1740 – 1760 St. Laurent Boulevard

TIA Strategy Report

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477563 - 01000

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed1 or registered 2 professional in good standing, whose field of expertise [check ✓ appropriate field(s)] is either transportation engineering ☑ or transportation planning □.

[1,2] **License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.**

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TIA STRATEGY REPORT

Parsons has been retained by Groupe Heafey to prepare a Transportation Impact Assessment (TIA) in support of a Zoning By-Law Amendment (ZBLA) and Site Plan Application (SPA) for a mixed-use development located at the 1740 and 1760 St. Laurent Boulevard. This document follows the current TIA process, as outlined by the City Transportation Impact Assessment (TIA) Guidelines (2017). The following report represents Step 4 – Strategy Report.

1. SCREENING FORM

The screening form confirmed the need for a TIA based on the trip generation trigger given that the development consists of approximately 672 apartment units and 2,900 m^2 (31,100 ft^2) of ground floor commercial; location trigger given that the development is located within the St. Laurent Boulevard Arterial Mainstreet Design Priority Area (DPA) and safety trigger given that the proposed driveway is in the influence area of an adjacent intersection. The Screening Form and City correspondence has been provided in **Appendix A**.

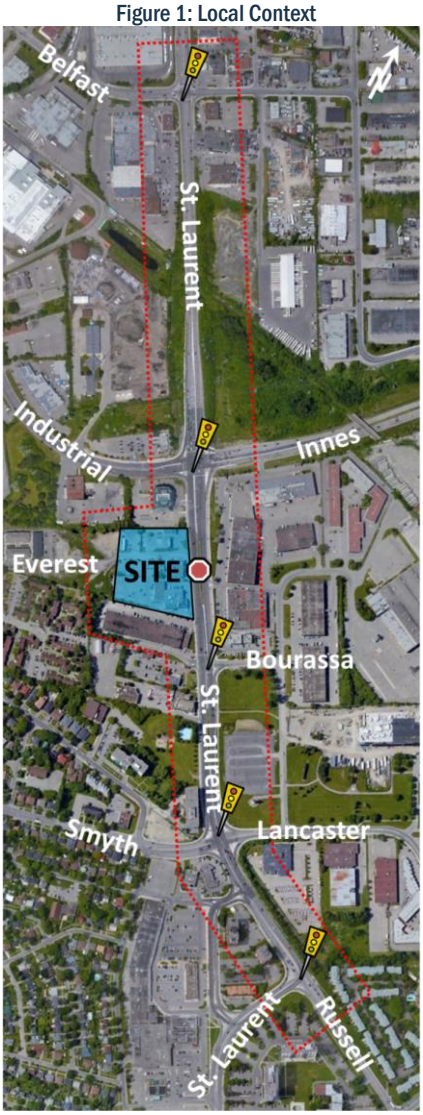
2. SCOPING REPORT

2.1. Existing and Planned Conditions

2.1.1. Proposed Development

The proposed development is located at the municipal addresses of 1740 and 1760 St. Laurent Boulevard. The existing site is currently occupied by several commercial businesses including a hardware store, alternative gym, two restaurants and a gas station. The site is currently zoned as AM10 and AM10[1658]; the AM10 zoning (1760 St. Laurent Blvd) allows mid-rise buildings up to 9-storeys or 30 meters high, while the AM10[1658] (1740 St. Laurent Blvd) allows buildings up to 50 meters in height. The site's context is displayed in **Figure 1.**

Figure 1: Local Context



The proponent proposes four 12 to 15-storey apartment buildings containing 672 residential units and approximately 31,100 ft^2 of commercial retail on ground floor. A two-phased development is proposed, with the initial phase being completed by 2022 and full build out of the site assumed by 2024. Given that the site accesses will be built to full buildout by the first phase, and the access conditions will be the same for phase 2, for the purposes on the ensuing assessment, only the full buildout and full buildout plus 5 years will be analyzed.

The development proposes a full movement signalized vehicle access to St. Laurent Boulevard (located slightly south of the existing site intersection at St. Laurent) and a right-in right-out (RIRO) access located on the southernmost limit of the site. Currently, Site/St. Laurent functions as a right-in right-out intersection with a median curb which restricts full movement operations. Within this report, the potential to convert this access to a signalized full movement intersection will be explored and is assumed to be in place for all phases of development. The current Site Plan proposes a total of approximately 670 parking units, with approximately 70 above ground and the remainder of 600 underground. The latest Site Plan Concept is shown in **Figure 2**.

Figure 2: Proposed Site Plan



Site Plan received March 26, 2021

2.1.2. Existing Conditions

Area Road Network

St. Laurent Boulevard is classified as an arterial roadway which extends from Sandridge Road in the north to Don Reid Drive in the south. Within the study area, St. Laurent Boulevard has a six-lane cross section with the outer lane being a bus only dedicated lane. The posted speed limit is 70 km/h within the study area.

Industrial Avenue & Innes Road is an arterial roadway which extends from Riverside Drive in the west as Industrial Avenue to St. Laurent Boulevard, where it continues as Innes Road to Dunning Road in the east. Within the study area, Industrial Avenue and Innes Road have four-lane cross sections. The posted speed limit is 60 km/h within the study area.

Smyth Road & Lancaster Road is an arterial roadway west of St. Laurent Boulevard and a collector roadway east of St. Laurent Boulevard. Smyth Road extends from Riverside Drive in the west to St. Laurent Boulevard, where it continues as Lancaster Road to Walkley Road in the east. Within the study area, Industrial Avenue and Innes Road have a four-lane cross section. The posted speed limit is 60 km/h within the study area.

Russell Rd is a northwest-southeast arterial roadway that has been cut into 4 parts over time due to ongoing major intersection modifications. Within the study area, Russell Road extends from St. Laurent Boulevard in the north to Hawthorne Road in the south, where it once again changes direction. Russell Road consists of a two-lane cross section and has a posted speed limit of 50km/h within the study area.

Belfast Road is classified as a collector roadway west of St. Laurent Boulevard and a local roadway east of St. Laurent Boulevard. Belfast Road extends from Coventry Road in the north-west to Michael Street in the east. Within the study area, Belfast Road has a two-lane cross section with a posted speed limit of 50km/h.

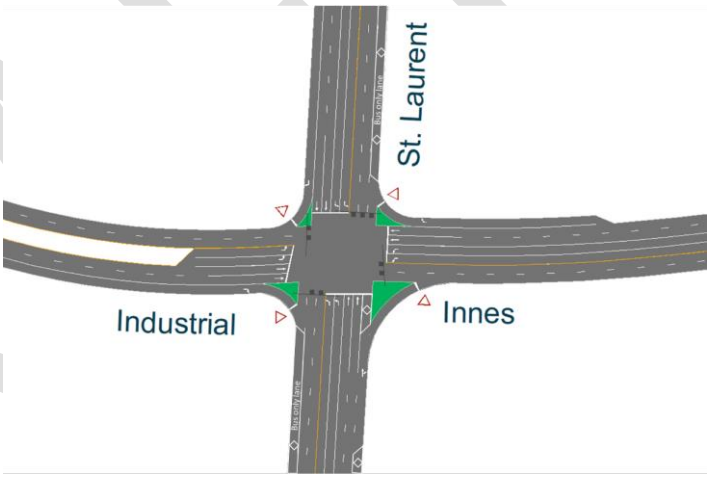
Bourassa Street is classified as a local roadway which extends a short distance from St. Laurent Boulevard in the west to Gladwin Crescent in the east. Within the study area, Bourassa Street has a two-lane cross section with an unposted speed limit assumed to be 50km/h.

Everest Private/Site Access is a local roadway with a two-lane cross section within the site. Approximately 110 meters from St. Laurent Boulevard, the roadway is barricaded to deter cut-through traffic between St. Laurent Boulevard and Russell Road. It is anticipated that the barricade will remain in place for the foreseeable future. Everest Private and the site access has an unposted speed limit assumed to be 50km/h.

Existing Study Area Intersections

Industrial/St. Laurent

The Industrial/St Laurent intersection is a signalized four-legged intersection. All approaches consist of a double left-turn lane, a channelized right-turn lane and two through lanes. The northbound approach has an additional third through lane which is part of a dedicated bus only lane. A receiving lane north of Industrial Road tapers off and merges on to mixed traffic approximately 150 meters north of the intersection. A southbound bus only lane begins just south of the intersection on St. Laurent Boulevard. All movements are permitted at this location.



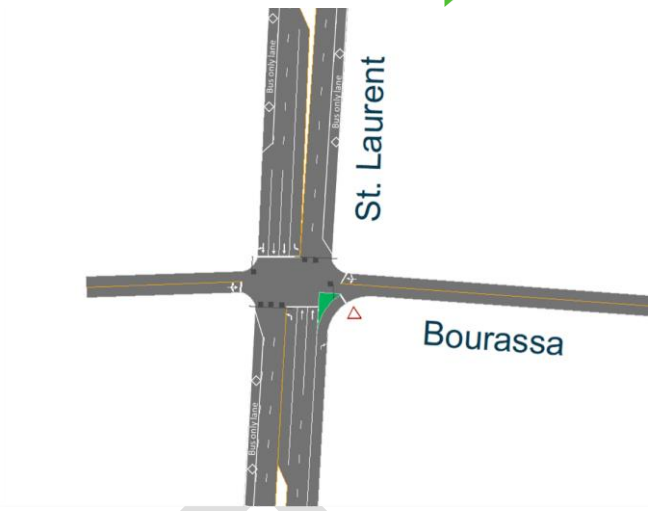
Site Access/St. Laurent

The Site Access/St. Laurent intersection is a three-legged intersection with a STOP control at the Site Access approach. The northbound consists of two through lanes and a transit lane. The southbound approach consists of two through lanes and a transit/right-turn lane. The eastbound approach has a right turn lane only. This intersection functions as a right-in right-out only due to the presence of a median along St. Laurent Boulevard.



Bourassa/St. Laurent

The Bourassa/St. Laurent intersection is a four-legged signalized intersection. The northbound approach consists of a left-turn lane, a channelized right-turn lane and two through lanes. North of Bourassa intersection, a third northbound lane begins and functions as a bus only lane. The southbound approach consists of a left-turn lane, a right-turn lane/transit lane. The eastbound and westbound approaches have a single all-movement lane. All movements are permitted at this intersection.



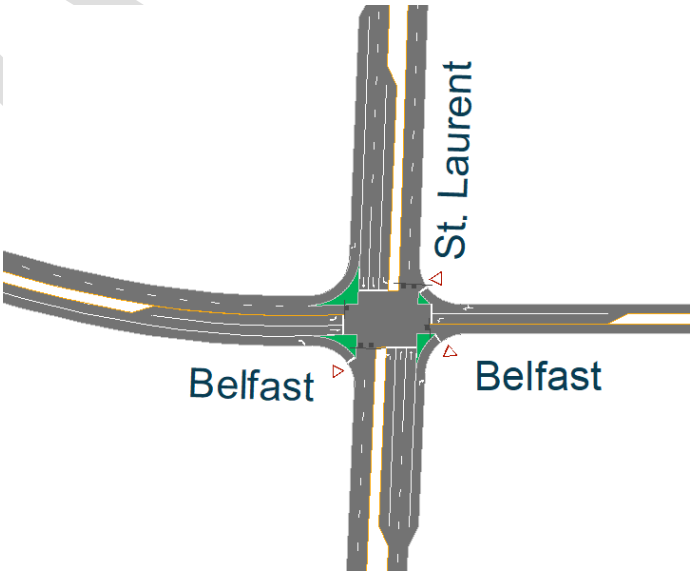
Smyth/St. Laurent

The Smyth/St. Laurent intersection is a four-legged signalized intersection. The northbound approach consists of a left-turn lane, a channelized right-turn lane and two through lanes. The southbound approach consists of a left-turn lane, a channelized right-turn lane and two through lanes. The eastbound approach consists of a double left-turn lane, a channelized right-turn lane and a single through lane. The westbound approach consists of a left-turn lane, a channelized right-turn lane and two through lanes. All movements are permitted at this intersection.



Belfast/St. Laurent

The Belfast/St. Laurent intersection is a four-legged signalized intersection. The northbound approach consists of a left-turn lane, a channelized right-turn lane and two through lanes. The southbound approach consists of a left-turn lane, a channelized right-turn lane and two through lanes. The eastbound approach consists of a left-turn lane, a channelized right-turn lane and a single through lane. The westbound approach consists of a left-turn lane and a channelized right-turn lane shared with a through lane. All movements are permitted at this intersection.



Russell/St. Laurent

The Russell/St. Laurent intersection is a three-legged signalized intersection. The northbound approach consists of a left-turn lane and two through lanes. The southbound approach consists of a channelized right-turn lane and two through lanes. The eastbound approach consists of a double left-turn lane and a channelized right-turn lane. All movements are permitted at this intersection.



Existing Driveways to Adjacent Developments

The existing driveways within 200m from each corner of the proposed site are shown in **Figure 3,** including:

- St. Laurent Boulevard West Side:
  - 1730 – There is a driveway to a surface parking lot for a commercial/office building that's approximately 8-storeys high, located approximately 20 meters north of the site boundary
  - 1740 – Accesses to Petro-Canada gas station, within site property
  - Everest Private – functions as a driveway to local businesses. Road connection to Russell Road is physically separated by a barricade (site property).
  - 1754 – Access to a restaurant, (site property).
  - 1760 – Two accesses on north and south ends of property parcel. Provides access to parking lot for a retail store, a recreational business and a restaurant, (site property).
  - 1800 – Access to a small industrial building including warehousing, auto service and a recreational business, located approximately 15 meters south of the property boundaries
  - 1810 – Access to telecommunications maintenance buildings and an office, located approximately 175 meters south of the property boundaries
- St. Laurent Boulevard East Side:
  - 1705 & 1755 – Major driveway functioning as right-in/right-out to St. Laurent Boulevard with access to multiple retail, commercial and light industrial uses. This driveway is located on the opposite side of St. Laurent Boulevard, adjacent to the proposed site

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Figure 3: Existing Driveways Adjacent to Development



Existing Area Traffic Management Measures

Below are the existing area traffic management measures within the study area:

- Channelized right turn lanes with refuge island at some intersections;
- Fully protected left turns at some intersections;
- Transit lanes along segments of St. Laurent Boulevard; and,
- Painted bike cross-rides at some intersections (further details in following section).

Pedestrian/Cycling Network

Pedestrian sidewalk facilities are provided on both sides of St. Laurent Boulevard, Industrial Avenue, Smyth Road, Lancaster Road, and Belfast Road. A multi-use pathway (MUP) is provided on the south side of Innes Road and Russell Road, while no pedestrian facilities are provided on the north side. The site access has sidewalk facilities on the south side of roadway only, while Bourassa Street has a sidewalk from St. Laurent Boulevard to the McDonalds on the north side of the roadway only. The westward continuation of the site access (Everest Private) past the concrete cinderblock barricade currently does not provide pedestrian facilities until the developments located at 257 Everest Private, where local pathways connect to Russell Road.

With regards to cycling, St. Laurent Boulevard has a 'cycle track' which consists of a bicycle only lane that is physically separated from the roadway by being elevated to curb height (similar to a sidewalk). The cycle track on St. Laurent Boulevard begins south of Industrial/St. Laurent intersection on both sides of the roadway and merges back to non-physically separated curbside on St. Laurent Boulevard at Smyth/St. Laurent for the west side of roadway and at Bourassa/St. Laurent for the east side of roadway. Cross-rides are present at the Bourassa/St. Laurent intersection for north and south bike travel lanes.

A paved MUP follows Innes Road on the south side of the roadway and continues for approximately 200 meters west of Industrial/St. Laurent intersection. The south leg of Industrial/St. Laurent intersection has a dedicated cross-rides connecting both sides of the MUP. The north side of Industrial Avenue provides a paved MUP, while the north side of Innes Road has no cycling facilities.

Smyth Road, Lancaster Road and St. Laurent Boulevard south of Smyth/St. Laurent provide curbside bike lanes with pocket lanes at some intersection approaches. Belfast Road and Russell Road provide paved shoulders.

There are no bike facilities on the site access and its continuation Everest Private or Bourassa Street.

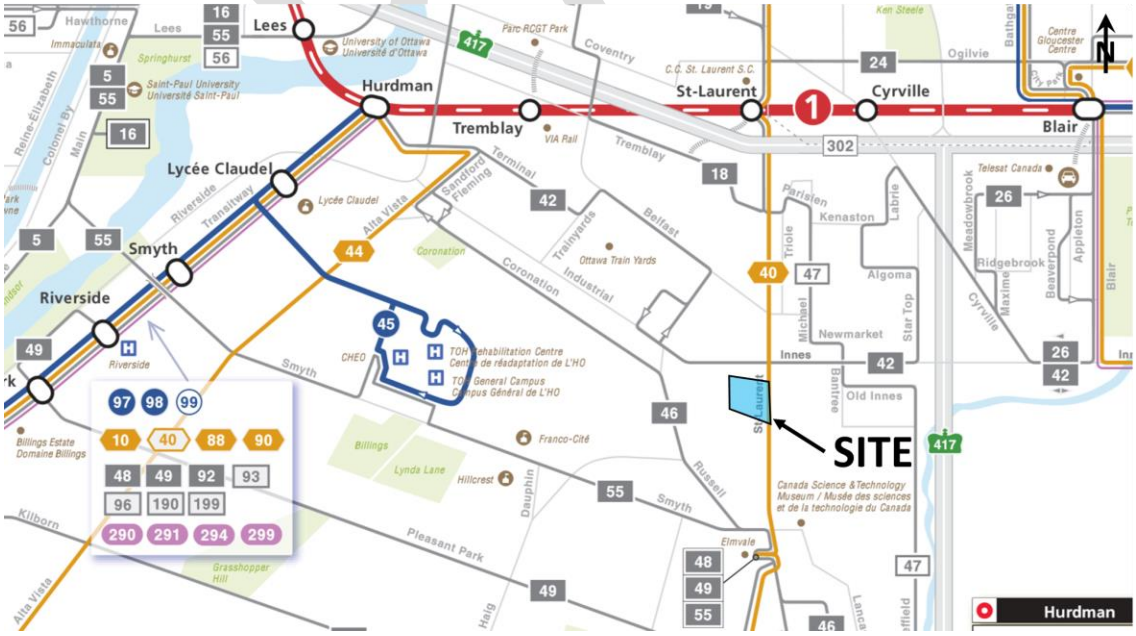
St. Laurent Boulevard, Smyth Road, Industrial Avenue, Innes Road and Russell Road are all classified as 'spine routes' within the TMP. **Section 2.1.3.** discusses the future Ultimate Cycling Network.

Transit Network

The transit network for the study area is illustrated in **Figure 4**. The following OC Transpo routes currently operate within 600-meter radius of the site frontage:

- **Route #40 (St. Laurent <-> Greenboro/Hurdman)**: identified by OC Transpo as a "Frequent Route", this route operates at a frequency of every 15 minutes or less on weekdays and operates 7 days a week. Route #40 provides quick connection to the Confederation LRT Line at St. Laurent Station and provides connection to Elmvale Shopping Center. Bus stops for this route are available on both sides of St. Laurent Boulevard, approximately 100 to 230 meters from the site.
- **Route #42 (Blair <-> Hurdman)**: identified by OC Transpo as a "Local Route", this route operates on customized routing and schedules, to serve local destinations with connection to the Confederation LRT Line at Blair Station and Hurdman Station and provides connection to Trainyards Shopping. Route #42 operates at an average rate of every 15 minutes during weekdays. Bus stops for this route are available on both sides of Industrial Avenue and Innes Road, approximately 180 to 215 meters from the site.
- **Route #46 (Hurdman <-> Billings Bridge)**: identified by OC Transpo as a "Local Route", this route operates on customized routing and schedules, to serve local destinations with connection to the Confederation LRT Line at Hurdman and provides connection to the BRT Transitway at Billings Bridge. Route #46 operates at an average rate of every 30 minutes during weekdays. Bus stops for this route are available on both sides of Russell Road, approximately 450 meters from the site.

Figure 4: Area Transit Network



Source: https://www.octranspo.com/images/files/maps/systemmap.pdf

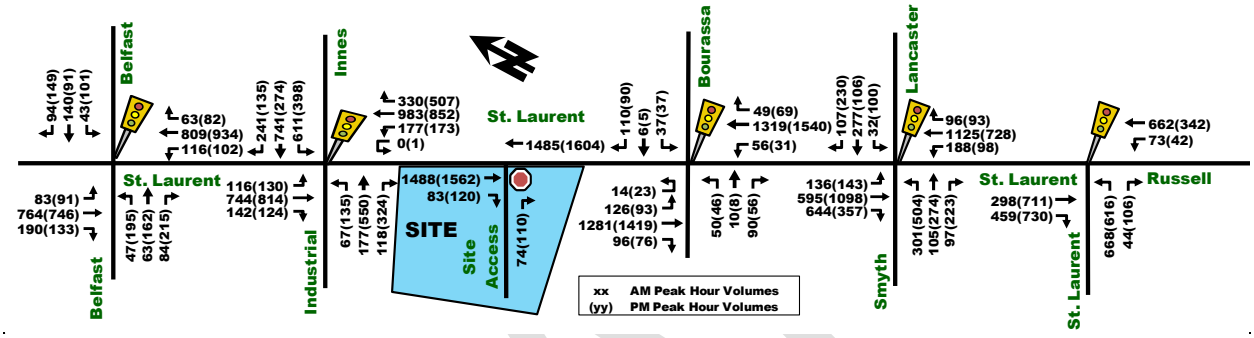
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Peak Hour Travel Demands

The existing peak hour traffic volumes within the study area are illustrated in **Figure 5** and pedestrian/cyclist volumes are illustrated in **Figure 6**, were obtained from the City of Ottawa. The peak hour traffic volume count data has been provided in **Appendix B**.

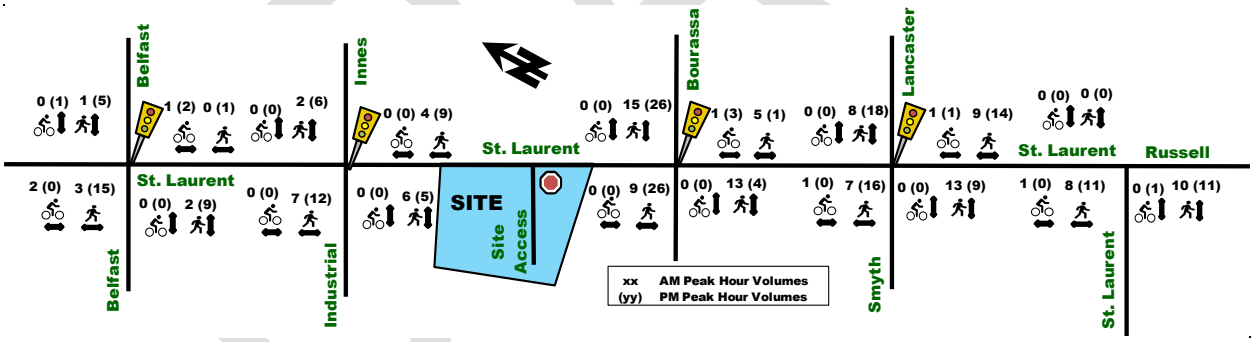
It is important to note that the data at the Industrial/St. Laurent and Bourassa/St. Laurent intersections reflect conditions after 2017 when the center median on St. Laurent Boulevard was built, eliminating full movement access to the site. Upon inspection of the counts, there is a notable number of U-turns on the southbound approach at Bourassa/St. Laurent, predominantly in the mid-day time period (~40 veh/h). Industrial/St. Laurent has very few U-turns by northbound vehicles. This is likely due to the size and complexity of the Industrial/St. Laurent intersection, and drivers choose to perform a different movement or simply forego their trip to the existing site location when approaching from the south on St. Laurent Boulevard.

Figure 5: Existing Peak Hour Traffic Volumes



Site Access/St. Laurent volumes derived from existing site uses, refer to Section 3.1

Figure 6: Existing Pedestrian/Cyclist Peak Hour Volumes



Existing Road Safety Conditions

A five-year collision history data (2014-2018, inclusive) was requested and obtained from the City of Ottawa for all intersections and road segments within the study area[1]. Upon analyzing the requested collision data, the total number of collisions observed within the broader study area was 539 collisions within the past five-years. The majority of the collisions 425 (79%) resulted in property damage only, and 114 (21%) resulted in non-fatal injury. The types of impact were broken down into the following: 267 (50%) rear end, 91 (17%) sideswipes, 90 (17%) turning movement, 58 (11%) angled, 25 (5%) single vehicle other, and 8 (1%) other.

To help quantify the relative safety risk at intersections within the study area, an industry standard unit of measure for assessing collisions at an intersection was used based on the number of collisions per million entering vehicles (MEV). An MEV value greater than 1.00 indicates a relatively high frequency of collisions; however, it does not explain the type or severity of collision. A secondary analysis is done to determine the

[1] Note that more recent 2019 data added to discussion at the end of this section.

severity of collision by representing the number of personal injuries as a percentage of the total number of collisions at a given intersection.

A high propensity (MEV > 1.00 or %PIR > 30%) would signal a potential intersection design deficiency or other contributing factor, such as poor intersection geometry, blind spots, poor lighting, excessive speeds, high amount of entry/exit driveways etc.

At intersections within the study area, reported collisions have historically taken place at a rate of:

- 1.32 Collisions/MEV with total of 141 collisions, 15% causing non-fatal injury at the intersection of Industrial/St. Laurent with 86 or 61% involving rear end, likely to do with the transition from a long un-interrupted road segment such as the north and east approaches of the intersection, horizontal road curvature on the west approach and high vehicle volumes. However, it should be noted that between 2017 and 2018, St. Laurent was improved to include smart channels, a double left-turn lane, dedicated transit lanes and removal of several median breaks. These improvements are not currently reflected in the traffic operations as it has not been enough time to evaluate the impacts it had on the number of collisions at this intersection.
- No collisions were recorded at the intersection of Site Access/St. Laurent
- 0.56 Collisions/MEV with 26% causing injury at the intersection of Bourassa/St. Laurent (total of 43 collisions with 11 of them involving injury. The majority of collisions, 21 or (49%), involved rear end. There were 3 collisions involving pedestrians at this intersection, all producing reportable injuries. Of the pedestrian injuries, 2 of 3 occurred during turning movements for vehicles heading westbound.
- 0.94 Collisions/MEV with 17% causing injury at the intersection of Smyth/St. Laurent (total of 81 collisions with 14 of them involving injury. The majority of collisions, 53 or (65%), involved rear end. This intersection has a mid to high propensity to collisions; however, they tend not to result in injury.
- 1.68 Collisions/MEV with 22% causing injury at the intersection of Belfast/St. Laurent (total of 111 collisions with 24 of them involving injury. 41 or (37%) involved rear end and 35 or (32%) involved turning movements. This intersection has a high propensity to collisions and a mid-range of them causing non-fatal injury. The majority of collisions causing non-fatal injury, involve rear ends and turning movements, indicating low collision speeds.
- 1.13 Collisions/MEV with 38% causing injury at the intersection of Russel/St. Laurent (total of 55 collisions with 21 of them involving non-fatal injury. 18 or (33%) involved turning movement, 15 or (27%) angle and 15 or (27%) involved rear end. This intersection has a high propensity to collisions and a high-range causing non-fatal injury. The majority of recorded non-fatal injury collisions involve angle and turning movement. It was also recorded that 2 collisions involved pedestrians.

Other collisions within the study area include:

- There was a total of 106 collisions between intersections (mid-block segments)
- The mid-block segment between Industrial Avenue and Bourassa Street on St. Laurent Boulevard, adjacent to the site, had more collisions than the mid-block segment between Bourassa Street and Smyth Road, with 39 (64%) versus 22 (36%) respectively. However, only 4 collisions, or 7% yielded injuries between Industrial and Bourassa, while 8 or 36% of the Bourassa and Smyth segment yielded injuries. All of the collisions resulting in non-fatal injury between Bourassa and Smyth resulted from rear end collisions, and 6 of 8 (75%) were headed southbound. 33 or (31%) of mid-block collisions occurred between Belfast Road and Industrial Road on St. Laurent Boulevard, with 21 (64%) of them involving rear ends. 12 (11%) of mid-block collisions occurred between Smyth Road and Russell Road.
- 3 collisions involved cyclists: one within mid-block segment between Industrial Avenue and Bourassa Street, one at the intersection of Industrial/St. Laurent, and one at the Russell/St. Laurent intersection.

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- There was a total of 9 non-fatal injury collisions involving pedestrians, 3 at the Bourassa/St. Laurent intersection, 1 at Belfast/St. Laurent intersection, 3 at Russell/St. Laurent intersection, 1 mid-block between Belfast Road and Industrial Road on St. Laurent Boulevard, and 1 between Smyth Road and Russell Road on St. Laurent Boulevard.

Supplemental data for year 2019 was obtained from Open Ottawa data platform to determine if any new trends are emerging on study area intersections. The total number of collisions data is available; however, the type and severity are unknown. Within the study area:

- Belfast/St. Laurent recorded 15 collisions in 2019, which is notably lower than the 5-year average of 22 collisions per year.
- Industrial/St. Laurent recorded 30 collisions in 2019, which is slightly higher to the 5-year average of 28 collisions per year.
- Bourassa/St. Laurent recorded 6 collisions in 2019, which is slightly lower to the 5-year average of 9 collisions per year. One of the 6 collisions in 2019 involved a cyclist at this location.
- Smyth/St. Laurent recorded 26 collisions in 2019, which is notably higher than the 5-year average of 16 collisions per year. It is possible that higher traffic using this intersection after the re-opening of the science museum nearby could be a source of the higher collision rate at this intersection.
- Russell/St. Laurent recorded 12 collisions in 2019, which is similar to the 5-year average of 11 collisions per year.
- St. Laurent between Industrial and Bourassa recorded 9 collisions in 2019, which is similar to the 5-year year average of 8 collisions per year. One of the 9 collisions in 2019 involved a cyclist at this location.

The source collision data as provided by the City of Ottawa and related analysis is provided as **Appendix C**.

