33	0.41	0.59	0.53	0.24	0.13	0.48	0.20

Intersection Summary

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

Future Total 2031 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	191	59	75	206	91	39	1323	51	71	949	47
Future Volume (vph)	66	191	59	75	206	91	39	1323	51	71	949	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.965			0.954			0.994			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1840	0	1738	1764	0	1825	3486	0	1738	3398	0
Flt Permitted	0.330			0.420			0.288			0.114		
Satd. Flow (perm)	622	1840	0	768	1764	0	553	3486	0	209	3398	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			26			6			9	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			104.1			311.8	
Travel Time (s)		22.7			14.2			7.5			22.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Adj. Flow (vph)	66	191	59	75	206	91	39	1323	51	71	949	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	250	0	75	297	0	39	1374	0	71	996	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	

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

Future Total 2031 Conditions  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		5.0	15.0	
Minimum Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		9.7	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		47.3	47.3		9.7	57.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		52.6%	52.6%		10.8%	63.3%	
Maximum Green (s)	26.0	26.0		26.0	26.0		41.3	41.3		5.7	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-1.0		-3.0	-1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)	20.4	20.4		20.4	20.4		51.2	51.2		63.6	59.6	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.57	0.57		0.71	0.66	
v/c Ratio	0.47	0.58		0.43	0.71		0.12	0.69		0.23	0.44	
Control Delay	39.8	33.4		36.2	38.1		13.5	18.1		7.0	8.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.8	33.4		36.2	38.1		13.5	18.1		7.0	8.7	
LOS	D	C		D	D		B	B		A	A	
Approach Delay		34.7			37.7			18.0			8.6	
Approach LOS		C			D			B			A	

Intersection Summary

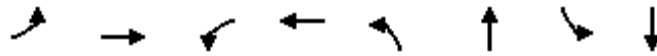
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 18.8      Intersection LOS: B  
 Intersection Capacity Utilization 82.9%      ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 1: Ontario Street & Laurier Road



Queues  
1: Ontario Street & Laurier Road

Future Total 2031 Conditions  
AM Peak Hour

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	250	75	297	39	1374	71	996
v/c Ratio	0.47	0.58	0.43	0.71	0.12	0.69	0.23	0.44
Control Delay	39.8	33.4	36.2	38.1	13.5	18.1	7.0	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	33.4	36.2	38.1	13.5	18.1	7.0	8.7
Queue Length 50th (m)	9.9	35.8	11.2	43.3	3.1	88.2	3.2	37.9
Queue Length 95th (m)	20.8	53.0	22.1	63.0	10.0	134.0	9.0	63.5
Internal Link Dist (m)		291.0		172.8		80.1		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	193	584	238	566	314	1985	306	2254
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.43	0.32	0.52	0.12	0.69	0.23	0.44
Intersection Summary								



































HCM Signalized Intersection Capacity Analysis  
1: Ontario Street & Laurier Road

Future Total 2031 Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	191	59	75	206	91	39	1323	51	71	949	47
Future Volume (vph)	66	191	59	75	206	91	39	1323	51	71	949	47
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1839		1738	1764		1825	3488		1738	3398	
Flt Permitted	0.33	1.00		0.42	1.00		0.29	1.00		0.11	1.00	
Satd. Flow (perm)	622	1839		768	1764		553	3488		208	3398	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	66	191	59	75	206	91	39	1323	51	71	949	47
RTOR Reduction (vph)	0	14	0	0	20	0	0	3	0	0	3	0
Lane Group Flow (vph)	66	236	0	75	277	0	39	1371	0	71	993	0
Heavy Vehicles (%)	2%	1%	0%	5%	3%	6%	0%	4%	6%	5%	7%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.4	18.4		18.4	18.4		49.4	49.4		58.6	58.6	
Effective Green, g (s)	20.4	20.4		20.4	20.4		50.4	50.4		61.6	59.6	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.56	0.56		0.68	0.66	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		4.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	140	416		174	399		309	1953		281	2250	
v/s Ratio Prot		0.13			c0.16			c0.39		0.02	c0.29	
v/s Ratio Perm	0.11			0.10			0.07			0.15		
v/c Ratio	0.47	0.57		0.43	0.69		0.13	0.70		0.25	0.44	
Uniform Delay, d1	30.1	30.9		29.8	31.9		9.4	14.4		8.2	7.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	1.1		0.6	4.2		0.8	2.1		0.5	0.6	
Delay (s)	31.0	31.9		30.5	36.1		10.2	16.5		8.7	7.9	
Level of Service	C	C		C	D		B	B		A	A	
Approach Delay (s)		31.8			35.0			16.3			7.9	
Approach LOS		C			C			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.2				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			11.0		
Intersection Capacity Utilization			82.9%				ICU Level of Service				E	
Analysis Period (min)			15									
c	Critical Lane Group											

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2031 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  			  	
Traffic Volume (vph)	404	1806	285	418	888	271	220	875	287	226	730	186
Future Volume (vph)	404	1806	285	418	888	271	220	875	287	226	730	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1755	5142	1570	1690	4995	1555	1789	4856	1570	1690	4550	0
Flt Permitted	0.231			0.089			0.148			0.218		
Satd. Flow (perm)	427	5142	1570	158	4995	1555	279	4856	1570	388	4550	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			113			183			287		51	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		622.6			218.7			223.1			131.0	
Travel Time (s)		37.4			13.1			16.1			9.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Adj. Flow (vph)	404	1806	285	418	888	271	220	875	287	226	730	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	404	1806	285	418	888	271	220	875	287	226	916	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

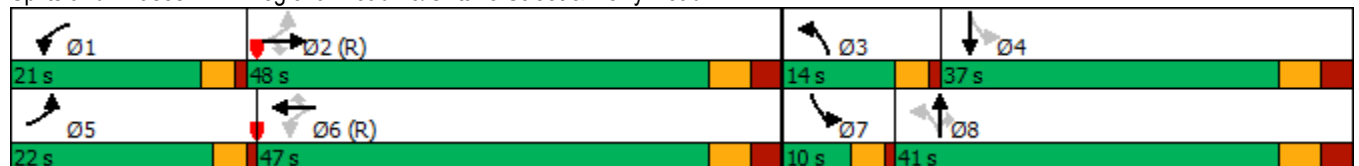
Future Total 2031 Conditions  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
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	5.0
Minimum Split (s)	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7	9.7	37.0	
Total Split (s)	22.0	48.0	48.0	21.0	47.0	47.0	14.0	41.0	41.0	10.0	37.0	
Total Split (%)	18.3%	40.0%	40.0%	17.5%	39.2%	39.2%	11.7%	34.2%	34.2%	8.3%	30.8%	
Maximum Green (s)	18.0	41.3	41.3	17.0	40.3	40.3	10.0	34.3	34.3	6.0	30.3	
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		23.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	67.9	43.0	43.0	68.0	43.7	43.7	48.4	34.4	34.4	43.4	30.4	
Actuated g/C Ratio	0.57	0.36	0.36	0.57	0.36	0.36	0.40	0.29	0.29	0.36	0.25	
v/c Ratio	0.85	0.98	0.45	1.15	0.49	0.40	0.80	0.63	0.44	0.95	0.77	
Control Delay	34.9	55.1	19.8	122.2	33.7	14.5	46.6	39.3	5.9	76.9	43.9	
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	34.9	55.1	19.8	122.2	33.7	14.5	46.6	39.3	5.9	76.9	43.9	
LOS	C	E	B	F	C	B	D	D	A	E	D	
Approach Delay		47.8			53.9			33.5			50.4	
Approach LOS		D			D			C			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 125  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.15  
 Intersection Signal Delay: 46.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 103.5%  
 ICU Level of Service G  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Queues  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2031 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	404	1806	285	418	888	271	220	875	287	226	916
v/c Ratio	0.85	0.98	0.45	1.15	0.49	0.40	0.80	0.63	0.44	0.95	0.77
Control Delay	34.9	55.1	19.8	122.2	33.7	14.5	46.6	39.3	5.9	76.9	43.9
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	34.9	55.1	19.8	122.2	33.7	14.5	46.6	39.3	5.9	76.9	43.9
Queue Length 50th (m)	51.0	152.8	29.8	~106.8	66.0	21.2	33.9	64.3	0.0	35.3	68.3
Queue Length 95th (m)	#100.1	#188.2	54.1	#169.3	80.5	44.8	#66.3	78.6	19.3	#69.9	84.2
Internal Link Dist (m)		598.6			194.7			199.1			107.0
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	480	1842	635	365	1817	682	275	1456	671	238	1250
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	0.84	0.98	0.45	1.15	0.49	0.40	0.80	0.60	0.43	0.95	0.73

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.























HCM Signalized Intersection Capacity Analysis  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2031 Conditions  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	404	1806	285	418	888	271	220	875	287	226	730	186
Future Volume (vph)	404	1806	285	418	888	271	220	875	287	226	730	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	5142	1570	1690	4995	1555	1789	4856	1570	1690	4548	
Flt Permitted	0.23	1.00	1.00	0.09	1.00	1.00	0.15	1.00	1.00	0.22	1.00	
Satd. Flow (perm)	426	5142	1570	158	4995	1555	279	4856	1570	388	4548	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	404	1806	285	418	888	271	220	875	287	226	730	186
RTOR Reduction (vph)	0	0	73	0	0	116	0	0	205	0	38	0
Lane Group Flow (vph)	404	1806	212	418	888	155	220	875	82	226	878	0
Heavy Vehicles (%)	4%	2%	4%	8%	5%	5%	2%	8%	4%	8%	12%	11%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	59.2	41.3	41.3	60.6	42.0	42.0	42.7	32.7	32.7	34.7	28.7	
Effective Green, g (s)	65.2	43.0	43.0	66.6	43.7	43.7	45.7	34.4	34.4	40.7	30.4	
Actuated g/C Ratio	0.54	0.36	0.36	0.55	0.36	0.36	0.38	0.29	0.29	0.34	0.25	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	462	1842	562	363	1819	566	269	1392	450	229	1152	
v/s Ratio Prot	0.15	c0.35		c0.21	0.18		c0.09	0.18		c0.07	0.19	
v/s Ratio Perm	0.32		0.14	0.43		0.10	0.22		0.05	c0.26		
v/c Ratio	0.87	0.98	0.38	1.15	0.49	0.27	0.82	0.63	0.18	0.99	0.76	
Uniform Delay, d1	18.0	38.1	28.6	38.3	29.5	26.9	28.1	37.2	32.2	34.7	41.5	
Progression Factor	1.00	1.00	1.00	0.87	1.09	1.31	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.6	16.8	1.9	94.0	0.9	1.1	17.3	0.9	0.2	55.3	3.0	
Delay (s)	34.6	54.9	30.5	127.2	33.0	36.4	45.4	38.1	32.4	89.9	44.5	
Level of Service	C	D	C	F	C	D	D	D	C	F	D	
Approach Delay (s)		48.8			58.6			38.1			53.5	
Approach LOS		D			E			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			49.7		HCM 2000 Level of Service						D	
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)						12.0	
Intersection Capacity Utilization			103.5%		ICU Level of Service						G	
Analysis Period (min)			15									
c Critical Lane Group												























Lanes, Volumes, Timings  
3: East Site Access/Site Access & Derry Road

Future Total 2031 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	20	2265	24	14	1754	16	39	0	71	18	0	4
Future Volume (vph)	20	2265	24	14	1754	16	39	0	71	18	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.999			0.913				0.975
Flt Protected	0.950			0.950				0.983				0.961
Satd. Flow (prot)	1643	4575	0	1610	4451	0	0	1521	0	0	1544	0
Flt Permitted	0.950			0.950				0.983				0.961
Satd. Flow (perm)	1643	4575	0	1610	4451	0	0	1521	0	0	1544	0
Link Speed (k/h)		60			60			50				50
Link Distance (m)		218.7			493.3			109.4				86.5
Travel Time (s)		13.1			29.6			7.9				6.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	3%	0%	2%	6%	0%	2%	2%	2%	6%	0%	0%
Adj. Flow (vph)	20	2265	24	14	1754	16	39	0	71	18	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	2289	0	14	1770	0	0	110	0	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		1.6			1.6			1.6				1.6
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop				Stop
<b>Intersection Summary</b>												
Area Type:	CBD											
Control Type:	Unsignalized											
Intersection Capacity Utilization	62.8%						ICU Level of Service B					
Analysis Period (min)	15											























HCM Unsignalized Intersection Capacity Analysis  
 3: East Site Access/Site Access & Derry Road

Future Total 2031 Conditions  
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (veh/h)	20	2265	24	14	1754	16	39	0	71	18	0	4
Future Volume (Veh/h)	20	2265	24	14	1754	16	39	0	71	18	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	2265	24	14	1754	16	39	0	71	18	0	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
	TWLTL				TWLTL							
Median storage (veh)	2				2							
Upstream signal (m)	219											
pX, platoon unblocked				0.66			0.66	0.66	0.66	0.66	0.66	
vC, conflicting volume	1770			2289			2934	4115	767	2656	4119	593
vC1, stage 1 conf vol							2317	2317		1790	1790	
vC2, stage 2 conf vol							617	1798		866	2329	
vCu, unblocked vol	1770			1151			2128	3917	0	1707	3923	593
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.6	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	94			96			66	100	90	76	100	99
cM capacity (veh/h)	357			398			115	83	716	75	90	454
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1		
Volume Total	20	906	906	477	14	702	702	367	110	22		
Volume Left	20	0	0	0	14	0	0	0	39	18		
Volume Right	0	0	0	24	0	0	0	16	71	4		
cSH	357	1700	1700	1700	398	1700	1700	1700	251	89		
Volume to Capacity	0.06	0.53	0.53	0.28	0.04	0.41	0.41	0.22	0.44	0.25		
Queue Length 95th (m)	1.3	0.0	0.0	0.0	0.8	0.0	0.0	0.0	15.9	6.8		
Control Delay (s)	15.7	0.0	0.0	0.0	14.4	0.0	0.0	0.0	30.1	58.5		
Lane LOS	C				B				D	F		
Approach Delay (s)	0.1				0.1				30.1	58.5		
Approach LOS									D	F		
Intersection Summary												
Average Delay				1.2								
Intersection Capacity Utilization			62.8%		ICU Level of Service				B			
Analysis Period (min)			15									

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road













Future Total 2031 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	56	2120	108	55	1432	21	161	45	133	42	46	77
Future Volume (vph)	56	2120	108	55	1432	21	161	45	133	42	46	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.998			0.888			0.906	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1644	5059	0	1738	4939	0	1807	1575	0	1738	1662	0
Flt Permitted	0.153			0.055			0.617			0.489		
Satd. Flow (perm)	265	5059	0	101	4939	0	1174	1575	0	895	1662	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			3			12			56	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Adj. Flow (vph)	56	2120	108	55	1432	21	161	45	133	42	46	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	2228	0	55	1453	0	161	178	0	42	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	



Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2031 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2	
Total Split (s)	82.5	82.5		82.5	82.5		37.5	37.5		37.5	37.5	
Total Split (%)	68.8%	68.8%		68.8%	68.8%		31.3%	31.3%		31.3%	31.3%	
Maximum Green (s)	76.8	76.8		76.8	76.8		30.3	30.3		30.3	30.3	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	86.8	86.8		86.8	86.8		23.2	23.2		23.2	23.2	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
v/c Ratio	0.29	0.61		0.75	0.41		0.71	0.57		0.24	0.34	
Control Delay	3.5	2.6		74.6	7.5		61.3	46.7		41.7	23.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.5	2.6		74.6	7.5		61.3	46.7		41.7	23.9	
LOS	A	A		E	A		E	D		D	C	
Approach Delay		2.6			10.0			53.6			28.4	
Approach LOS		A			A			D			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 10.2  
 Intersection Capacity Utilization 77.9%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service D