2.1.3. Planned Conditions

Planned Study Area Transportation Network Changes

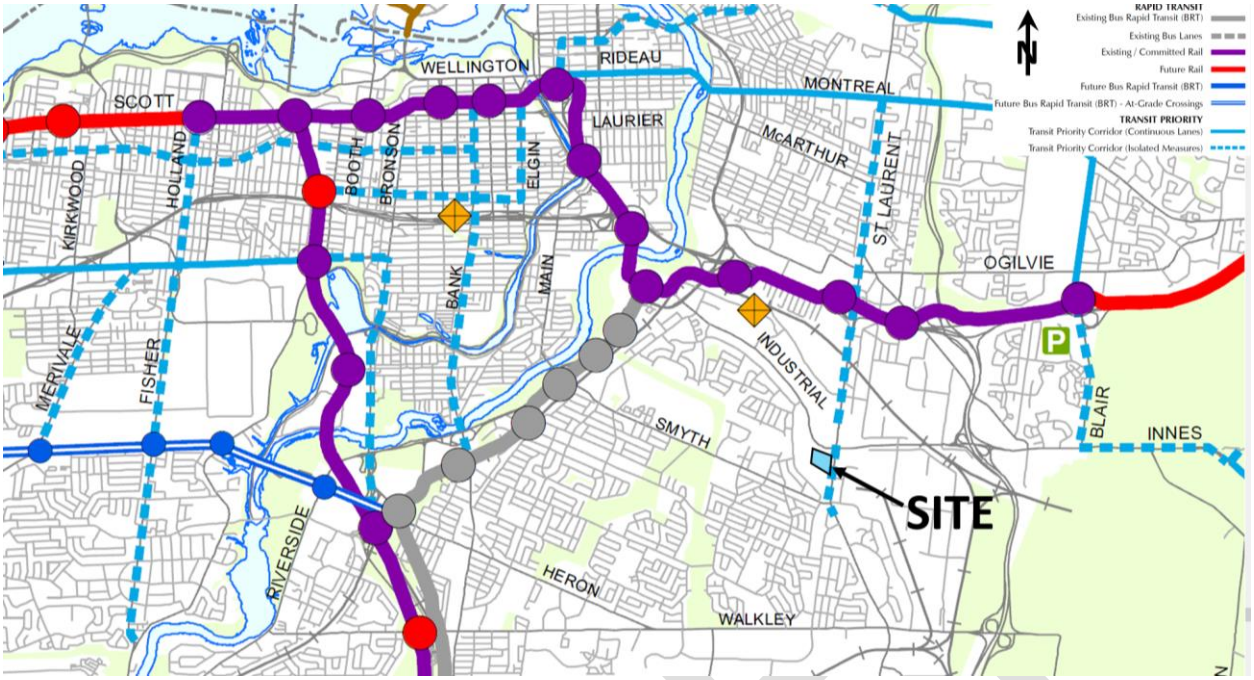
Transit Network

The 2031 Rapid Transit and Transit Priority Network – 2031 Affordable Network within the Transportation Master Plan 2013 suggests St. Laurent Boulevard as a 'transit priority corridor with isolated measures. This corridor extends from Montreal Road (planned continuous lane transit priority corridor) in the north to the Elmvale Shopping Center in the south.

Currently, transit lanes have been implemented between Industrial/St. Laurent to Smyth/St. Laurent heading southbound and transit lanes between Bourassa/St. Laurent and Industrial/St. Laurent heading northbound. It is anticipated that transit priority measures will be added elsewhere within the St. Laurent Boulevard Corridor over time. The transit priority corridor is anticipated to improve transit travel times between the site and the Confederation Line, as displayed in **Figure 7.**

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Figure 7: 2031 Affordable Network

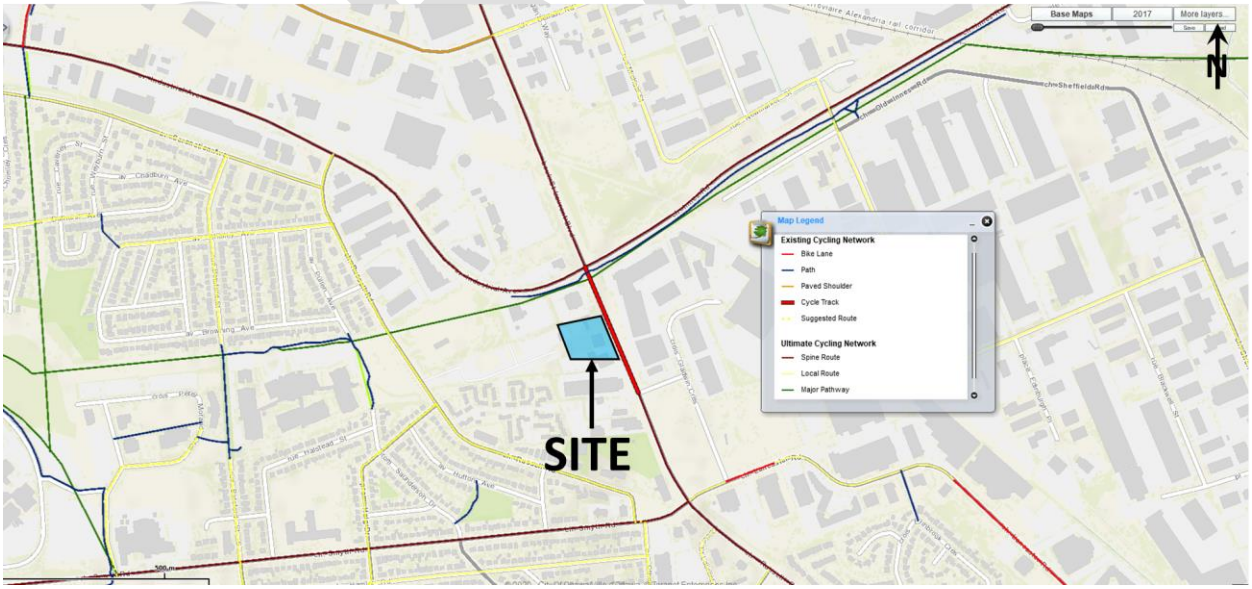


Source: Transportation Master Plan 2013 – 2031 Affordable Network

Cycling Network

Within the City of Ottawa Ultimate Cycling Plan, St. Laurent Boulevard, Smyth Road, Industrial Avenue and Innes Road are all classified 'spine routes' within the TMP. A future major pathway is proposed along Innes Road, connecting to the Alexandria Rail Corridor (to be converted to a MUP) and along the hydro network corridor to the west. Russell Road is classified as a local route and Lancaster Road is a local route that includes discontinuous bike lanes. **Figure 8** depicts the existing and future Ultimate Cycling Network.

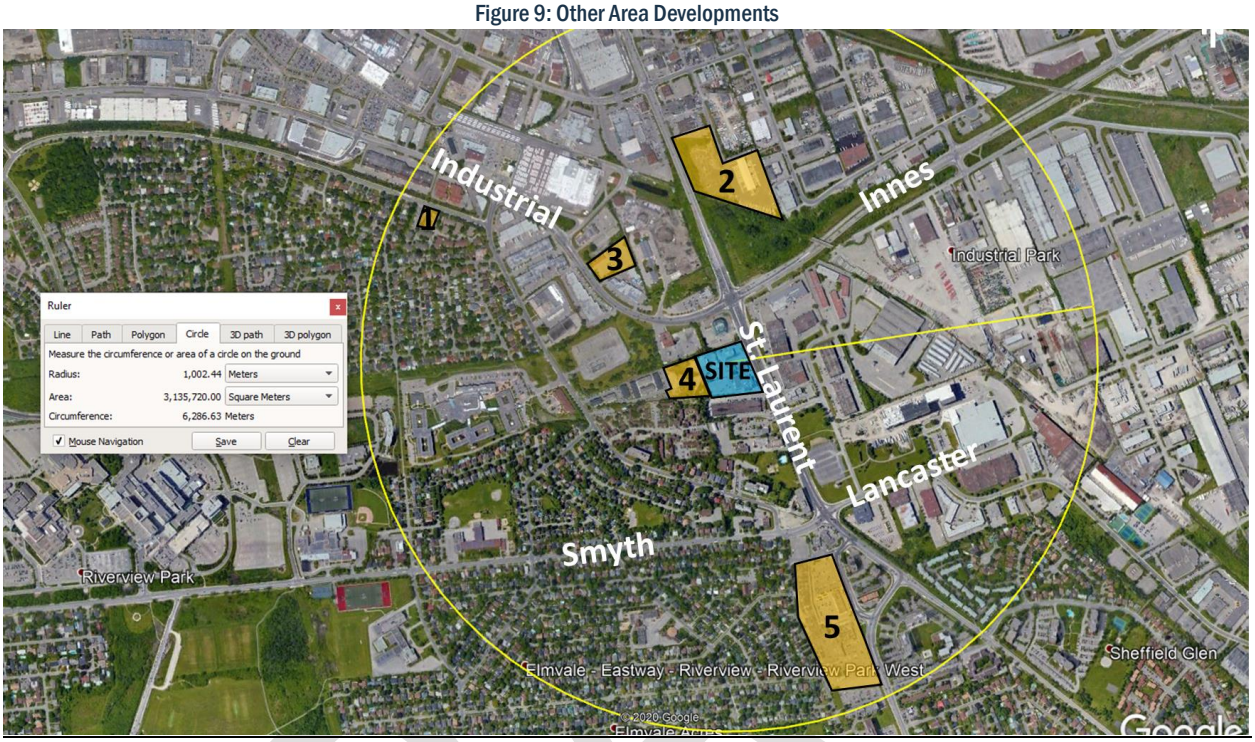
Figure 8: Existing and Future 'Ultimate Cycling Network"



Other Area Developments

The following section outlines adjacent developments in the general area that were considered in the TIA. The criteria for inclusion of other area developments are either approved developments or developments that have an active planning application in the City. **Figure 9** illustrates the location and relative size of relevant other area developments.

Figure 9: Other Area Developments



1 – 700 Coronation Avenue

The proposed development is a 4-storey residential building comprised of 35 units. No TIA report was found for this development.

2 – 1599 St. Laurent Boulevard

Reimer Properties is proposing the construction of a new truck transport terminal including a one-storey warehouse with 44 loading bays, 36 surface loading spaces and 28 employee surface parking spaces. The projected two-way vehicle trips according to a report written by IBI for this proposed development are approximately 175 total daily trips, with only about 15 veh/h during the AM and PM peak hours. Given the operating hours for the bulk of site generated trips and the limited trips during peak hours, it is not anticipated that this development will play a role in worsening traffic conditions.

3 – 851 Industrial Avenue

Dymon Storage has recently completed construction of a five-storey building consisting mainly of storage spaces and a small retail space. The development site is anticipated to generate a minimal number of person trips (less than 60 person trips during weekday peak hours). As such, this development is considered to have negligible effect on the road network within the study area.

4 – 355 / 374 Everest Private

Groupe Heafey is proposing to expand the existing residential developments by adding two 6 to 8 storey buildings consisting of approximately 293 residential units. The projected increase in two-way vehicle trips according to a report written by Parsons for this proposed residential development is approximately 85 to 90 veh/h during the AM and PM peak hours. Future volumes from this development will be layered on to background volumes.

5 – 1910 St. Laurent Boulevard

RioCan is proposing the multi-phased construction of four apartment building towers ranging from 9 to 26-storeys high and totaling 815 units by full buildout. The TIA written by Parsons projects an ultimate build out two-way vehicle trips of approximately 120 to 245 veh/h during the AM and PM peak hours. Future volumes from this development will be layered on to background volumes.

2.2. Study Area and Time Periods

Full buildout of the proposed mixed-use development is assumed to be 2024. Given that a full movement signalized intersection is assumed for both phases and conditions are anticipated to be similar, the horizon years being analyzed in this report are the more critical 2024 full buildout and 2029 (five years after full buildout) horizon years, using the weekday morning and afternoon peak hour time periods.

Proposed study area intersections and boundary roads are outlined below and highlighted in **Figure 10**.

- Industrial/St. Laurent intersection;
- Site Access/St. Laurent intersection;
- Bourassa/St. Laurent intersection;
- Russell/St. Laurent intersection;
- Smyth/St. Laurent intersection;
- Belfast/St. Laurent intersection; and,
- Along St. Laurent Boulevard adjacent to the site.

Figure 10: Study Area Boundaries and Intersections



2.3. Exemption Review

The following modules/elements of the TIA process recommended to be exempt in the subsequent steps of the TIA process, based on the City's TIA guidelines and the subject site:

Table 1: Exemptions Review Summary

Module	Element	Exemption Consideration
4.1 Development Design	4.1.3 New Streets Networks	Only required for plans of subdivision
4.2 Parking	4.2.2 Spillover Parking	Development anticipated to provide sufficient parking. This will be verified in Section 4.2.
4.6 Neighborhood Traffic Management	4.6.1 Adjacent Neighborhoods	Only required when development relies on local or collector streets for access. Driveway will have direct access to St. Laurent Boulevard (arterial)

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3. FORECASTING REPORT

3.1. Development-Generated Travel Demand

3.1.1. Trip Generation and Mode Shares

The existing site has four driveways all which currently operate as RIRO. Prior to 2017, the main access between the St. Hubert and Petro Canada had a full movement, unsignalized access (for which traffic data was gathered as part of the previous study). However, since this segment of St. Laurent Boulevard has significantly changed since that time, and the available traffic data does not include turning movements from the other three RIRO driveways, then new counts at all locations. Given the on-going COVID-19 pandemic, additional data collection yielding realistic values is not feasible. For this report, existing site land uses within the ITE Trip Generation Manual were used to estimate vehicle activity to/from the existing site, with all activity consolidated into 1a single driveway for simplicity. These vehicles will later be reduced from the network prior to adding the new site generated trips. The trip rates for existing land uses are summarized in **Table 2**.

Table 2: Existing Land Uses

Land Use	Size	Data Source	Trip Rates	
			AM Peak	PM Peak
Shopping Center[1]	15,500 ft²	ITE 820	T = 0.97(x)	T = 3.81(x)
High Turnover (Sit Down) Restaurant[2]	6,000 ft²	ITE 932	T = 9.94(x)	T = 9.77(x)
Gasoline/Service Station	8 pumps	ITE 944	T = 10.25(p)	T = 14.00(p)
Note: T = Average Vehicle Trip Ends, x = sq. ft commercial, p = number of pumps *1). Trip rates for Shopping Center are based on an average rate and not the fitted curve due to site size vs average study size* *2). Saint Hubert Restaurant which includes drive-thru*				

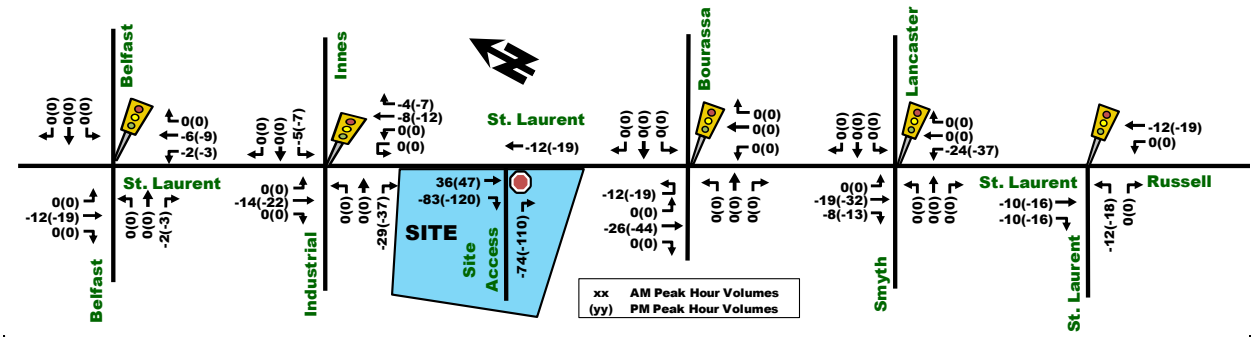
Based on the vehicle trip generation rates shown above, the existing trips to and from site can be calculated as shown in **Table 3**.

Table 3: Estimated Existing Trip Generation

Land Use	'New' Trips	AM Peak (veh/h)			PM Peak (veh/h)		
		In	Out	Total	In	Out	Total
Shopping Center	Auto Trips Generated	9	6	15	28	31	59
	Less Pass-By (-35% PM)	*0*	*0*	*0*	*-10*	*-10*	*-20*
High Turnover (Sit Down) Restaurant	Auto Trips Generated	33	27	60	36	23	59
	Less Pass-By (-40% AM -43% PM)	*-12*	*-12*	*-24*	*-13*	*-13*	*-26*
Gasoline/Service Station	Auto Trips Generated	41	41	82	56	56	112
	Less Pass-By (-58% AM -42% PM)	*-24*	*-24*	*-48*	*-24*	*-24*	*-48*
Total Auto Trips to be Removed		**47**	**38**	**85**	**73**	**63**	**136**

The estimated existing trips were then assigned to the consolidated site driveway as seen in **Figure 11** to estimate the existing performance of the Site Access/St. Laurent, and subsequently removed from the network as they will be replaced by new trips generated as discussed below.

Figure 11: Estimated Existing Site Traffic to be Removed



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As mentioned in **Section 2**, a consolidated full buildout phase only will be analyzed. Future trip generation rates for the proposed residential segment of the development consisting of approximately 672 high-rise apartment units were obtained from the City's 2009 TRANS Trip Generation – Residential Trip Rates Report[2], whereas the ITE Trip Generation Manual was used as the basis for the commercial component. These rates are summarized in **Table 4**. For the purpose of this study, since the commercial segment is unknown at this time, it was assumed to be a small shopping center similar to the uses across the street on St. Laurent Boulevard (1705 – 1755 St. Laurent Boulevard). Given that the average size of a shopping center for ITE is 351,000 ft^2 and this development is only 31,127 ft^2 of commercial, the average rate for shopping centers similar in size to the proposed one was used rather than the fitted curve which accounts for all sized shopping centers and is not very reflective of smaller ones.

Table 4: Future Trip Generation Rates

Land Use	Size	Data Source	Trip Rates	
			AM Peak	PM Peak
High Rise Apartments	672 Units	TRANS 222	T = 0.24(du)	T = 0.27(du)
Shopping Center$_1$	25,127 ft^2	ITE 820	T = 0.96(x)	T = 3.82(x)
High Turnover (Sit Down) Restaurant$_2$	6,000 ft^2	ITE 932	T = 9.94(x)	T = 9.77(x)
Note: T = Average Vehicle Trip Ends; du = dwelling units, x = sq. ft commercial *1). Trip rates for Shopping Center are based on an average rate and not the fitted curve* *2). Assumes that the Saint Hubert restaurant with drive-thru is to be relocated within tower 1*				

Using the TRANS Trip Generation rates, the total amount of vehicle trips generated by the proposed 672 residential units was calculated. The results are summarized in **Table 5**.

Table 5: Projected Residential Vehicle Trip Generation – TRANS Model

Land Use	Area	AM Peak (Veh/h)			PM Peak (Veh/h)		
		In	Out	Total	In	Out	Total
High-Rise Apartments	672 units	38	123	161	139	42	181

As shown in **Table 5**, a total of 160 and 180 veh/h are projected to travel to/from the proposed development for the residential aspect of the development during the weekday morning and afternoon commuter peak hours. Using the TRANS Auto Trips projected in **Table 5** and the mode share percentages in the TRANS Trip Generation Report (Table 3.13), the total projected number of person trips by mode for the residential segment of the development are summarized in **Table 6**. The 'person trip generation' for the development was then converted to 'vehicle trip generation' using mode shares extrapolated from the OD-Survey 2011 for the Alta Vista District and are summarized in **Table 7.**

Table 6: Projected Residential Generation – Person Trip Derivation

Travel Mode	Mode Share	AM Peak (trips per mode/h)			Mode Share	PM Peak (trips per mode/h)		
		In	Out	Total		In	Out	Total
Auto Driver	37%	38	123	161	40%	139	42	181
Auto Passenger	8%	8	26	34	9%	31	9	40
Transit	41%	42	137	179	37%	129	39	168
Non-motorized	14%	14	47	61	14%	49	15	64
Total Person Trips	**100%**	**102**	**333**	**435**	**100%**	**348**	**105**	**453**

Table 7: Projected Residential Generation – Vehicle Trip Derivation

Travel Mode	AM Mode Share	AM Peak (trips per mode/h)			PM Mode Share	PM Peak (trips per mode/h)		
		In	Out	Total		In	Out	Total
Auto Driver	55%	57	183	240	60%	208	63	271
Auto Passenger	15%	16	49	65	15%	52	16	68
Transit	20%	20	67	87	15%	52	16	68
Non-motorized	10%	10	33	43	10%	35	11	46
Total People Trips	**100%**	103	332	435	**100%**	347	106	453
Total 'New' Auto Trips		**57**	**183**	**240**	-	**208**	**63**	**271**

[2] It is acknowledged that an updated version of the TRANS Trip Generation Manual is now available (dated October 21, 2020).

The commercial segment of the development was calculated using the ITE Trip Generation Manual based on the development size and equations provided in **Table 4**. The mode shares for the commercial aspect are relatively similar to the existing mode shares for the Alta Vista District based on the OD-Survey conducted in 2011 with a slight increase in non-motorized trips and reduction in transit trips to account for surrounding neighborhood trips. The future projected trips generated for the commercial segment are provided in **Table 8**.

Table 8: Projected Commercial Trip Generation

Travel Mode	AM Mode Share[1]	AM Peak (trips per mode/h)			PM Mode Share[1]	PM Peak (trips per mode/h)		
		In	Out	Total		In	Out	Total
Auto Driver Total	55-70%	48	36	84	55-70%	82	73	155
Auto Driver Shopping	*55%*	*15*	*9*	*24*	*55%*	*46*	*50*	*96*
Auto Driver Restaurant	*70%*	*33*	*27*	*60*	*70%*	*36*	*23*	*59*
Auto Passenger	15%	11	9	20	15%	20	19	39
Transit	5-15%	6	4	10	5-15%	14	14	28
Non-motorized	10-15%	7	5	12	10-15%	17	16	33
Total People Trips	**100%**	**72**	**54**	**126**	100%	**133**	**122**	**255**
Less Pass-by Shopping	*0%*	0	0	0	*-35%*	-17	-17	-34
Less Pass-by Restaurant	*-40%*	-12	-12	-24	*-43%*	-13	-13	-26
Total 'New' Auto Trips		**36**	**24**	**60**	-	**52**	**43**	**95**

*1.) Mode shares are approximate as slightly different values were used for the different land uses. Refer to **Appendix D** for more detail.*

Based on the summation of **Table 7** and **Table 8**, an approximate 300 and 365 'new' two-way vehicle trips are projected for the proposed site assuming the existing mode shares for the Alta Vista District. Given the site context, refinements to the modal share assumptions are recommended and will be analyzed below.

Refined Modal Share Assumptions

Given the location of the site, near frequent bus route #40 and rapid transit corridor with isolated measures, close proximity via bus to major LRT Station at St. Laurent and close to southbound connecting Elmvale Station, a higher transit modal share is considered appropriate. Full TOD targets were not assumed as the site is not located within 600 meters walking distance to a major LRT Station, but some increase in transit and decrease in the auto mode can be anticipated due to the better than average transit availability near site compared to the greater Alta Vista District. **Table 9** illustrates future customized modal shares which reflect the site's likelier modal share based on its location within Alta Vista. Note that the custom modal shares are for residential only. It is assumed that commercial trips will remain as proposed in **Table 8**.

Table 9: Modified Modal Share Targets for Proposed Development – Residential Aspect

Travel Mode	Mode Share Target	Rationale
Transit	30%	Increase in transit from 20% for Alta Vista to 30% given the close proximity to the St. Laurent Transit Priority Corridor with isolated measures and close connectivity to St. Laurent LRT Station
Walking	5%	This is consistent with existing walking mode shares.
Biking	5%	This is consistent with existing cycling mode shares.
Auto Passenger	15%	This is consistent with existing auto passenger mode shares.
Auto Driver	45%	Decrease in auto driver from 55% to 45% to account for likelier transit users due to the location of the site relative to transit facilities.

Based on the future mode share targets for this development, the project site-generated person trips for the residential segment are outlined in **Table 10**.

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Table 10: Modified Projected Residential Trip Generation

Travel Mode	Mode Share	AM Peak (trips per mode/h)			PM Peak (trips per mode/h)		
		In	Out	Total	In	Out	Total
Auto Driver	45%	47	149	196	156	47	203
Auto Passenger	15%	16	49	65	52	16	68
Transit	30%	31	99	130	104	32	136
Walk	5%	5	17	22	18	6	23
Bike	5%	5	17	22	17	5	23
Total Person Trips	**100%**	104	331	435	347	106	453
Total 'New' Auto Trips		**47**	**149**	**196**	**156**	**47**	**203**

The future projected residential site generated trips from **Table 10** were summed with commercial site generated trips from **Table 8** to produce the total site generated trips as seen in **Table 11**.

Table 11: Total Site Generated Trips – Commercial and Residential Combined

Travel Mode	AM Peak (trips per mode/h)			PM Peak (trips per mode/h)		
	In	Out	Total	In	Out	Total
Auto Driver	95	185	280	238	120	358
Auto Passenger	27	58	85	72	35	107
Transit	37	103	140	118	46	164
Walk	9	20	29	26	13	39
Bike	8	19	27	26	14	40
Total People Trips	**176**	**385**	**561**	**480**	**228**	**708**
Less Pass-by Combined	-12	-12	-24	-30	-30	-60
Less Internalization Reduction (-5%)	-9	-19	-28	-24	-11	-35
Total 'New' Auto Trips	**74**	**154**	**228**	**184**	**79**	**263**

As seen in **Table 11**, the combined commercial and residential site generated trips at full buildout are projected to be approximately 230 and 260 'new' two-way vehicle trips in the AM and PM peaks respectively. New two-way transit trips are projected at 140 and 165 trips, walk trips projected at 30 and 40, and cycling trips projected at 25 and 40 people trips during the AM and PM peak hours respectively.

3.1.2. Trip Distribution

Based on the OD Mode Share Survey, existing traffic volume counts and the location of adjacent arterial roadways and neighborhoods, the distribution of site-generated traffic volumes is as follows:

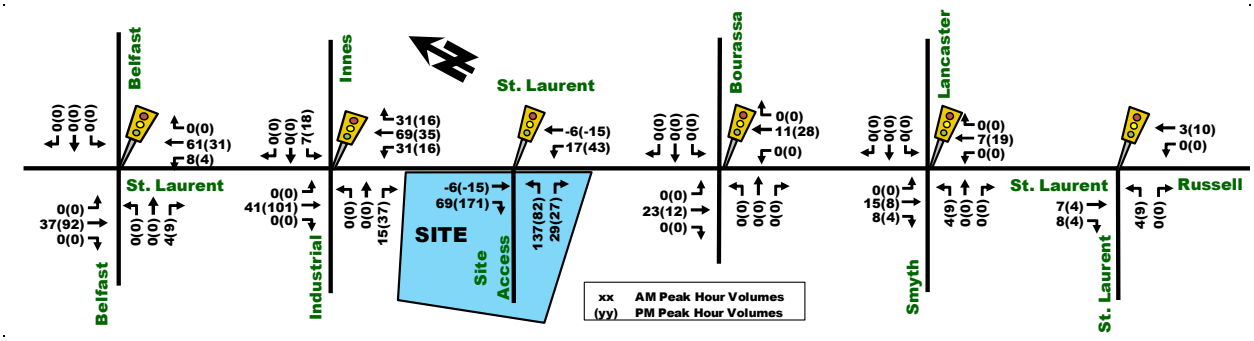
- 15% to/from the east;
- 15% to/from the south;
- 25% to/from the west; and
- 45% to/from the north.

3.1.3. Trip Assignment

A full movement driveway with a new traffic signal control connection to St. Laurent Boulevard is proposed to serve the subject development. This driveway is proposed slightly south of the existing RIRO that serves Petro-Canada and St. Hubert Restaurant, approximately 150 meters south of St. Laurent Boulevard. The 'new' site-generated vehicle trips, including pass-by trips outlined in **Table 10,** were assigned to the study area network and are illustrated as **Figure 12**. The RIRO on the southern quadrant of the site is assumed as a garbage pick-up only or very low use. Note that negative numbers reflect pass-by trips.

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Figure 12: 'New' Site-Generated Traffic



3.2. Background Network Travel Demands

3.2.1. Transportation Network Plans

As mentioned in **Section 2.1.3** Planned Conditions, St. Laurent Boulevard is designated as a 'transit priority corridor with isolated measures' from Montreal Road to Elmvale Shopping Center within the 2031 Affordable Network. Though no design is currently available, there is the potential that segments of St. Laurent Boulevard that have not received transit retrofits yet could be upgraded to provide better transit service within the corridor (segments adjacent to the site were retrofitted around 2017). Cycling improvements are also anticipated as discussed in **Section 2.1.3**.

3.2.2. Background Growth

The emphasis in the City's recent Official Plan and Transportation Master Plan is to place priority on transit, encourage intensification around transit stations, encourage mixed-use developments and provide "complete streets" that better accommodate the active transportation needs of its residents and reduce the use of the private auto. Given the location of the site near frequent bus service within the St. Laurent transit priority corridor, close bus connectivity to the LRT Confederation Line and Elmvale Mall, the trips generated from this development as well as nearby developments will likely choose alternate modes of transportation over driving as transit infrastructure improves.

The following background traffic growth (summarized in **Table 12**) was calculated based on historical traffic count data (years 2001, 2009, 2014, 2016 and 2020) provided by the City of Ottawa at the Smyth/St. Laurent intersection near the site. Note that the year 2012 was omitted as counts were almost double any other year count and it was considered an anomaly year or miscount. Detailed background traffic growth analysis is included as **Appendix E**.

Table 12: Smyth/St. Laurent Historical Background Growth (2001-2020)

Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	-0.17%	-0.13%	1.66%	0.47%	0.17%
AM Peak	-0.24%	0.00%	1.77%	0.52%	0.23%
PM Peak	-0.48%	-0.42%	1.53%	0.33%	-0.06%

As shown in **Table 12**, the Smyth/St. Laurent intersection, has experienced between 0.25% to 0% overall annual growth in traffic within recent years. A conservative growth rate of 1% annually will be added to background growth to account for future potential growth to the south and surrounding areas.

3.2.3. Other Developments

The volumes from the other area development as mentioned in **Section 2.1.3** were layered onto the existing traffic volumes for the future analysis volumes. **Figure 13** and **Figure 14** outlines the site generated volumes for 1910 St. Laurent development and 355-374 Everest development respectively.