Splits and Phases: 4: Holly Avenue & Derry Road



Queues  
4: Holly Avenue & Derry Road

Future Total 2031 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	2228	55	1453	161	178	42	123
v/c Ratio	0.29	0.61	0.75	0.41	0.71	0.57	0.24	0.34
Control Delay	3.5	2.6	74.6	7.5	61.3	46.7	41.7	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.5	2.6	74.6	7.5	61.3	46.7	41.7	23.9
Queue Length 50th (m)	0.9	13.7	6.9	43.0	35.8	35.7	8.5	13.4
Queue Length 95th (m)	m1.3	m16.7	#22.5	67.0	54.3	53.1	17.3	27.7
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	191	3661	73	3571	317	435	242	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.61	0.75	0.41	0.51	0.41	0.17	0.25

Intersection Summary

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


























Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis















## 4: Holly Avenue & Derry Road

Future Total 2031 Conditions  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						 	
Traffic Volume (vph)	56	2120	108	55	1432	21	161	45	133	42	46	77
Future Volume (vph)	56	2120	108	55	1432	21	161	45	133	42	46	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1644	5057		1738	4938		1807	1575		1738	1662	
Flt Permitted	0.15	1.00		0.05	1.00		0.62	1.00		0.49	1.00	
Satd. Flow (perm)	265	5057		100	4938		1173	1575		894	1662	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	2120	108	55	1432	21	161	45	133	42	46	77
RTOR Reduction (vph)	0	4	0	0	1	0	0	10	0	0	45	0
Lane Group Flow (vph)	56	2224	0	55	1452	0	161	168	0	42	78	0
Heavy Vehicles (%)	11%	3%	2%	5%	6%	5%	1%	18%	5%	5%	11%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	86.1	86.1		86.1	86.1		21.0	21.0		21.0	21.0	
Effective Green, g (s)	86.8	86.8		86.8	86.8		23.2	23.2		23.2	23.2	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.19	0.19		0.19	0.19	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	3657		72	3571		226	304		172	321	
v/s Ratio Prot		0.44			0.29			0.11			0.05	
v/s Ratio Perm	0.21			0.55			0.14			0.05		
v/c Ratio	0.29	0.61		0.76	0.41		0.71	0.55		0.24	0.24	
Uniform Delay, d1	5.8	8.2		10.3	6.5		45.3	43.7		41.0	41.0	
Progression Factor	0.20	0.24		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.3		34.3	0.0		10.1	2.2		0.7	0.4	
Delay (s)	2.9	2.3		44.5	6.5		55.4	45.9		41.7	41.4	
Level of Service	A	A		D	A		E	D		D	D	
Approach Delay (s)		2.4			7.9			50.4			41.4	
Approach LOS		A			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			9.6				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			77.9%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												















Lanes, Volumes, Timings  
5: Regional Road 25 & West Site Access

Future Total 2031 Conditions  
AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			   			  
Traffic Volume (vph)	0	62	1320	16	0	1433
Future Volume (vph)	0	62	1320	16	0	1433
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Frt		0.865	0.998			
Flt Protected						
Satd. Flow (prot)	0	1629	5132	0	0	5142
Flt Permitted						
Satd. Flow (perm)	0	1629	5132	0	0	5142
Link Speed (k/h)	50		50			70
Link Distance (m)	173.8		1307.3			223.1
Travel Time (s)	12.5		94.1			11.5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	62	1320	16	0	1433
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	62	1336	0	0	1433
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	36.4%		ICU Level of Service A			
Analysis Period (min)	15					























HCM Unsignalized Intersection Capacity Analysis  
5: Regional Road 25 & West Site Access

Future Total 2031 Conditions  
AM Peak Hour

							
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations			   			  	
Traffic Volume (veh/h)	0	62	1320	16	0	1433	
Future Volume (Veh/h)	0	62	1320	16	0	1433	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	0	62	1320	16	0	1433	
<b>Pedestrians</b>							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage veh							
Upstream signal (m)							223
pX, platoon unblocked	0.86						
vC, conflicting volume	1806	448					1336
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1350	448					1336
tC, single (s)	6.8	6.9					4.1
tC, 2 stage (s)							
tF (s)	3.5	3.3					2.2
p0 queue free %	100	89					100
cM capacity (veh/h)	121	558					512
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>NB 3</b>	<b>SB 1</b>	<b>SB 2</b>	<b>SB 3</b>
Volume Total	62	528	528	280	478	478	478
Volume Left	0	0	0	0	0	0	0
Volume Right	62	0	0	16	0	0	0
cSH	558	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.31	0.31	0.16	0.28	0.28	0.28
Queue Length 95th (m)	2.8	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	12.3	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	12.3	0.0					0.0
Approach LOS	B						
<b>Intersection Summary</b>							
Average Delay			0.3				
Intersection Capacity Utilization			36.4%	ICU Level of Service	A		
Analysis Period (min)			15				

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2031 Conditions  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	634	483	150	469	83	155	945	138	50	1102	100
Future Volume (vph)	130	634	483	150	469	83	155	945	138	50	1102	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	20.0		0.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Frt		0.935			0.977				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1659	3318	0	1722	3457	0	1674	4902	1541	1755	4856	1471
Flt Permitted	0.308			0.117			0.150			0.237		
Satd. Flow (perm)	538	3318	0	212	3457	0	264	4902	1541	438	4856	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		193			18				138			134
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1307.3	
Travel Time (s)		32.8			61.8			26.6			67.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Adj. Flow (vph)	130	634	483	150	469	83	155	945	138	50	1102	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1117	0	150	552	0	155	945	138	50	1102	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

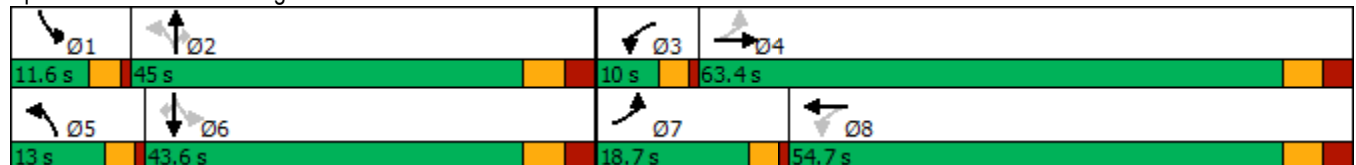
Future Total 2031 Conditions  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	18.7	63.4		10.0	54.7		13.0	45.0	45.0	11.6	43.6	43.6
Total Split (%)	14.4%	48.8%		7.7%	42.1%		10.0%	34.6%	34.6%	8.9%	33.5%	33.5%
Maximum Green (s)	14.7	56.4		6.0	47.7		9.0	38.0	38.0	7.6	36.6	36.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	51.4	37.3		46.1	33.1		55.8	43.1	43.1	52.6	38.8	38.8
Actuated g/C Ratio	0.47	0.34		0.42	0.30		0.51	0.39	0.39	0.48	0.36	0.36
v/c Ratio	0.33	0.89		0.70	0.52		0.54	0.49	0.20	0.15	0.64	0.16
Control Delay	18.5	36.9		38.1	32.2		23.4	27.9	5.4	17.0	32.5	2.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	36.9		38.1	32.2		23.4	27.9	5.4	17.0	32.5	2.7
LOS	B	D		D	C		C	C	A	B	C	A
Approach Delay		35.0			33.5			24.8			29.5	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 109.2  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 30.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 86.2%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2031 Conditions  
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	1117	150	552	155	945	138	50	1102	100
v/c Ratio	0.33	0.89	0.70	0.52	0.54	0.49	0.20	0.15	0.64	0.16
Control Delay	18.5	36.9	38.1	32.2	23.4	27.9	5.4	17.0	32.5	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	36.9	38.1	32.2	23.4	27.9	5.4	17.0	32.5	2.7
Queue Length 50th (m)	15.4	99.6	17.9	49.2	17.2	56.6	0.0	5.2	71.2	0.0
Queue Length 95th (m)	26.1	125.8	#44.0	67.7	35.2	82.6	13.6	13.7	101.0	6.2
Internal Link Dist (m)		431.0		834.9		493.1			1283.3	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	436	1873	214	1592	290	1933	691	343	1726	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.60	0.70	0.35	0.53	0.49	0.20	0.15	0.64	0.16

Intersection Summary

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

























HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2031 Conditions  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	634	483	150	469	83	155	945	138	50	1102	100
Future Volume (vph)	130	634	483	150	469	83	155	945	138	50	1102	100
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1659	3318		1722	3459		1674	4902	1541	1755	4856	1471
Flt Permitted	0.31	1.00		0.12	1.00		0.15	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	539	3318		213	3459		265	4902	1541	437	4856	1471
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	634	483	150	469	83	155	945	138	50	1102	100
RTOR Reduction (vph)	0	127	0	0	13	0	0	0	84	0	0	64
Lane Group Flow (vph)	130	990	0	150	539	0	155	945	54	50	1102	36
Heavy Vehicles (%)	10%	2%	4%	6%	3%	4%	9%	7%	6%	4%	8%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	45.4	35.4		37.1	31.1		50.0	41.1	41.1	43.2	37.7	37.7
Effective Green, g (s)	48.4	37.4		43.1	33.1		53.6	43.1	43.1	49.2	39.7	39.7
Actuated g/C Ratio	0.44	0.34		0.39	0.30		0.49	0.39	0.39	0.45	0.36	0.36
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	372	1128		206	1040		281	1920	603	297	1752	530
v/s Ratio Prot	0.04	c0.30		c0.06	0.16		c0.06	0.19		0.01	c0.23	
v/s Ratio Perm	0.11			0.23			0.21		0.04	0.06		0.02
v/c Ratio	0.35	0.88		0.73	0.52		0.55	0.49	0.09	0.17	0.63	0.07
Uniform Delay, d1	19.4	34.1		26.0	31.9		17.8	25.2	21.1	17.6	29.1	23.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	7.7		12.1	0.4		2.3	0.9	0.3	0.3	1.7	0.2
Delay (s)	19.9	41.8		38.1	32.3		20.2	26.1	21.4	17.8	30.8	23.3
Level of Service	B	D		D	C		C	C	C	B	C	C
Approach Delay (s)		39.5			33.5			24.8			29.7	
Approach LOS		D			C			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.7				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			86.2%				ICU Level of Service			E		
Analysis Period (min)			15									
c	Critical Lane Group											

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

Future Total 2031 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	218	39	103	261	105	58	1118	87	129	1401	87
Future Volume (vph)	67	218	39	103	261	105	58	1118	87	129	1401	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	35.0		0.0	15.0		0.0	40.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.977			0.957			0.989			0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1789	1877	0	1807	1810	0	1825	3512	0	1789	3514	0
Flt Permitted	0.223			0.412			0.118			0.185		
Satd. Flow (perm)	420	1877	0	784	1810	0	227	3512	0	348	3514	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			20			15			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		315.0			196.8			113.2			311.8	
Travel Time (s)		22.7			14.2			8.2			22.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Adj. Flow (vph)	67	218	39	103	261	105	58	1118	87	129	1401	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	257	0	103	366	0	58	1205	0	129	1488	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	



Queues  
1: Ontario Street & Laurier Road

Future Total 2031 Conditions  
PM Peak Hour

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	257	103	366	58	1205	129	1488
v/c Ratio	0.66	0.56	0.54	0.81	0.39	0.52	0.57	0.64
Control Delay	64.3	36.2	43.4	47.5	19.1	10.3	23.0	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.3	36.2	43.4	47.5	19.1	10.3	23.0	12.3
Queue Length 50th (m)	11.5	41.5	17.2	62.4	4.9	59.3	12.8	83.7
Queue Length 95th (m)	#30.1	63.3	33.3	92.0	17.2	81.1	#39.6	113.7
Internal Link Dist (m)		291.0		172.8		89.2		287.8
Turn Bay Length (m)	15.0		35.0		15.0		40.0	
Base Capacity (vph)	117	532	219	521	149	2314	228	2314
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.48	0.47	0.70	0.39	0.52	0.57	0.64

Intersection Summary

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

































HCM Signalized Intersection Capacity Analysis  
1: Ontario Street & Laurier Road

Future Total 2031 Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 			 	
Traffic Volume (vph)	67	218	39	103	261	105	58	1118	87	129	1401	87
Future Volume (vph)	67	218	39	103	261	105	58	1118	87	129	1401	87
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1877		1807	1810		1825	3513		1789	3515	
Flt Permitted	0.22	1.00		0.41	1.00		0.12	1.00		0.18	1.00	
Satd. Flow (perm)	420	1877		784	1810		227	3513		348	3515	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	218	39	103	261	105	58	1118	87	129	1401	87
RTOR Reduction (vph)	0	7	0	0	15	0	0	5	0	0	4	0
Lane Group Flow (vph)	67	250	0	103	351	0	58	1200	0	129	1484	0
Heavy Vehicles (%)	2%	0%	0%	1%	1%	3%	0%	3%	0%	2%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.3	22.3		22.3	22.3		64.7	64.7		64.7	64.7	
Effective Green, g (s)	24.3	24.3		24.3	24.3		65.7	65.7		65.7	65.7	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.66	0.66		0.66	0.66	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	102	456		190	439		149	2308		228	2309	
v/s Ratio Prot		0.13			c0.19			0.34			c0.42	
v/s Ratio Perm	0.16			0.13			0.26			0.37		
v/c Ratio	0.66	0.55		0.54	0.80		0.39	0.52		0.57	0.64	
Uniform Delay, d1	34.1	33.1		33.0	35.6		7.9	8.9		9.4	10.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.0	0.7		1.7	9.2		7.5	0.8		9.8	1.4	
Delay (s)	45.1	33.8		34.7	44.7		15.4	9.8		19.2	11.6	
Level of Service	D	C		C	D		B	A		B	B	
Approach Delay (s)		36.1			42.5			10.0			12.2	
Approach LOS		D			D			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.4				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			99.1%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2031 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  			  	
Traffic Volume (vph)	285	1291	168	272	1462	208	275	965	222	330	778	213
Future Volume (vph)	285	1291	168	272	1462	208	275	965	222	330	778	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	5193	1617	1807	5193	1633	1789	4995	1498	1807	4865	0
Flt Permitted	0.101			0.102			0.185			0.152		
Satd. Flow (perm)	188	5193	1617	194	5193	1633	348	4995	1498	289	4865	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			116			222			63
Link Speed (k/h)		60			60			50				50
Link Distance (m)		622.6			218.7			217.4				121.9
Travel Time (s)		37.4			13.1			15.7				8.8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%
Adj. Flow (vph)	285	1291	168	272	1462	208	275	965	222	330	778	213
Shared Lane Traffic (%)												
Lane Group Flow (vph)	285	1291	168	272	1462	208	275	965	222	330	991	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7				3.7
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.9			4.9			4.9				4.9
Two way Left Turn Lane					Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7				28.7
Detector 2 Size(m)		1.8			1.8			1.8				1.8
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7		4

Lanes, Volumes, Timings  
2: Regional Road 25/Ontario Street & Derry Road

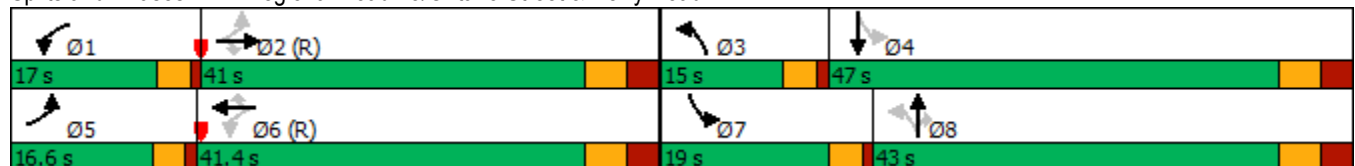
Future Total 2031 Conditions  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
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	5.0
Minimum Split (s)	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7	9.7	40.7	40.7
Total Split (s)	16.6	41.0	41.0	17.0	41.4	41.4	15.0	43.0	43.0	19.0	47.0	47.0
Total Split (%)	13.8%	34.2%	34.2%	14.2%	34.5%	34.5%	12.5%	35.8%	35.8%	15.8%	39.2%	39.2%
Maximum Green (s)	12.6	34.3	34.3	13.0	34.7	34.7	11.0	36.3	36.3	15.0	40.3	40.3
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7	-3.0	-1.7	-1.7
Total Lost Time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		27.0	27.0		27.0	27.0		27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	60.1	38.4	38.4	59.3	37.8	37.8	52.1	34.1	34.1	57.1	38.1	38.1
Actuated g/C Ratio	0.50	0.32	0.32	0.49	0.32	0.32	0.43	0.28	0.28	0.48	0.32	0.32
v/c Ratio	0.86	0.78	0.29	0.82	0.89	0.35	0.86	0.68	0.38	0.90	0.62	0.62
Control Delay	54.3	41.4	14.0	44.5	42.3	10.7	47.4	40.5	5.9	54.5	34.0	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	41.4	14.0	44.5	42.3	10.7	47.4	40.5	5.9	54.5	34.0	34.0
LOS	D	D	B	D	D	B	D	D	A	D	C	C
Approach Delay		40.9			39.2			36.5			39.2	
Approach LOS		D			D			D			D	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 104 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 39.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 96.0%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 2: Regional Road 25/Ontario Street & Derry Road



Queues  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2031 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	285	1291	168	272	1462	208	275	965	222	330	991
v/c Ratio	0.86	0.78	0.29	0.82	0.89	0.35	0.86	0.68	0.38	0.90	0.62
Control Delay	54.3	41.4	14.0	44.5	42.3	10.7	47.4	40.5	5.9	54.5	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	41.4	14.0	44.5	42.3	10.7	47.4	40.5	5.9	54.5	34.0
Queue Length 50th (m)	49.4	103.5	10.6	34.1	124.1	17.6	38.5	73.3	0.0	52.2	67.4
Queue Length 95th (m)	#105.7	121.8	28.0	#91.5	#151.1	27.9	#75.8	85.0	16.9	#100.6	78.7
Internal Link Dist (m)		598.6			194.7			193.4			97.9
Turn Bay Length (m)	30.0		35.0	35.0		45.0	70.0		70.0	30.0	
Base Capacity (vph)	333	1661	589	331	1635	593	319	1581	626	365	1743
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.78	0.29	0.82	0.89	0.35	0.86	0.61	0.35	0.90	0.57

































Intersection Summary

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





















HCM Signalized Intersection Capacity Analysis  
2: Regional Road 25/Ontario Street & Derry Road

Future Total 2031 Conditions  
PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		  			  			  			  		
Traffic Volume (vph)	285	1291	168	272	1462	208	275	965	222	330	778	213	
Future Volume (vph)	285	1291	168	272	1462	208	275	965	222	330	778	213	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.91		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1772	5193	1617	1807	5193	1633	1789	4995	1498	1807	4864		
Flt Permitted	0.10	1.00	1.00	0.10	1.00	1.00	0.19	1.00	1.00	0.15	1.00		
Satd. Flow (perm)	188	5193	1617	195	5193	1633	349	4995	1498	289	4864		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	285	1291	168	272	1462	208	275	965	222	330	778	213	
RTOR Reduction (vph)	0	0	72	0	0	79	0	0	159	0	43	0	
Lane Group Flow (vph)	285	1291	96	272	1462	129	275	965	63	330	948	0	
Heavy Vehicles (%)	3%	1%	1%	1%	1%	0%	2%	5%	9%	1%	5%	2%	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases	2		2	6		6	8		8	4			
Actuated Green, G (s)	51.8	36.7	36.7	50.6	36.1	36.1	43.4	32.4	32.4	51.4	36.4		
Effective Green, g (s)	57.8	38.4	38.4	56.6	37.8	37.8	49.4	34.1	34.1	54.4	38.1		
Actuated g/C Ratio	0.48	0.32	0.32	0.47	0.31	0.31	0.41	0.28	0.28	0.45	0.32		
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7	6.7	4.0	6.7		
Vehicle Extension (s)	3.0	0.2	0.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	329	1661	517	327	1635	514	311	1419	425	358	1544		
v/s Ratio Prot	c0.13	0.25		0.12	c0.28		0.10	0.19		c0.14	0.19		
v/s Ratio Perm	0.29		0.06	0.27		0.08	c0.26		0.04	0.28			
v/c Ratio	0.87	0.78	0.19	0.83	0.89	0.25	0.88	0.68	0.15	0.92	0.61		
Uniform Delay, d1	33.3	36.9	29.5	31.3	39.2	30.6	25.7	38.1	32.1	28.0	34.7		
Progression Factor	1.00	1.00	1.00	0.88	0.88	0.64	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	20.5	3.6	0.8	14.8	7.2	1.0	24.3	1.4	0.2	28.5	0.7		
Delay (s)	53.8	40.6	30.3	42.4	41.6	20.6	50.1	39.5	32.3	56.5	35.4		
Level of Service	D	D	C	D	D	C	D	D	C	E	D		
Approach Delay (s)		41.7			39.4			40.4			40.7		
Approach LOS		D			D			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			40.5									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)	12.0
Intersection Capacity Utilization			96.0%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													



















Lanes, Volumes, Timings  
 3: East Site Access/Commercial Access & Derry Road

Future Total 2031 Conditions  
 PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1755	72	40	2101	20	15	0	42	19	0	24
Future Volume (vph)	10	1755	72	40	2101	20	15	0	42	19	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	45.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.999			0.901			0.925	
Flt Protected	0.950			0.950				0.987			0.978	
Satd. Flow (prot)	1825	5020	0	1789	5188	0	0	1675	0	0	1738	0
Flt Permitted	0.950			0.950				0.987			0.978	
Satd. Flow (perm)	1825	5020	0	1789	5188	0	0	1675	0	0	1738	0
Link Speed (k/h)		60			60			48			48	
Link Distance (m)		218.7			493.3			111.9			86.5	
Travel Time (s)		13.1			29.6			8.4			6.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	4%	0%	2%	1%	0%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	10	1755	72	40	2101	20	15	0	42	19	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1827	0	40	2121	0	0	57	0	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	52.0%						ICU Level of Service A					
Analysis Period (min)	15											






















HCM Unsignalized Intersection Capacity Analysis  
 3: East Site Access/Commercial Access & Derry Road

Future Total 2031 Conditions  
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1755	72	40	2101	20	15	0	42	19	0	24
Future Volume (Veh/h)	10	1755	72	40	2101	20	15	0	42	19	0	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	1755	72	40	2101	20	15	0	42	19	0	24
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
	TWLTL				TWLTL							
Median storage (veh)	2				2							
Upstream signal (m)	219											
pX, platoon unblocked				0.78			0.78	0.78	0.78	0.78	0.78	
vC, conflicting volume	2121			1827			2615	4012	621	2838	4038	710
vC1, stage 1 conf vol							1811	1811		2191	2191	
vC2, stage 2 conf vol							804	2201		647	1847	
vCu, unblocked vol	2121			1060			2075	3872	0	2361	3905	710
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			92			90	100	95	56	100	94
cM capacity (veh/h)	261			507			149	60	843	43	68	380
Direction, Lane #												
	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1		
Volume Total	10	702	702	423	40	840	840	440	57	43		
Volume Left	10	0	0	0	40	0	0	0	15	19		
Volume Right	0	0	0	72	0	0	0	20	42	24		
cSH	261	1700	1700	1700	507	1700	1700	1700	379	85		
Volume to Capacity	0.04	0.41	0.41	0.25	0.08	0.49	0.49	0.26	0.15	0.51		
Queue Length 95th (m)	0.9	0.0	0.0	0.0	1.9	0.0	0.0	0.0	4.0	16.6		
Control Delay (s)	19.4	0.0	0.0	0.0	12.7	0.0	0.0	0.0	16.2	85.0		
Lane LOS	C				B				C	F		
Approach Delay (s)	0.1				0.2				16.2	85.0		
Approach LOS									C	F		
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			52.0%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2031 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1482	172	147	1844	52	165	84	77	34	88	51
Future Volume (vph)	57	1482	172	147	1844	52	165	84	77	34	88	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	20.0		0.0	20.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.996			0.928			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1825	5070	0	1825	5173	0	1807	1737	0	1825	1782	0
Flt Permitted	0.086			0.118			0.584			0.534		
Satd. Flow (perm)	165	5070	0	227	5173	0	1111	1737	0	1026	1782	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			7			38			23	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		493.3			470.6			88.3			198.3	
Travel Time (s)		29.6			28.2			6.4			14.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Adj. Flow (vph)	57	1482	172	147	1844	52	165	84	77	34	88	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1654	0	147	1896	0	165	161	0	34	139	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane		Yes										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	

Lanes, Volumes, Timings  
4: Holly Avenue & Derry Road

Future Total 2031 Conditions  
PM Peak Hour

	↗		→		↘		↙		←		↖		↗		↑		↘		↓		↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR										
Permitted Phases	2			6			8			4												
Detector Phase	2	2		6	6		8	8		4	4											
Switch Phase																						
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0											
Minimum Split (s)	31.7	31.7		31.7	31.7		37.2	37.2		37.2	37.2											
Total Split (s)	82.8	82.8		82.8	82.8		37.2	37.2		37.2	37.2											
Total Split (%)	69.0%	69.0%		69.0%	69.0%		31.0%	31.0%		31.0%	31.0%											
Maximum Green (s)	77.1	77.1		77.1	77.1		30.0	30.0		30.0	30.0											
Yellow Time (s)	3.7	3.7		3.7	3.7		3.7	3.7		3.7	3.7											
All-Red Time (s)	2.0	2.0		2.0	2.0		3.5	3.5		3.5	3.5											
Lost Time Adjust (s)	-0.7	-0.7		-0.7	-0.7		-2.2	-2.2		-2.2	-2.2											
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0											
Lead/Lag																						
Lead-Lag Optimize?																						
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0											
Recall Mode	C-Max	C-Max		None	None		None	None		None	None											
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0											
Flash Dont Walk (s)	19.0	19.0		19.0	19.0		23.0	23.0		23.0	23.0											
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0											
Act Effct Green (s)	86.0	86.0		86.0	86.0		24.0	24.0		24.0	24.0											
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20											
v/c Ratio	0.48	0.45		0.91	0.51		0.74	0.43		0.17	0.37											
Control Delay	27.7	9.3		70.7	8.8		64.2	33.8		38.8	35.7											
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0											
Total Delay	27.7	9.3		70.7	8.8		64.2	33.8		38.8	35.7											
LOS	C	A		E	A		E	C		D	D											
Approach Delay		9.9			13.3			49.2			36.3											
Approach LOS		A			B			D			D											

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBTL, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 15.6  
 Intersection Capacity Utilization 83.4%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service E

Splits and Phases: 4: Holly Avenue & Derry Road



Queues  
4: Holly Avenue & Derry Road

Future Total 2031 Conditions  
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	1654	147	1896	165	161	34	139
v/c Ratio	0.48	0.45	0.91	0.51	0.74	0.43	0.17	0.37
Control Delay	27.7	9.3	70.7	8.8	64.2	33.8	38.8	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	9.3	70.7	8.8	64.2	33.8	38.8	35.7
Queue Length 50th (m)	4.5	110.7	24.9	65.1	36.8	25.2	6.7	23.5
Queue Length 95th (m)	m11.7	129.5	#41.9	95.5	56.5	41.7	14.6	38.7
Internal Link Dist (m)		469.3		446.6		64.3		174.3
Turn Bay Length (m)	30.0		30.0		20.0		20.0	
Base Capacity (vph)	118	3643	162	3709	298	493	275	494
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.45	0.91	0.51	0.55	0.33	0.12	0.28

Intersection Summary

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


























Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis















## 4: Holly Avenue & Derry Road

Future Total 2031 Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  							
Traffic Volume (vph)	57	1482	172	147	1844	52	165	84	77	34	88	51
Future Volume (vph)	57	1482	172	147	1844	52	165	84	77	34	88	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.93		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	5072		1825	5173		1807	1738		1825	1782	
Flt Permitted	0.09	1.00		0.12	1.00		0.58	1.00		0.53	1.00	
Satd. Flow (perm)	165	5072		227	5173		1110	1738		1026	1782	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	1482	172	147	1844	52	165	84	77	34	88	51
RTOR Reduction (vph)	0	10	0	0	2	0	0	30	0	0	18	0
Lane Group Flow (vph)	57	1644	0	147	1894	0	165	131	0	34	121	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	5%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.3	85.3		85.3	85.3		21.8	21.8		21.8	21.8	
Effective Green, g (s)	86.0	86.0		86.0	86.0		24.0	24.0		24.0	24.0	
Actuated g/C Ratio	0.72	0.72		0.72	0.72		0.20	0.20		0.20	0.20	
Clearance Time (s)	5.7	5.7		5.7	5.7		7.2	7.2		7.2	7.2	
Vehicle Extension (s)	0.2	0.2		0.2	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	3634		162	3707		222	347		205	356	
v/s Ratio Prot		0.32			0.37			0.08				0.07
v/s Ratio Perm	0.35			0.65			0.15			0.03		
v/c Ratio	0.48	0.45		0.91	0.51		0.74	0.38		0.17	0.34	
Uniform Delay, d1	7.4	7.1		13.8	7.6		45.1	41.5		39.7	41.2	
Progression Factor	1.35	1.18		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.2	0.3		43.6	0.0		12.6	0.7		0.4	0.6	
Delay (s)	19.2	8.7		57.4	7.6		57.7	42.2		40.1	41.8	
Level of Service	B	A		E	A		E	D		D	D	
Approach Delay (s)		9.0			11.2			50.1			41.4	
Approach LOS		A			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.5				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			83.4%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
5: Regional Road 25 & West Site Access















Future Total 2031 Conditions  
PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			   			  
Traffic Volume (vph)	0	44	1418	48	0	1218
Future Volume (vph)	0	44	1418	48	0	1218
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Frt		0.865	0.995			
Flt Protected						
Satd. Flow (prot)	0	1629	5116	0	0	5142
Flt Permitted						
Satd. Flow (perm)	0	1629	5116	0	0	5142
Link Speed (k/h)	50		70			70
Link Distance (m)	118.0		1312.9			217.4
Travel Time (s)	8.5		67.5			11.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	44	1418	48	0	1218
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	44	1466	0	0	1218
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	38.5%		ICU Level of Service A			
Analysis Period (min)	15					

























HCM Unsignalized Intersection Capacity Analysis  
5: Regional Road 25 & West Site Access