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Figure 13: 1910 St. Laurent Blvd Background Volumes

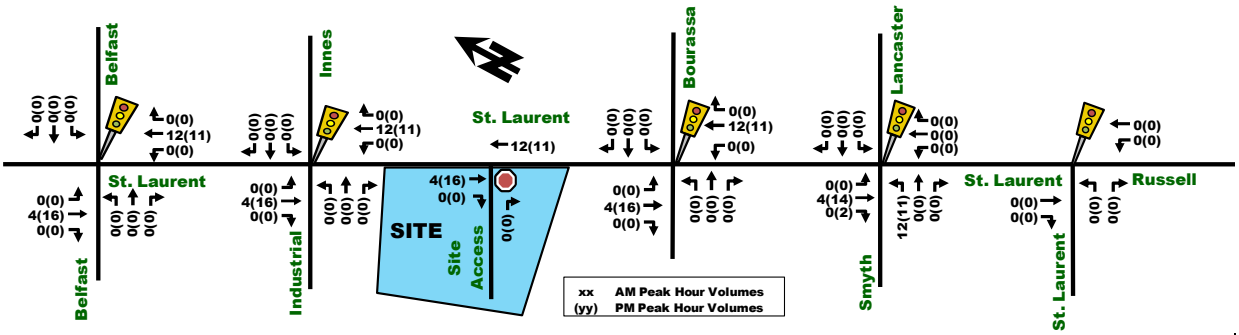
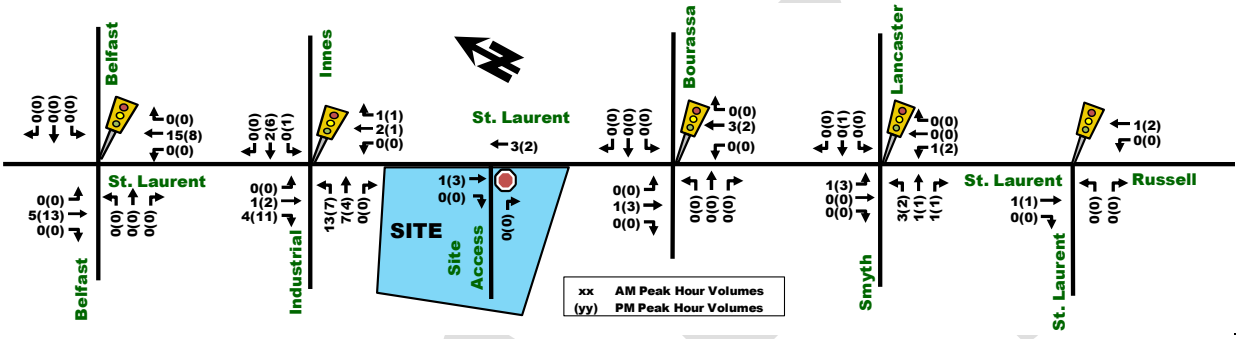


Figure 14: 355-374 Everest Background Volumes



3.3. Demand Rationalization

Figure 15 and **Figure 16** display the total projected volumes for the horizon years 2024 and 2029, respectively. The volumes shown, include the projected site trip generation, other proposed development volumes and the anticipated 1% background growth volumes.

Figure 15: 2024 Future Total Projected Traffic Volumes

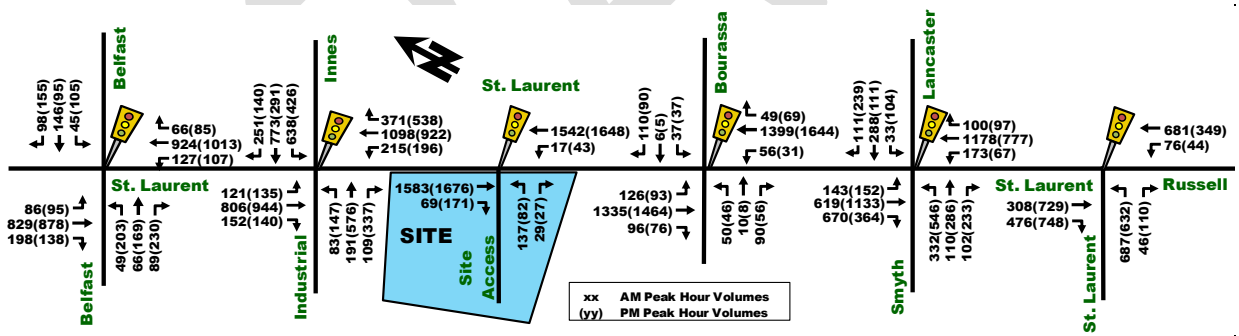
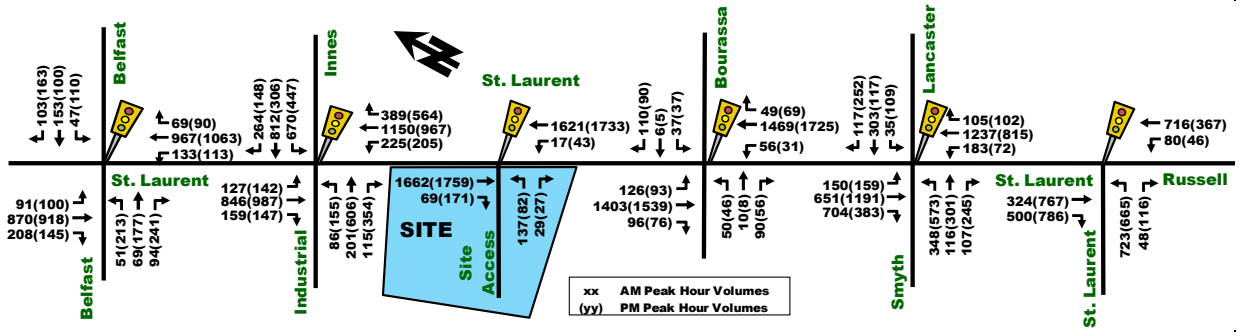


Figure 16: 2029 Future Total Projected Traffic Volumes



4. STRATEGY REPORT

4.1. Development Design

At this time, a detailed Site Plan has not been developed that provides specifics with respect to several important on-site elements, including for example bicycle parking, underground parking circulation/layout, etc. The ensuing review of the development design is therefore limited to a high-level discussion.

4.1.1. Design for Sustainable Modes

Location of Transit Facilities

The subject site is located approximately 100 to 175 meters walking distance to the existing bus stops located on St. Laurent Boulevard for route #40. Additional bus stops include Innes Road for route #42 located approximate 180 to 215 meters away and Russell Road for route #46 approximately 450 meters away. Within the City of Ottawa TMP Affordable Network, St. Laurent Boulevard is proposed to be upgraded to a 'transit priority corridor with isolated measures', which should improve travel times for route #40 going to and from site to St. Laurent Shopping Center where there is connectivity to the Confederation LRT Line.

Pedestrian/Cycling Routes and Facilities

All proposed buildings will have direct pedestrian and cycling access to St. Laurent Boulevard via internal sidewalks and paths. The private driveway access to the buildings will bisect the site in two, with two towers per side of the road. All buildings have entrances that link directly to the central private road which will have sidewalks on both sides of the road. Currently there are sidewalks on both side of St. Laurent Boulevard.

Bicycle Parking

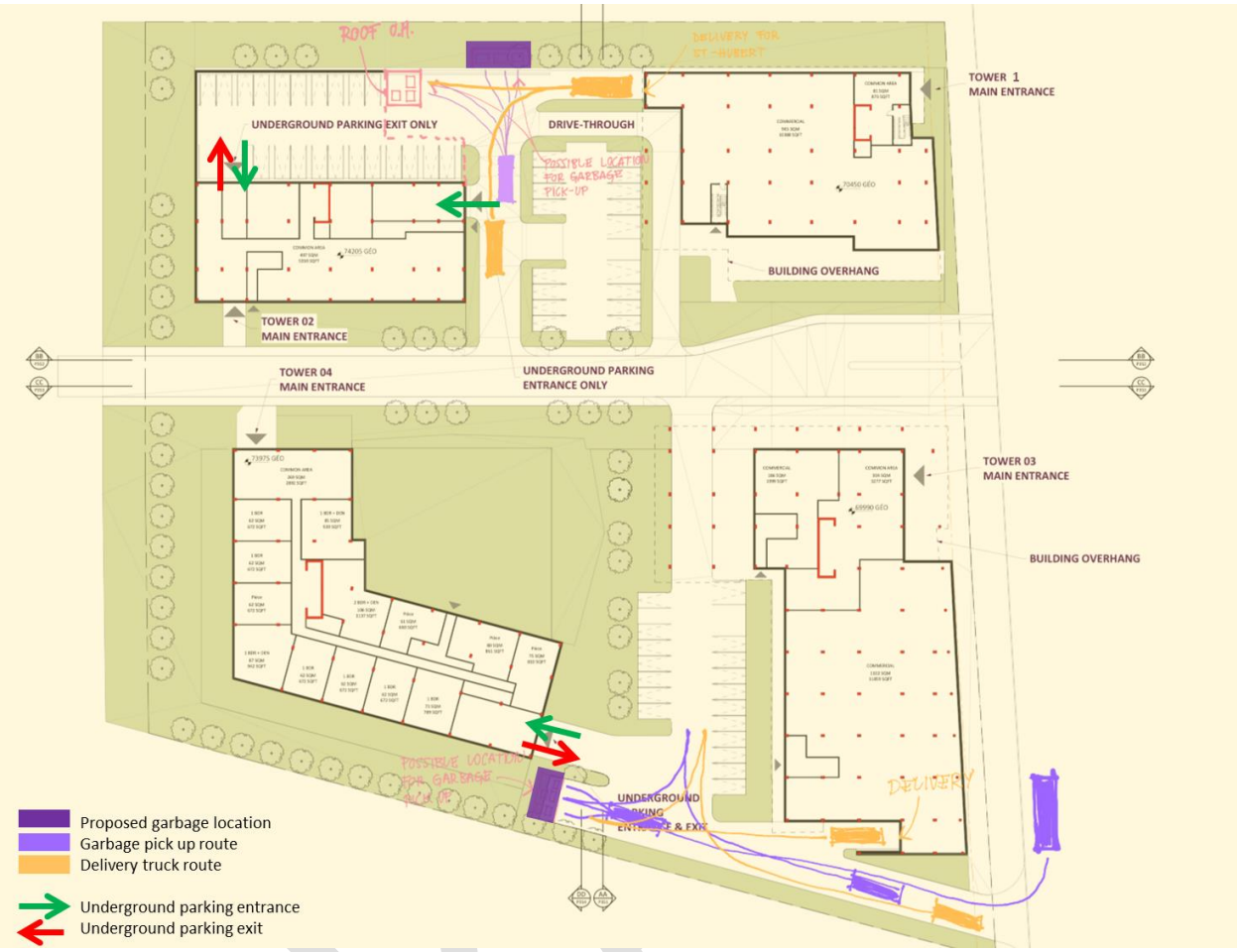
Bicycle parking is currently proposed predominantly underground within the parking structures, located in near each of the elevator blocks for each tower, stored indoors in well-lit areas. Residents will have easy access between the bike storage rooms and the elevator shafts which have access to the main entrances and ground floor. Some outdoor bike parking spaces are also proposed, to serve visitors and commercial patron parking, however, the location has not been finalized yet. The main entrances for the Towers connect to the main full movement driveway which provides connectivity to Everest Private to the west and St. Laurent Boulevard cycle facilities to the east.

4.1.2. Circulation and Access

It is understood that vehicular access to the proposed development, the surface and underground parking will be provided via a private roadway located off St. Laurent Boulevard along the east frontage of the site. The intersection between St. Laurent Boulevard and the site access is proposed a full movement signalized intersection. A drive-thru facility is proposed as a counter-clockwise loop with a roof structure overhang pertaining to Tower 1. The underground parking garage is split into two structures: the north structure which services Towers 1 and 2 is accessed through a unidirectional entry ramp located on the east side of Tower 2 with an additional bi-directional entry and exit ramp located on the north side of Tower 2; the south structure which services Towers 3 and 4 is accessed through a ramp located on the east side of Tower 4 and functions as both entrance and exit ramp as shown conceptually in **Figure 17**.

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Figure 17: Garage Accesses and Garbage Pick Up



Garbage pick-up will take place on ground floor directly north of the Tower 1 and 2 drive isle and also at the end of the right-in right-out roadway on the southern quadrant, adjacent to Tower 4.

4.1.3. New Streets Network

Exempt. See **Table 1**.

4.2. Parking

4.2.1. Parking Supply

According to Part 4 – Parking, Queueing and Loading Provisions for the City of Ottawa By-Laws, the site is located in Area B based on Schedule 1, Area B in Schedule 1A and is not within Rapid Transit Stations within Schedule 2B. **Table 13** summarizes the vehicle parking minimum and maximums allowed within the parking by-law. **Table 14** summarizes the bicycle parking requirements as per City of Ottawa Zoning By-Law-Part 4, sections 100-114.

Table 13: Proposed Vehicle Parking Space Supply

Land Use		Rate per Unit/Size		Required Vehicle Spaces			Proposed Spaces
		Base	Visitor	Base	Visitor	Min. Req.	
Residential	672 Units	0.5 per unit[1]	0.2 per unit[1]	330	132	462	670
Shopping Center	2,334 m²	3.4 per 100 m²	-	79	-	79	
High Turnover Restaurant	557 m²	See notes[2]	-	53	-	53	
			Totals	462	132	594	Meets mins.

1.) First 12 units are exempt 2.) 3 per first 50 m² and 10 per each 100 m² subsequent for fast food GFA

Table 14: Bicycle Parking Requirements

Land Use		Rate per Unit/Size	Required Bicycle Spaces	Proposed Spaces
Residential	672 Units	0.5 per unit	336	Unknown
Commercial	2,891 m²	1 per 250 m²	12	
		Totals	348	

Discussions with the developer suggests a total of approximately 670 parking spaces, with approximately 70 being above ground and catered to commercial visitors while the remaining 600 are proposed underground. Towers 1 and 2 will share a 2-storey underground parking lot accessed on the east side of Tower 2 while Towers 3 and 4 will share a different 2-storey underground parking lot accessed on the south-east corner of Tower 4 (refer to **Figure 17** for more detail). It is anticipated that peak demand for commercial parking will occur at different times to residential visitor parking, allowing for the potential of shared parking. The proposed number of parking spaces is between the minimum and maximum City of Ottawa Parking Guidelines.

The bicycle parking by-laws suggest that 348 parking spaces are required. At the moment, the exact number of bike parking to be provided has not been finalized, but it is understood that the minimum requirement of bike parking will be met.

4.2.2. Spillover Parking

Exempt. See table **Table 1**.

4.3. Boundary Street Design

4.3.1. Existing Conditions

The boundary street for the development is St. Laurent Boulevard. The existing roadway geometries consist of the following features:

- *St. Laurent Boulevard:*
  - 2 vehicle and 1 bus travel lanes in each direction;
  - 2m sidewalk with 2m bike lane buffer on both sides of roadway;
  - Additional boulevard style buffer on east side of roadway;
  - More than 3,000 vehicles per day;
  - Posted speed limit is 70km/h;
  - Classified as major arterial roadway and identified as a trucking route; and,
  - Identified as a spine route and major pathway for cycling.

The proposed site is located within St. Laurent Boulevard Arterial Mainstreet segment. Multi-modal Level of Service (MMLOS) analysis for the subject road segments adjacent to the site is summarized in **Table 15** with detail analysis provided in **Appendix F**.

Table 15: MMLOS – Boundary Street Segment Existing

Road Segment	Multi-Modal Level of Service							
	Pedestrian		Bicycle		Transit		Truck	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target
St. Laurent Blvd – west side between Industrial Ave. & Bourassa Street	D	C	A	C	B	D	A	D
St. Laurent Blvd – east side between Industrial Ave. & Bourassa Street	D	C	A	C	B	D	A	D

<u>Pedestrian</u>

- ***Both sides of St. Laurent Boulevard*** do not meet pedestrian PLoS due high vehicle operating speeds. Since providing a sidewalk of greater than 2 meters wide with a 2-meter boulevard is already in place, the only remaining mitigation would be reducing speeds from 70km/h to 50-60km/h or reducing daily curb volumes to below 3,000 vehicles a day, both which are very unlikely to occur due to the roadway's function and classification.

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Bicycle

- *Both sides of St. Laurent Boulevard* meet cyclist BLoS.

Transit

- *Both sides of St. Laurent Boulevard* meet transit TLoS targets.

Truck

- *Both sides of St. Laurent Boulevard* meet trucking route TkLoS targets.

4.3.2. Future Conditions

Although the existing intersection will be modified from a right-in right-out only, the road segments adjacent to the site will continue to operate the same as existing.

4.4. Access Intersection Design

There have been ongoing discussions with City staff regarding a fully movement signalized intersection for the site. Within one of the most recent briefings, the City of Ottawa indicated that three conditions be met for a signalized intersection to be considered. These conditions include:

1. There must be a fully protected left-turn lane developed into the site (NBL)
2. The traffic signals must be installed as far south as possible, away from Industrial/St. Laurent
3. The accesses for this development must be consolidated (currently 4 RIRO accesses within the site)

The intent of the ensuing section is to demonstrate the extent to which these conditions have been satisfied.

4.4.1. Location and Design of Access

The proposed access to the site includes a main driveway connecting to St. Laurent Boulevard which has smaller internal roads connecting to the drive-thru under Tower 1, access to surface parking and underground parking ramps. The main driveway is located slightly south of the existing driveway that services Petro-Canada and St. Hubert Diner, located approximately 135 meters south of Industrial/St. Laurent.

The main site access driveway aligns with Everest Private to the west, which provides connectivity to Russell Road. However, large concrete cinderblocks on Everest Private restrict vehicular access between Russell Road and St. Laurent Boulevard as a condition of site development, and therefore it is very unlikely that this configuration will change. This proposed access is located just north of the existing shopping center RIRO access across the street.

Just south of the existing shopping center RIRO access across the street, and at the southernmost extent of the site, there's a secondary minor access proposed as a RIRO. This access is predominantly envisioned as a commercial truck delivery access and garbage truck access, as illustrated in **Figure 17**.

4.4.2. Intersection Control

The current access to the site operates as an unsignalized STOP-control on the minor right-in right-out intersection. As part of this development, the intersection is proposed to be upgraded to a full movement access with traffic signal control.

A traffic signal warrant analysis was completed, and it did not trigger the need for a traffic signal, with 73% of the required 100% needed to trigger the warrant. The addition of approximately 35% more forecasted outbound left-turning vehicles from the site (approximately 80 more eastbound left-turning vehicles in the AM, PM or a combination of both totaling 80) would satisfy the signal warrant. It is possible that by moving the intersection further south to align with the RIRO on the east side of St. Laurent Boulevard (strip mall at 1705 St. Laurent), or moving the strip mall's access further north to match the site's access, that traffic volumes would be high enough to satisfy the warrant for traffic signal, albeit performance may be jeopardized as a result of the additional traffic to/from the east leg[3]. It is understood that if a traffic signal is not warranted, that the developer is responsible

[3] Turning movement data for this driveway on the east side of St. Laurent Boulevard are not currently available to formally complete the analysis.

for the traffic signal construction costs and future maintenance costs until a traffic signal warrant is 100% met. The warrant has been provided in **Appendix G**.

The new signalized access would be approximately 150 meters south of the signalized Industrial/St. Laurent intersection and approximately 160 meters north of the signalized Bourassa/St. Laurent intersection. According to the City of Ottawa Private Approach By-Law Section 25, if a site has more than 300 parking spaces, a minimum distance between the private approach and signalized intersection is 75 meters. Given that both neighboring intersections are further than 75 meters away, this new signalized intersection would meet the minimum by-law requirements.

4.4.3. Intersection Design

Northbound left-turning vehicles would be required to cross 3 opposing traffic lanes and a cycle facility, triggering the need for a fully protected phase. In order to create a fully protected phase without interfering with northbound through traffic, an auxiliary turn lane will be required. The nominal storage length for left turns should be 38 meters or more. It is possible that a southbound right-turn lane may be required based on queues. This will be further analyzed in **Section 4.9.2.** based on Synchro queueing information.

Included in **Appendix H** is the draft Functional Design Drawing for the proposed signalized intersection.

4.5. Transportation Demand Management

4.5.1. Context for TDM

Based on the type of development, it is assumed that most trips generated by the proposed site will be residents leaving the site in the AM peak to go to work and returning from work to the proposed site in the PM peak. Sections 3.1.1 and 3.1.2 describe how many trips are anticipated per travel mode and anticipates the likely locations that they will travel to and from based on the OD-Survey 2011 for Ottawa. The site is not located within 600 meters of rapid transit; however, it is located in a transit priority corridor with isolated measures.

4.5.2. Need and Opportunity

Since the development is located in a transit priority corridor with isolated measures, measures to provide sustainable active mode shares are encouraged. Such measures are described in more detail in Section 4.5.3 below, but can include reduced parking, more aggressive Multi-Modal Levels of Service (MMLOS) as described in Section 4.3 and 4.9 and safe and efficient connectivity to public transit as described in Section 4.7, to name a few.

4.5.3. TDM Program

The TDM infrastructure checklist and TDM Measures are attached as **Appendix I**.

Regarding the TDM Supportive Development Design and Infrastructure Checklist:

- All ten (10) Required measures related to Walking and Cycling (facilities and bicycle parking) and Vehicle Parking have been satisfied
- At least nine (9) of fourteen (14) Basic measures related to Walking and Cycling, Transit, Ridesharing and Parking have been satisfied or are not applicable
- Two (2) of the of the seven (7) candidate Better measures are also proposed or are non-applicable, namely:
    - Separate long-term and short-term parking areas

Regarding the TDM Measures Checklist, the developer has indicated there is a willingness to consider the following measures:

- Designate a TDM program coordinator
- Display walking and cycling information at major entrances
- Display transit information at major entrances
- Unbundle parking costs from monthly rent; and

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4.6. Neighborhood Traffic Management

4.6.1. Adjacent Neighborhoods

This section is technically exempt as the access driveway will operate as a private approach driveway given that there will be no connectivity to the local roadway just west of the site, Everest Private.

4.7. Transit

4.7.1. Route Capacity

With less than 200 'new' two-way transit passenger trips per hour generated for the AM and PM peak hours, it is not anticipated that this development will place buses at capacity. Given the transit priority isolated measures planned for St. Laurent Boulevard, it is anticipated that the future transit network will have sufficient capacity to accommodate the subject development transit demand[4]. Additionally, added capacity is available on local bus routes on Russell Road and Industrial Avenue.

4.7.2. Transit Priority

Given that the site proposes a new signalized intersection at Site Access/St. Laurent, it is possible that slight delays may occur for buses traveling on the bus only lanes on St. Laurent Boulevard. By coordinating the traffic signals between Industrial/St. Laurent, Site Access/St. Laurent and Bourassa/St. Laurent, an efficient bus corridor can be maintained without majorly affecting transit priority. The bus only lanes are not anticipated to be removed once the new intersection is built. According to Synchro analysis for year 2029, the northbound and southbound through movements for the AM and PM peaks are all less than 20 second delays for the Site Access/St. Laurent intersection. Note that this estimate does not take into consideration the benefit of the shoulder bus lanes that would reduce any transit delays (these lanes are not explicitly replicated within Synchro).

4.8. Review of Network Concept

The approximate 165 units above allowable zoning would create approximate 110 more peak hour person trips than the equivalent volume permitted by established zoning. Since 110 peak hour person trips is lower than 200 as suggested by the TIA Guidelines, then the remainder of this step can be exempt.

4.9. Intersection Design

4.9.1. Intersection Control

A new signalized intersection is proposed for the Site Access/St. Laurent intersection. A cycle of 120 seconds was initially assumed to match nearby intersections for coordination (with the exception of Industrial/St. Laurent which runs independently), whereas the minimum timing splits were determined using walking speeds, roadway speeds and clearing distances. Additional timing was allocated to the northbound left-turn which will require a fully protected phase.

4.9.2. Intersection Design

Multi-Modal Level of Service

As stated in the MMLOS Guidelines, only signalized intersections are considered for the intersection Level of Service measures. The future proposed Site Access/St. Laurent is considered, as is Industrial/St. Laurent given its proximity to the site and alternate bus routes (although no changes to the existing and future MMLOS are expected). The MMLOS analysis is summarized in **Table 16**, with detailed analyses provided in **Appendix J**.

Table 16: MMLOS – Existing and Future Adjacent Signalized Intersections

Road Segment	Multi-Modal Level of Service							
	Pedestrian		Bicycle		Transit		Truck	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target
Site Access/St. Laurent[1]	F	C	C	C	C	D	C	D
Industrial/St. Laurent	F	C	A	C	F	D	A	D
1.) Future Site Access/St. Laurent is based on the latest plans available – subject to change								

[4] Data from OC Transpo has been requested to determine existing route capacity; data still pending.

Pedestrian

- For both intersections, pedestrians must cross at least 7 lanes of traffic due to the St. Laurent Boulevard cross-section. There are no options that can help improve the PLoS significantly enough to come anywhere near achieving the target PLoS 'C'.

Bicycle

- For both intersections, the bicycle BLoS target was met given that the bicycle lane arrangements on approach consist of physically separated bike lanes. For cyclists turning left at Industrial/St. Laurent, they can use the bicycle phase and cross as a two-stage process with refuge on the channelized right-turn islands.

Transit

- Transit TLoS targets were not met at Industrial/St. Laurent intersection as it relies on average signal delay. To reach the target goal, buses must wait no longer than 30 seconds at the intersection. Since the existing cycle is in the magnitude of 140-150 seconds, buses are anticipated to wait longer than 30 seconds. The Site Access/St. Laurent is anticipated to have delays of less than 20 seconds for NB-SB movement, which meets the desired TLoS. More extensive modelling would be required to explicitly model any forecasted delay to transit.

Truck

- Truck target level of service was met for both intersections

Existing Intersection Performance

The following **Table 17** provides a summary of the existing traffic operations at the study area intersection based on the Synchro (V10) traffic analysis software. The subject intersections were assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The Synchro model outputs of existing conditions are provided within **Appendix K** and the volumes used were obtained from **Figure 5**.

Table 17: Existing Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Signalized Intersections						
Industrial/St. Laurent	E(D)	0.98(0.83)	WBL(EBT)	46.4(46.2)	D(C)	0.82(0.78)
Bourassa/St. Laurent	D(D)	0.81(0.88)	EBT(NBT)	20.6(24.5)	C(D)	0.75(0.83)
Smyth/St. Laurent	D(E)	0.89(1.00)	SBR(EBL)	38.9(47.2)	D(D)	0.83(0.88)
Belfast/St. Laurent	C(D)	0.79(0.81)	WBT(WBT)	24.4(29.4)	A(B)	0.55(0.70)
Russell/St. Laurent	C(C)	0.76(0.73)	EBL(EBL)	15.5(15.3)	B(C)	0.68(0.73)
Unsignalized Intersections						
Site Access/St. Laurent[1]	C(D)	20(26)	EB(EB)	1(1)	A(A)	-

Note: Analysis of signalized intersections assumes a PHF of 0.9 and a saturation flow rate of 1800 veh/h/lane.
1.) Based on existing trip generation obtained from **Table 3**

As seen in **Table 17** all intersections operate overall at acceptable LoS 'D' or better with critical movements operating at LoS 'E' or better during the existing conditions.

Background Conditions 2029

The future background 2029 conditions represent the impact of additional development and forecasted growth in background volumes. Since 2029 background has the same intersection layouts as 2024 and is the more critical of the two scenarios, only 2029 will be analyzed. The future projected 2029 background volumes are

illustrated in **Figure 18** with projected operation outputs in **Table 18**. The detailed Synchro results can be found in **Appendix L**.

Figure 18: 2029 Background Projected Volumes

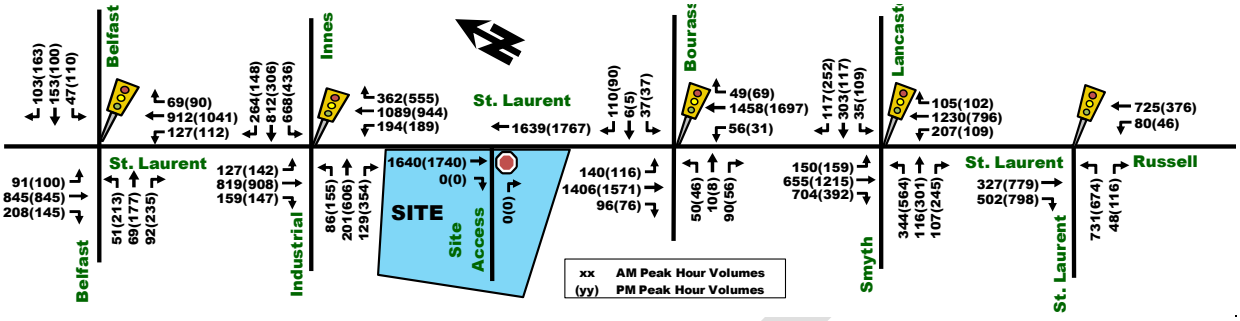


Table 18: 2029 Background Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Signalized Intersections						
Industrial/St. Laurent	E(D)	0.96(0.85)	WBL(EBT)	46.3(48.3)	D(C)	0.81(0.77)
Bourassa/St. Laurent	C(D)	0.75(0.82)	EBT(NBT)	22.4(22.2)	C(C)	0.71(0.78)
Smyth/St. Laurent	E(E)	0.91(0.95)	EBL(EBL)	41.6(42.2)	D(D)	0.85(0.87)
Belfast/St. Laurent	C(D)	0.78(0.83)	WBT(WBT)	24.5(29.8)	A(B)	0.55(0.70)
Russell/St. Laurent	C(C)	0.75(0.73)	EBL(EBL)	15.3(15.0)	B(C)	0.67(0.72)
Unsignalized Intersections						
Site Access/St. Laurent[1]	C(C)	20(24)	EB(EB)	1(1)	A(A)	-

Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.
1.) Based on existing trip generation obtained from **Table 3** and existing intersection layout

As seen in **Table 18**, all intersections operate overall at acceptable LoS 'D' or better with critical movements operating at LoS 'E' or better during the 2029 background volumes. Operations are similar with existing intersection performance.

Future Conditions 2024 – Full Buildout

The future full build-out 2024 volumes were derived by superimposing background 2024 volumes which include other area developments and background growth, with future site-generated volumes. The future projected 2024 volumes are illustrated in **Figure 19** with projected operation outputs in **Table 19**. The detailed Synchro results can be found in **Appendix M**.

Figure 19: 2024 Total Projected Volumes

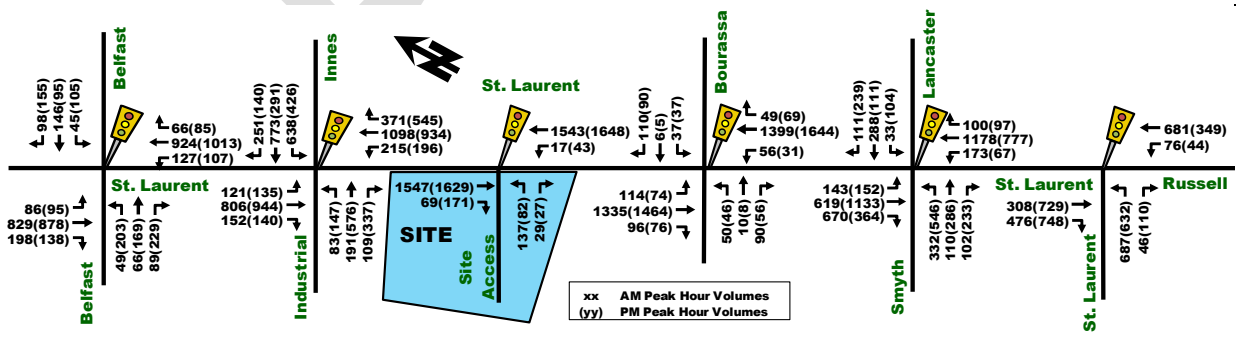


Table 19: 2024 Full Build-out Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Signalized Intersections						
Industrial/St. Laurent	E(D)	0.94(0.84)	WBL(WBL)	47.7(48.1)	C(C)	0.79(0.78)
Site Access/St. Laurent	B(C)	0.68(0.72)	EBL(SBT)	14.7(15.4)	B(B)	0.65(0.70)
Bourassa/St. Laurent	C(C)	0.75(0.78)	EBT(NBT)	21.7(20.7)	B(C)	0.68(0.74)
Smyth/St. Laurent	D(D)	0.84(0.90)	EBL(EBL)	37.7(37.4)	C(C)	0.80(0.76)
Belfast/St. Laurent	C(D)	0.77(0.81)	WBT(WBT)	23.8(29.2)	A(B)	0.53(0.68)
Russell/St. Laurent	C(C)	0.73(0.71)	EBL(EBL)	15.0(14.4)	B(B)	0.65(0.70)
Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.						