Future Total 2031 Conditions  
PM Peak Hour

							
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations			   			  	
Traffic Volume (veh/h)	0	44	1418	48	0	1218	
Future Volume (Veh/h)	0	44	1418	48	0	1218	
Sign Control	Stop		Free			Free	
Grade	0%		0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	0	44	1418	48	0	1218	
<b>Pedestrians</b>							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage veh							
Upstream signal (m)							217
pX, platoon unblocked	0.86						
vC, conflicting volume	1848	497					1466
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1416	497					1466
tC, single (s)	6.8	6.9					4.1
tC, 2 stage (s)							
tF (s)	3.5	3.3					2.2
p0 queue free %	100	92					100
cM capacity (veh/h)	110	519					456
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	44	567	567	332	406	406	406
Volume Left	0	0	0	0	0	0	0
Volume Right	44	0	0	48	0	0	0
cSH	519	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.08	0.33	0.33	0.20	0.24	0.24	0.24
Queue Length 95th (m)	2.1	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	12.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	12.6	0.0					0.0
Approach LOS	B						
<b>Intersection Summary</b>							
Average Delay			0.2				
Intersection Capacity Utilization			38.5%	ICU Level of Service	A		
Analysis Period (min)			15				

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2031 Conditions  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	432	197	95	633	61	299	1222	196	67	904	139
Future Volume (vph)	89	432	197	95	633	61	299	1222	196	67	904	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		15.0	20.0		50.0	60.0		60.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.91	1.00	1.00	0.91	1.00
Frt		0.953			0.987				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1772	3433	0	1772	3570	0	1789	4995	1570	1825	4995	1633
Flt Permitted	0.218			0.217			0.221			0.192		
Satd. Flow (perm)	407	3433	0	405	3570	0	416	4995	1570	369	4995	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65			9				151			126
Link Speed (k/h)		50			50			70			70	
Link Distance (m)		455.0			858.9			517.1			1312.9	
Travel Time (s)		32.8			61.8			26.6			67.5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Adj. Flow (vph)	89	432	197	95	633	61	299	1222	196	67	904	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	629	0	95	694	0	299	1222	196	67	904	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	

Lanes, Volumes, Timings  
6: Regional Road 25 & Louis Saint Laurent Avenue

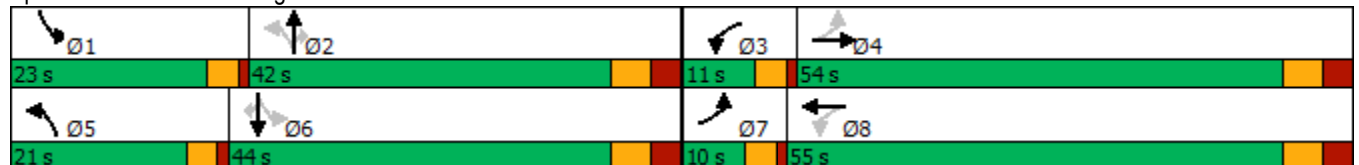
Future Total 2031 Conditions  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	9.7	30.0		9.7	30.0		9.7	32.0	32.0	9.7	32.0	32.0
Total Split (s)	10.0	54.0		11.0	55.0		21.0	42.0	42.0	23.0	44.0	44.0
Total Split (%)	7.7%	41.5%		8.5%	42.3%		16.2%	32.3%	32.3%	17.7%	33.8%	33.8%
Maximum Green (s)	6.0	47.0		7.0	48.0		17.0	35.0	35.0	19.0	37.0	37.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-2.0		-3.0	-2.0		-3.0	-2.0	-2.0	-3.0	-2.0	-2.0
Total Lost Time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		16.0			16.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	40.0	26.9		41.9	30.2		63.0	49.9	49.9	53.6	39.3	39.3
Actuated g/C Ratio	0.37	0.25		0.39	0.28		0.59	0.47	0.47	0.50	0.37	0.37
v/c Ratio	0.33	0.69		0.33	0.69		0.62	0.52	0.24	0.21	0.49	0.20
Control Delay	23.9	36.2		23.8	38.0		18.2	23.1	6.9	13.2	28.5	6.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	36.2		23.8	38.0		18.2	23.1	6.9	13.2	28.5	6.8
LOS	C	D		C	D		B	C	A	B	C	A
Approach Delay		34.7			36.3			20.4			24.8	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 106.9  
 Natural Cycle: 85  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 26.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 73.4%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 6: Regional Road 25 & Louis Saint Laurent Avenue



Queues  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2031 Conditions  
PM Peak Hour































Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	89	629	95	694	299	1222	196	67	904	139
v/c Ratio	0.33	0.69	0.33	0.69	0.62	0.52	0.24	0.21	0.49	0.20
Control Delay	23.9	36.2	23.8	38.0	18.2	23.1	6.9	13.2	28.5	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	36.2	23.8	38.0	18.2	23.1	6.9	13.2	28.5	6.8
Queue Length 50th (m)	11.9	57.0	12.7	69.8	30.0	68.5	5.4	5.8	55.2	1.8
Queue Length 95th (m)	22.0	75.3	23.2	89.4	53.4	96.0	21.2	13.8	75.4	15.4
Internal Link Dist (m)		431.0		834.9		493.1			1288.9	
Turn Bay Length (m)	50.0		20.0		60.0		60.0	50.0		50.0
Base Capacity (vph)	268	1619	287	1686	503	2330	812	519	1835	679
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.39	0.33	0.41	0.59	0.52	0.24	0.13	0.49	0.20

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
6: Regional Road 25 & Louis Saint Laurent Avenue

Future Total 2031 Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			  			  	
Traffic Volume (vph)	89	432	197	95	633	61	299	1222	196	67	904	139
Future Volume (vph)	89	432	197	95	633	61	299	1222	196	67	904	139
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91	1.00	1.00	0.91	1.00
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1772	3434		1772	3569		1789	4995	1570	1825	4995	1633
Flt Permitted	0.22	1.00		0.22	1.00		0.22	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)	406	3434		404	3569		417	4995	1570	369	4995	1633
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	432	197	95	633	61	299	1222	196	67	904	139
RTOR Reduction (vph)	0	48	0	0	6	0	0	0	82	0	0	79
Lane Group Flow (vph)	89	581	0	95	688	0	299	1222	114	67	904	60
Heavy Vehicles (%)	3%	1%	2%	3%	1%	0%	2%	5%	4%	0%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	30.5	25.9		35.1	28.2		57.9	47.9	47.9	44.3	38.3	38.3
Effective Green, g (s)	36.5	27.9		39.8	30.2		60.9	49.9	49.9	50.3	40.3	40.3
Actuated g/C Ratio	0.34	0.26		0.37	0.28		0.56	0.46	0.46	0.46	0.37	0.37
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	0.2		3.0	3.0		3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	231	881		272	991		468	2293	720	291	1851	605
v/s Ratio Prot	c0.03	0.17		c0.03	c0.19		c0.11	c0.24		0.02	0.18	
v/s Ratio Perm	0.10			0.10			0.25		0.07	0.09		0.04
v/c Ratio	0.39	0.66		0.35	0.69		0.64	0.53	0.16	0.23	0.49	0.10
Uniform Delay, d1	26.1	36.1		24.1	35.1		13.9	21.1	17.2	16.4	26.3	22.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	1.4		0.8	2.1		2.9	0.9	0.5	0.4	0.9	0.3
Delay (s)	27.2	37.5		24.9	37.2		16.7	21.9	17.6	16.8	27.2	22.7
Level of Service	C	D		C	D		B	C	B	B	C	C
Approach Delay (s)		36.2			35.8			20.5			26.0	
Approach LOS		D			D			C			C	

Intersection Summary		
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.60	
Actuated Cycle Length (s)	108.7	Sum of lost time (s) 12.0
Intersection Capacity Utilization	73.4%	ICU Level of Service D
Analysis Period (min)	15	
c Critical Lane Group		

**Appendix F**  
**SimTraffic Reports**

## SimTraffic Simulation Summary

## Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:45	6:45	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	9070	9106	9010	9013	8861	9009
Vehs Exited	8804	8846	8815	8735	8639	8768
Starting Vehs	694	636	655	626	703	663
Ending Vehs	960	896	850	904	925	908
Travel Distance (km)	14185	14277	14106	14002	13833	14081
Travel Time (hr)	1400.3	1338.9	1307.4	1297.9	1355.9	1340.1
Total Delay (hr)	1128.9	1065.3	1036.9	1029.0	1090.3	1070.1
Total Stops	15639	15523	13978	14430	15568	15029
Fuel Used (l)	2001.2	1953.9	1912.2	1904.0	1935.9	1941.5

## Interval #0 Information Seeding

Start Time	6:45
End Time	7:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

## Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	9070	9106	9010	9013	8861	9009
Vehs Exited	8804	8846	8815	8735	8639	8768
Starting Vehs	694	636	655	626	703	663
Ending Vehs	960	896	850	904	925	908
Travel Distance (km)	14185	14277	14106	14002	13833	14081
Travel Time (hr)	1400.3	1338.9	1307.4	1297.9	1355.9	1340.1
Total Delay (hr)	1128.9	1065.3	1036.9	1029.0	1090.3	1070.1
Total Stops	15639	15523	13978	14430	15568	15029
Fuel Used (l)	2001.2	1953.9	1912.2	1904.0	1935.9	1941.5

## Queuing and Blocking Report

## Intersection: 1: Ontario Street &amp; Laurier Road

Movement	EB	EB	WB	WB	NB	NB	NB	B20	B20	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	T	T	L	T	TR
Maximum Queue (m)	22.5	146.8	42.6	162.9	22.3	104.2	104.8	39.2	82.2	47.6	317.5	317.1
Average Queue (m)	13.8	65.2	27.5	80.3	8.8	64.2	70.7	2.2	5.2	26.9	276.6	270.3
95th Queue (m)	27.1	143.3	50.1	170.5	20.6	110.8	116.0	18.4	33.2	64.4	385.5	387.6
Link Distance (m)		300.4		182.2		87.9	87.9	101.7	101.7		300.7	300.7
Upstream Blk Time (%)				9		3	4	0	0		70	43
Queuing Penalty (veh)				0		20	33	0	0		0	0
Storage Bay Dist (m)	15.0		35.0		15.0					40.0		
Storage Blk Time (%)	16	56	21	26	7	26				0	96	
Queuing Penalty (veh)	39	37	64	20	47	10				0	68	

## Intersection: 2: Regional Road 25/Ontario Street &amp; Derry Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	T
Maximum Queue (m)	37.5	620.3	617.2	619.0	42.6	42.6	197.4	150.9	118.1	52.6	77.6	200.4
Average Queue (m)	36.9	609.0	606.9	605.8	31.3	42.4	195.5	63.8	66.6	37.8	74.8	175.6
95th Queue (m)	40.8	627.9	627.6	639.1	56.8	43.3	197.7	106.3	100.3	67.6	89.5	235.1
Link Distance (m)		602.4	602.4	602.4			192.6	192.6	192.6			194.6
Upstream Blk Time (%)		83	65	72			72	0				34
Queuing Penalty (veh)		0	0	0			420	0				158
Storage Bay Dist (m)	30.0				35.0	35.0				45.0	70.0	
Storage Blk Time (%)	59	32		64	1	88	7		16	0	66	22
Queuing Penalty (veh)	354	130		182	8	257	27		42	1	193	51

## Intersection: 2: Regional Road 25/Ontario Street &amp; Derry Road

Movement	NB	NB	NB	SB	SB	SB	SB	B20	B20
Directions Served	T	T	R	L	T	T	TR	T	T
Maximum Queue (m)	197.7	191.3	77.6	37.5	126.3	117.8	118.4	98.6	99.3
Average Queue (m)	137.9	101.7	44.5	37.4	118.3	58.6	64.1	90.6	28.0
95th Queue (m)	226.9	204.9	84.9	37.8	123.0	121.5	121.7	97.4	96.7
Link Distance (m)	194.6	194.6			101.7	101.7	101.7	87.9	87.9
Upstream Blk Time (%)	6	4			100	7	7	67	3
Queuing Penalty (veh)	26	20			364	24	27	369	14
Storage Bay Dist (m)			70.0	30.0					
Storage Blk Time (%)		11	1	98	9				
Queuing Penalty (veh)		30	4	238	21				



## Queuing and Blocking Report

## Intersection: 3: East Site Access/Site Access &amp; Derry Road

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	T	T	TR	R	LTR
Maximum Queue (m)	9.9	26.6	1.3	484.6	493.1	492.9	29.8	20.3
Average Queue (m)	2.7	0.9	0.0	363.4	346.8	295.1	12.8	6.3
95th Queue (m)	9.2	18.7	0.9	595.5	601.8	611.1	23.7	16.7
Link Distance (m)		192.6	192.6	474.8	474.8	474.8	94.8	71.3
Upstream Blk Time (%)				34	9	3		
Queuing Penalty (veh)				187	52	16		
Storage Bay Dist (m)	45.0							
Storage Blk Time (%)								
Queuing Penalty (veh)								

## Intersection: 4: Holly Avenue &amp; Derry Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	30.6	29.2	40.3	42.1	37.5	283.5	276.6	245.1	27.5	81.2	27.3	60.2
Average Queue (m)	10.2	9.9	17.6	22.4	19.5	118.9	108.7	85.4	25.0	60.5	10.2	24.9
95th Queue (m)	23.5	23.6	36.1	38.3	43.1	304.2	291.0	245.5	29.8	89.2	23.1	49.5
Link Distance (m)		474.8	474.8	474.8		458.8	458.8	458.8		69.6		179.6
Upstream Blk Time (%)						4	1	0		37		
Queuing Penalty (veh)						0	0	0		0		
Storage Bay Dist (m)	30.0				30.0				20.0		20.0	
Storage Blk Time (%)	1	0			3	49			58	17	2	17
Queuing Penalty (veh)	8	0			15	27			103	27	2	7

## Intersection: 5: Regional Road 25 &amp; West Site Access

Movement	WB	NB	NB	NB
Directions Served	R	T	T	TR
Maximum Queue (m)	82.0	87.8	81.9	37.2
Average Queue (m)	42.4	31.7	24.0	5.8
95th Queue (m)	130.4	92.7	81.3	32.8
Link Distance (m)	159.3	1285.1	1285.1	1285.1
Upstream Blk Time (%)	13			
Queuing Penalty (veh)	0			
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

## Queuing and Blocking Report

## Intersection: 6: Regional Road 25 &amp; Louis Saint Laurent Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	T	R	L
Maximum Queue (m)	57.5	258.0	256.6	27.5	102.8	86.5	67.3	94.0	89.3	73.3	28.2	32.6
Average Queue (m)	41.3	138.9	152.1	25.5	56.7	55.4	28.9	51.5	47.6	34.6	7.3	7.2
95th Queue (m)	72.9	256.8	266.9	31.4	90.5	82.8	57.7	80.8	76.5	63.2	18.5	20.4
Link Distance (m)		434.7	434.7		838.5	838.5		500.2	500.2	500.2		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0			20.0			60.0				60.0	50.0
Storage Blk Time (%)	1	42		50	22		0	4		0	0	
Queuing Penalty (veh)	3	55		116	34		0	6		0	0	

## Intersection: 6: Regional Road 25 &amp; Louis Saint Laurent Avenue

Movement	SB	SB	SB	SB
Directions Served	T	T	T	R
Maximum Queue (m)	73.6	71.4	72.5	47.8
Average Queue (m)	38.3	41.4	39.0	9.9
95th Queue (m)	64.6	65.6	67.2	35.8
Link Distance (m)	1285.1	1285.1	1285.1	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				50.0
Storage Blk Time (%)	3		5	0
Queuing Penalty (veh)	2		5	0

## Network Summary

Network wide Queuing Penalty: 3962

## SimTraffic Simulation Summary

## Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:45	6:45	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	9618	9589	9574	9702	9650	9626
Vehs Exited	9062	9092	9081	9082	8958	9054
Starting Vehs	620	710	648	632	584	632
Ending Vehs	1176	1207	1141	1252	1276	1209
Travel Distance (km)	14560	14660	14569	14659	14636	14617
Travel Time (hr)	1303.8	1345.3	1294.2	1228.4	1131.0	1260.5
Total Delay (hr)	1035.7	1075.7	1026.5	959.0	862.6	991.9
Total Stops	20451	20150	19401	19974	20000	19995
Fuel Used (l)	1946.6	1979.6	1939.3	1886.8	1801.0	1910.7

## Interval #0 Information Seeding

Start Time	6:45
End Time	7:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

## Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	9618	9589	9574	9702	9650	9626
Vehs Exited	9062	9092	9081	9082	8958	9054
Starting Vehs	620	710	648	632	584	632
Ending Vehs	1176	1207	1141	1252	1276	1209
Travel Distance (km)	14560	14660	14569	14659	14636	14617
Travel Time (hr)	1303.8	1345.3	1294.2	1228.4	1131.0	1260.5
Total Delay (hr)	1035.7	1075.7	1026.5	959.0	862.6	991.9
Total Stops	20451	20150	19401	19974	20000	19995
Fuel Used (l)	1946.6	1979.6	1939.3	1886.8	1801.0	1910.7

## Queuing and Blocking Report

## Intersection: 1: Ontario Street &amp; Laurier Road

Movement	EB	EB	WB	WB	NB	NB	NB	B20	B20	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	T	T	L	T	TR
Maximum Queue (m)	22.5	212.5	42.6	193.7	22.5	112.5	112.2	27.2	103.9	47.6	317.2	316.4
Average Queue (m)	16.7	111.5	35.5	154.7	13.3	51.3	57.7	1.3	5.2	39.8	267.5	264.7
95th Queue (m)	28.4	238.7	55.0	228.0	24.6	107.7	115.9	14.7	42.4	63.9	400.5	401.2
Link Distance (m)		300.4		182.2		97.0	97.0	92.6	92.6		300.7	300.7
Upstream Blk Time (%)		4		39		2	2		0		65	44
Queuing Penalty (veh)		0		0		15	16		0		0	0
Storage Bay Dist (m)	15.0		35.0		15.0					40.0		
Storage Blk Time (%)	39	59	40	58	32	18				1	83	
Queuing Penalty (veh)	101	40	148	60	178	10				10	107	

## Intersection: 2: Regional Road 25/Ontario Street &amp; Derry Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	T
Maximum Queue (m)	37.5	615.3	615.0	610.2	42.6	42.6	203.0	207.8	206.7	52.6	77.6	196.7
Average Queue (m)	37.3	501.8	494.3	473.4	28.5	41.7	195.6	197.0	196.2	43.1	77.5	191.7
95th Queue (m)	39.4	709.9	710.2	711.1	54.9	46.6	209.0	212.1	207.8	71.8	78.0	198.7
Link Distance (m)		601.8	601.8	601.8			193.4	193.4	193.4			188.3
Upstream Blk Time (%)		45	34	29			46	45	48			65
Queuing Penalty (veh)		0	0	0			326	322	342			317
Storage Bay Dist (m)	30.0				35.0	35.0				45.0	70.0	
Storage Blk Time (%)	86	16		69	0	73	47		68	0	85	18
Queuing Penalty (veh)	371	45		116	2	355	120		141	1	274	50

## Intersection: 2: Regional Road 25/Ontario Street &amp; Derry Road

Movement	NB	NB	NB	SB	SB	SB	SB	B20	B20
Directions Served	T	T	R	L	T	T	TR	T	T
Maximum Queue (m)	200.8	198.7	77.6	37.4	116.8	97.5	102.2	104.2	112.6
Average Queue (m)	169.2	161.2	56.7	37.4	108.3	51.9	58.5	98.9	33.7
95th Queue (m)	232.6	235.7	102.3	37.4	111.6	92.3	90.2	109.5	107.9
Link Distance (m)	188.3	188.3			92.6	92.6	92.6	97.0	97.0
Upstream Blk Time (%)	30	24			96	0	0	47	1
Queuing Penalty (veh)	146	115			499	2	2	369	8
Storage Bay Dist (m)			70.0	30.0					
Storage Blk Time (%)		41	0	89	4				
Queuing Penalty (veh)		91	1	230	13				

## Queuing and Blocking Report

## Intersection: 3: East Site Access/Commercial Access &amp; Derry Road

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	T	T	TR	R	LTR
Maximum Queue (m)	18.0	3.3	484.5	484.4	487.0	26.3	75.9
Average Queue (m)	1.9	0.1	368.5	369.6	370.6	8.7	57.3
95th Queue (m)	9.5	2.3	599.1	600.1	598.7	18.1	93.9
Link Distance (m)		193.4	474.8	474.8	474.8	96.9	71.3
Upstream Blk Time (%)			9	9	12		58
Queuing Penalty (veh)			59	62	79		0
Storage Bay Dist (m)	45.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

## Intersection: 4: Holly Avenue &amp; Derry Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	34.6	43.6	45.1	49.4	37.4	302.8	294.2	263.4	27.5	76.8	27.4	72.2
Average Queue (m)	12.3	15.3	20.6	24.3	30.9	127.5	119.3	105.5	25.9	60.6	10.1	33.1
95th Queue (m)	27.3	33.3	38.8	43.4	46.9	312.9	301.5	275.7	30.1	89.0	24.7	62.3
Link Distance (m)		474.8	474.8	474.8		458.8	458.8	458.8		69.6		179.6
Upstream Blk Time (%)						1	0			34		
Queuing Penalty (veh)						0	0			0		
Storage Bay Dist (m)	30.0				30.0				20.0		20.0	
Storage Blk Time (%)	3	1			13	41			58	22	2	30
Queuing Penalty (veh)	17	0			75	60			94	36	2	10

## Intersection: 5: Regional Road 25 &amp; West Site Access

Movement	WB	NB	NB	NB
Directions Served	R	T	T	TR
Maximum Queue (m)	107.5	322.7	321.3	310.1
Average Queue (m)	81.2	194.0	178.5	139.4
95th Queue (m)	138.6	353.0	357.1	342.4
Link Distance (m)	103.4	1290.5	1290.5	1290.5
Upstream Blk Time (%)	60			
Queuing Penalty (veh)	0			
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

## Queuing and Blocking Report

## Intersection: 6: Regional Road 25 &amp; Louis Saint Laurent Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	T	R	L
Maximum Queue (m)	57.4	82.2	86.9	27.4	91.0	93.4	67.4	108.7	99.1	80.7	51.3	36.1
Average Queue (m)	18.9	44.7	48.8	19.0	58.2	61.4	44.1	58.3	55.6	41.8	12.4	10.2
95th Queue (m)	39.3	68.4	75.4	33.4	84.0	87.1	71.6	94.8	87.1	70.6	35.1	24.5
Link Distance (m)		434.6	434.6		838.5	838.5		500.2	500.2	500.2		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0			20.0			60.0				60.0	50.0
Storage Blk Time (%)	0	4		8	42		4	5		1	0	
Queuing Penalty (veh)	0	4		24	39		17	14		3	0	

## Intersection: 6: Regional Road 25 &amp; Louis Saint Laurent Avenue

Movement	SB	SB	SB	SB
Directions Served	T	T	T	R
Maximum Queue (m)	60.2	63.1	75.4	57.2
Average Queue (m)	32.0	38.1	40.2	14.5
95th Queue (m)	54.9	61.1	65.5	43.8
Link Distance (m)	1290.5	1290.5	1290.5	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				50.0
Storage Blk Time (%)	2		6	0
Queuing Penalty (veh)	1		8	0

## Network Summary

Network wide Queuing Penalty: 5548

## SimTraffic Simulation Summary

## Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:45	6:45	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	9012	8901	8710	9170	8937	8944
Vehs Exited	8711	8547	8548	8750	8690	8650
Starting Vehs	706	704	723	602	732	695
Ending Vehs	1007	1058	885	1022	979	989
Travel Distance (km)	14022	13957	13683	14093	14062	13963
Travel Time (hr)	1434.7	1558.5	1398.6	1260.8	1373.9	1405.3
Total Delay (hr)	1166.5	1290.8	1136.4	990.5	1104.3	1137.7
Total Stops	16769	14635	14456	15405	15339	15320
Fuel Used (l)	2023.2	2124.7	1974.4	1880.1	1975.9	1995.7

## Interval #0 Information Seeding

Start Time	6:45
End Time	7:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

## Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	9012	8901	8710	9170	8937	8944
Vehs Exited	8711	8547	8548	8750	8690	8650
Starting Vehs	706	704	723	602	732	695
Ending Vehs	1007	1058	885	1022	979	989
Travel Distance (km)	14022	13957	13683	14093	14062	13963
Travel Time (hr)	1434.7	1558.5	1398.6	1260.8	1373.9	1405.3
Total Delay (hr)	1166.5	1290.8	1136.4	990.5	1104.3	1137.7
Total Stops	16769	14635	14456	15405	15339	15320
Fuel Used (l)	2023.2	2124.7	1974.4	1880.1	1975.9	1995.7

## Queuing and Blocking Report

## Intersection: 1: Ontario Street &amp; Laurier Road

Movement	EB	EB	WB	WB	NB	NB	NB	B20	B20	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	T	T	L	T	TR
Maximum Queue (m)	22.5	201.2	42.5	149.5	22.3	104.8	106.0	40.5	66.8	47.6	316.8	316.3
Average Queue (m)	14.0	81.8	26.6	69.8	7.6	65.2	71.1	2.5	4.9	27.7	259.3	253.5
95th Queue (m)	27.7	172.3	48.2	153.9	18.6	113.4	119.5	20.7	29.6	64.1	399.8	401.4
Link Distance (m)		300.4		182.2		87.9	87.9	101.7	101.7		300.7	300.7
Upstream Blk Time (%)				11		3	5	0	0		67	40
Queuing Penalty (veh)				0		23	39	0	0		0	0
Storage Bay Dist (m)	15.0		35.0		15.0					40.0		
Storage Blk Time (%)	16	60	21	19	5	26				0	91	
Queuing Penalty (veh)	40	40	61	14	34	10				1	65	

## Intersection: 2: Regional Road 25/Ontario Street &amp; Derry Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	T
Maximum Queue (m)	37.4	619.0	619.0	617.9	42.6	42.6	197.7	139.4	125.7	52.6	77.5	195.9
Average Queue (m)	37.3	604.1	603.3	600.1	32.0	42.5	195.0	63.7	66.6	38.1	71.8	148.7
95th Queue (m)	38.3	648.9	650.3	664.3	56.9	42.6	204.6	114.5	103.9	67.7	93.1	234.4
Link Distance (m)		602.4	602.4	602.4			192.6	192.6	192.6			194.6
Upstream Blk Time (%)		82	64	71			70	0				24
Queuing Penalty (veh)		0	0	0			419	0				110
Storage Bay Dist (m)	30.0				35.0	35.0				45.0	70.0	
Storage Blk Time (%)	67	23		63	1	87	7		17	0	57	19
Queuing Penalty (veh)	401	92		181	5	258	28		45	1	166	41

## Intersection: 2: Regional Road 25/Ontario Street &amp; Derry Road

Movement	NB	NB	NB	SB	SB	SB	SB	B20	B20
Directions Served	T	T	R	L	T	T	TR	T	T
Maximum Queue (m)	200.8	192.7	77.5	37.5	129.4	113.4	115.9	101.0	105.6
Average Queue (m)	131.4	106.0	44.9	37.4	118.4	60.5	66.9	91.0	26.5
95th Queue (m)	213.9	202.5	86.3	37.8	123.9	121.3	120.4	96.2	93.1
Link Distance (m)	194.6	194.6			101.7	101.7	101.7	87.9	87.9
Upstream Blk Time (%)	4	1			100	6	7	64	2
Queuing Penalty (veh)	17	7			360	23	24	349	11
Storage Bay Dist (m)			70.0	30.0					
Storage Blk Time (%)		14	0	98	10				
Queuing Penalty (veh)		40	1	239	22				



## Queuing and Blocking Report

## Intersection: 3: East Site Access/Site Access &amp; Derry Road

Movement	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	T	L	T	T	TR	LTR	LTR
Maximum Queue (m)	12.4	4.5	17.4	483.6	490.7	496.5	101.7	42.5
Average Queue (m)	2.7	0.1	4.7	409.4	396.1	359.7	78.6	14.3
95th Queue (m)	9.5	3.2	16.9	615.2	622.8	642.9	126.5	37.7
Link Distance (m)		192.6		474.8	474.8	474.8	94.8	71.3
Upstream Blk Time (%)				50	14	5	63	0
Queuing Penalty (veh)				281	78	28	0	0
Storage Bay Dist (m)	45.0		15.0					
Storage Blk Time (%)			1	89				
Queuing Penalty (veh)			5	12				

## Intersection: 4: Holly Avenue &amp; Derry Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	33.9	38.6	37.3	43.1	37.5	418.0	408.3	384.9	27.5	79.9	27.4	152.8
Average Queue (m)	12.9	11.0	15.1	20.3	21.3	197.1	185.9	151.7	24.3	63.3	10.1	78.1
95th Queue (m)	28.3	27.1	31.7	37.4	46.1	444.0	430.7	382.2	29.8	90.4	27.1	188.3
Link Distance (m)		474.8	474.8	474.8		458.8	458.8	458.8		69.6		179.6
Upstream Blk Time (%)						7	5	1		54		20
Queuing Penalty (veh)						0	0	0		0		0
Storage Bay Dist (m)	30.0				30.0				20.0		20.0	
Storage Blk Time (%)	3	0			2	68			71	10	3	50
Queuing Penalty (veh)	23	0			10	37			127	17	3	21

## Intersection: 5: Regional Road 25 &amp; West Site Access

Movement	WB	NB	NB	NB
Directions Served	R	T	T	TR
Maximum Queue (m)	50.4	80.0	81.5	80.3
Average Queue (m)	21.0	27.8	22.0	7.2
95th Queue (m)	75.4	105.8	93.8	52.7
Link Distance (m)	159.3	1285.1	1285.1	1285.1
Upstream Blk Time (%)	1			
Queuing Penalty (veh)	0			
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

## Queuing and Blocking Report

## Intersection: 6: Regional Road 25 &amp; Louis Saint Laurent Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	T	R	L
Maximum Queue (m)	57.4	250.6	255.6	27.4	98.9	103.9	66.2	98.6	91.0	60.9	20.9	57.3
Average Queue (m)	40.4	124.6	139.0	25.3	53.5	55.6	31.4	51.7	48.9	32.5	7.3	9.3
95th Queue (m)	72.0	220.7	235.2	32.1	85.9	86.8	60.6	82.1	76.7	57.2	16.5	29.5
Link Distance (m)		434.7	434.7		838.5	838.5		500.2	500.2	500.2		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0			20.0			60.0				60.0	50.0
Storage Blk Time (%)	1	38		46	21		2	3		0		
Queuing Penalty (veh)	3	49		108	31		8	4		0		