As seen in **Table 19**, all study area intersections are expected to operate similarly to existing conditions with acceptable delays.

Future Conditions 2029 – Full Buildout + 5 Years

The future full build-out 2029 volumes were derived by superimposing background 2029 volumes which include other area developments and background growth, with future site-generated volumes. The future projected 2029 volumes are illustrated in **Figure 20** with projected operation outputs in **Table 20.** The detailed Synchro results can be found in **Appendix M**.

Figure 20: 2029 Total Projected Volumes

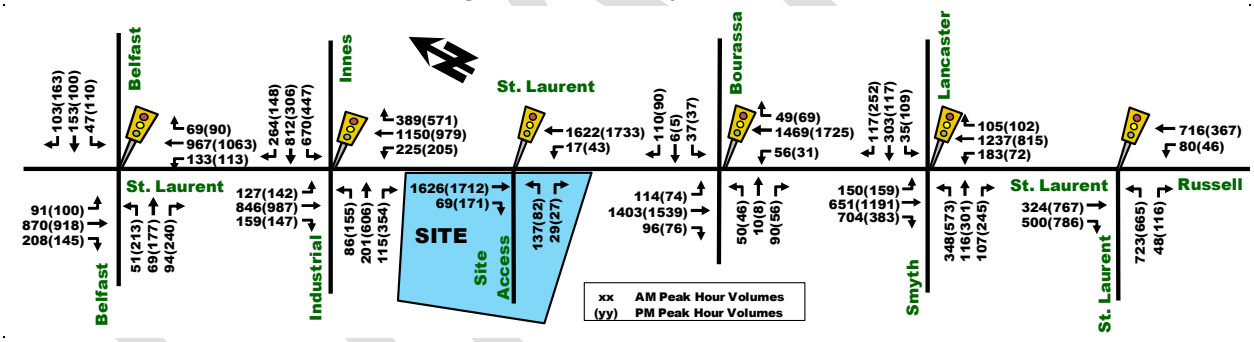


Table 20: 2029 Full Build-out Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Signalized Intersections						
Industrial/St. Laurent	E(D)	0.97(0.85)	WBL(EBT)	54.7(50.3)	D(D)	0.84(0.81)
Site Access/St. Laurent	B(C)	0.68(0.75)	EBL(SBT)	15.8(17.5)	B(C)	0.68(0.73)
Bourassa/St. Laurent	C(D)	0.75(0.82)	EBT(NBT)	22.2(21.7)	C(C)	0.71(0.78)
Smyth/St. Laurent	D(E)	0.90(0.95)	SBR(EBL)	40.7(39.8)	D(C)	0.84(0.80)
Belfast/St. Laurent	C(D)	0.78(0.83)	WBT(WBT)	24.4(30.3)	A(C)	0.57(0.72)
Russell/St. Laurent	C(C)	0.75(0.73)	EBL(EBL)	15.3(14.9)	B(C)	0.67(0.72)
Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.						

As seen in **Table 20**, all study area intersections are expected to operate similarly to existing conditions with acceptable delays.

Queuing Assessment

Analyses were completed to determine if the new signalized intersection will pose queueing concerns at adjacent intersections. **Table 21** summarizes the available storage capacity as well as the projected 95th percentile queue based on the findings of both Synchro and SimTraffic software.

Table 21: 95th Percentile Queue for Intersections Adjacent to Site/St. Laurent

Intersection - Movement	Available Storage (m)	95th Percentile Queue AM (PM) (m)	
		Synchro	Sim Traffic
Industrial/St. Laurent – NBL	100	55 (47)	-
Industrial/St. Laurent – NBT	135	221 (161)	155 (138)
Site/St. Laurent – SBT	135	190 (217)	126 (186)
Site/St. Laurent – NBL	40[1]	12 (25)	30 (30)
Site/St. Laurent – NBT	150	134 (153)	173 (112)
Bourassa/St. Laurent – SBT	150	156 (172)	212 (141)

1.) Modelled and illustrated within draft design as 40 meters

As seen in **Table 21**, the through movements upstream and downstream on St. Laurent Boulevard of the new proposed signalized intersection are anticipated to produce queues which exceed their available storage capacities. This means that some vehicles may need to stop on a green light at the new intersection so as to leave the intersection clear of standing vehicles. Upon further visual analysis of Sim Traffic simulations, it appears that most vehicles clear the new intersection and the subsequent intersection once they are given a green light. The new proposed northbound left-turn lane on the Site Access/St. Laurent intersection is expected to have sufficient capacity at a length of 40 meters. Providing a short southbound right-turn lane (tapered lines within the bus only lanes) significantly reduces queue lengths, from 270 meters in the PM to 196 meters with the addition of a 15-meter auxiliary lane. The Sim Traffic results have been included in **Appendix N**.

Possible Mitigation Strategies

Move Proposed Signal Further South

Consideration was given to moving the signalized intersection to the southernmost extent of the property, which would create an approximate additional 85 meters distance separation from the Industrial/St. Laurent intersection. This would maximize the separation between the two intersections at approximately 220 meters, and should alleviate most of the queueing concerns north of the driveway, but would make the queueing concerns between the Site Access/St. Laurent and Bourassa/St. Laurent intersection more prevalent. Furthermore, moving the access to the southernmost quadrant of the site would place the new intersection at around 65-meter separation to Bourassa/St. Laurent intersection, which would not meet the City's minimum required separation. This option is not recommended.

Modify Signal Timing/Coordinate Signals

The study area network was analyzed with a coordinated time plan with varying cycle lengths ranging between 120 to 150 seconds. A general pattern emerged where a higher cycle length improved v/c performance but resulted increased vehicle queues, whereas lower cycle lengths resulted in worse v/c performance but reduced vehicle queues. Overall, the modified signal timing plans did not fully mitigate the queue spillback observed between Industrial Avenue and Bourassa Street.

Sensitivity analysis confirmed that if north-south through traffic volumes on this section of St. Laurent Boulevard in the peak hour periods were reduced by approximately 20%, vehicular queue lengths would be accommodated within the available storage capacity; therefore, it is reasonable to expect queue spillback will be isolated to the peak hour periods.

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Connect to Alternative Access Location

Choosing an alternate access could provide new alternatives that do not rely on creating the signalized intersection at the proposed location. Some alternative access locations could include:

1. Obtain a connection to the east via Everest Private roadway, thereby providing full access to Russell Road. This option has been discussed previously and dismissed as it is not supported by the adjacent property owners / Condo Board.
2. Obtain a connection through the property to the south at 1800 St. Laurent Boulevard, either through purchase or come to an agreement to construct a driveway via through this parcel. It provides access to the signalized Bourassa/St. Laurent intersection.
3. Obtain a connection to the north via the office building located at 1730 St. Laurent, which would introduce additional demand through the Industrial/St. Laurent intersection and the unsignalized intersection located less than 100m to the west.

Revert Back to RIRO

Consideration was given to maintaining the existing RIRO operation and forcing left-turn movements to/from the site to occur as U-turn movements at the adjacent Industrial/St. Laurent and Bourassa/St. Laurent intersections. Preliminary analysis indicates that performance at these intersections is diminished to LoS 'E' conditions from previously forecasted 'C' and 'D' in future 2029 conditions with the intersection modelled as a signalized intersection. Note that a level of service 'E' is still within acceptable performance.

Future Conditions if Custom Mode Share not Met

Figure 21 shows the projected network volumes if the custom mode shares from **Table 9** are not met. The projected intersection performance for the critical scenario 2029 with Alta Vista Area mode shares is shown in **Table 22** with detailed output in **Appendix O**.

Figure 21: 2029 Total if Custom Mode Share not Met Projected Volumes

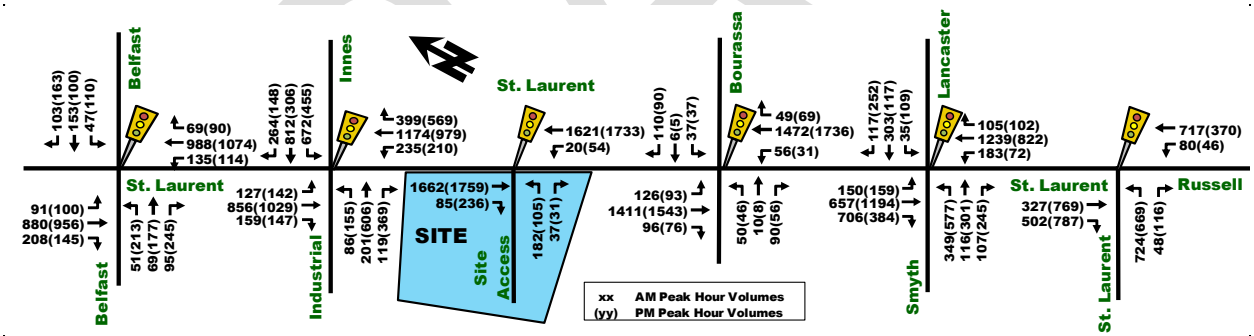


Table 22: Intersection Performance if Custom Mode Shares not Met

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Signalized Intersections						
Industrial/St. Laurent	E(D)	0.97(0.87)	WBL(WBL)	56.9(51.6)	D(D)	0.85(0.83)
Site Access/St. Laurent	C(C)	0.77(0.77)	EBL(SBT)	19.2(20.0)	C(C)	0.71(0.75)
Bourassa/St. Laurent	C(D)	0.75(0.82)	EBT(NBT)	22.3(21.8)	C(C)	0.71(0.78)
Smyth/St. Laurent	D(E)	0.90(0.95)	EBL(EBL)	40.8(39.9)	D(D)	0.85(0.81)
Belfast/St. Laurent	C(D)	0.78(0.83)	WBT(WBT)	24.3(30.6)	A(C)	0.58(0.72)
Russell/St. Laurent	C(C)	0.75(0.73)	EBL(EBL)	15.3(14.9)	B(C)	0.67(0.72)
Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.						

As seen in **Table 22**, most intersections operate the same with or without the custom mode shares for year 2029, implying that the site plays a minor role in worsening conditions.

5. FINDINGS AND RECOMMENDATIONS

Based on the results summarized herein the following findings and recommendations are provided:

Existing Conditions

- The site is currently occupied by commercial uses and is zoned as AM10 and AM10[1658]
- The site is located in a transit priority corridor with isolated measures
- Overall, there were 539 collisions recorded within 5 years for the study area. 39 of them occurred between Industrial Avenue and Bourassa Street on St. Laurent Boulevard.
- The site is currently accessed by four right-in right-out driveways to/from southbound St. Laurent Boulevard
- Existing intersections operate at good overall LoS 'D' or better with some critical movements approaching capacity at LoS 'E' or better during the weekday peak hours.

Proposed Development

- The proposed development will comprise of approximately 672 residential units and 31,100 ft^2 of ground floor commercial/retail in four 12 to 15-storey buildings.
- TDM measures include all required measures, some basic and better measures and provides additional policy measures like program coordinator, displaying active transportation routes and unbundling of parking costs to monthly rent.
- The proposed development is projected to generate approximately 140 to 160 'new' transit trips during the AM and PM peak hour periods, which can be accommodated by route 40 which operates on St. Laurent transit priority corridor. Additional capacity is available on local bus available within 450-meter walk or less.
- A total of 670 parking spaces are proposed which would meet the City's minimum and maximum parking requirements for this development.
- The proposed development is projected to generate 'new' vehicle volumes of approximately 230 to 260 veh/h two-way total during the weekday morning and afternoon peak hours.
- The access to the site proposes to convert the main right-in right-out driveway into a new full movement intersection off St. Laurent Boulevard with traffic signal controls. With greater than 75m to the nearest signalized intersection, it meets City By-Law requirements. A secondary RIRO is proposed on the southernmost quadrant of the site and is meant to be predominantly used by delivery or garbage trucks.

Future Conditions

- Other nearby developments and a 1% growth rate were applied to existing volumes to estimate 2029 background conditions. The 2029 background overall intersection performance of all study area intersections was LoS 'D' or better and with critical movement of 'E' or better which is similar to existing.
- The MMLOS road segment analysis shows that existing and future conditions on boundary streets do not meet MMLOS area targets for pedestrians due to high vehicular volumes, however, all other targets are met.
- The MMLOS intersection analysis shows that truck target goals and bicycle target goals are met at all intersections. Given the fast-operating speeds and number of lanes crossed, it is not possible to meet

DRAFT

pedestrian desirable target goals. The transit TLoS was not met for Industrial/St. Laurent given the existing and anticipated delay times.

- The new site vehicle access was modelled as a signalized 3-legged intersection with a new northbound left-turn lane to incorporate a protected NBL phase. An auxiliary NBL storage lane of approximately 40 meters is sufficient to service the site.
- A short 15-meter segment of shared bus and southbound right-turn lane at Site Access/St. Laurent significantly reduces queue lengths for the southbound movement.
- Future conditions with the addition of pedestrians, cyclists, transit patrons and site vehicle traffic performed at acceptable levels of service with respect to v/c and delay resulting in overall LoS 'D' or better and with critical movement of 'E' or better.
- Queueing concerns were noted as a result of the new Site Access/St. Laurent signalized intersection for both north and southbound through movements. Spillback through adjacent intersection is forecasted at times during the morning and afternoon peak hours, however, it is anticipated that most vehicles would clear during each cycle.
- A number of mitigation measures were considered to alleviate the projected queueing issues resulting from the proposed traffic signal, including refinements to the placement of the signal, timing parameters, etc. None of the measures were found to dramatically improve the forecasted queuing through adjacent intersections, other than elimination of the signal altogether that would result in RIRO operation to/from St. Laurent Boulevard. A number of alternative access locations through properties to the north, west and south were also identified, all of which would require additional property acquisition and agreements.
- Despite the aforementioned queuing concerns during peak times, the three conditions stipulated by the City of Ottawa, for traffic signal control to be considered, have been substantially satisfied, namely: fully protected left-turn lane developed into the site (NBL); signals located as far south as possible; and consolidated access.

Based on the foregoing findings, the proposed development located at 1740 – 1760 St. Laurent Boulevard is recommended from a transportation perspective.

Prepared By:

Juan Lavin, E.I.T.

Reviewed By:

Matthew Mantle, P.Eng.
Transportation Engineer

DRAFT

APPENDIX A

SCREENING FORM & CITY CORRESPONDANCE

PARSONS

1223 Michael Street, Suite 100, Ottawa, Ontario, K1J 7T2
P: +1 613.738.4160 I F: +1 613.739.7105 I www.parsons.com

City of Ottawa 2017 TIA Guidelines

TIA Screening Form

Date	15-Jul-20
Project	1740 -1760 St Laurent
Project Number	477563-01000

Results of Screening	Yes/No
Development Satisfies the Trip Generation Trigger	Yes
Development Satisfies the Location Trigger	Yes
Development Satisfies the Safety Trigger	Yes

Module 1.1 - Description of Proposed Development	
Municipal Address	1740-1760 St. Laurent Boulevard, Ottawa, ON
Description of location	Approximately 150m south of St. Laurent Blvd on the west side
Land Use	Mixed-use (residential with ground commercial)
Development Size	672 units and approximately 2,891 sqm commercial
Number of Accesses and Locations	1 on to St. Laurent Boulevard. Potential new traffic signal to upgrade right-in right-out to full movement intersection
Development Phasing	2 Phases
Buildout Year	2022 / 2024
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger		
Land Use Type	Townhomes or Apartments	
Development Size	672	Units
Trip Generation Trigger Met?	Yes	

Module 1.3 - Location Triggers		
Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	Yes	St. Laurent currently has a cycle-track adjacent to the site and is considered a Spine Cycle route under the Ultimate Cycling Network
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	Yes	St. Laurent Arterial Mainstreet DPA
Location Trigger Met?	Yes	

Module 1.4 - Safety Triggers		
Posted Speed Limit on any boundary road	<80	km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No	
A proposed driveway is within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions) or within auxiliary lanes of an intersection;	Yes	Within 150 meters of St. Laurent/Industrial
A proposed driveway makes use of an existing median break that serves an existing site	No	
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	No	
The development includes a drive-thru facility	No	
Safety Trigger Met?	Yes	

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10 August 2020

City of Ottawa

Development Review Services

110 Laurier Avenue West

Ottawa, ON K1P 1J1

Attention: Josiane Gervais, P.Eng.

Dear Josian:

Re: 1740 – 1760 St. Laurent
Step 2 – Comment and Response Form

The following response form has been prepared to address City of Ottawa comments received on August 7th, 2020. City comments are noted in black with the corresponding responses from Parsons in Green.

Transportation Engineering Services

- Element 2.1.1 - Proposed Development
  - Please replace Figure 2, text showing aisle width dimensions is illegible. Figure updated
- Element 2.1.2 - Existing Conditions
  - include cycling and pedestrian volumes during the peak hour, as TIA guidelines require existing peak hour travel demands by mode. Noted, added as new figure 6
  - Revise description of St Laurent Blvd: "Don Reid Drive in the south." Noted, text updated
- Element 2.2.1 - Study Area
  - The St-Laurent Blvd/Belfast Rd and St-Laurent Blvd/Russell Rd intersections are also within the 1km radius and should be included within the study area for analysis of auto demand (cycling and pedestrian review of these intersections can be excluded as they are beyond 600m). Noted.
  - Typically, the TIA analysis must be completed for each development phase. Section 2.1.1 mentions that the potential for converting the access to a signal will be explored. Ensure the subsequent TIA steps outline when this is proposed to take place (i.e. 2022 or 2024) and how this affects warrants/operations. Assuming a single build-out time horizon for this site may be appropriate for this TIA (depending on assumptions), however it is possible that analysis for both phases be requested as part of future circulations. It is understood that the traffic signals will be constructed for the first phase of development
- Because this TIA is in support of a re-zoning application, the TIA must address the worst-case scenario for traffic generation based upon the zoning sought and compare this to the traffic generated under the current zoning. Noted, will be discussed in Step 4 for Network Concept
- Module 2.3 - Exemptions Review:
  - Should it be determined in Section 4.2 that parking supply is 15% below unconstrained demand, Module 4.2.2 will be required. Noted, will be discussed in Step 4.

- Will the barricade remain on Everest Private to prevent cut-through traffic between St-Laurent Blvd and Russell Road? If not, then Module 4.6 is required as Russell Road is a collector street. It is understood at this time that the barricade will remain on Everest Private

1223 Michael Street North, Suite 100 | Ottawa, ON K1J 7T2
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16 July 2021

City of Ottawa

Development Review Services

110 Laurier Avenue West

Ottawa, ON K1P 1J1

Attention: Josiane Gervais, P.Eng.

Dear Josiane:

Re: 1740 – 1760 St. Laurent
Step 3 – Comment and Response Form

The following response form has been prepared to address City of Ottawa comments received on September 23rd, 2020. City comments are noted in black with the corresponding responses from Parsons in Green.

Transportation Engineering Services

Section 3.1.1 Trip Generation and Mode Shares:

1. Consider using the average rate Land Use Code 820 rather than the fitted curve equation. While it is generally preferred to use the fitted curve when the sample size is large enough, the size of the commercial development (31,127 ft2) versus the average size of the shopping centres surveyed (327,000 ft2) may lead to an overly conservative estimate. Noted, average rate used instead
2. Justify the pass-by rate of 35% for the AM Peak for the commercial development. The Trip Generation Handbook, 3rd Edition, only provides data for the PM Peak. Noted, pass-by for AM removed
3. Consider applying an internalization reduction as this is a mixed-use development. Noted
4. An estimate of the existing site-generated trips should be provided in the absence of counts in order to deduct the existing development trips from the new two-way vehicle trips. Noted, included in trip generation segment
5. The proposed reduction in auto mode share is supported but will require TOD strategies to encourage the shift to alternative modes. Consider the needs of transit users in the Strategy review. Noted, will be included in section 4.5
6. The site plan shows a drive-through included within Tower 1 (even though the screening form claims no drive-through facility is proposed). A drive-through should not be approximated as "Shopping Center". Screening form updated and drive-through trip generation included separate from shopping center

Section 3.1.2 Trip Distribution:

7. Justify the trip distribution. The location of this development within the context of the Alta Vista TAZ makes 20% to/from east and 25% to/from south seem high. Noted, distribution adjusted to reflect 'trips from area' closer than trips going to area to more closely resemble residents leaving for work and then returning home.

Section 3.2.2 Background Growth:

8. In the future, consult with Tim Wei (tim.wei@ottawa.ca) to obtain a snapshot of the Long-Range Transportation Model to inform the development of background growth rates. Noted

Site Plan considerations:

9. An RMA will be required for any proposed intersection modifications on the boundary roads. All road modification costs will be at the expense of the applicant. Any full-movement access will require a protected intersection on St-Laurent Blvd. Noted, RMA to be included and Synchro to be modelled as protected access
10. Annex 1 of the OP protects a 44.5m ROW for St. Laurent Boulevard adjacent to the site. Show the ROW measurement from the centreline of St. Laurent Boulevard, and indicate any additional property (ROW) that needs to be provided to the City. Noted
11. The site is disconnected from Everest Private to the west (see adjacent site plan on DevApps, D07-12-19-0135), with through access provided for pedestrians, cyclists, and emergency vehicles only. This site plan should include a space for vehicles to turnaround west of Tower 3 and Tower 4. Noted, will advice developers

Traffic Signal Operations

12. Collision analysis indicates that site access area is currently problematic and would be likely to remain so. Further collision analysis may be required. It is anticipated that once a traffic signal is added to the site intersection, collision patterns will significantly change, and existing collision data will no longer be valid. If no traffic signal is added at the site access, then further collision analysis will be conducted.
13. Analysis of impacts to auxiliary lanes on St. Laurent Blvd will be required in subsequent submissions. If the new proposed signal on St-Laurent Blvd is shown to impact adjacent signalized intersections, then alternatives to full-movement at Everest should be considered. Noted, will be included in section 4.9
14. Provide traffic signal warrant analysis. Noted, will be included in section 4.4.2

Transit Services

15. Agree that 30% transit mode share seems a reasonable target assuming transit supportive TDM measures are included. In addition, we support the reduction of parking to be in line with the targeted mode shares. Noted, will include TDM measures in Step 4, will advice developer of parking reduction suggestion
16. There are no direct impacts to bus stops from the proposed site plan. However, the proposed new signalized intersection would create additional delay for transit in both directions and would undermine previous transit priority efforts (signal timing, dedicated lanes). Noted
17. The signalized intersection would also create additional start-stop for buses, which erodes passenger comfort. For example: southbound buses would serve the stop at Innes, accelerate only slightly to then stop at the new signal, then accelerate slightly again towards Bourassa, and possibly stop again at the signal before serving the next stop on the far side of the intersection. This would be a big change from the current conditions which are almost free flow along this stretch. Noted
18. Finally, a new signalized intersection would also not provide any measurable benefit for pedestrian access to/from bus stops. Stops on the east side of St-Laurent Blvd are located at the Bourassa and Innes intersections, so pedestrians can use the west sidewalk to go north or south first before crossing at the existing intersections. Noted

Development Review – Transportation

- Should allowing access through Everest (at Russell Rd) be considered, perhaps as an alternative access scenario as mentioned above, then this additional intersection should be assessed. Noted, to be discussed with developer
- Please include comments/responses from Steps 2 and 3 within Appendix of the Strategy report. Noted, will include both

If the above comments can be incorporated within the next submission, please proceed to Step 4: Strategy.

Please submit the Strategy Report and digital files of ICA outputs (Synchro/Sidra/Rodel, if applicable) for circulation. To be included

Please note that I strongly encourage the submission of the draft Strategy and functional plan for staff review and comment prior to submission of the application. If you choose to omit this step, all documents required for Step 5 (TIA report, drawings, and/or monitoring plan, as required) need to be included to deem an application complete. All costs and delays resulting from the choice to omit Step 4 for staff review before proceeding to Step 5 are the responsibility of the applicant. Noted

APPENDIX B

TRAFFIC COUNT DATA

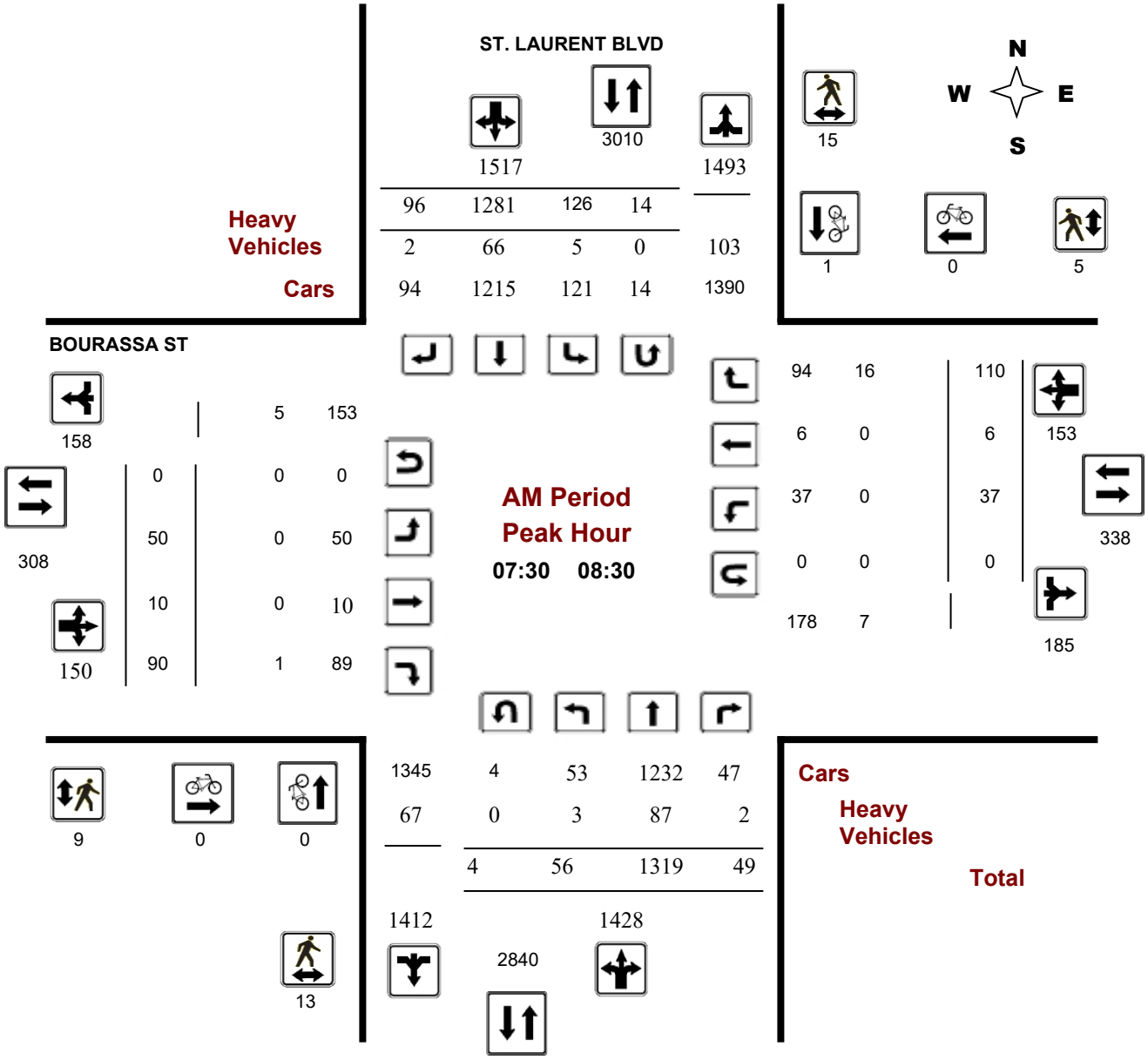
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BOURASSA ST @ ST. LAURENT BLVD

Survey Date: Thursday, January 09, 2020 **WO No:** 39291

Start Time: 07:00 **Device:** Miovision



Comments 5469233 - THU JAN 09, 2020 - 8HRS - LORETTA

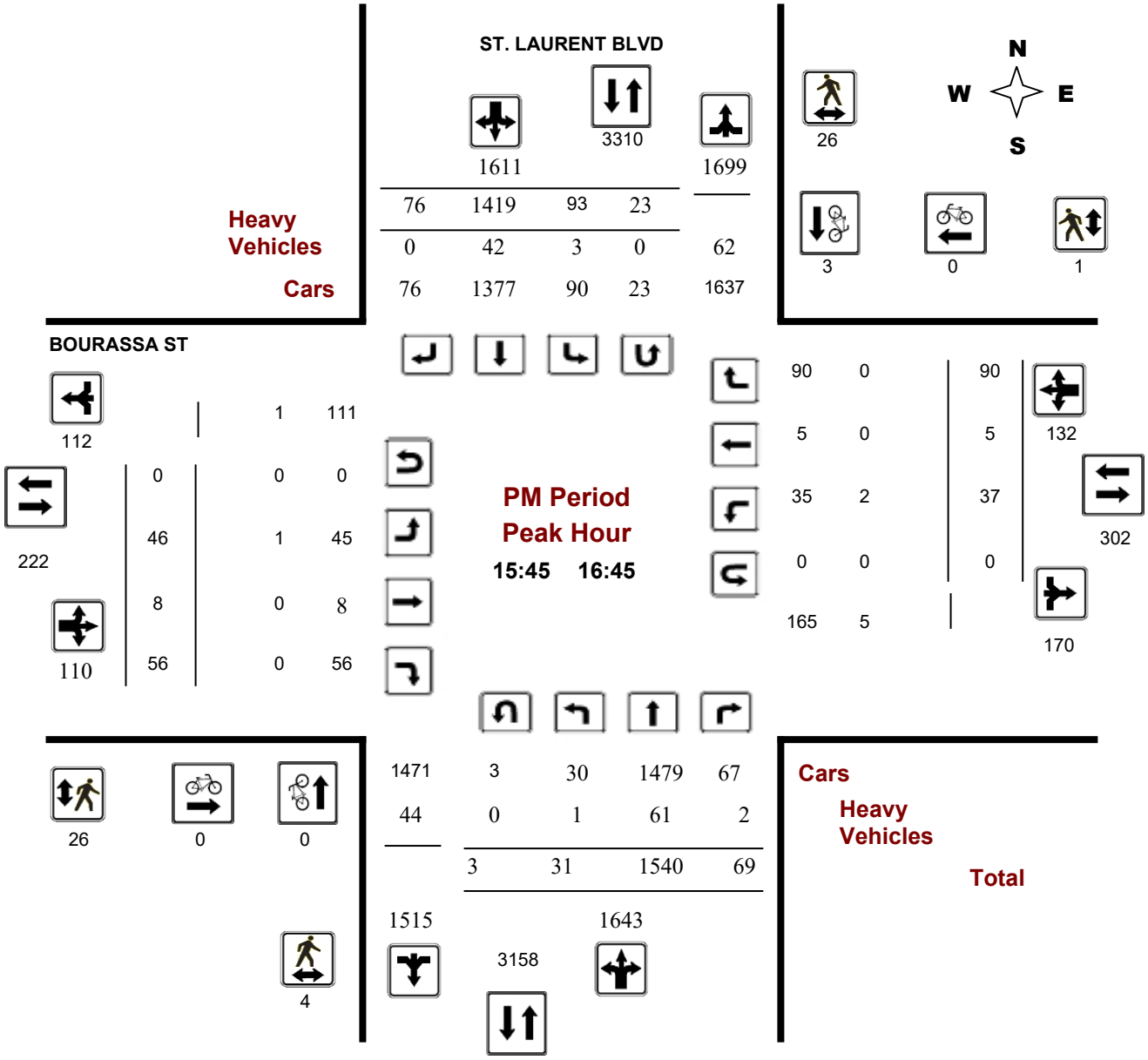
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BOURASSA ST @ ST. LAURENT BLVD