## Intersection: 6: Regional Road 25 &amp; Louis Saint Laurent Avenue

Movement	SB	SB	SB	SB
Directions Served	T	T	T	R
Maximum Queue (m)	82.1	83.4	85.6	57.6
Average Queue (m)	44.0	46.2	43.9	13.2
95th Queue (m)	71.9	74.5	74.0	42.9
Link Distance (m)	1285.1	1285.1	1285.1	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				50.0
Storage Blk Time (%)	6		7	0
Queuing Penalty (veh)	3		7	0

## Network Summary

Network wide Queuing Penalty: 4026

## SimTraffic Simulation Summary

## Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:45	6:45	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	9729	9999	9598	9767	9870	9791
Vehs Exited	9048	9382	8992	9119	9252	9157
Starting Vehs	607	683	654	635	630	643
Ending Vehs	1288	1300	1260	1283	1248	1274
Travel Distance (km)	14831	15136	14542	14656	15006	14834
Travel Time (hr)	1286.5	1292.8	1256.7	1253.3	1164.4	1250.7
Total Delay (hr)	1014.4	1014.7	989.9	983.5	888.2	978.2
Total Stops	20809	21581	19985	19791	21068	20640
Fuel Used (l)	1944.7	1976.9	1907.6	1908.4	1853.3	1918.2

## Interval #0 Information Seeding

Start Time	6:45
End Time	7:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

## Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	9729	9999	9598	9767	9870	9791
Vehs Exited	9048	9382	8992	9119	9252	9157
Starting Vehs	607	683	654	635	630	643
Ending Vehs	1288	1300	1260	1283	1248	1274
Travel Distance (km)	14831	15136	14542	14656	15006	14834
Travel Time (hr)	1286.5	1292.8	1256.7	1253.3	1164.4	1250.7
Total Delay (hr)	1014.4	1014.7	989.9	983.5	888.2	978.2
Total Stops	20809	21581	19985	19791	21068	20640
Fuel Used (l)	1944.7	1976.9	1907.6	1908.4	1853.3	1918.2

## Queuing and Blocking Report

## Intersection: 1: Ontario Street &amp; Laurier Road

Movement	EB	EB	WB	WB	NB	NB	NB	B20	B20	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	T	T	L	T	TR
Maximum Queue (m)	22.5	206.5	42.6	196.7	22.5	112.1	112.2	21.9	36.5	47.6	315.6	314.7
Average Queue (m)	15.0	82.6	36.3	159.5	13.7	57.7	63.5	0.8	1.6	39.7	255.0	248.6
95th Queue (m)	27.5	176.2	54.0	236.3	25.0	110.5	118.2	12.5	20.9	65.3	389.9	389.3
Link Distance (m)		300.4		182.2		97.0	97.0	92.6	92.6		300.7	300.7
Upstream Blk Time (%)				57		1	2		0		51	36
Queuing Penalty (veh)				0		11	16		0		0	0
Storage Bay Dist (m)	15.0		35.0		15.0					40.0		
Storage Blk Time (%)	24	56	42	52	40	19				3	76	
Queuing Penalty (veh)	61	38	153	54	226	11				23	99	

## Intersection: 2: Regional Road 25/Ontario Street &amp; Derry Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	T
Maximum Queue (m)	37.5	613.9	614.3	611.8	42.6	42.6	203.5	208.1	206.7	52.6	77.6	198.6
Average Queue (m)	37.4	494.3	484.8	469.7	29.4	42.0	196.4	198.3	197.5	42.2	77.5	189.7
95th Queue (m)	37.6	719.8	718.7	709.9	57.1	46.2	205.2	207.7	207.4	71.8	77.6	208.5
Link Distance (m)		601.8	601.8	601.8			193.4	193.4	193.4			188.3
Upstream Blk Time (%)		42	31	30			48	46	49			61
Queuing Penalty (veh)		0	0	0			341	330	348			298
Storage Bay Dist (m)	30.0				35.0	35.0				45.0	70.0	
Storage Blk Time (%)	86	16		70	0	77	43		68	0	90	21
Queuing Penalty (veh)	369	47		117	2	376	117		141	1	290	57

## Intersection: 2: Regional Road 25/Ontario Street &amp; Derry Road

Movement	NB	NB	NB	SB	SB	SB	SB	B20	B20
Directions Served	T	T	R	L	T	T	TR	T	T
Maximum Queue (m)	201.7	203.0	77.6	37.4	113.1	102.6	96.3	103.1	121.3
Average Queue (m)	187.1	183.3	62.7	37.4	108.2	58.1	62.2	96.6	69.3
95th Queue (m)	221.2	229.0	102.5	37.5	111.9	96.2	89.1	118.2	145.8
Link Distance (m)	188.3	188.3			92.6	92.6	92.6	97.0	97.0
Upstream Blk Time (%)	41	31			95	1	0	38	3
Queuing Penalty (veh)	201	150			489	3	2	291	23
Storage Bay Dist (m)			70.0	30.0					
Storage Blk Time (%)		49	1	89	4				
Queuing Penalty (veh)		108	2	231	12				

## Queuing and Blocking Report

## Intersection: 3: East Site Access/Commercial Access &amp; Derry Road

Movement	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	L	TR	L	T	T	TR	LTR	LTR
Maximum Queue (m)	13.9	7.4	17.4	484.7	485.2	483.4	100.8	75.9
Average Queue (m)	1.7	0.6	10.2	386.3	387.4	388.2	86.6	59.4
95th Queue (m)	8.3	3.7	22.7	608.2	607.4	606.6	126.0	97.7
Link Distance (m)		193.4		474.8	474.8	474.8	96.9	71.3
Upstream Blk Time (%)				10	11	16	78	71
Queuing Penalty (veh)				71	76	107	0	0
Storage Bay Dist (m)	45.0		15.0					
Storage Blk Time (%)			4	73				
Queuing Penalty (veh)			25	29				

## Intersection: 4: Holly Avenue &amp; Derry Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	TR	L	TR
Maximum Queue (m)	26.7	42.0	43.8	46.3	37.5	395.5	388.8	369.2	27.5	81.0	27.4	113.3
Average Queue (m)	11.5	16.2	20.6	25.2	32.2	178.5	171.7	158.3	25.9	63.8	10.8	42.0
95th Queue (m)	24.9	32.3	37.1	43.6	46.5	433.1	425.3	409.8	30.4	90.7	25.9	92.0
Link Distance (m)		474.8	474.8	474.8		458.8	458.8	458.8		69.6		179.6
Upstream Blk Time (%)						11	9	8		46		0
Queuing Penalty (veh)						0	0	0		0		0
Storage Bay Dist (m)	30.0				30.0				20.0		20.0	
Storage Blk Time (%)	2	0			9	49			66	23	1	37
Queuing Penalty (veh)	7	0			56	71			106	39	2	13

## Intersection: 5: Regional Road 25 &amp; West Site Access

Movement	WB	NB	NB	NB
Directions Served	R	T	T	TR
Maximum Queue (m)	87.7	329.2	324.2	322.4
Average Queue (m)	51.3	196.8	190.9	165.2
95th Queue (m)	117.5	398.3	393.4	365.4
Link Distance (m)	103.4	1290.5	1290.5	1290.5
Upstream Blk Time (%)	30			
Queuing Penalty (veh)	0			
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

## Queuing and Blocking Report

## Intersection: 6: Regional Road 25 &amp; Louis Saint Laurent Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	T	R	L
Maximum Queue (m)	57.4	87.8	85.1	27.4	89.4	93.9	67.5	128.5	120.0	88.3	66.8	39.8
Average Queue (m)	24.0	47.8	50.4	18.0	57.5	61.3	48.1	63.6	59.0	44.7	12.6	9.3
95th Queue (m)	51.0	76.5	80.0	32.7	84.1	86.6	76.3	106.1	95.5	76.3	36.0	22.9
Link Distance (m)		434.6	434.6		838.5	838.5		500.2	500.2	500.2		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0			20.0			60.0				60.0	50.0
Storage Blk Time (%)	0	7		6	38		7	5		2	0	0
Queuing Penalty (veh)	1	6		19	36		27	16		3	0	0

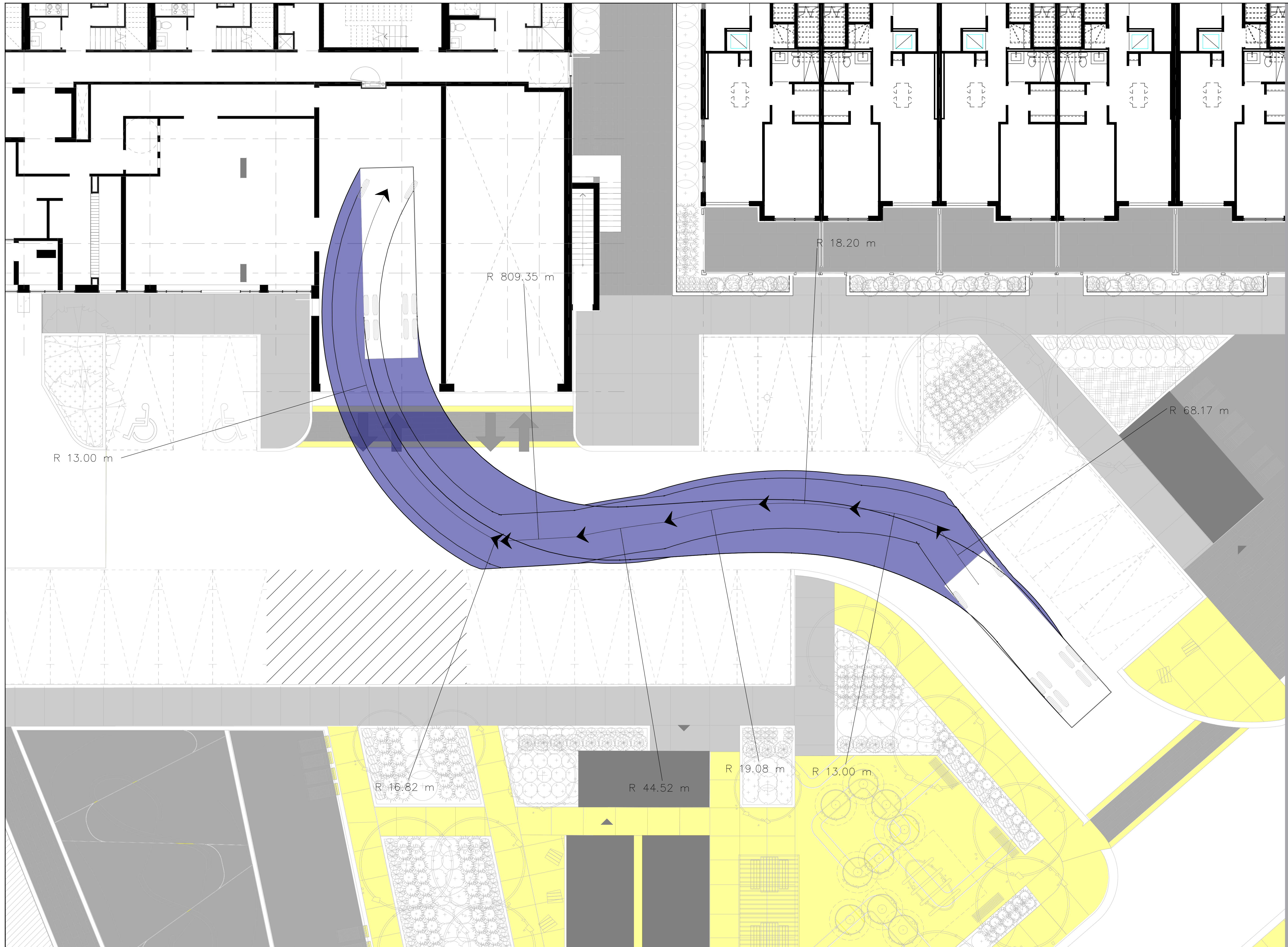
## Intersection: 6: Regional Road 25 &amp; Louis Saint Laurent Avenue

Movement	SB	SB	SB	SB
Directions Served	T	T	T	R
Maximum Queue (m)	67.5	74.2	77.7	57.3
Average Queue (m)	32.4	38.5	40.6	14.8
95th Queue (m)	56.9	63.4	66.7	44.9
Link Distance (m)	1290.5	1290.5	1290.5	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				50.0
Storage Blk Time (%)	2		6	0
Queuing Penalty (veh)	1		8	0

## Network Summary

Network wide Queuing Penalty: 5756

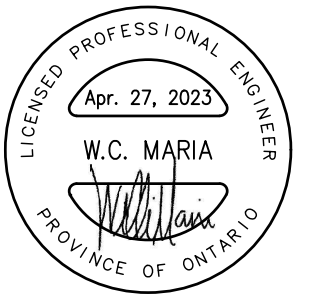
**Appendix G**  
**AutoTURN Analysis**



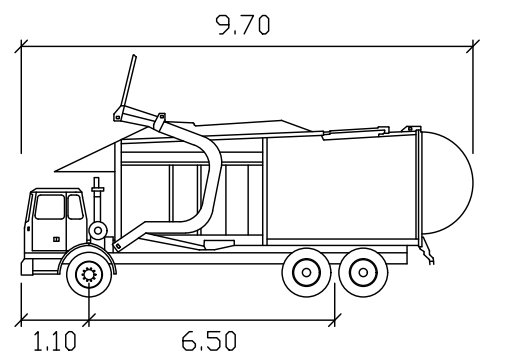
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Halton-Front-End  
meters  
Width : 2.70  
Track : 2.70  
Lock to Lock Time : 6.0  
Steering Angle : 30.0

No.	Issue	Checked	W.M	W.M	4/27/23	Date
1	First Submission					

Author	RA	Designer	RA
Drafting Check	W.M	Design Check	W.M
Project Manager	W.M	Project Director	W.M

Client  
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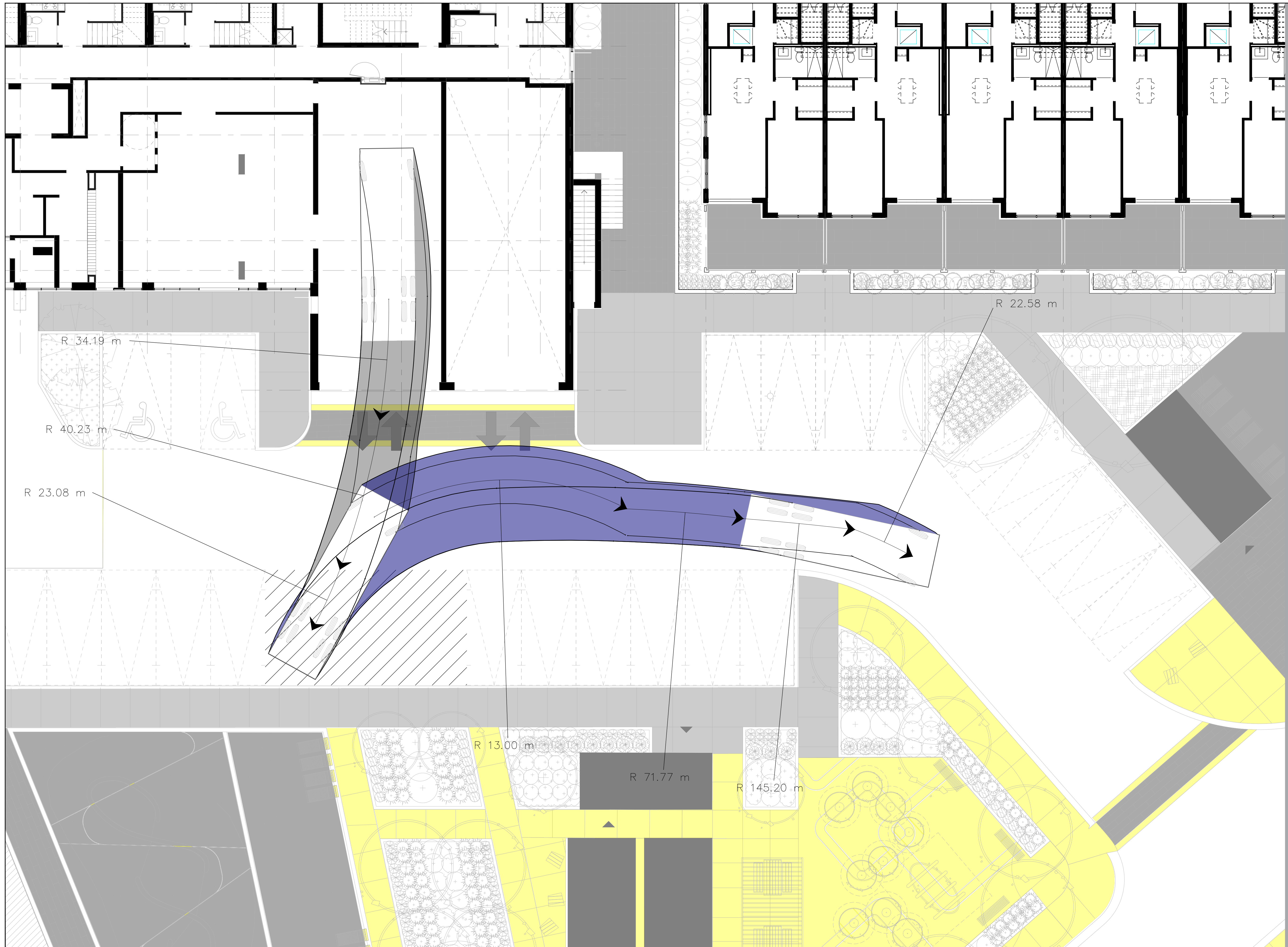
Project  
**DERRY ROAD AND REGIONAL ROAD 25 RESIDENTIAL DEVELOPMENT**

Date: April 27, 2023 | Scale: NTS

Title  
**VEHICLE MANEUVERING DIAGRAM - WASTE COLLECTION (INBOUND)**

Sheet No.  
**AT-101**

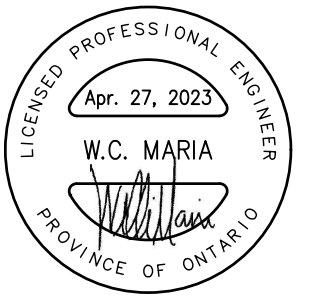




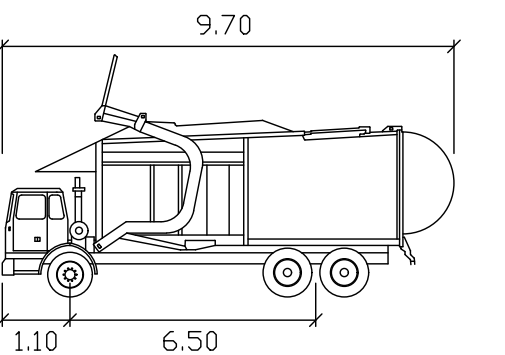
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Track : 2.70  
Lock to Lock Time : 6.0  
Steering Angle : 30.0

No.	Issue	Checked	Approved	Date
1	First Submission	W.M	W.M	4/27/23

Author R.A Designer R.A

Drafting Check W.M Design Check W.M

Project Manager W.M Project Director W.M

Client  
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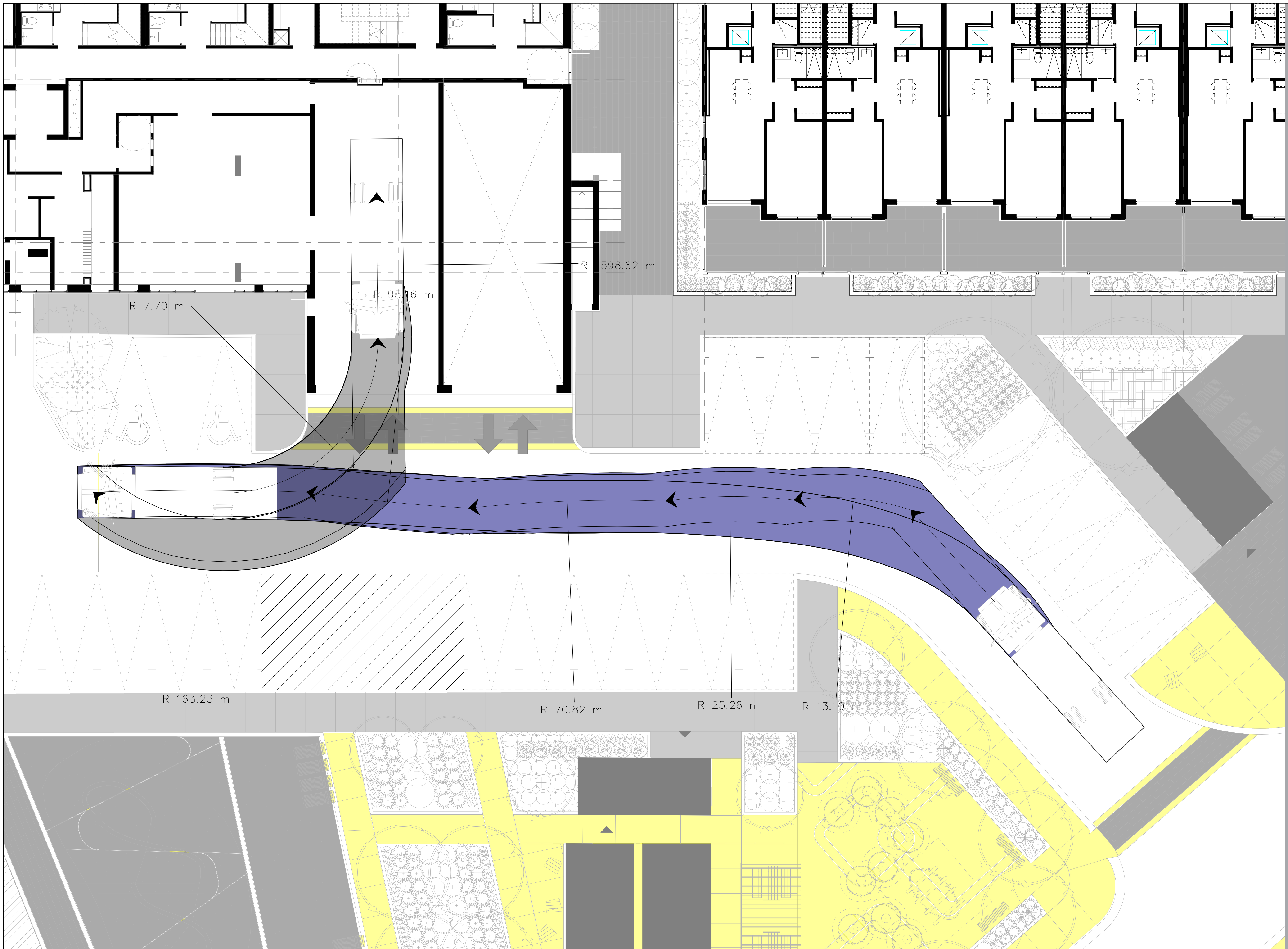
Project  
**DERRY ROAD AND REGIONAL ROAD 25 RESIDENTIAL DEVELOPMENT**

Date April 27, 2023 Scale NTS

Project No.

Title  
**VEHICLE MANEUVERING DIAGRAM - WASTE COLLECTION (OUTBOUND)**

Sheet No.  
**AT-102**

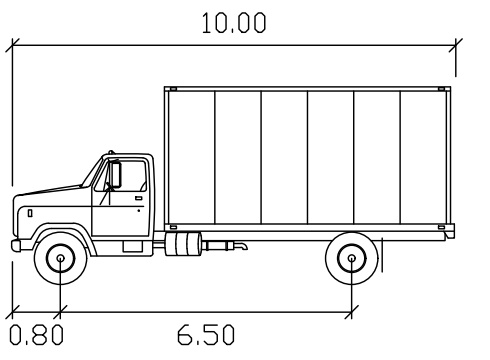


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MSU meters  
 Width : 2.60  
 Track : 2.60  
 Lock to Lock Time : 6.0  
 Steering Angle : 40.2

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1	First Submission					4/27/23

Author R.A Designer R.A  
 Drafting Check W.M Design Check W.M  
 Project Manager W.M Project Director W.M

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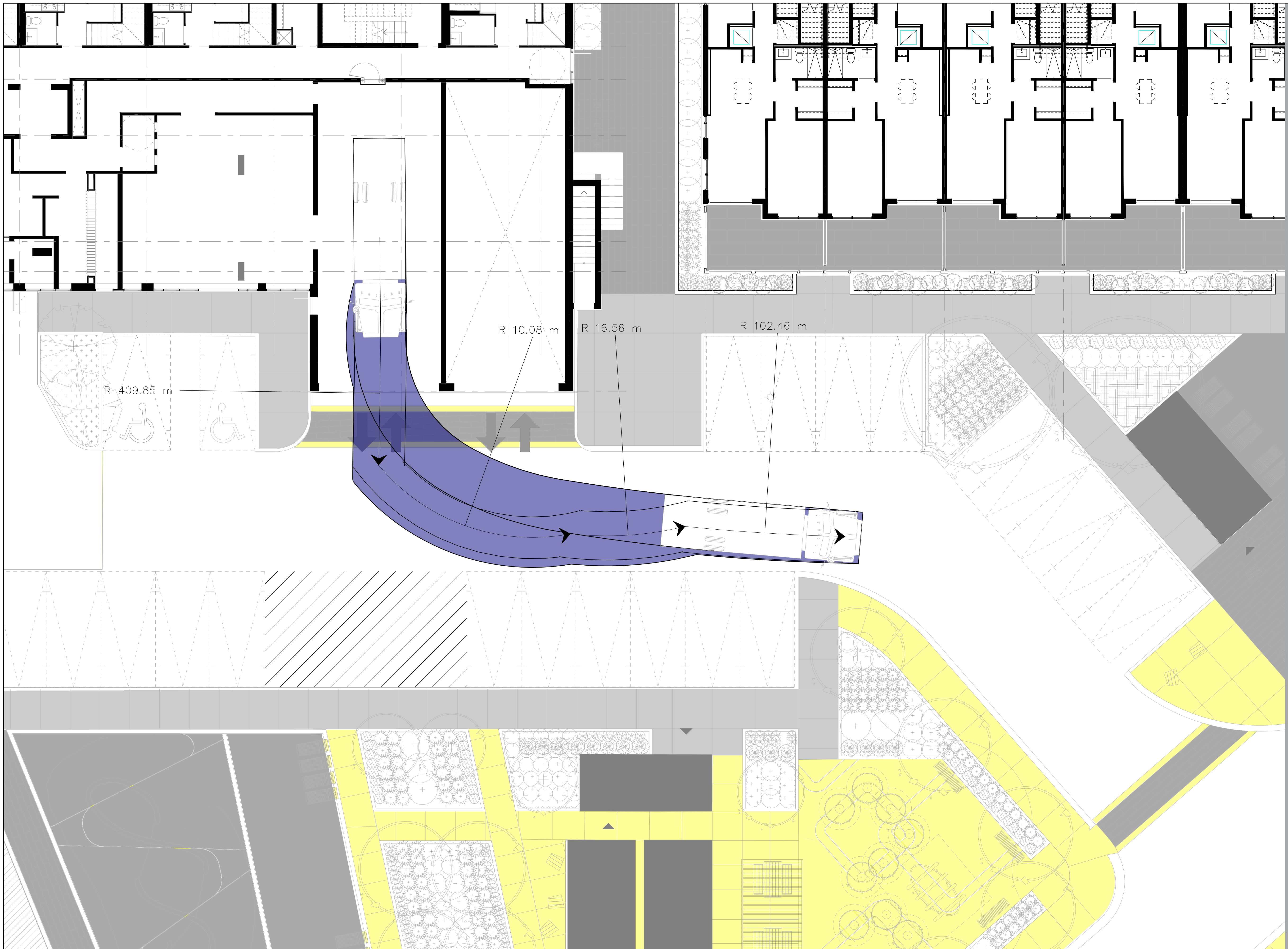
Date April 27, 2023 Scale NTS

Project No. -

Title  
**VEHICLE MANEUVERING DIAGRAM - MSU TRUCK (INBOUND)**

Size  
**ANSI D**

Sheet No.  
**AT-103**



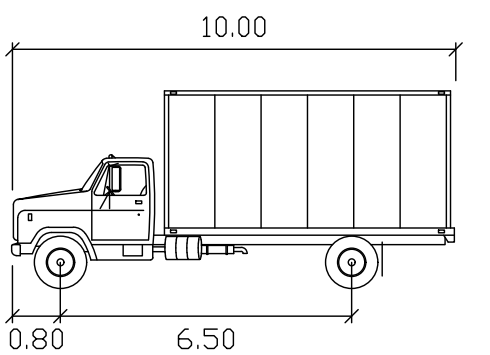
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MSU meters  
 Width : 2.60  
 Track : 2.60  
 Lock to Lock Time : 6.0  
 Steering Angle : 40.2