Survey Date: Thursday, January 09, 2020 **WO No:** 39291

Start Time: 07:00 **Device:** Miovision



Comments 5469233 - THU JAN 09, 2020 - 8HRS - LORETTA

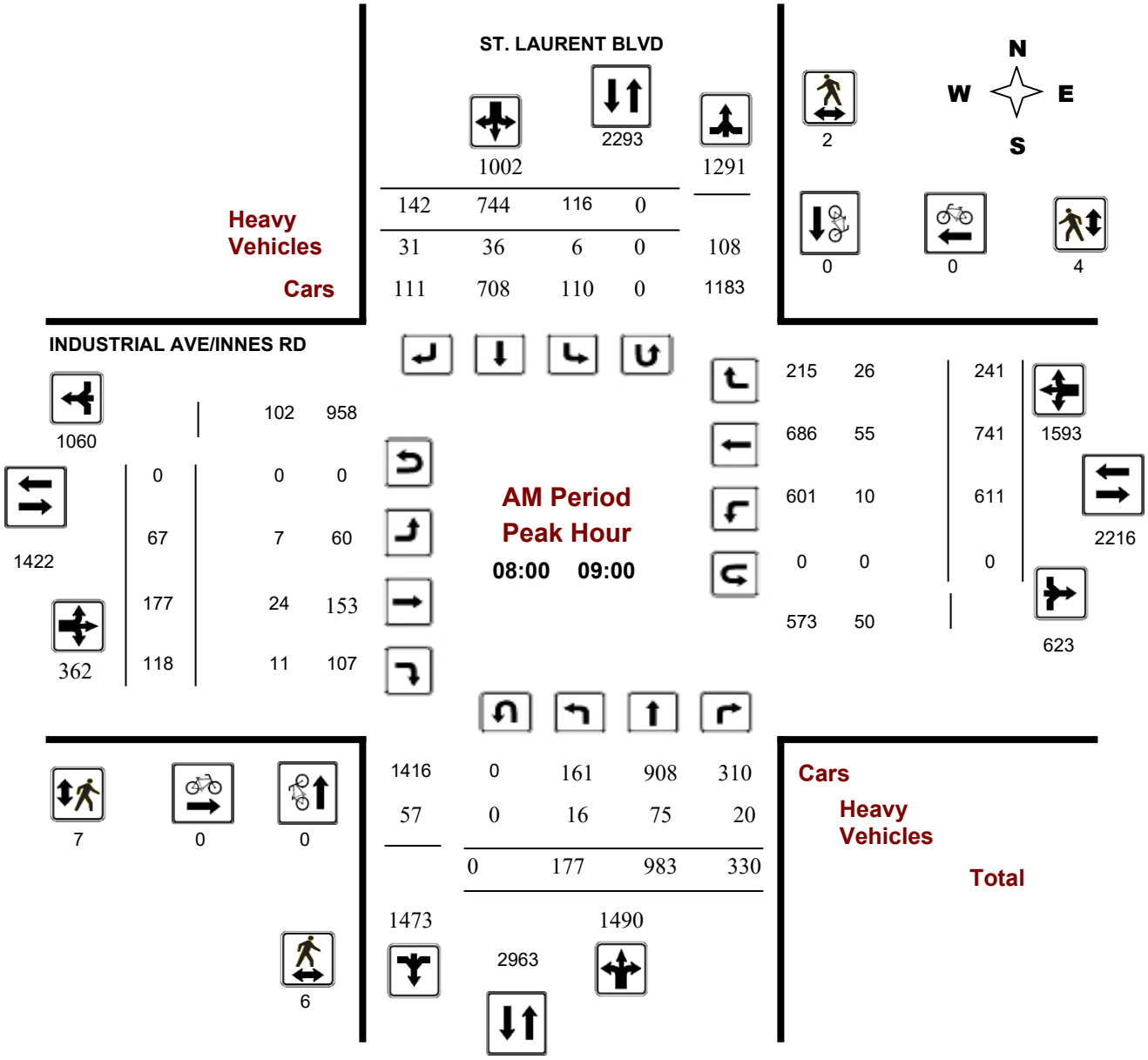
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

INDUSTRIAL AVE/INNES RD @ ST. LAURENT BLVD

Survey Date: Wednesday, January 30, 2019 **WO No:** 38336

Start Time: 07:00 **Device:** Miovision



Comments

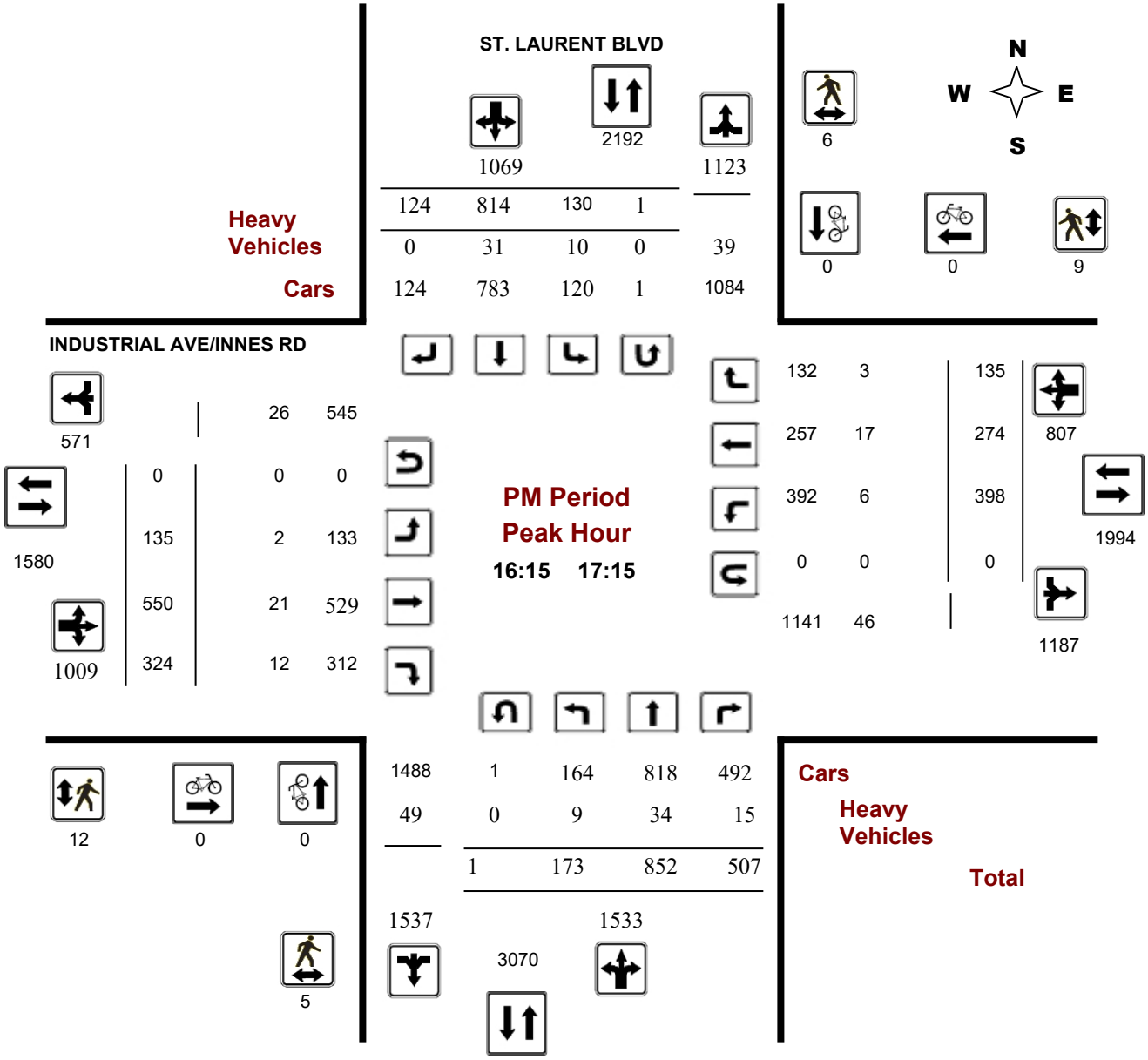
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

INDUSTRIAL AVE/INNES RD @ ST. LAURENT BLVD

Survey Date: Wednesday, January 30, 2019 **WO No:** 38336

Start Time: 07:00 **Device:** Miovision



Comments

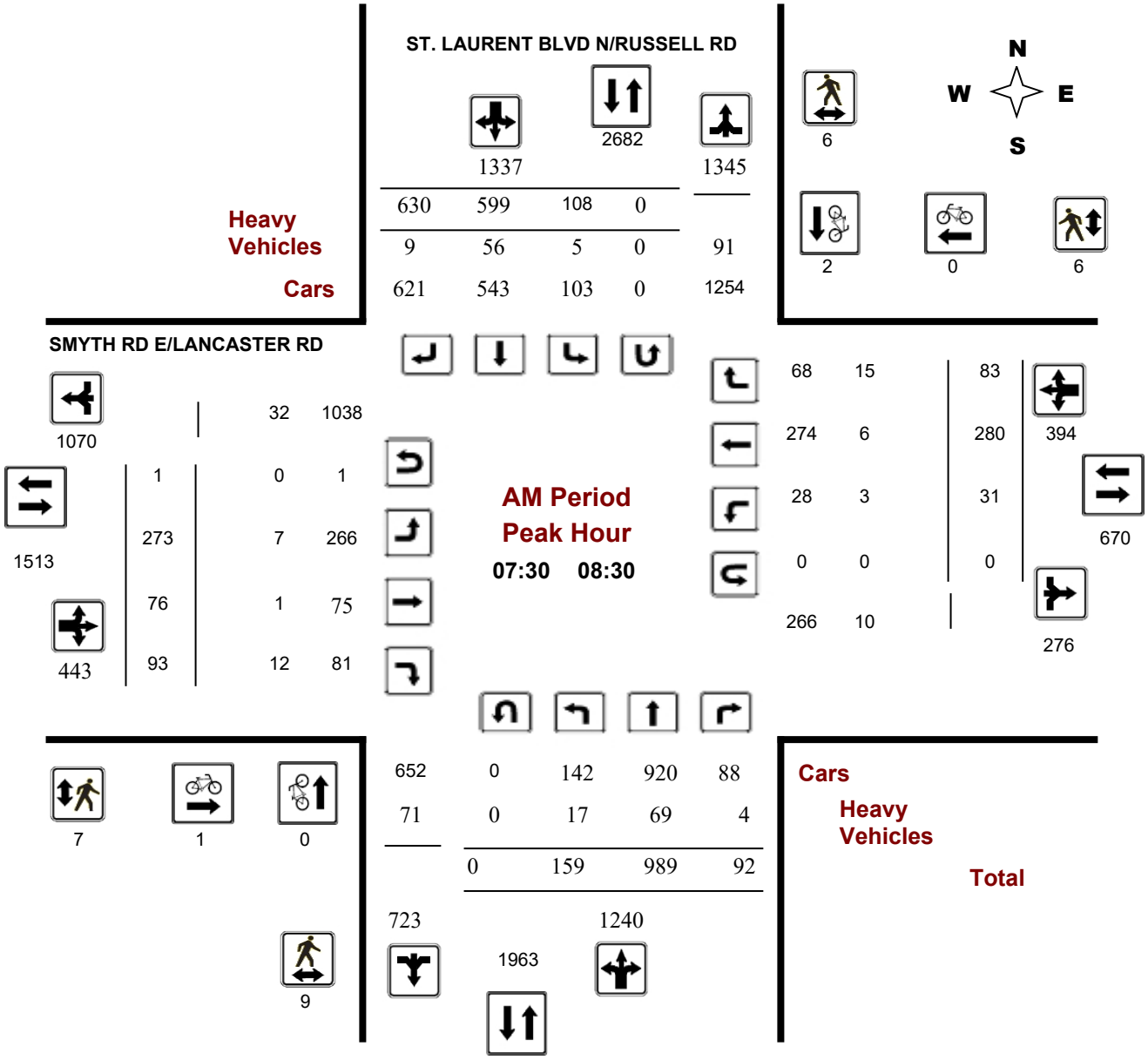
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

SMYTH RD E/LANCASTER RD @ ST. LAURENT BLVD N/R

Survey Date: Thursday, January 28, 2016 **WO No:** 37985

Start Time: 07:00 **Device:** Miovision



Comments

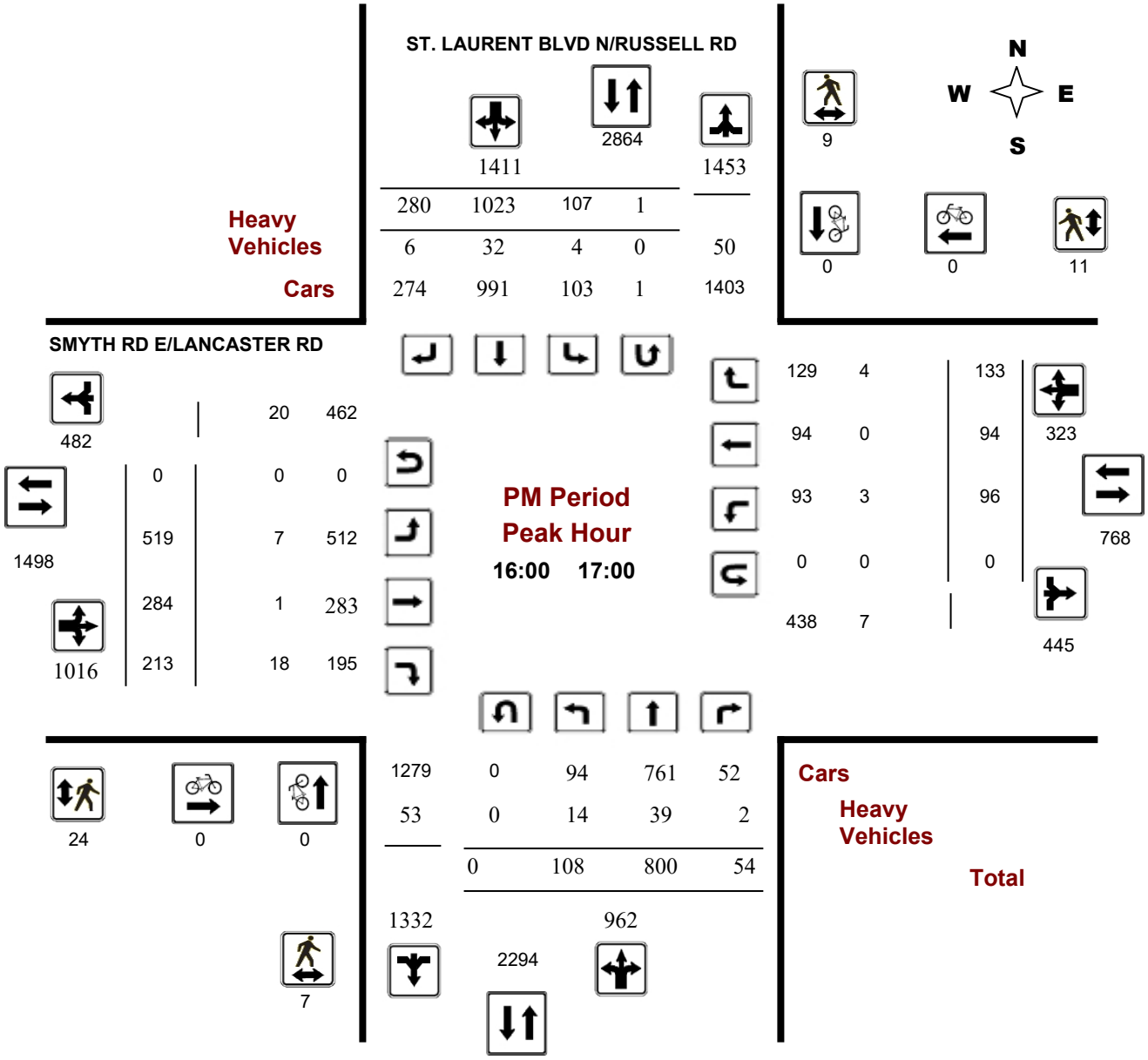
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

SMYTH RD E/LANCASTER RD @ ST. LAURENT BLVD N/R

Survey Date: Thursday, January 28, 2016 **WO No:** 37985

Start Time: 07:00 **Device:** Miovision



Comments

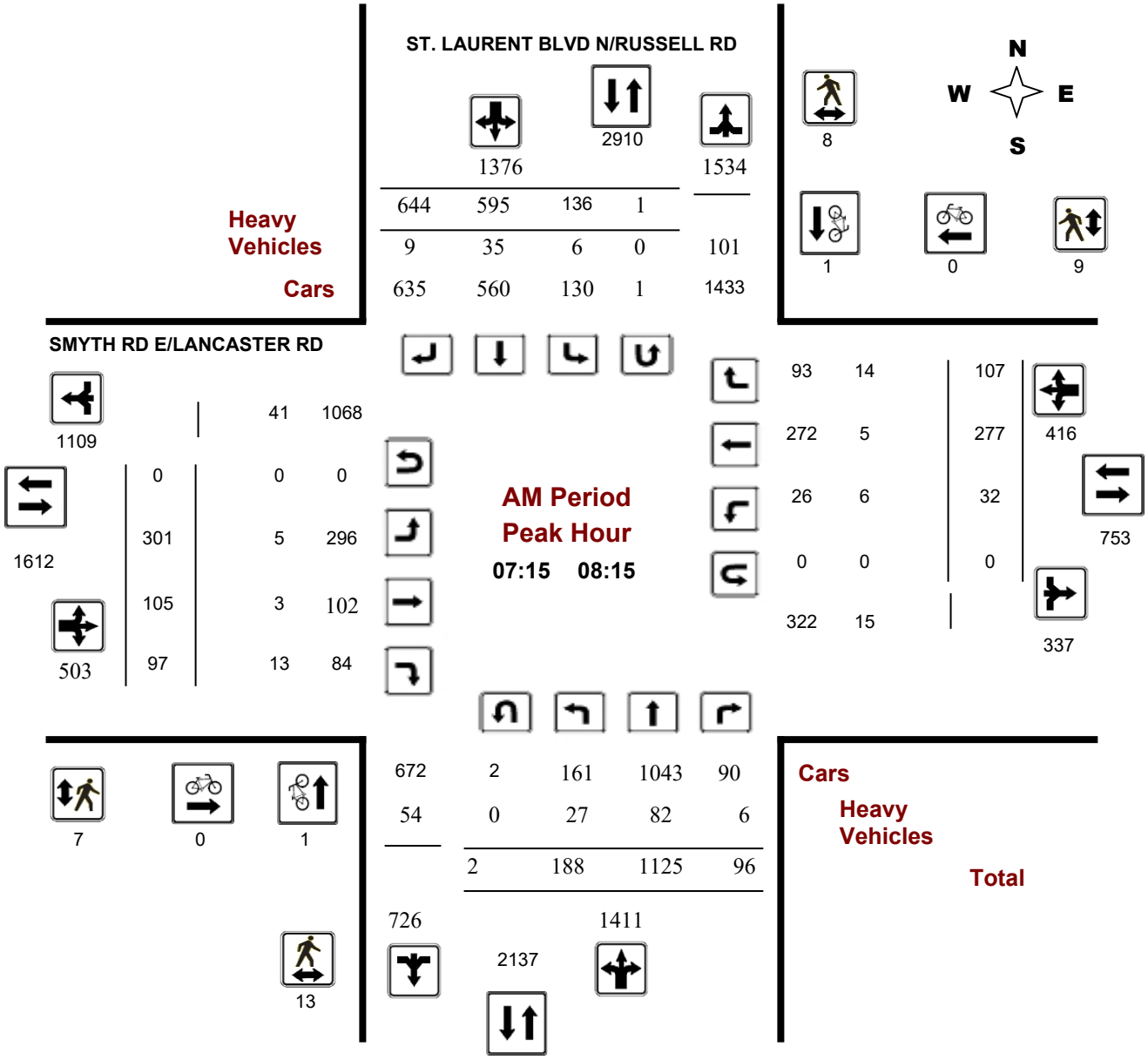
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

SMYTH RD E/LANCASTER RD @ ST. LAURENT BLVD N/R

Survey Date: Thursday, March 05, 2020 **WO No:** 39290

Start Time: 07:00 **Device:** Miovision



Comments 5469232 - MAR 5, 2020 - 8HRS - LORETTA

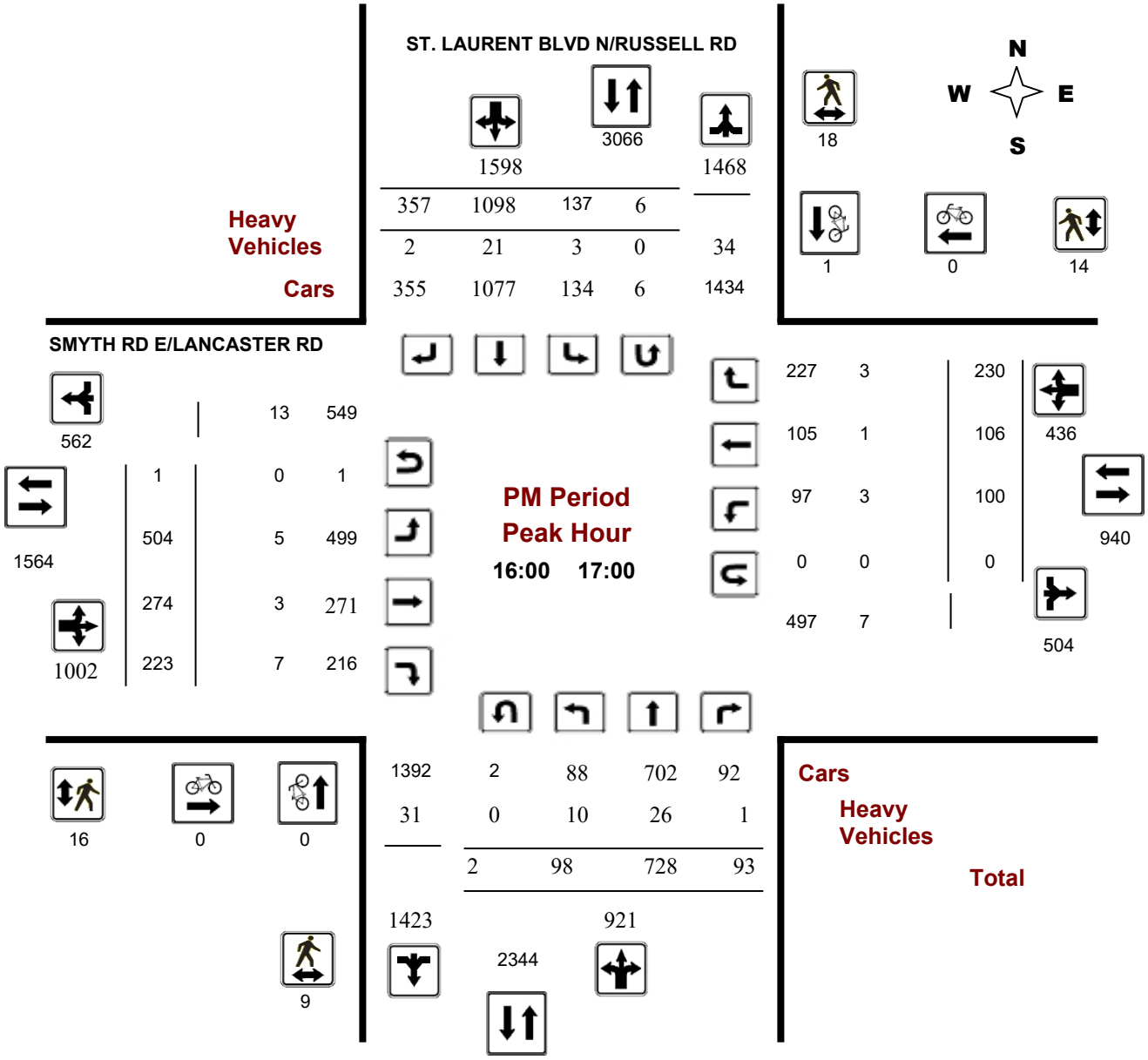
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

SMYTH RD E/LANCASTER RD @ ST. LAURENT BLVD N/R

Survey Date: Thursday, March 05, 2020 **WO No:** 39290

Start Time: 07:00 **Device:** Miovision



Comments 5469232 - MAR 5, 2020 - 8HRS - LORETTA

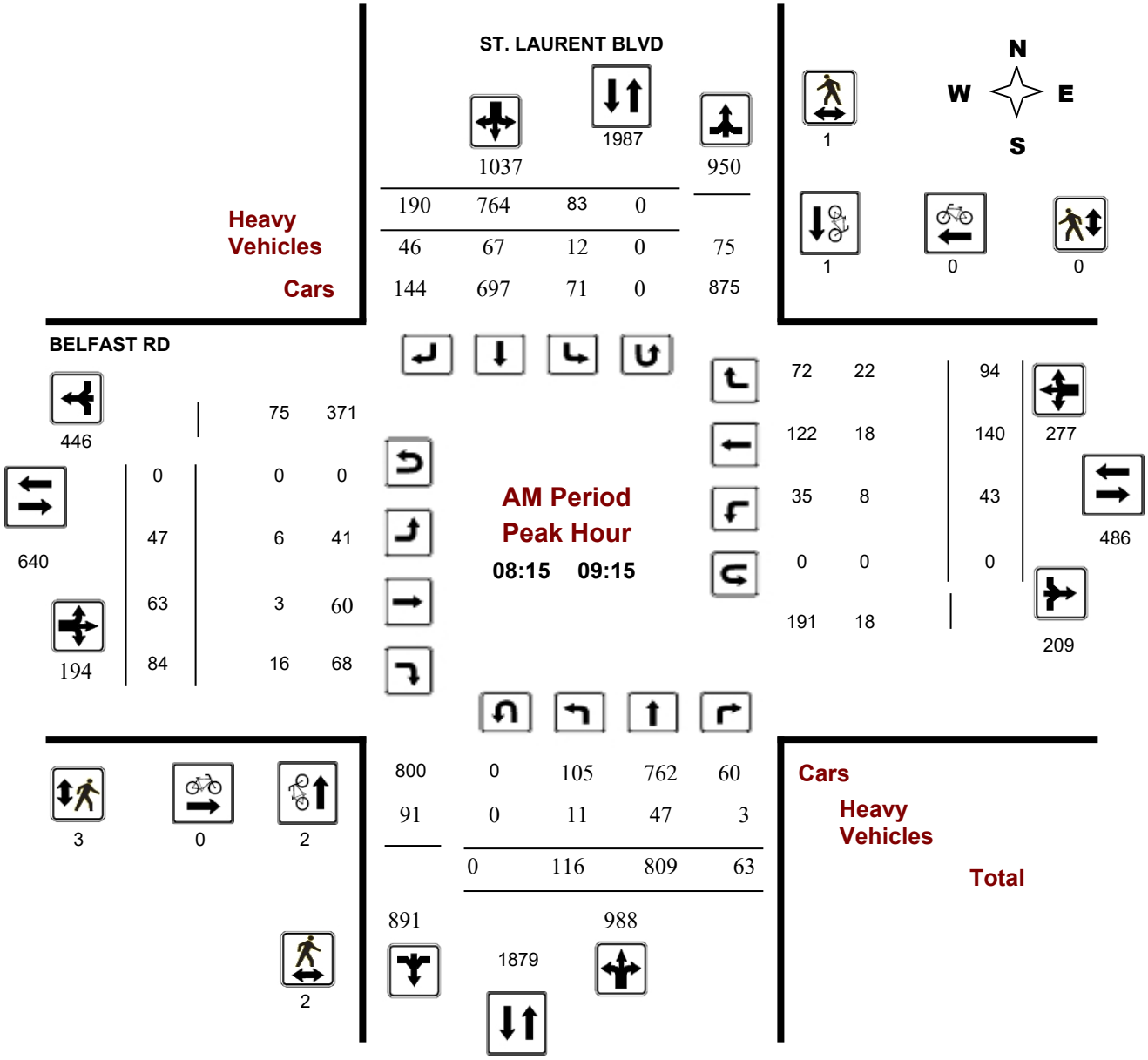
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BELFAST RD @ ST. LAURENT BLVD

Survey Date: Tuesday, February 06, 2018
Start Time: 07:00

WO No: 37494
Device: Miovision



Comments

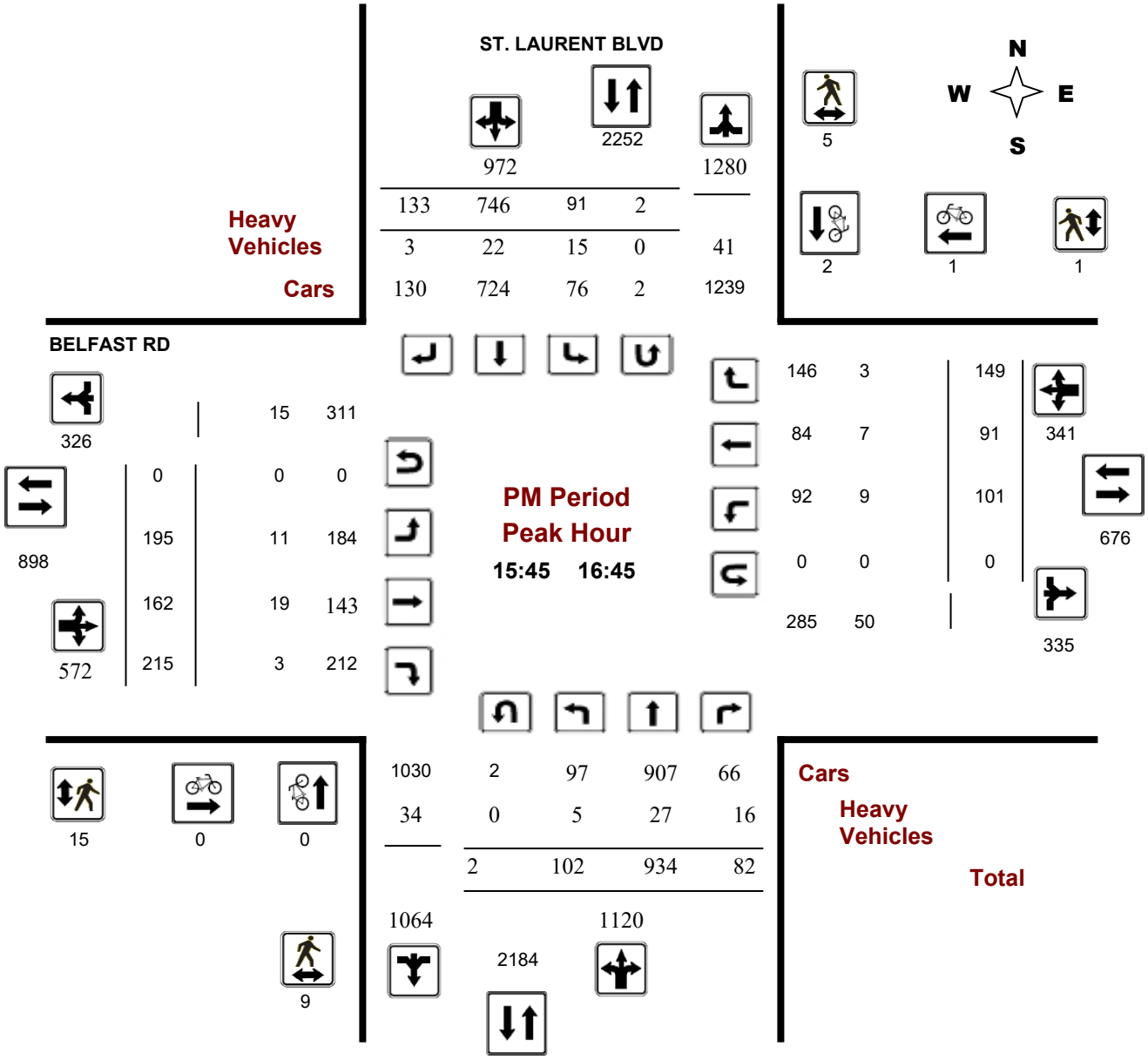
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BELFAST RD @ ST. LAURENT BLVD

Survey Date: Tuesday, February 06, 2018
Start Time: 07:00

WO No: 37494
Device: Miovision



Comments

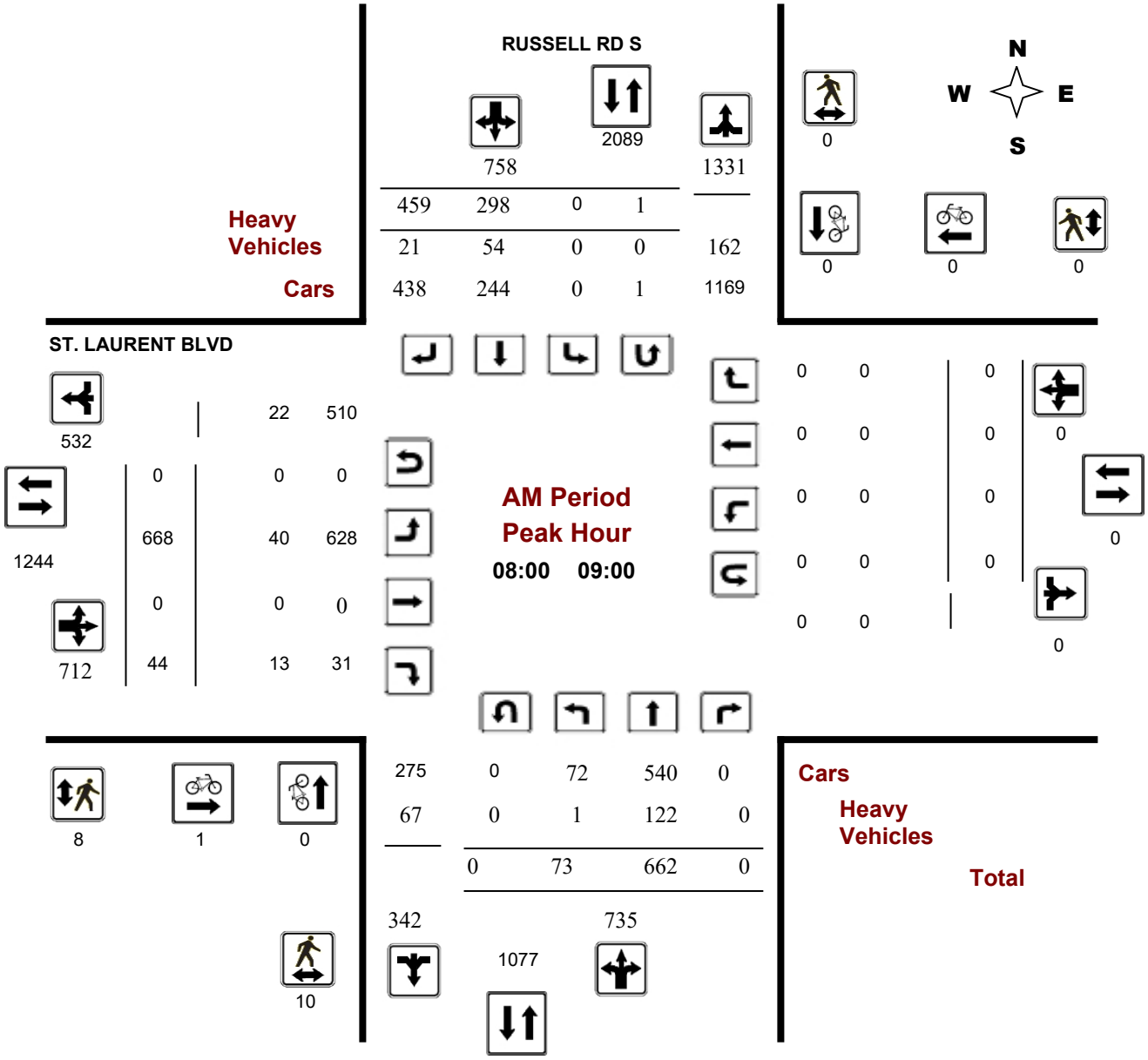
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RUSSELL RD S @ ST. LAURENT BLVD

Survey Date: Tuesday, April 11, 2017
Start Time: 07:00

WO No: 36886
Device: Miovision



Comments

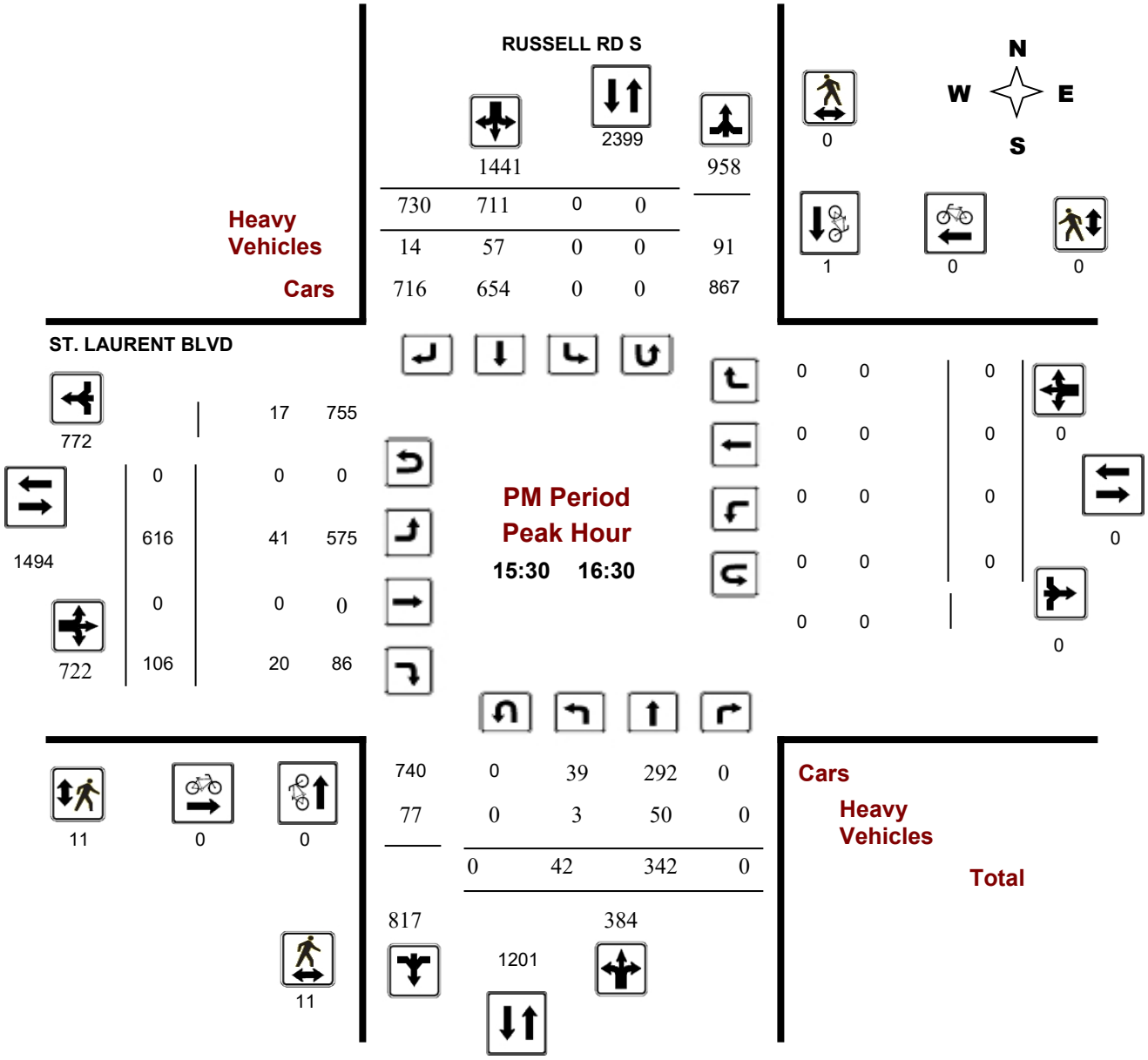
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RUSSELL RD S @ ST. LAURENT BLVD

Survey Date: Tuesday, April 11, 2017
Start Time: 07:00

WO No: 36886
Device: Miovision



Comments

APPENDIX C

COLLISION DATA

Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	213	63	86	46	2	11	2	2	425	79%
Non-fatal injury	54	27	5	12	0	14	0	2	114	21%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**267**	**90**	**91**	**58**	**2**	**25**	**2**	**4**	**539**	100%
	#1 or 50%	#3 or 17%	#2 or 17%	#4 or 11%	#7 or 0%	#5 or 5%	#7 or 0%	#6 or 1%		

INDUSTRIAL AVE/ INNES RD / ST. LAURENT BLVD (0002203)

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	141	58,461	1825	**1.32**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	72	12	25	9	0	2	0	0	120	85%
Non-fatal injury	14	4	1	1	0	1	0	0	21	15%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**86**	**16**	**26**	**10**	**0**	**3**	**0**	**0**	**141**	100%
	61%	11%	18%	7%	0%	2%	0%	0%		

BOURASSA ST / ST. LAURENT BLVD (0007731)

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	43	42,442	1825	**0.56**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	18	7	5	2	0	0	0	0	32	74%
Non-fatal injury	3	3	0	1	0	3	0	1	11	26%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**21**	**10**	**5**	**3**	**0**	**3**	**0**	**1**	**43**	100%
	49%	23%	12%	7%	0%	7%	0%	2%		

SMYTH RD E/LANCASTER RD / ST. LAURENT BLVD N/R (0002256)

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	81	47,266	1825	**0.94**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	43	4	15	3	1	1	0	0	67	83%
Non-fatal injury	10	1	2	0	0	1	0	0	14	17%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**53**	**5**	**17**	**3**	**1**	**2**	**0**	**0**	**81**	100%
	65%	6%	21%	4%	1%	2%	0%	0%		

BELFAST RD / ST. LAURENT BLVD (0007658)

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	111	36,162	1825	**1.68**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	32	26	14	10	0	3	0	2	87	78%
Non-fatal injury	9	9	2	2	0	2	0	0	24	22%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**41**	**35**	**16**	**12**	**0**	**5**	**0**	**2**	**111**	100%
	37%	32%	14%	11%	0%	5%	0%	2%		

RUSSELL RD S / ST. LAURENT BLVD (0007734)

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	55	26,673	1825	**1.13**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	11	10	2	9	0	2	0	0	34	62%
Non-fatal injury	4	8	0	6	0	3	0	0	21	38%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**15**	**18**	**2**	**15**	**0**	**5**	**0**	**0**	**55**	100%
	27%	33%	4%	27%	0%	9%	0%	0%		

Road Segments

ST. LAURENT BLVD /twn INDUSTRIAL AVE & BOURASSA ST (__3ZBOFB)

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	39	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	9	4	11	9	0	2	0	0	35	90%
Non-fatal injury	1	1	0	1	0	1	0	0	4	10%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**10**	**5**	**11**	**10**	**0**	**3**	**0**	**0**	**39**	100%
	26%	13%	28%	26%	0%	8%	0%	0%		

ST. LAURENT BLVD /twn BOURASSA ST & SMYTH RD (__3ZA3R6)

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	22	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	9	0	3	1	0	0	1	0	14	64%
Non-fatal injury	8	0	0	0	0	0	0	0	8	36%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**17**	**0**	**3**	**1**	**0**	**0**	**1**	**0**	**22**	100%
	77%	0%	14%	5%	0%	0%	5%	0%		

ST. LAURENT BLVD /twn BELFAST RD & INDUSTRIAL AVE (__3ZA3R8)

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	33	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	17	0	6	0	1	1	1	0	26	79%
Non-fatal injury	4	0	0	0	0	2	0	1	7	21%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**21**	**0**	**6**	**0**	**1**	**3**	**1**	**1**	**33**	100%
	64%	0%	18%	0%	3%	9%	3%	3%		

RUSSELL RD /twn SMYTH RD & ST. LAURENT BLVD (__3ZA3R3)

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	6	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	0	4	0	0	0	0	0	5	83%
Non-fatal injury	1	0	0	0	0	0	0	0	1	17%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**2**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**6**	100%
	33%	0%	67%	0%	0%	0%	0%	0%		

RUSSELL RD /twn ST. LAURENT BLVD & ST. LAURENT BLVD (__3ZBOFC)

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	6	n/a	1825	**n/a**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	0	1	2	0	0	0	0	4	67%
Non-fatal injury	0	0	0	1	0	1	0	0	2	33%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**0**	**1**	**3**	**0**	**1**	**0**	**0**	**6**	100%
	17%	0%	17%	50%	0%	17%	0%	0%		

APPENDIX D

COMMERCIAL VEHICLE TRIP GENERATION

ITE Vehicle Trip Generation Rates

Land Use	Data Source	Trip Rate		
		AM Peak	PM Peak	SAT Peak
Shopping Center	ITE 820	0.93	3.79	0.00
High Turn Over Restaurant	ITE 932	0.00	0.00	0.00
Gasoline with Service Station	ITE 944	0.00	0.00	0.00

Modified Person Trip Generation Rates

Land Use	Data Source	Person Trip Rate		
		AM Peak	PM Peak	SAT Peak
Shopping Center	ITE 820	1.19	4.85	0.00
High Turn Over Restaurant	ITE 932	0.00	0.00	0.00
Gasoline with Service Station	ITE 944	0.00	0.00	0.00

Note: 1.28 factor to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%

ITE Fitted Curve Equations

Land Use	Data Source	Fitted Curve Equation								
		AM Peak			PM Peak			SAT Peak		
Shopping Center	ITE 820	T=	1.32(x)	+ 0.00	T=	5.32(x)	+ 0.00	N/A	0.00(x)	+ 0.00
High Turn Over Restaurant	ITE 932	T=	11.00(x)	+ 0.00	T=	10.80(x)	+ 0.00	N/A	0.00(x)	+ 0.00
Gasoline with Service Station	ITE 944	T=	8.00(x)	+ 0.00	T=	10.90(x)	+ 0.00	N/A	0.00(x)	+ 0.00

1.33 passengers/veh

AM pass by 0

1.22 passengers/veh

AM pass by 40%

1.00 passengers/veh

AM pass by 58%

1.13 passengers/veh

0 m² to 0 ft²
0 ft² to 0 m²

Modified Person Trip Generation

Land Use	Data Source	Area	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)			SAT Peak (Person Trips/hr)		
			In	Out	Total	In	Out	Total	In	Out	Total
		ft²	62%	38%		48%	52%			100%	
Shopping Center	ITE 820	15,500 ft²	16	10	26	50	56	106	0	0	0
		ft²	55%	45%		62%	38%			100%	
High Turn Over Restaurant	ITE 932	6,000 ft²	46	38	84	51	32	83	0	0	0
		Units	50%	50%		50%	50%			100%	
Gasoline with Service Station	ITE 944	8 du	41	41	82	56	56	112	0	0	0
		Total	103	89	192	157	144	301	0	0	0

Shopping Center Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)			SAT Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total	In	Out	Total
Auto Driver	55%	9	6	15	28	31	59	0	0	0
Auto Passenger	15%	3	2	5	8	9	17	0	0	0
Transit	15%	2	1	3	7	8	15	0	0	0
Non-motorized	15%	2	1	3	7	8	15	0	0	0
Total Person Trips	100%	16	10	26	50	56	106	0	0	0
	Less Pass-by (35%)	0	0	0	-10	-10	-20	0	0	0
Total 'New' Shopping Center Auto Trips		**9**	**6**	**15**	**18**	**21**	**39**	**0**	**0**	**0**

High Turn Over Restaurant Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)			SAT Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total	In	Out	Total
Auto Driver	70%	33	27	60	36	23	59	0	0	0
Auto Passenger	15%	7	6	13	8	5	13	0	0	0
Transit	5%	2	2	4	2	1	3	0	0	0
Non-motorized	10%	4	3	7	5	3	8	0	0	0
Total Person Trips	100%	46	38	84	51	32	83	0	0	0
	Less Pass-by (43%)	-12	-12	-24	-13	-13	-26	0	0	0
Total 'New' High Turn Over Restaurant Auto Trips		**21**	**15**	**36**	**23**	**10**	**33**	**0**	**0**	**0**

Gasoline with Service Station Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)			SAT Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total	In	Out	Total
Auto Driver	100%	41	41	82	56	56	112	0	0	0
Auto Passenger	0%	0	0	0	0	0	0	0	0	0
Transit	0%	0	0	0	0	0	0	0	0	0
Non-motorized	0%	0	0	0	0	0	0	0	0	0
Total Person Trips	100%	41	41	82	56	56	112	0	0	0
	Less Pass-by (42%)	-24	-24	-48	-24	-24	-48	0	0	0
Total 'New' Gasoline with Service Station Auto Trips		**17**	**17**	**34**	**32**	**32**	**64**	**0**	**0**	**0**

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)			SAT Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total	In	Out	Total
Auto Driver	55%	83	74	157	120	110	230	0	0	0
Auto Passenger	15%	10	8	18	16	14	30	0	0	0
Transit	15%	4	3	7	9	9	18	0	0	0
Non-motorized	15%	6	4	10	12	11	23	0	0	0
Total Person Trips	100%	103	89	192	157	144	301	0	0	0
	Less Pass-by (0%)	-36	-36	-72	-47	-47	-94	0	0	0
Total 'New' Auto Trips		**47**	**38**	**85**	**73**	**63**	**136**	**0**	**0**	**0**

Volumes Figures

	'New' Trips		'Pass-by' Trips	
	In	Out	In	Out
AM	9	6	0	0
PM	18	21	-10	-10
SAT	0	0	0	0
0% Multi-Purpose Trip Reduction				

Volumes Figures

	'New' Trips		'Pass-by' Trips	
	In	Out	In	Out
AM	21	15	-12	-12
PM	23	10	-13	-13
SAT	0	0	0	0
0% Multi-Purpose Trip Reduction				

Volumes Figures

	'New' Trips		'Pass-by' Trips	
	In	Out	In	Out
AM	17	17	-24	-24
PM	32	32	-24	-24
SAT	0	0	0	0
0% Multi-Purpose Trip Reduction				

Volumes Figures

	'New' Trips		'Pass-by' Trips	
	In	Out	In	Out
AM	47	38	-36	-36
PM	73	63	-47	-47
SAT	0	0	0	0
0% Multi-Purpose Trip Reduction				

APPENDIX E

TRAFFIC GROWTH DATA

Road/Road
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2001	Tues June 12	11373	10796	8185	8810	2382	2072	4757	5019	53394
2009	Friday June 5	11865	9457	7059	9682	2592	2206	4754	4925	52540
2014	29-May	9042	12396	11204	8999	2677	4871	6053	2710	57952
2016	Thurs Jan 28	10206	10237	7679	7956	2457	2378	5309	5080	51302
2020	Thurs March 5	11206	10725	7889	8274	3017	2951	5331	5593	54986

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2001	10796	11373	22169	53394				
2009	9457	11865	21322	52540	-12.4%	4.3%	-3.8%	-1.6%
2014	12396	9042	21438	57952	31.1%	-23.8%	0.5%	10.3%
2016	10237	10206	20443	51302	-17.4%	12.9%	-4.6%	-11.5%
2020	10725	11206	21931	54986	4.8%	9.8%	7.3%	7.2%

Regression Estimate	2001	10495	11363	21858
Regression Estimate	2020	10887	10284	21172
Average Annual Change		**0.19%**	**-0.52%**	**-0.17%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2001	4757	5019	9776	53394				
2009	4754	4925	9679	52540	-0.1%	-1.9%	-1.0%	-1.6%
2014	6053	2710	8763	57952	27.3%	-45.0%	-9.5%	10.3%
2016	5309	5080	10389	51302	-12.3%	87.5%	18.6%	-11.5%
2020	5331	5593	10924	54986	0.4%	10.1%	5.1%	7.2%

Regression Estimate	2001	4758	4640	9397
Regression Estimate	2020	5592	4684	10276
Average Annual Change		**0.85%**	**0.05%**	**0.47%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2001	2072	2382	4454	53394				
2009	2206	2592	4798	52540	6.5%	8.8%	7.7%	-1.6%
2014	4871	2677	7548	57952	120.8%	3.3%	57.3%	10.3%
2016	2378	2457	4835	51302	-51.2%	-8.2%	-35.9%	-11.5%
2020	2951	3017	5968	54986	24.1%	22.8%	23.4%	7.2%

Regression Estimate	2001	2204	2351	4555
Regression Estimate	2020	3398	2825	6223
Average Annual Change		**2.31%**	**0.97%**	**1.66%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2001	8185	8810	16995	53394				
2009	7059	9682	16741	52540	-13.8%	9.9%	-1.5%	-1.6%
2014	11204	8999	20203	57952	58.7%	-7.1%	20.7%	10.3%
2016	7679	7956	15635	51302	-31.5%	-11.6%	-22.6%	-11.5%
2020	7889	8274	16163	54986	2.7%	4.0%	3.4%	7.2%

Regression Estimate	2001	8145	9255	17400
Regression Estimate	2020	8591	8373	16964
Average Annual Change		**0.28%**	**-0.53%**	**-0.13%**

Road/Road
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2001	Tues June 12	1636	1319	1177	1064	285	285	489	918	7173
2009	Friday June 5	1633	1149	1082	1045	344	338	422	949	6962
2014	43980	1401	1294	1750	1293	403	814	561	534	8050
2016	Thurs Jan 28	1337	1345	1240	723	394	276	443	1070	6828
2020	Thurs March 5	1376	1534	1411	726	416	337	503	1109	7412

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2001	1319	1636	2955	7173				
2009	1149	1633	2782	6962	-12.9%	-0.2%	-5.9%	-2.9%
2014	1294	1401	2695	8050	12.6%	-14.2%	-3.1%	15.6%
2016	1345	1337	2682	6828	3.9%	-4.6%	-0.5%	-15.2%
2020	1534	1376	2910	7412	14.1%	2.9%	8.5%	8.6%

Regression Estimate	2001	1211	1669	2879
Regression Estimate	2020	1414	1337	2750
Average Annual Change		**0.82%**	**-1.16%**	**-0.24%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2001	489	918	1407	7173				
2009	422	949	1371	6962	-13.7%	3.4%	-2.6%	-2.9%
2014	561	534	1095	8050	32.9%	-43.7%	-20.1%	15.6%
2016	443	1070	1513	6828	-21.0%	100.4%	38.2%	-15.2%
2020	503	1109	1612	7412	13.5%	3.6%	6.5%	8.6%

Regression Estimate	2001	470	850	1320
Regression Estimate	2020	494	964	1457
Average Annual Change		**0.27%**	**0.66%**	**0.52%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2001	285	285	570	7173				
2009	338	344	682	6962	18.6%	20.7%	19.6%	-2.9%
2014	814	403	1217	8050	140.8%	17.2%	78.4%	15.6%
2016	276	394	670	6828	-66.1%	-2.2%	-44.9%	-15.2%
2020	337	416	753	7412	22.1%	5.6%	12.4%	8.6%

Regression Estimate	2001	344	289	633
Regression Estimate	2020	458	426	884
Average Annual Change		**1.51%**	**2.06%**	**1.77%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2001	1177	1064	2241	7173				
2009	1082	1045	2127	6962	-8.1%	-1.8%	-5.1%	-2.9%
2014	1750	1293	3043	8050	61.7%	23.7%	43.1%	15.6%
2016	1240	723	1963	6828	-29.1%	-44.1%	-35.5%	-15.2%
2020	1411	726	2137	7412	13.8%	0.4%	8.9%	8.6%

Regression Estimate	2001	1149	1153	2302
Regression Estimate	2020	1465	837	2302
Average Annual Change		**1.29%**	**-1.67%**	**0.00%**

Road/Road
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2001	Tues June 12	1555	1674	1105	1415	381	318	904	538	7890
2009	Friday June 5	1751	1589	1058	1642	450	338	912	600	8340
2014	43980	1154	2002	1573	1224	404	680	1121	346	8504
2016	Thurs Jan 28	1411	1453	962	1332	323	445	1016	482	7424
2020	Thurs March 5	1598	1468	921	1423	436	504	1002	562	7914

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2001	1674	1555	3229	7890				
2009	1589	1751	3340	8340	-5.1%	12.6%	3.4%	5.7%
2014	2002	1154	3156	8504	26.0%	-34.1%	-5.5%	2.0%
2016	1453	1411	2864	7424	-27.4%	22.3%	-9.3%	-12.7%
2020	1468	1598	3066	7914	1.0%	13.3%	7.1%	6.6%

Regression Estimate	2001	1721	1577	3298
Regression Estimate	2020	1577	1433	3010
Average Annual Change		**-0.46%**	**-0.50%**	**-0.48%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2001	904	538	1442	7890				
2009	912	600	1512	8340	0.9%	11.5%	4.9%	5.7%
2014	1121	346	1467	8504	22.9%	-42.3%	-3.0%	2.0%
2016	1016	482	1498	7424	-9.4%	39.3%	2.1%	-12.7%
2020	1002	562	1564	7914	-1.4%	16.6%	4.4%	6.6%

Regression Estimate	2001	907	537	1443
Regression Estimate	2020	1052	483	1535
Average Annual Change		**0.79%**	**-0.55%**	**0.33%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2001	318	381	699	7890				
2009	338	450	788	8340	6.3%	18.1%	12.7%	5.7%
2014	680	404	1084	8504	101.2%	-10.2%	37.6%	2.0%
2016	445	323	768	7424	-34.6%	-20.0%	-29.2%	-12.7%
2020	504	436	940	7914	13.3%	35.0%	22.4%	6.6%

Regression Estimate	2001	320	396	717
Regression Estimate	2020	556	401	957
Average Annual Change		**2.95%**	**0.06%**	**1.53%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2001	1105	1415	2520	7890				
2009	1058	1642	2700	8340	-4.3%	16.0%	7.1%	5.7%
2014	1573	1224	2797	8504	48.7%	-25.5%	3.6%	2.0%
2016	962	1332	2294	7424	-38.8%	8.8%	-18.0%	-12.7%
2020	921	1423	2344	7914	-4.3%	6.8%	2.2%	6.6%

Regression Estimate	2001	1174	1476	2649
Regression Estimate	2020	1088	1357	2445
Average Annual Change		**-0.40%**	**-0.44%**	**-0.42%**

APPENDIX F

MMLOS ANALYSIS: ROAD SEGMENTS

Multi-Modal Level of Service - Segments Form

Consultant	Parsons	**Project**	477563
Scenario	1740 St. Laurent	**Date**	Oct. 23, 2020
Comments			

SEGMENTS		Street A	St. Laurent West Side	St. Laurent East Side	Section 3	Section 4	Section 5	Section 6	Section 7	Section 8	Section 9
Pedestrian	Sidewalk Width Boulevard Width	D	≥ 2 m > 2 m	≥ 2 m > 2 m							
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000							
	Operating Speed On-Street Parking		> 50 to 60 km/h no	> 60 km/h no							
	Exposure to Traffic PLoS		**C**	**D**	-	-	-	-	-	-	-
	Effective Sidewalk Width		2.0 m	2.0 m							
	Pedestrian Volume		500 ped /hr	500 ped /hr							
	Crowding PLoS		**B**	**B**	-	-	-	-	-	-	-
	Level of Service		**C**	**D**	-	-	-	-	-	-	-
Bicycle	Type of Cycling Facility	A	Physically Separated	Physically Separated							
	Number of Travel Lanes										
	Operating Speed										
	# of Lanes & Operating Speed LoS		-	-	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width										
	Bike Lane Width LoS		-	-	-	-	-	-	-	-	-
	Bike Lane Blockages										
	Blockage LoS		-	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)										
	No. of Lanes at Unsignalized Crossing										
	Sidestreet Operating Speed										
	Unsignalized Crossing - Lowest LoS		**A**	**A**	-	-	-	-	-	-	-
	Level of Service		**A**	**A**	-	-	-	-	-	-	-
Transit	Facility Type	B	Bus lane	Bus lane							
	Friction or Ratio Transit:Posted Speed		Cf ≤ 60	Cf ≤ 60							
	Level of Service		**B**	**B**	-	-	-	-	-	-	-
Truck	Truck Lane Width	A	≤ 3.5 m	≤ 3.5 m							
	Travel Lanes per Direction		> 1	> 1							
	Level of Service		**A**	**A**	-	-	-	-	-	-	-

APPENDIX G

TRAFFIC SIGNAL WARRANT

St. Laurent/Site - (peak hour signal warrant)

Signal Warrant		Description		Minimum Requirement for Two-Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	900	204%	27%	**73% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	27%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	900	197%	73%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	73%		