No.	Issue	Checked	Approved	Date
1	First Submission	W.M	W.M	4/27/23

Author R.A Designer R.A

Drafting Check W.M Design Check W.M

Project Manager W.M Project Director W.M

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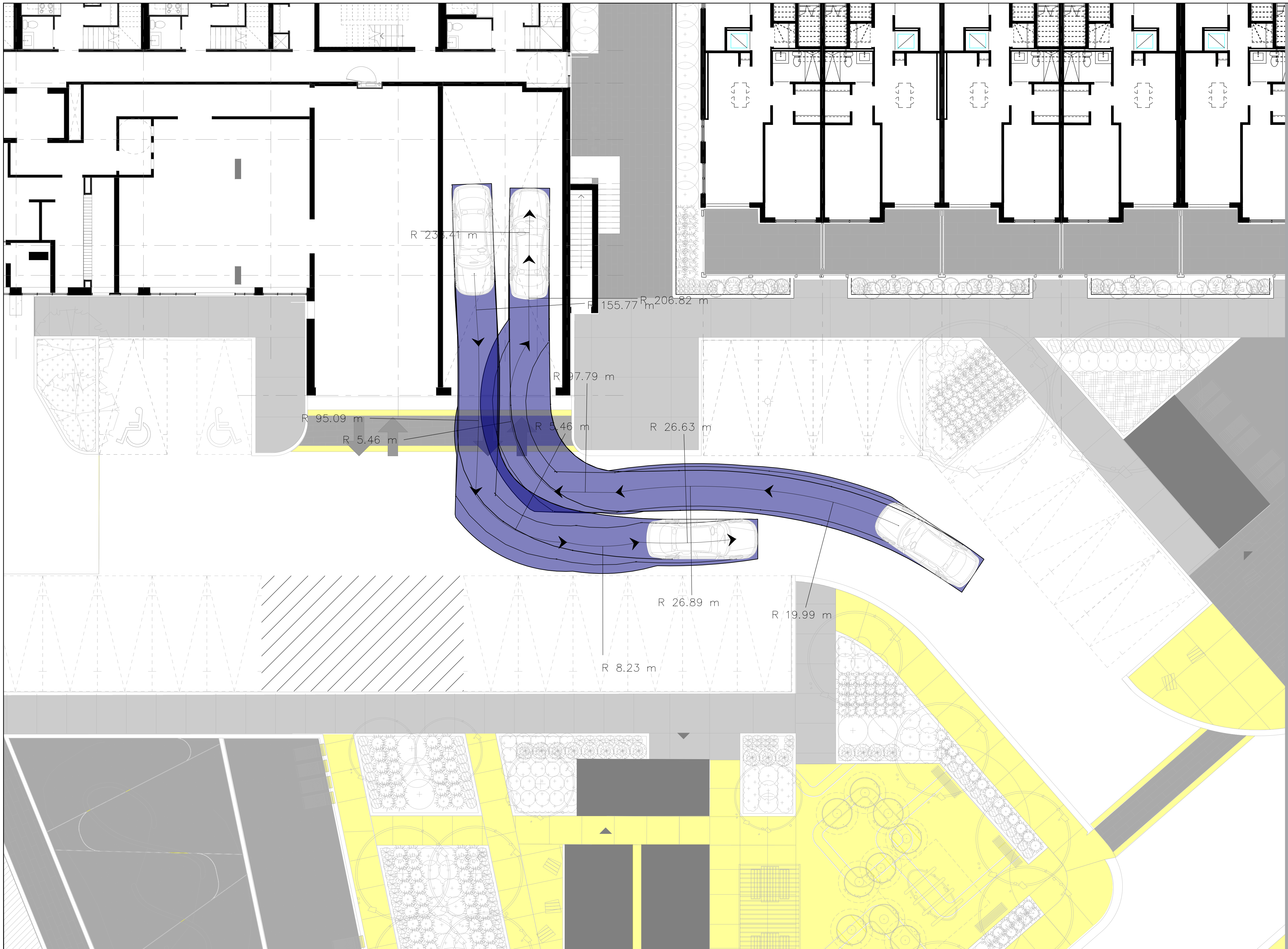
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Project No.

Title  
 VEHICLE MANEUVERING DIAGRAM - MSU TRUCK (OUTBOUND)

Size  
 ANSI D

Sheet No.  
 AT-104



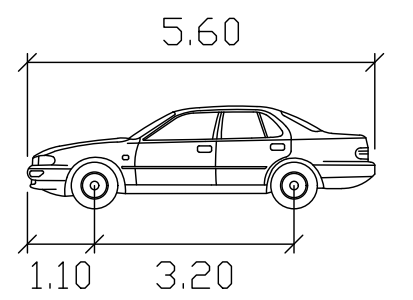
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P  
 Width : 2.00 meters  
 Track : 2.00  
 Lock to Lock Time : 6.0  
 Steering Angle : 35.9

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Author	RA	Designer	RA
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Project Manager	W.M	Project Director	W.M

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**MILTERON DEVELOPMENTS LIMITED**

Project  
**DERRY ROAD AND REGIONAL ROAD 25 RESIDENTIAL DEVELOPMENT**

Date April 27, 2023 Scale NTS

Project No.

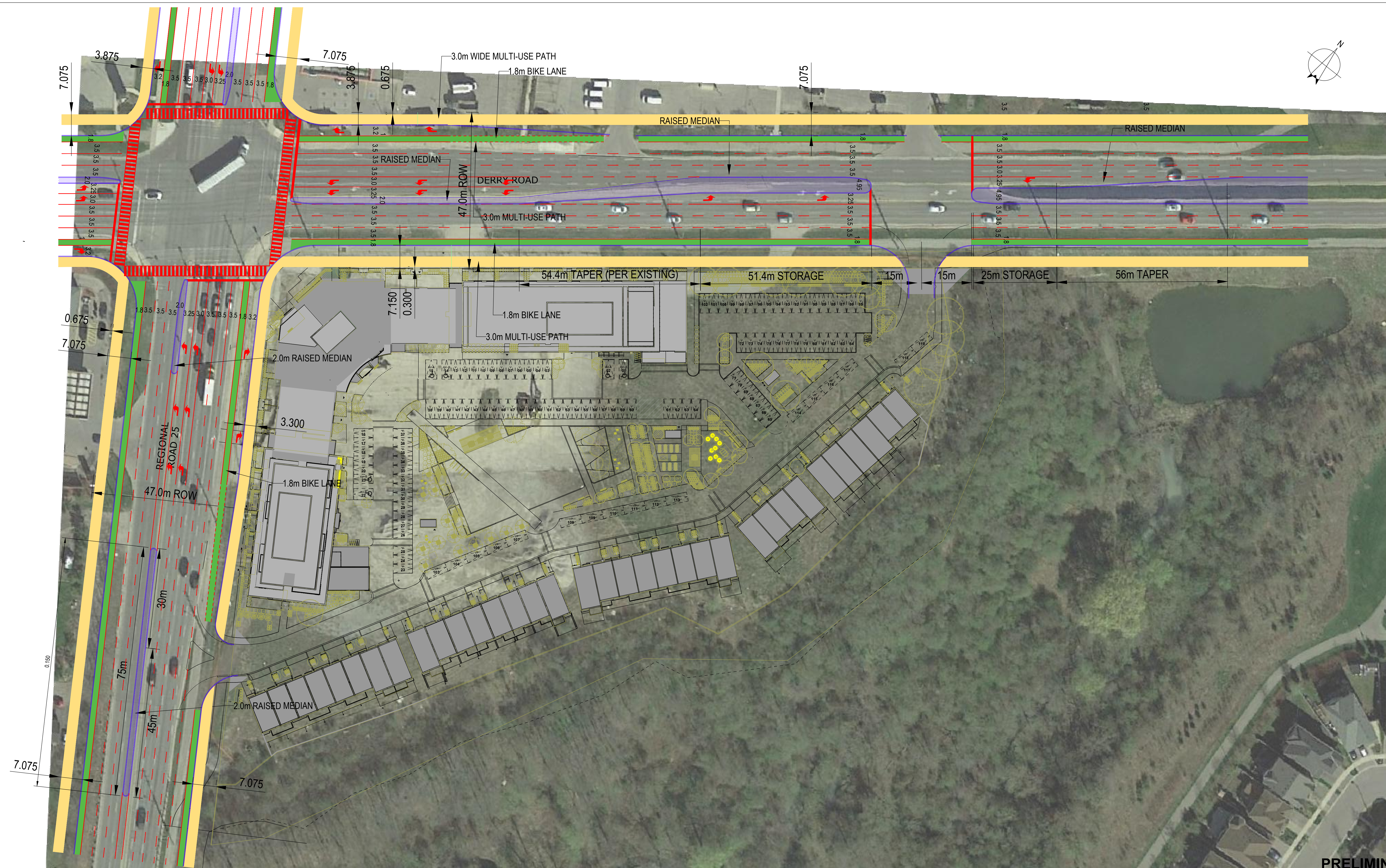
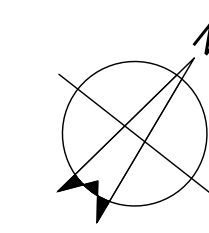
Title  
**VEHICLE MANEUVERING DIAGRAM - PASSENGER VEHICLE**

Size  
 ANSI D

Sheet No.  
 AT-105

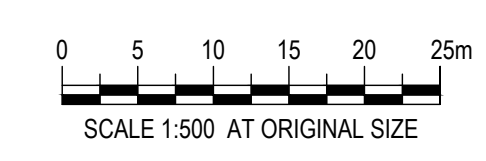
# **Appendix I**

## **Functional Design**



**PRELIMINARY**

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date



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

<b>DO NOT SCALE</b>		Drawn	Designer
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Drafting Check	WM	Design Check	WM
Approved (Project Director)	WM	Date	July 24, 2020
Scale	AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

Client	<b>Briarwood (Milton Green Fields) Ltd.</b>
Project	<b>Derry Road at Regional Road 25</b>
Title	<b>Site Access Functional Design - Ultimate 2031</b>
Original Size	Arch D Drawing No: <b>FD-2</b>
Rev:	<b>D</b>

**Appendix K**  
**Deviation Memo**



January 27, 2020

Transportation Planning Coordinator  
Infrastructure Planning & Policy  
Public Works  
Halton Region  
1151 Bronte Road,  
Oakville, Ontario, L6M 3L1

Attention: Patrick Monaghan

**Re:    Transportation Deviation Memo  
       Derry Road and RR25 Residential Development  
       Briarwood (Milton Green Fields) Ltd.  
       Milton, ON**

## **1.    Location of Deviation**

The proposed residential development is located on the southeast corner of Regional Road 25 at Derry Road West in the Town of Milton. The site at the intersection of two major regional arterial roads is ideal for the proposed type of high density residential development consistent with the Region of Halton Official Plan which encourages and aims to attract high density development along major arterial roads.

This deviation memo is being submitted in support of a request to locate and signalize a full moves driveway to the subject site on Derry Road east of Regional Road 25 opposite an existing uncontrolled full moves access to a commercial plaza.

## **2.    Impact of Site on the Regional Road Network**

The proposed development consists of 585 apartment units and 58 townhouse units. Based on these assumptions and the proposed land use, it is estimated that the subject development will generate approximately 202 new two-way vehicle trips during the a.m. peak hour consisting of 48 inbound and 154 outbound trips. During the p.m. peak hour it is expected to generate 237 new two-way vehicle trips consisting of 145 inbound and 92 outbound trips.

Under existing conditions the regional road network surrounding the site is operating with generally acceptable conditions. Under the future background conditions in 2022 with the addition of background traffic from adjacent planned developments the adjacent road network is expected to continue to operate with acceptable conditions without any geometric road improvements. The addition of the proposed



site traffic under 2022 total traffic conditions has only a slight impact on the adjacent road capacity which is expected to continue to operate under acceptable conditions.

Analysis of the future background traffic condition in 2027 confirmed that there is insufficient capacity on the adjacent regional road network to accommodate the assumed corridor growth and background development traffic. The addition of the proposed site traffic will contribute to additional delays in the 2027 planning horizon.

Analysis of the 2031 planning horizon which included the planned widening of Derry Road and Regional Road 25 to six lanes with additional intersection improvements confirmed adequate capacity to be available to accommodate all planned developments and corridor growth.

What the analysis makes clear is the planned background developments and the proposed subject development do not contribute significantly to the capacity issues along the regional roads. It is the assumed background corridor growth that will significantly add traffic to the arterial roads. It is worth noting that corridor growth was applied in a linear form from existing to future planning horizons. In reality, the Region is investing in network improvements along parallel routes that will add capacity on a screenline basis to the east/west and north/south directions. It is more likely that background growth will not occur as assumed since corridor traffic will redistribute to parallel routes to avoid Derry Road and Regional Road 25 as lane volumes reach capacity.

### **3. Related Halton Region Reference**

This deviation is in reference to the Halton Region Access Management Guidelines, January 2015 Section 3.2 Access Spacing that states “The general spacing guidelines for a full movements access is 300 metres to 400 metres.”

### **4. Summary of Reason for Deviation**

The deviation is being requested to locate and signalize the proposed full moves access from the subject site to Derry Road. The proposed driveway is located at the eastern limit of the property, the furthest distance possible from the existing signalized intersection of Derry Road and Regional Road 25. Despite this, the proposed access spacing from the signalized intersection of Derry Road and Regional Road 25 is less than the required 300 to 400 meters.

The proposed site access is also located directly opposite an existing uncontrolled full moves access into an existing commercial plaza on the north side of Derry Road making the enforcement of a right-in/out driveway difficult.

Given the existing constraints, a signalized four-leg intersection aligned with the commercial driveway is the best option to service these lands. Limiting the proposed access to a right-in/out would require either:

1. A median island down the middle of Derry Road which is not possible due to the existing full moves driveway to the commercial plaza; or
2. Constructing a pork chop island at the proposed driveway which is difficult to enforce undesirable movements from a compliance standpoint.

## **5. Why the deviation should be considered?**

The proposed high-density development will generate a volume of site traffic that is best served by providing at a minimum one full moves driveway to the regional road network. Without it, the site will be serviced by two right-in/out driveways which will result in significant u-turns at adjacent signalized intersections and traffic infiltration through the adjacent residential neighbourhoods.

The proposed development will also bring additional pedestrians to the area. With a commercial plaza located on the north side of Derry Road, an additional signalized crossing of Derry Road will facilitate pedestrian crossing of Derry Road as traffic along Derry Road is forced to stop.

Lastly, allowing for a full moves access that is signalized provides the Region with more control over access to their road from both the subject site and the existing commercial site to the north.

## **6. What are the potential benefits of the deviation?**

Signalizing the Derry Road access will improve the capacity at the intersection of Derry Road and Regional Road 25 in addition to improving the safety of the access for vehicular traffic.

There is a benefit to the existing plaza which is currently operating with an unsignalized access to Derry Road. As volumes on Derry Road increase, this driveway becomes less operational as delays to enter and exit the driveway increase and motorists become reluctant to use the driveway due to increased delays. This will place additional future capacity constraints at the intersection of Derry Road and Regional Road 25.

A full moves signalized access will also provide an additional signalized crossing of Derry Road to facilitate pedestrians crossing Derry Road to access the commercial plaza and transit stops on the opposite side of Derry Road.

Finally, providing a full moves signalized intersection on Derry Road would provide additional capacity to adjacent signalized intersections as it eliminates the need for future residents and visitors to the development to make u-turns when arriving or leaving the site. There is also less likely to be infiltration through the adjacent residential neighbourhoods afforded by the additional turning movements allowed at the signalized site access.

## **7. What are the potential disadvantages of the deviation?**

One likely disadvantage of the deviation is that through traffic along Derry Road will be impacted by additional side friction which will slow traffic. There is also additional delays due to the introduction of an all red cycle phase for east/west traffic on Derry Road that will require traffic to come to a complete stop at the intersection.

Furthermore, due to the close spacing of the two signalized intersections along Derry Road, the Region will have to coordinate the two intersections to ensure capacity is maximized and queuing along Derry Road is minimized. In coordinating the two sets of signals, the Region loses some flexibility to optimize signal timings and cycle lengths to adjust to future conditions.

**8. What has been proposed to mitigate the potential disadvantage?**

To minimize the potential disadvantages proper coordination of the signals is important to ensure delays are minimized along Derry Road.

**9. Rationale for the accept/reject decision?**

The proposed signalization of the full moves access onto Derry Road is the best opportunity for Region to control access to this site given existing constraints on the north side of Derry Road, it maximizes access to the high density development, provides benefit to the existing commercial plaza and provides the most benefit for both existing and future residents in the area.

**10. Should the existing standard be updated? Why?**

No, this is a site specific constraint that is best dealt with through a deviation from the existing standards. The existing standards should continue to provide guidance throughout the Region for new developments.

We trust the enclosed is sufficient for your needs, but please do not hesitate to contact the undersigned should you require additional assistance.

Sincerely,

GHD



**William Maria, P.Eng.**  
Senior Project Manager



## about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

**William Maria**  
William.Maria@ghd.com  
905.814.4397

[www.ghd.com](http://www.ghd.com)