Notes

1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above*

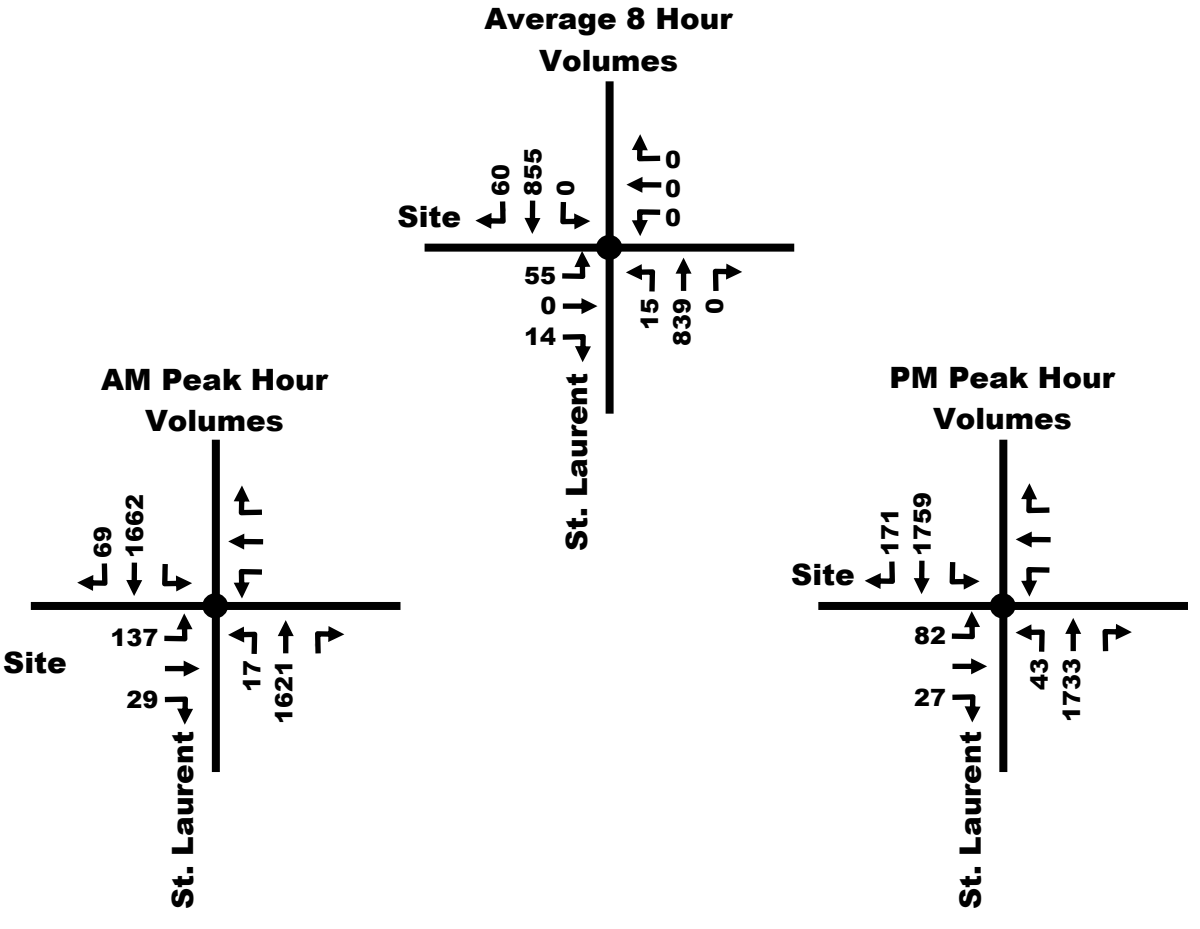
2 *For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08*

3 *The Lowest Sectional Percentage Governs the Entire Warrant*

4 *For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)*

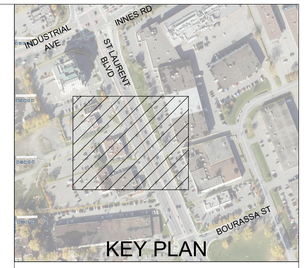
Yes

Yes



APPENDIX H

DRAFT DESIGN: NEW SIGNALIZED INTERSECTION



CYCLE TRACK
SIDEWALK
PROPOSED 3.0m CROSSWALK
PROPOSED WIDENED MEDIAN
MATCH EXISTING
ST LAURENT BLVD
TWSI (TYP.)
PROPOSED AUXILIARY LEFT-TURN LANE AND MODIFIED MEDIAN
PROPOSED 21m TAPER
MATCH EXISTING
3.0m
3.5m
3.5m
3.5m
3.5m
1.5m
1.0m
39.8m
21.0m
3.5m
3.5m
3.5m
3.0m
1.3m
1.6m
0.2m
0.2m
2.0m
2.6m
6m R
6m R
MATCH EXISTING
CYCLE TRACK
SIDEWALK
2.0m WIDE CROSS RIDE
PROPOSED 3.0m CROSSWALK
MATCH EXISTING
CYCLE TRACK
SIDEWALK
6.0m
1.5m
4.5m
SITE ACCESS
PROPOSED MEDIAN

No.	DATE	DESCRIPTION	BY
A	07-16-21	STEP 4 TIA	M.B.

REVISIONS

5m 0 5 10m
SCALE: 1:250

PARSONS
1223 Michael Street, Suite 100, Ottawa, Ontario, Canada K1J 7T2
Tel: (613) 738-4160 Fax: (613) 739-7105

CLIENT
HEAFEY GROUP

PROJECT
1740-1760 ST LAURENT BOULEVARD - SITE PLAN APPLICATION

TITLE
FUNCTIONAL PLAN

DESIGNED BY	M.M.
DRAWN BY	J.E.
CHECKED BY	M.B.
DATE	July 16, 2021
SCALE	1:200
PROJECT NO.	477563
DRAWING NO.	1

APPENDIX I

TDM MEASURES

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑ Most of parking underground
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑ All main entrances abut sidewalks
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑ modern building design with windows
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☑ main entrances connect to sidewalks on both sides of the site access which connects to sidewalks on St. Laurent Blvd and transit stops
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑ refer to comment 1.2.1.

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑ sidewalks to be built to City Standards
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑ sidewalks to be built to City Standards
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑ internal sidewalks to connect to existing pedestrian and cycling infrastructure on St. Laurent Blvd. Additional connection to Everest Private for pedestrians and cyclists only
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑ refer to comment in 1.2.5.
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑ St. Laurent has existing road lighting
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑ Majority of bike parking proposed underground
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑ Developer suggests that at least the minimum required will be met
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑ bicycle parking to meet by-law standards
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑ Majority of bike parking proposed in underground parking structure
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐ no on-site transit stops
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐ no on-site transit stops
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐ no on-site transit stops

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑ current parking proposed meets min/max allowed
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☑ surface parking for visitors separate from underground
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☑ surface parking to be shared by commercial and residential visitors
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☑ residential underground parking separate from surface visitor parking

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Residential developments*	Check if proposed & add descriptions
	1.	**TDM PROGRAM MANAGEMENT**	
	1.1	**Program coordinator**	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☑
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
	2.	**WALKING AND CYCLING**	
	2.1	**Information on walking/cycling routes & destinations**	
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances *(multi-family, condominium)*	☑
	2.2	**Bicycle skills training**	
BETTER	2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☐

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances *(multi-family, condominium)*	☑
BETTER		3.1.2	Provide real-time arrival information display at entrances *(multi-family, condominium)*	☐
		3.2	**Transit fare incentives**	
BASIC	★	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	☐
BETTER		3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in	☐
		3.3	**Enhanced public transit service**	
BETTER	★	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels *(subdivision)*	☐
		3.4	**Private transit service**	
BETTER		3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	☐
		4.	**CARSHARING & BIKESHARING**	
		4.1	**Bikeshare stations & memberships**	
BETTER		4.1.1	Contract with provider to install on-site bikeshare station (*multi-family)*	☐
BETTER		4.1.2	Provide residents with bikeshare memberships, either free or subsidized *(multi-family)*	☐
		4.2	**Carshare vehicles & memberships**	
BETTER		4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents	☐
BETTER		4.2.2	Provide residents with carshare memberships, either free or subsidized	☐
		5.	**PARKING**	
		5.1	**Priced parking**	
BASIC	★	5.1.1	Unbundle parking cost from purchase price *(condominium)*	☐
BASIC	★	5.1.2	Unbundle parking cost from monthly rent *(multi-family)*	☑

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		6.	**TDM MARKETING & COMMUNICATIONS**	
		6.1	**Multimodal travel information**	
BASIC	★	6.1.1	Provide a multimodal travel option information package to new residents	☐
		6.2	**Personalized trip planning**	
BETTER	★	6.2.1	Offer personalized trip planning to new residents	☐

APPENDIX J

MMLOS ANALYSIS: INTERSECTIONS

Multi-Modal Level of Service - Intersections Form

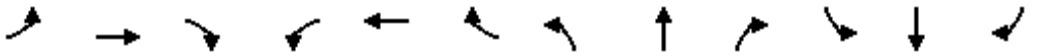
Consultant	**Parsons**	**Project**	**477563**
Scenario	**1740 St. Laurent**	**Date**	**Oct. 29, 2020**
Comments			

Unlocked Rows for Replicating

INTERSECTIONS		Site Access/St. Laurent				Industrial/St. Laurent				Intersection C			
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	7	6		3	10+	10+	8	8				
	Median	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m				
	Conflicting Left Turns	No left turn / Prohib.	Protected		Permissive	Protected	Protected	Protected	Protected				
	Conflicting Right Turns	Permissive or yield control	No right turn		Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control				
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR prohibited		RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed				
	Ped Signal Leading Interval?	No	No		No	No	No	No	No				
	Right Turn Channel	No Channel	No Channel		No Channel	Conv'tl without Receiving Lane	Conv'tl without Receiving Lane	Conv'tl without Receiving Lane	Conv'tl without Receiving Lane				
	Corner Radius	15-25m	15-25m		15-25m	15-25m	15-25m	15-25m	15-25m				
	Crosswalk Type	Std transverse markings	Std transverse markings		Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings				
	PETSI Score	**10**	**34**		**68**	**-35**	**-35**	**-2**	**-2**				
	Ped. Exposure to Traffic LoS	**F**	**E**	**-**	**C**	**#N/A**	**#N/A**	**F**	**F**	**-**	**-**	**-**	**-**
	Cycle Length	140	140		140	140	140	140	140				
	Effective Walk Time	31	31		31	31	31	32	32				
	Average Pedestrian Delay	**42**	**42**		**42**	**42**	**42**	**42**	**42**				
	Pedestrian Delay LoS	**E**	**E**	**-**	**E**	**E**	**E**	**E**	**E**	**-**	**-**	**-**	**-**
	Level of Service	**F**	**E**	**-**	**E**	**#N/A**	**#N/A**	**F**	**F**	**-**	**-**	**-**	**-**
		F				**#N/A**				**-**			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP			Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP				
	Right Turn Lane Configuration	Not Applicable	Not Applicable			Not Applicable	Not Applicable	Not Applicable	Not Applicable				
	Right Turning Speed	Not Applicable	Not Applicable			Not Applicable	Not Applicable	Not Applicable	Not Applicable				
	Cyclist relative to RT motorists	**Not Applicable**	**Not Applicable**	**-**	**-**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**-**	**-**	**-**	**-**
	Separated or Mixed Traffic	**Separated**	**Separated**	**-**	**-**	**Separated**	**Separated**	**Separated**	**Separated**	**-**	**-**	**-**	**-**
	Left Turn Approach	No lane crossed	No lane crossed			2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box				
	Operating Speed	≥ 60 km/h	≥ 60 km/h			≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h				
	Left Turning Cyclist	**C**	**C**	**-**	**-**	**A**	**A**	**A**	**A**	**-**	**-**	**-**	**-**
	Level of Service	**C**	**C**	**-**	**-**	**A**	**A**	**A**	**A**	**-**	**-**	**-**	**-**
		C				**A**				**-**			
Transit	Average Signal Delay	≤ 20 sec	≤ 20 sec			> 40 sec	> 40 sec						
	Level of Service	**C**	**C**	**-**	**-**	**F**	**F**	**-**	**-**	**-**	**-**	**-**	**-**
		C				**F**				**-**			
Truck	Effective Corner Radius	> 15 m	> 15 m		> 15 m	> 15 m	> 15 m	> 15 m	> 15 m				
	Number of Receiving Lanes on Departure from Intersection	1	1		≥ 2	≥ 2	≥ 2	≥ 2	≥ 2				
	Level of Service	**C**	**C**	**-**	**A**	**A**	**A**	**A**	**A**	**-**	**-**	**-**	**-**
		C				**A**				**-**			
Auto	Volume to Capacity Ratio												
	Level of Service	**-**				**-**				**-**			

APPENDIX K

SYNCHRO ANALYSIS: EXISTING INTERSECTION PERFORMANCE



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	177	118	611	741	241	177	983	330	116	744	142
Future Volume (vph)	67	177	118	611	741	241	177	983	330	116	744	142
Satd. Flow (prot)	3288	3390	1517	3288	3390	1517	3288	3390	1517	3288	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3284	3390	1487	3256	3390	1495	3272	3390	1490	3282	3390	1484
Satd. Flow (RTOR)			180			268			343			180
Lane Group Flow (vph)	74	197	131	679	823	268	197	1092	367	129	827	158
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	38.6	38.6	11.6	38.6	38.6	11.3	37.6	37.6	11.3	37.6	37.6
Total Split (s)	25.0	38.0	38.0	36.0	49.0	49.0	23.0	43.0	43.0	23.0	43.0	43.0
Total Split (%)	17.9%	27.1%	27.1%	25.7%	35.0%	35.0%	16.4%	30.7%	30.7%	16.4%	30.7%	30.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.1	2.4	2.4	2.1	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.3	6.6	6.6	6.3	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	8.5	20.1	20.1	29.4	43.6	43.6	13.5	53.5	53.5	10.8	50.8	50.8
Actuated g/C Ratio	0.06	0.14	0.14	0.21	0.31	0.31	0.10	0.38	0.38	0.08	0.36	0.36
v/c Ratio	0.37	0.40	0.36	0.98	0.78	0.41	0.62	0.84	0.47	0.51	0.67	0.24
Control Delay	67.9	55.3	4.3	85.3	49.8	5.6	69.3	47.4	7.1	68.7	42.5	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	55.3	4.3	85.3	49.8	5.6	69.3	47.4	7.1	68.7	42.5	4.4
LOS	E	E	A	F	D	A	E	D	A	E	D	A
Approach Delay		41.0			56.7			41.1			40.1	
Approach LOS		D			E			D			D	
Queue Length 50th (m)	10.3	26.5	0.0	97.4	113.0	0.0	27.4	143.1	4.1	17.9	100.6	0.0
Queue Length 95th (m)	18.2	35.2	5.1	#136.4	124.4	18.4	39.5	#228.6	32.1	28.1	#157.0	12.2
Internal Link Dist (m)		460.3			515.4			130.1			572.9	
Turn Bay Length (m)	35.0		120.0	160.0		85.0	90.0		110.0	135.0		155.0
Base Capacity (vph)	432	760	473	690	1087	661	392	1296	781	392	1231	653
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.26	0.28	0.98	0.76	0.41	0.50	0.84	0.47	0.33	0.67	0.24

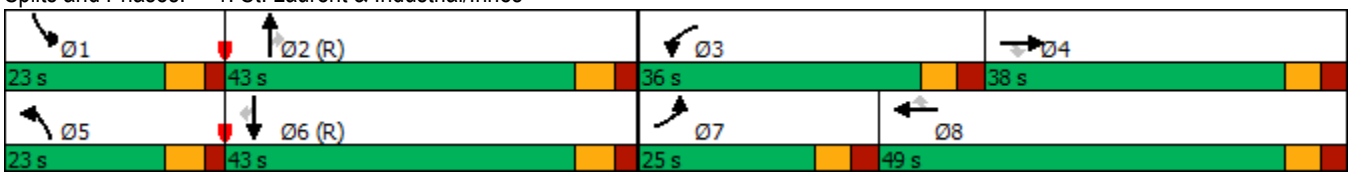
Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 46.4	Intersection LOS: D
Intersection Capacity Utilization 84.7%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 1: St. Laurent & Industrial/Innes



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	50	10	90	37	6	110	56	1319	49	14	126	1281
Future Volume (vph)	50	10	90	37	6	110	56	1319	49	14	126	1281
Satd. Flow (prot)	0	1586	0	0	1559	0	1695	3390	1517	0	1695	3390
Flt Permitted		0.696			0.792		0.950				0.950	
Satd. Flow (perm)	0	1116	0	0	1245	0	1689	3390	1464	0	1692	3390
Satd. Flow (RTOR)		58			99				86			
Lane Group Flow (vph)	0	167	0	0	170	0	62	1466	54	0	156	1423
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8					2			
Detector Phase	4	4		8	8		5	2	2	1	1	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	5.0	10.0
Minimum Split (s)	33.3	33.3		33.3	33.3		11.2	27.2	27.2	11.2	11.2	33.0
Total Split (s)	34.0	34.0		34.0	34.0		18.0	68.0	68.0	18.0	18.0	68.0
Total Split (%)	28.3%	28.3%		28.3%	28.3%		15.0%	56.7%	56.7%	15.0%	15.0%	56.7%
Yellow Time (s)	3.3	3.3		3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	1.7	1.7	2.0	2.0	1.7
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		6.3			6.3		6.2	5.9	5.9		6.2	5.9
Lead/Lag							Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	None	C-Min
Act Effct Green (s)		17.0			17.0		9.5	68.3	68.3		16.3	77.5
Actuated g/C Ratio		0.14			0.14		0.08	0.57	0.57		0.14	0.65
v/c Ratio		0.80			0.65		0.46	0.76	0.06		0.68	0.65
Control Delay		58.5			31.9		58.5	13.7	1.1		65.0	17.3
Queue Delay		0.0			0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		58.5			31.9		58.5	13.7	1.1		65.0	17.3
LOS		E			C		E	B	A		E	B
Approach Delay		58.5			31.9			15.0				20.9
Approach LOS		E			C			B				C
Queue Length 50th (m)		25.7			15.6		15.6	53.5	0.3		34.6	103.9
Queue Length 95th (m)		45.9			35.3		m19.0	53.2	m0.5		#75.3	172.2
Internal Link Dist (m)		48.8			101.3			271.9				163.4
Turn Bay Length (m)							55.0		105.0		80.0	
Base Capacity (vph)		302			363		168	1929	870		230	2190
Starvation Cap Reductn		0			0		0	0	0		0	0
Spillback Cap Reductn		0			0		0	0	0		0	0
Storage Cap Reductn		0			0		0	0	0		0	0
Reduced v/c Ratio		0.55			0.47		0.37	0.76	0.06		0.68	0.65

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 113 (94%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	96
Future Volume (vph)	96
Satd. Flow (prot)	1517
Flt Permitted	
Satd. Flow (perm)	1448
Satd. Flow (RTOR)	86
Lane Group Flow (vph)	107
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	33.0
Total Split (s)	68.0
Total Split (%)	56.7%
Yellow Time (s)	4.2
All-Red Time (s)	1.7
Lost Time Adjust (s)	0.0
Total Lost Time (s)	5.9
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Min
Act Effct Green (s)	77.5
Actuated g/C Ratio	0.65
v/c Ratio	0.11
Control Delay	4.2
Queue Delay	0.0
Total Delay	4.2
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	1.7
Queue Length 95th (m)	11.0
Internal Link Dist (m)	
Turn Bay Length (m)	60.0
Base Capacity (vph)	965
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.11

Intersection Summary

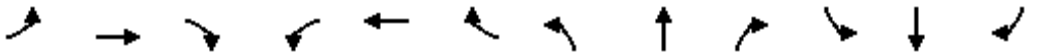
Maximum v/c Ratio: 0.80

Intersection Signal Delay: 20.6	Intersection LOS: C
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: St. Laurent & Bourassa





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	301	105	97	32	277	107	188	1125	96	136	595	644
Future Volume (vph)	301	105	97	32	277	107	188	1125	96	136	595	644
Satd. Flow (prot)	3288	1784	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3242	1784	1467	1664	3390	1479	1687	3390	1448	1688	3390	1481
Satd. Flow (RTOR)			132			132			130			385
Lane Group Flow (vph)	334	117	108	36	308	119	209	1250	107	151	661	716
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	11.2	28.2	28.2	11.2	28.2	28.2
Total Split (s)	20.0	28.0	28.0	20.0	28.0	28.0	20.0	52.0	52.0	20.0	52.0	52.0
Total Split (%)	16.7%	23.3%	23.3%	16.7%	23.3%	23.3%	16.7%	43.3%	43.3%	16.7%	43.3%	43.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.9	2.0	2.0	1.9	2.0	2.0	1.8	1.7	1.7	1.8	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.7	5.7	5.6	5.7	5.7	6.0	5.9	5.9	6.0	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	14.2	27.4	27.4	8.0	16.5	16.5	19.6	51.3	51.3	14.8	46.5	46.5
Actuated g/C Ratio	0.12	0.23	0.23	0.07	0.14	0.14	0.16	0.43	0.43	0.12	0.39	0.39
v/c Ratio	0.86	0.29	0.25	0.32	0.66	0.38	0.75	0.86	0.15	0.72	0.50	0.89
Control Delay	73.3	41.8	5.3	60.1	55.9	9.2	66.7	39.7	3.0	76.2	25.0	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.3	41.8	5.3	60.1	55.9	9.2	66.7	39.7	3.0	76.2	25.0	24.9
LOS	E	D	A	E	E	A	E	D	A	E	C	C
Approach Delay		53.6			44.2			40.8			30.0	
Approach LOS		D			D			D			C	
Queue Length 50th (m)	40.3	24.2	0.0	8.3	36.8	0.0	47.2	141.4	0.0	38.0	40.0	103.5
Queue Length 95th (m)	#63.6	40.4	9.7	18.5	48.8	12.8	#100.0	#196.2	7.4	m#66.0	60.8	#108.8
Internal Link Dist (m)		678.5			293.4			245.7			271.9	
Turn Bay Length (m)	70.0		100.0	35.0		15.0	65.0		25.0	110.0		90.0
Base Capacity (vph)	394	406	436	203	629	382	277	1448	693	218	1313	809
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.29	0.25	0.18	0.49	0.31	0.75	0.86	0.15	0.69	0.50	0.89

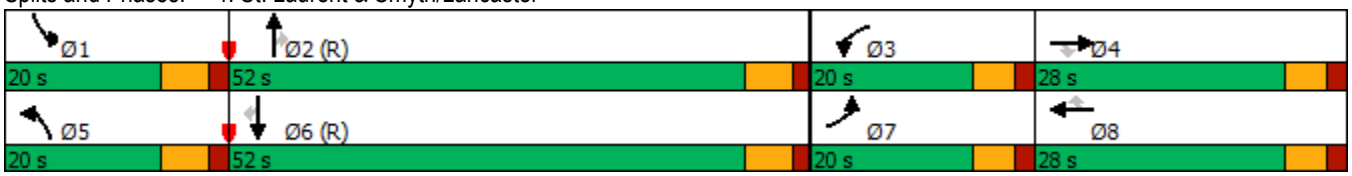
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 110 (92%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

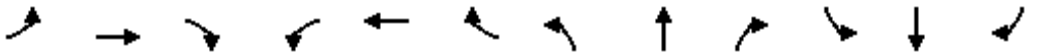
Maximum v/c Ratio: 0.89

Intersection Signal Delay: 38.9	Intersection LOS: D
Intersection Capacity Utilization 79.9%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: St. Laurent & Smyth/Lancaster





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	63	84	43	140	94	116	809	63	83	764	190
Future Volume (vph)	47	63	84	43	140	94	116	809	63	83	764	190
Satd. Flow (prot)	1695	1784	1517	1695	1668	0	1695	3390	1517	1695	3390	1517
Flt Permitted	0.246			0.711			0.245			0.234		
Satd. Flow (perm)	439	1784	1494	1265	1668	0	437	3390	1485	418	3390	1492
Satd. Flow (RTOR)			93		26				130			211
Lane Group Flow (vph)	52	70	93	48	260	0	129	899	70	92	849	211
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	27.8	27.8	27.8	27.8		11.2	41.6	41.6	11.2	41.6	41.6
Total Split (s)	16.0	48.0	48.0	32.0	32.0		15.0	57.0	57.0	15.0	57.0	57.0
Total Split (%)	13.3%	40.0%	40.0%	26.7%	26.7%		12.5%	47.5%	47.5%	12.5%	47.5%	47.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.4	1.4	1.5	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8		5.7	5.6	5.6	5.7	5.6	5.6
Lead/Lag	Lead			Lag	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	34.5	34.5	34.5	22.2	22.2		69.1	60.4	60.4	67.5	59.5	59.5
Actuated g/C Ratio	0.29	0.29	0.29	0.18	0.18		0.58	0.50	0.50	0.56	0.50	0.50
v/c Ratio	0.24	0.14	0.19	0.21	0.79		0.38	0.53	0.09	0.29	0.51	0.25
Control Delay	29.3	28.3	5.8	41.1	58.6		15.5	24.2	0.2	14.7	24.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	28.3	5.8	41.1	58.6		15.5	24.2	0.2	14.7	24.2	3.9
LOS	C	C	A	D	E		B	C	A	B	C	A
Approach Delay		18.8			55.9			21.7			19.8	
Approach LOS		B			E			C			B	
Queue Length 50th (m)	8.8	11.9	0.0	9.7	53.3		12.5	76.4	0.0	8.7	72.2	0.0
Queue Length 95th (m)	15.7	19.9	10.2	19.1	76.6		26.6	115.3	0.2	19.8	107.3	14.9
Internal Link Dist (m)		480.6			437.7			572.9			582.7	
Turn Bay Length (m)	70.0		200.0	65.0			65.0		65.0	75.0		100.0
Base Capacity (vph)	236	643	597	284	394		356	1735	823	339	1719	860
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	0.22	0.11	0.16	0.17	0.66		0.36	0.52	0.09	0.27	0.49	0.25

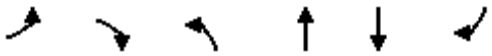
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 100 (83%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 24.4	Intersection LOS: C
Intersection Capacity Utilization 69.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: St. Laurent & Belfast





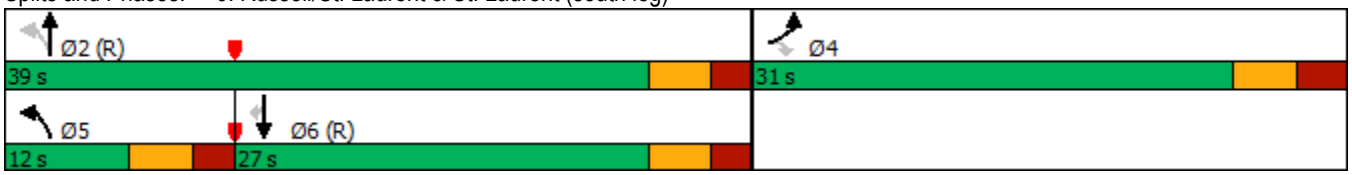
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	668	44	73	662	298	459
Future Volume (vph)	668	44	73	662	298	459
Satd. Flow (prot)	3288	1517	1695	3390	3390	1517
Flt Permitted	0.950		0.457			
Satd. Flow (perm)	3288	1485	812	3390	3390	1485
Satd. Flow (RTOR)		31				510
Lane Group Flow (vph)	742	49	81	736	331	510
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	24.0	26.5	26.5
Total Split (s)	31.0	31.0	12.0	39.0	27.0	27.0
Total Split (%)	44.3%	44.3%	17.1%	55.7%	38.6%	38.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	20.9	20.9	37.6	37.6	27.7	27.7
Actuated g/C Ratio	0.30	0.30	0.54	0.54	0.40	0.40
v/c Ratio	0.76	0.11	0.16	0.40	0.25	0.57
Control Delay	27.4	9.2	9.9	11.1	16.9	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.4	9.2	9.9	11.1	16.9	5.0
LOS	C	A	A	B	B	A
Approach Delay	26.3			10.9	9.7	
Approach LOS	C			B	A	
Queue Length 50th (m)	44.8	1.7	4.8	27.6	15.9	0.0
Queue Length 95th (m)	57.3	7.7	12.0	44.8	27.1	19.8
Internal Link Dist (m)	174.1			99.9	245.7	
Turn Bay Length (m)		15.0	65.0			90.0
Base Capacity (vph)	1174	550	523	1822	1340	895
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.09	0.15	0.40	0.25	0.57

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 55.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Russell/St. Laurent & St. Laurent (south leg)



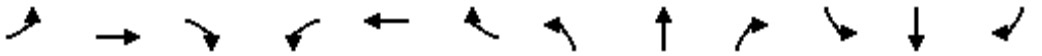
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	74	0	1485	1488	83
Future Vol, veh/h	0	74	0	1485	1488	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	82	0	1650	1653	92

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	827	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	315	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	315	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	315	-	-
HCM Lane V/C Ratio	-	0.261	-	-
HCM Control Delay (s)	-	20.4	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	550	324	398	274	135	173	852	507	130	814	124
Future Volume (vph)	135	550	324	398	274	135	173	852	507	130	814	124
Satd. Flow (prot)	3288	3390	1517	3288	3390	1517	3288	3390	1517	3288	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3258	3390	1488	3272	3390	1486	3261	3390	1479	3269	3390	1473
Satd. Flow (RTOR)			305			150			462			168
Lane Group Flow (vph)	150	611	360	442	304	150	192	947	563	144	904	138
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	38.6	38.6	11.6	38.6	38.6	11.3	37.6	37.6	11.3	37.6	37.6
Total Split (s)	19.0	38.0	38.0	41.0	60.0	60.0	28.0	43.0	43.0	28.0	43.0	43.0
Total Split (%)	12.7%	25.3%	25.3%	27.3%	40.0%	40.0%	18.7%	28.7%	28.7%	18.7%	28.7%	28.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.1	2.4	2.4	2.1	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.3	6.6	6.6	6.3	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	11.3	32.5	32.5	25.4	46.7	46.7	14.1	54.0	54.0	11.9	51.9	51.9
Actuated g/C Ratio	0.08	0.22	0.22	0.17	0.31	0.31	0.09	0.36	0.36	0.08	0.35	0.35
v/c Ratio	0.61	0.83	0.64	0.79	0.29	0.27	0.62	0.78	0.68	0.55	0.77	0.22
Control Delay	77.8	66.6	14.9	70.5	39.0	5.9	74.1	49.1	13.1	74.3	50.4	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.8	66.6	14.9	70.5	39.0	5.9	74.1	49.1	13.1	74.3	50.4	3.5
LOS	E	E	B	E	D	A	E	D	B	E	D	A
Approach Delay		51.5			49.0			40.0			47.8	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	22.5	91.0	13.3	65.9	35.8	0.0	28.8	133.5	22.2	21.6	128.3	0.0
Queue Length 95th (m)	34.4	113.0	47.0	81.0	45.7	14.9	41.0	#192.2	75.0	32.5	#187.5	9.5
Internal Link Dist (m)		460.3			515.4			130.1			572.9	
Turn Bay Length (m)	35.0		120.0	160.0		85.0	90.0		110.0	135.0		155.0
Base Capacity (vph)	271	759	569	754	1206	625	475	1221	828	475	1172	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.81	0.63	0.59	0.25	0.24	0.40	0.78	0.68	0.30	0.77	0.22

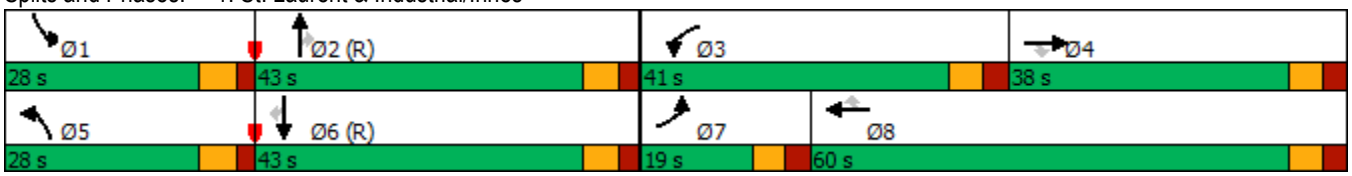
Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

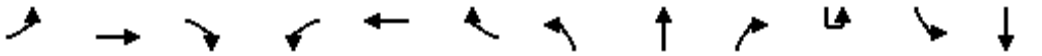
Maximum v/c Ratio: 0.83

Intersection Signal Delay: 46.2	Intersection LOS: D
Intersection Capacity Utilization 82.5%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 1: St. Laurent & Industrial/Innes





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	46	8	56	37	5	90	31	1540	69	23	93	1419
Future Volume (vph)	46	8	56	37	5	90	31	1540	69	23	93	1419
Satd. Flow (prot)	0	1614	0	0	1548	0	1695	3390	1517	0	1695	3390
Flt Permitted		0.711			0.842		0.950				0.950	
Satd. Flow (perm)	0	1159	0	0	1320	0	1681	3390	1479	0	1695	3390
Satd. Flow (RTOR)		40			68				86			
Lane Group Flow (vph)	0	122	0	0	147	0	34	1711	77	0	129	1577
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8					2			
Detector Phase	4	4		8	8		5	2	2	1	1	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	5.0	10.0
Minimum Split (s)	33.3	33.3		33.3	33.3		11.2	27.2	27.2	11.2	11.2	27.2
Total Split (s)	34.0	34.0		34.0	34.0		13.0	73.0	73.0	13.0	13.0	73.0
Total Split (%)	28.3%	28.3%		28.3%	28.3%		10.8%	60.8%	60.8%	10.8%	10.8%	60.8%
Yellow Time (s)	3.3	3.3		3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	1.7	1.7	2.0	2.0	1.7
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		6.3			6.3		6.2	5.9	5.9		6.2	5.9
Lead/Lag							Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	None	C-Min
Act Effct Green (s)		17.4			17.4		7.0	68.8	68.8		15.4	82.1
Actuated g/C Ratio		0.14			0.14		0.06	0.57	0.57		0.13	0.68
v/c Ratio		0.60			0.59		0.35	0.88	0.09		0.60	0.68
Control Delay		42.8			33.8		60.3	28.3	4.8		63.8	16.3
Queue Delay		0.0			0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		42.8			33.8		60.3	28.3	4.8		63.8	16.3
LOS		D			C		E	C	A		E	B
Approach Delay		42.8			33.8			27.9				19.1
Approach LOS		D			C			C				B
Queue Length 50th (m)		19.0			18.0		8.3	193.6	1.7		28.1	109.2
Queue Length 95th (m)		34.9			35.0		m12.1	m220.6	m3.3		#76.0	186.8
Internal Link Dist (m)		48.8			101.3			271.9				163.4
Turn Bay Length (m)							55.0		105.0		80.0	
Base Capacity (vph)		298			357		102	1944	884		216	2319
Starvation Cap Reductn		0			0		0	0	0		0	0
Spillback Cap Reductn		0			0		0	0	0		0	0
Storage Cap Reductn		0			0		0	0	0		0	0
Reduced v/c Ratio		0.41			0.41		0.33	0.88	0.09		0.60	0.68

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 42 (35%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	76
Future Volume (vph)	76
Satd. Flow (prot)	1517
Flt Permitted	
Satd. Flow (perm)	1376
Satd. Flow (RTOR)	86
Lane Group Flow (vph)	84
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	27.2
Total Split (s)	73.0
Total Split (%)	60.8%
Yellow Time (s)	4.2
All-Red Time (s)	1.7
Lost Time Adjust (s)	0.0
Total Lost Time (s)	5.9
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Min
Act Effct Green (s)	82.1
Actuated g/C Ratio	0.68
v/c Ratio	0.09
Control Delay	2.7
Queue Delay	0.0
Total Delay	2.7
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	6.6
Internal Link Dist (m)	
Turn Bay Length (m)	60.0
Base Capacity (vph)	968
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.09

Intersection Summary

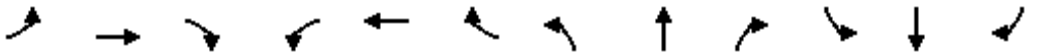
Maximum v/c Ratio: 0.88

Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 84.8%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: St. Laurent & Bourassa





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	504	274	223	100	106	230	98	728	93	143	1098	357
Future Volume (vph)	504	274	223	100	106	230	98	728	93	143	1098	357
Satd. Flow (prot)	3288	1784	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3151	1784	1477	1679	3390	1455	1687	3390	1428	1674	3390	1460
Satd. Flow (RTOR)			248			192			130			372
Lane Group Flow (vph)	560	304	248	111	118	256	109	809	103	159	1220	397
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	11.2	28.2	28.2	11.2	28.2	28.2
Total Split (s)	26.0	28.0	28.0	26.0	28.0	28.0	17.0	49.0	49.0	17.0	49.0	49.0
Total Split (%)	21.7%	23.3%	23.3%	21.7%	23.3%	23.3%	14.2%	40.8%	40.8%	14.2%	40.8%	40.8%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.9	2.0	2.0	1.9	2.0	2.0	1.8	1.7	1.7	1.8	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.7	5.7	5.6	5.7	5.7	6.0	5.9	5.9	6.0	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	20.4	25.4	25.4	13.2	18.2	18.2	10.9	44.2	44.2	14.0	47.3	47.3
Actuated g/C Ratio	0.17	0.21	0.21	0.11	0.15	0.15	0.09	0.37	0.37	0.12	0.39	0.39
v/c Ratio	1.00	0.80	0.49	0.60	0.23	0.67	0.71	0.65	0.17	0.81	0.91	0.50
Control Delay	88.8	61.9	8.4	63.6	44.4	21.8	77.6	34.7	2.9	80.4	43.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.8	61.9	8.4	63.6	44.4	21.8	77.6	34.7	2.9	80.4	43.2	9.3
LOS	F	E	A	E	D	C	E	C	A	F	D	A
Approach Delay		63.5			36.9			36.1			39.0	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	~68.9	66.7	0.0	25.3	12.6	13.2	24.9	83.7	0.0	40.3	~141.8	0.8
Queue Length 95th (m)	#105.2	#114.5	21.4	42.0	20.9	40.0	#51.6	105.3	7.0	m#80.5	#196.1	41.6
Internal Link Dist (m)		678.5			293.4			245.7			271.9	
Turn Bay Length (m)	70.0		100.0	35.0		15.0	65.0		25.0	110.0		90.0
Base Capacity (vph)	558	378	508	288	629	426	161	1249	608	197	1336	800
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.80	0.49	0.39	0.19	0.60	0.68	0.65	0.17	0.81	0.91	0.50

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 41 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

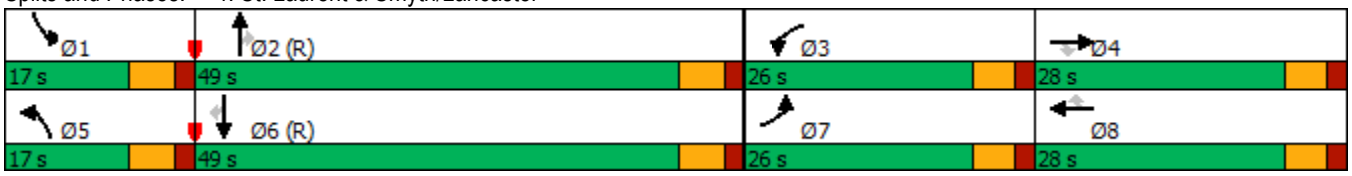
Intersection Signal Delay: 44.3	Intersection LOS: D
Intersection Capacity Utilization 85.1%	ICU Level of Service E
Analysis Period (min) 15	

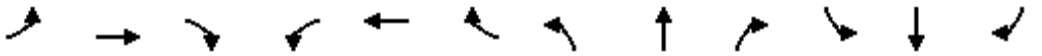
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Splits and Phases: 4: St. Laurent & Smyth/Lancaster





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	162	215	101	91	149	102	934	82	91	746	133
Future Volume (vph)	195	162	215	101	91	149	102	934	82	91	746	133
Satd. Flow (prot)	1695	1784	1517	1695	1597	0	1695	3390	1517	1695	3390	1517
Flt Permitted	0.208			0.644			0.233			0.152		
Satd. Flow (perm)	370	1784	1477	1136	1597	0	414	3390	1481	271	3390	1473
Satd. Flow (RTOR)			217		64				130			148
Lane Group Flow (vph)	217	180	239	112	267	0	113	1038	91	101	829	148
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	27.8	27.8	27.8	27.8		11.2	41.6	41.6	11.2	41.6	41.6
Total Split (s)	15.0	49.0	49.0	34.0	34.0		14.0	57.0	57.0	14.0	57.0	57.0
Total Split (%)	12.5%	40.8%	40.8%	28.3%	28.3%		11.7%	47.5%	47.5%	11.7%	47.5%	47.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.4	1.4	1.5	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8		5.7	5.6	5.6	5.7	5.6	5.6
Lead/Lag	Lead			Lag	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.1	42.1	42.1	20.7	20.7		61.1	52.5	52.5	60.4	52.2	52.2
Actuated g/C Ratio	0.35	0.35	0.35	0.17	0.17		0.51	0.44	0.44	0.50	0.44	0.44
v/c Ratio	0.72	0.29	0.36	0.57	0.81		0.37	0.70	0.13	0.43	0.56	0.20
Control Delay	45.1	28.8	6.3	55.9	54.6		17.6	31.5	1.6	19.8	28.1	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	28.8	6.3	55.9	54.6		17.6	31.5	1.6	19.8	28.1	4.1
LOS	D	C	A	E	D		B	C	A	B	C	A
Approach Delay		25.9			55.0			28.0			24.0	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	34.4	27.7	3.1	24.4	46.8		13.8	114.5	0.0	12.3	84.5	0.0
Queue Length 95th (m)	#80.9	47.7	20.3	40.3	72.0		21.8	128.4	3.9	19.8	95.7	11.8
Internal Link Dist (m)		480.6			437.7			572.9			582.7	
Turn Bay Length (m)	70.0		200.0	65.0			65.0		65.0	75.0		100.0
Base Capacity (vph)	301	663	685	266	424		309	1538	743	242	1535	748
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	0.72	0.27	0.35	0.42	0.63		0.37	0.67	0.12	0.42	0.54	0.20

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 49 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

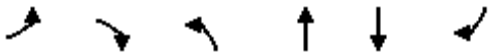
Maximum v/c Ratio: 0.81

Intersection Signal Delay: 29.4	Intersection LOS: C
Intersection Capacity Utilization 78.6%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 5: St. Laurent & Belfast





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	616	106	42	342	711	730
Future Volume (vph)	616	106	42	342	711	730
Satd. Flow (prot)	3288	1517	1695	3390	3390	1517
Flt Permitted	0.950		0.226			
Satd. Flow (perm)	3288	1483	402	3390	3390	1481
Satd. Flow (RTOR)		80				811
Lane Group Flow (vph)	684	118	47	380	790	811
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	24.0	26.5	26.5
Total Split (s)	31.0	31.0	12.0	39.0	27.0	27.0
Total Split (%)	44.3%	44.3%	17.1%	55.7%	38.6%	38.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	20.1	20.1	38.4	38.4	31.1	31.1
Actuated g/C Ratio	0.29	0.29	0.55	0.55	0.44	0.44
v/c Ratio	0.73	0.24	0.14	0.20	0.52	0.73
Control Delay	26.9	8.4	9.7	9.1	18.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	8.4	9.7	9.1	18.2	6.8
LOS	C	A	A	A	B	A
Approach Delay	24.2			9.2	12.5	
Approach LOS	C			A	B	
Queue Length 50th (m)	40.9	3.6	2.7	12.4	43.4	0.0
Queue Length 95th (m)	52.2	12.9	8.0	22.2	67.9	#39.2
Internal Link Dist (m)	174.1			99.9	245.7	
Turn Bay Length (m)		15.0	65.0			90.0
Base Capacity (vph)	1174	581	342	1860	1507	1108
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.20	0.14	0.20	0.52	0.73

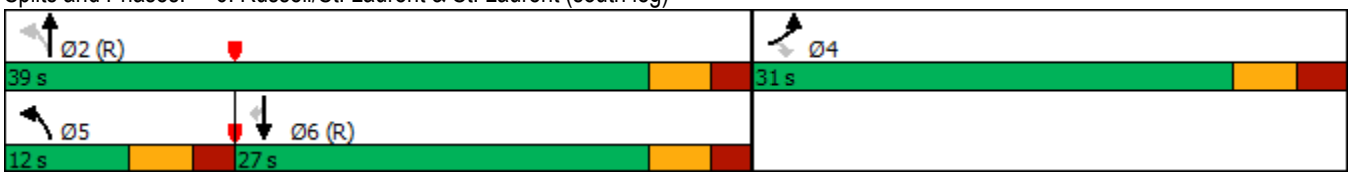
Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 27 (39%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 62.2%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 6: Russell/St. Laurent & St. Laurent (south leg)



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	110	0	1604	1562	120
Future Vol, veh/h	0	110	0	1604	1562	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	122	0	1782	1736	133

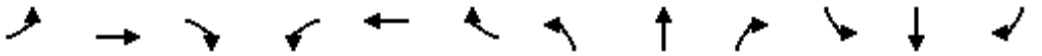
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	868	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	296	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	296	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.5	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	296	-	-
HCM Lane V/C Ratio	-	0.413	-	-
HCM Control Delay (s)	-	25.5	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	1.9	-	-

APPENDIX L

SYNCHRO ANALYSIS: BACKGROUND INTERSECTION PERFORMANCE



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	201	129	668	812	264	194	1089	362	127	819	159
Future Volume (vph)	86	201	129	668	812	264	194	1089	362	127	819	159
Satd. Flow (prot)	3288	3390	1517	3288	3390	1517	3288	3390	1517	3288	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3284	3390	1487	3256	3390	1495	3272	3390	1490	3282	3390	1484
Satd. Flow (RTOR)			180			153			362			180
Lane Group Flow (vph)	86	201	129	668	812	264	194	1089	362	127	819	159
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	38.6	38.6	11.6	38.6	38.6	11.3	37.6	37.6	11.3	37.6	37.6
Total Split (s)	14.2	38.6	38.6	36.0	60.4	60.4	17.4	52.7	52.7	12.7	48.0	48.0
Total Split (%)	10.1%	27.6%	27.6%	25.7%	43.1%	43.1%	12.4%	37.6%	37.6%	9.1%	34.3%	34.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.1	2.4	2.4	2.1	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.3	6.6	6.6	6.3	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	7.4	20.1	20.1	29.5	42.3	42.3	12.5	54.4	54.4	9.8	51.8	51.8
Actuated g/C Ratio	0.05	0.14	0.14	0.21	0.30	0.30	0.09	0.39	0.39	0.07	0.37	0.37
v/c Ratio	0.50	0.41	0.35	0.96	0.79	0.47	0.66	0.83	0.45	0.55	0.65	0.24
Control Delay	74.6	55.5	4.1	80.9	50.6	17.7	72.8	45.9	5.1	71.8	41.3	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.6	55.5	4.1	80.9	50.6	17.7	72.8	45.9	5.1	71.8	41.3	4.2
LOS	E	E	A	F	D	B	E	D	A	E	D	A
Approach Delay		43.5			57.2			40.1			39.4	
Approach LOS		D			E			D			D	
Queue Length 50th (m)	12.1	27.2	0.0	95.4	110.1	24.1	26.9	143.3	0.0	17.6	99.2	0.0
Queue Length 95th (m)	21.1	35.5	4.8	#133.4	116.8	43.6	#44.0	#202.5	22.4	#36.7	136.3	11.8
Internal Link Dist (m)		460.3			515.4			130.1			572.9	
Turn Bay Length (m)	35.0		120.0	160.0		85.0	90.0		110.0	135.0		155.0
Base Capacity (vph)	178	774	478	693	1302	668	298	1317	800	231	1253	662
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.26	0.27	0.96	0.62	0.40	0.65	0.83	0.45	0.55	0.65	0.24

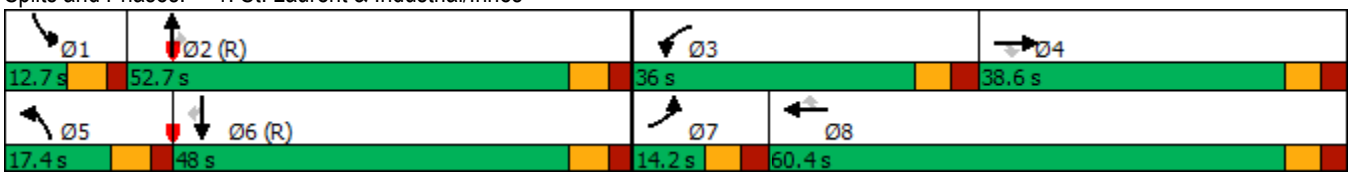
Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

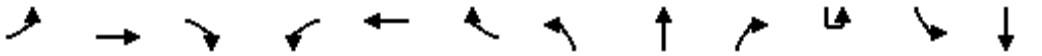
Maximum v/c Ratio: 0.96

Intersection Signal Delay: 46.3	Intersection LOS: D
Intersection Capacity Utilization 89.5%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 1: St. Laurent & Industrial/Innes





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	50	10	90	37	6	110	56	1458	49	14	126	1406
Future Volume (vph)	50	10	90	37	6	110	56	1458	49	14	126	1406
Satd. Flow (prot)	0	1585	0	0	1559	0	1695	3390	1517	0	1695	3390
Flt Permitted		0.716			0.804		0.950				0.950	
Satd. Flow (perm)	0	1148	0	0	1264	0	1689	3390	1464	0	1692	3390
Satd. Flow (RTOR)		58			99				86			
Lane Group Flow (vph)	0	150	0	0	153	0	56	1458	49	0	140	1406
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8					2			
Detector Phase	4	4		8	8		5	2	2	1	1	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	5.0	10.0
Minimum Split (s)	33.3	33.3		33.3	33.3		11.2	27.2	27.2	11.2	11.2	27.2
Total Split (s)	33.3	33.3		33.3	33.3		15.0	66.0	66.0	21.0	21.0	72.0
Total Split (%)	27.7%	27.7%		27.7%	27.7%		12.5%	54.9%	54.9%	17.5%	17.5%	59.9%
Yellow Time (s)	3.3	3.3		3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	1.7	1.7	2.0	2.0	1.7
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		6.3			6.3		6.2	5.9	5.9		6.2	5.9
Lead/Lag							Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	None	C-Min
Act Effct Green (s)		15.8			15.8		8.5	71.9	71.9		14.1	80.0
Actuated g/C Ratio		0.13			0.13		0.07	0.60	0.60		0.12	0.67
v/c Ratio		0.75			0.61		0.47	0.72	0.05		0.70	0.62
Control Delay		51.6			28.3		66.3	21.4	0.9		70.0	15.2
Queue Delay		0.0			0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		51.6			28.3		66.3	21.4	0.9		70.0	15.2
LOS		D			C		E	C	A		E	B
Approach Delay		51.6			28.3			22.3				19.2
Approach LOS		D			C			C				B
Queue Length 50th (m)		21.6			11.9		12.8	118.8	0.0		31.9	95.3
Queue Length 95th (m)		39.8			30.0		26.5	187.5	1.7		#57.3	156.4
Internal Link Dist (m)		48.8			101.3			271.9				163.4
Turn Bay Length (m)							55.0		105.0		80.0	
Base Capacity (vph)		302			360		130	2027	910		218	2253
Starvation Cap Reductn		0			0		0	0	0		0	0
Spillback Cap Reductn		0			0		0	0	0		0	0
Storage Cap Reductn		0			0		0	0	0		0	0
Reduced v/c Ratio		0.50			0.42		0.43	0.72	0.05		0.64	0.62

Intersection Summary
Cycle Length: 120.3
Actuated Cycle Length: 120.3
Offset: 113 (94%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	96
Future Volume (vph)	96
Satd. Flow (prot)	1517
Flt Permitted	
Satd. Flow (perm)	1448
Satd. Flow (RTOR)	86
Lane Group Flow (vph)	96
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	27.2
Total Split (s)	72.0
Total Split (%)	59.9%
Yellow Time (s)	4.2
All-Red Time (s)	1.7
Lost Time Adjust (s)	0.0
Total Lost Time (s)	5.9
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Min
Act Effct Green (s)	80.0
Actuated g/C Ratio	0.67
v/c Ratio	0.10
Control Delay	3.2
Queue Delay	0.0
Total Delay	3.2
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.8
Queue Length 95th (m)	8.6
Internal Link Dist (m)	
Turn Bay Length (m)	60.0
Base Capacity (vph)	991
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.10

Intersection Summary

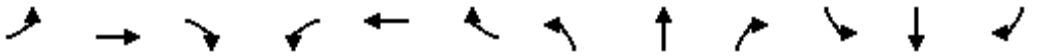
Maximum v/c Ratio: 0.75

Intersection Signal Delay: 22.4	Intersection LOS: C
Intersection Capacity Utilization 83.7%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: St. Laurent & Bourassa





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	344	116	107	35	303	117	207	1230	105	150	655	704
Future Volume (vph)	344	116	107	35	303	117	207	1230	105	150	655	704
Satd. Flow (prot)	3288	1784	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3241	1784	1467	1664	3390	1479	1687	3390	1449	1688	3390	1481
Satd. Flow (RTOR)			132			183			181			302
Lane Group Flow (vph)	344	116	107	35	303	117	207	1230	105	150	655	704
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	11.2	28.2	28.2	11.2	28.2	28.2
Total Split (s)	19.0	35.0	35.0	12.0	28.0	28.0	22.0	55.0	55.0	18.0	51.0	51.0
Total Split (%)	15.8%	29.2%	29.2%	10.0%	23.3%	23.3%	18.3%	45.8%	45.8%	15.0%	42.5%	42.5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.9	2.0	2.0	1.9	2.0	2.0	1.8	1.7	1.7	1.8	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.7	5.7	5.6	5.7	5.7	6.0	5.9	5.9	6.0	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	13.7	28.5	28.5	6.2	16.3	16.3	18.9	51.9	51.9	14.9	47.8	47.8
Actuated g/C Ratio	0.11	0.24	0.24	0.05	0.14	0.14	0.16	0.43	0.43	0.12	0.40	0.40
v/c Ratio	0.91	0.27	0.24	0.40	0.66	0.33	0.78	0.84	0.14	0.72	0.49	0.91
Control Delay	82.1	40.3	4.8	68.7	55.8	3.1	68.5	37.4	0.4	70.0	29.0	37.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.1	40.3	4.8	68.7	55.8	3.1	68.5	37.4	0.4	70.0	29.0	37.5
LOS	F	D	A	E	E	A	E	D	A	E	C	D
Approach Delay		59.0			43.2			39.0			37.1	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	42.0	23.9	0.0	8.1	36.2	0.0	45.8	137.9	0.0	33.5	62.0	103.9
Queue Length 95th (m)	#69.7	38.6	8.9	18.8	48.2	2.0	#92.1	#171.0	0.0	#72.1	79.8	#186.6
Internal Link Dist (m)		678.5			293.4			245.7			271.9	
Turn Bay Length (m)	70.0		100.0	35.0		15.0	65.0		25.0	110.0		90.0
Base Capacity (vph)	376	456	473	90	629	423	268	1465	729	209	1350	771
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.25	0.23	0.39	0.48	0.28	0.77	0.84	0.14	0.72	0.49	0.91

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 110 (92%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

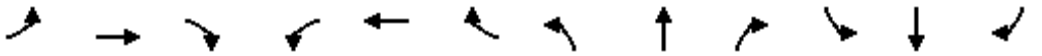
Maximum v/c Ratio: 0.91

Intersection Signal Delay: 41.6	Intersection LOS: D
Intersection Capacity Utilization 85.4%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 4: St. Laurent & Smyth/Lancaster





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	69	92	47	153	103	127	912	69	91	845	208
Future Volume (vph)	51	69	92	47	153	103	127	912	69	91	845	208
Satd. Flow (prot)	1695	1784	1517	1695	1668	0	1695	3390	1517	1695	3390	1517
Flt Permitted	0.250			0.712			0.243			0.232		
Satd. Flow (perm)	446	1784	1494	1267	1668	0	433	3390	1485	414	3390	1492
Satd. Flow (RTOR)			92		27				130			208
Lane Group Flow (vph)	51	69	92	47	256	0	127	912	69	91	845	208
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	27.8	27.8	27.8	27.8		11.2	41.6	41.6	11.2	41.6	41.6
Total Split (s)	11.0	48.0	48.0	37.0	37.0		17.0	58.0	58.0	14.0	55.0	55.0
Total Split (%)	9.2%	40.0%	40.0%	30.8%	30.8%		14.2%	48.3%	48.3%	11.7%	45.8%	45.8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.4	1.4	1.5	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8		5.7	5.6	5.6	5.7	5.6	5.6
Lead/Lag	Lead			Lag	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	34.3	34.3	34.3	22.0	22.0		69.9	60.6	60.6	67.2	59.2	59.2
Actuated g/C Ratio	0.29	0.29	0.29	0.18	0.18		0.58	0.50	0.50	0.56	0.49	0.49
v/c Ratio	0.23	0.14	0.19	0.20	0.78		0.36	0.53	0.08	0.29	0.51	0.25
Control Delay	29.4	28.4	5.8	41.1	57.8		15.1	24.2	0.2	14.7	24.7	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	28.4	5.8	41.1	57.8		15.1	24.2	0.2	14.7	24.7	4.1
LOS	C	C	A	D	E		B	C	A	B	C	A
Approach Delay		18.8			55.2			21.7			20.2	
Approach LOS		B			E			C			C	
Queue Length 50th (m)	8.6	11.7	0.0	9.5	52.1		12.3	77.6	0.0	8.6	71.5	0.0
Queue Length 95th (m)	15.6	19.7	10.0	18.9	75.0		26.2	117.6	0.0	19.6	111.3	15.4
Internal Link Dist (m)		480.6			437.7			572.9			582.7	
Turn Bay Length (m)	70.0		200.0	65.0			65.0		65.0	75.0		100.0
Base Capacity (vph)	218	642	597	329	453		381	1750	829	328	1709	855
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	0.23	0.11	0.15	0.14	0.57		0.33	0.52	0.08	0.28	0.49	0.24

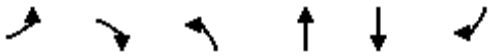
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 100 (83%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 71.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: St. Laurent & Belfast





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	731	48	80	725	327	502
Future Volume (vph)	731	48	80	725	327	502
Satd. Flow (prot)	3288	1517	1695	3390	3390	1517
Flt Permitted	0.950		0.460			
Satd. Flow (perm)	3288	1485	817	3390	3390	1485
Satd. Flow (RTOR)		30				502
Lane Group Flow (vph)	731	48	80	725	327	502
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	24.0	26.5	26.5
Total Split (s)	30.0	30.0	11.0	40.0	29.0	29.0
Total Split (%)	42.9%	42.9%	15.7%	57.1%	41.4%	41.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	20.8	20.8	37.7	37.7	27.9	27.9
Actuated g/C Ratio	0.30	0.30	0.54	0.54	0.40	0.40
v/c Ratio	0.75	0.10	0.15	0.40	0.24	0.56
Control Delay	27.1	9.2	10.0	11.0	16.8	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	9.2	10.0	11.0	16.8	4.9
LOS	C	A	A	B	B	A
Approach Delay	26.0			10.9	9.6	
Approach LOS	C			B	A	
Queue Length 50th (m)	44.2	1.7	4.6	26.8	15.5	0.0
Queue Length 95th (m)	55.1	7.5	12.3	45.1	26.9	19.7
Internal Link Dist (m)	174.1			99.9	245.7	
Turn Bay Length (m)		15.0	65.0			90.0
Base Capacity (vph)	1144	536	522	1844	1389	904
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.09	0.15	0.39	0.24	0.56

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 57.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Russell/St. Laurent & St. Laurent (south leg)



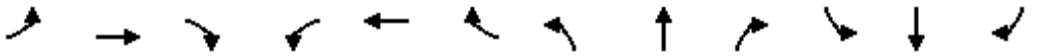
Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	74	0	1639	1640	83
Future Vol, veh/h	0	74	0	1639	1640	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	74	0	1639	1640	83

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	820	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	318	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	318	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	318	-	-
HCM Lane V/C Ratio	-	0.233	-	-
HCM Control Delay (s)	-	19.7	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.9	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	606	354	436	306	148	189	944	555	142	908	147
Future Volume (vph)	155	606	354	436	306	148	189	944	555	142	908	147
Satd. Flow (prot)	3288	3390	1517	3288	3390	1517	3288	3390	1517	3288	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3258	3390	1488	3272	3390	1486	3261	3390	1479	3269	3390	1473
Satd. Flow (RTOR)			168			148			351			168
Lane Group Flow (vph)	155	606	354	436	306	148	189	944	555	142	908	147
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	38.6	38.6	11.6	38.6	38.6	11.3	37.6	37.6	11.3	37.6	37.6
Total Split (s)	18.9	41.0	41.0	32.0	54.1	54.1	19.0	61.0	61.0	16.0	58.0	58.0
Total Split (%)	12.6%	27.3%	27.3%	21.3%	36.1%	36.1%	12.7%	40.7%	40.7%	10.7%	38.7%	38.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.1	2.4	2.4	2.1	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.3	6.6	6.6	6.3	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	11.6	31.5	31.5	23.8	43.7	43.7	12.3	58.6	58.6	10.1	56.3	56.3
Actuated g/C Ratio	0.08	0.21	0.21	0.16	0.29	0.29	0.08	0.39	0.39	0.07	0.38	0.38
v/c Ratio	0.61	0.85	0.80	0.84	0.31	0.28	0.70	0.71	0.70	0.65	0.71	0.22
Control Delay	77.6	69.2	42.7	76.0	41.7	6.6	81.3	43.4	19.4	82.1	45.0	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.6	69.2	42.7	76.0	41.7	6.6	81.3	43.4	19.4	82.1	45.0	3.8
LOS	E	E	D	E	D	A	F	D	B	F	D	A
Approach Delay		61.9			52.6			39.7			44.3	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	23.2	90.6	54.3	65.0	36.5	0.0	28.4	131.5	55.5	21.3	127.4	0.0
Queue Length 95th (m)	35.4	112.1	92.7	84.1	48.8	15.7	42.0	156.3	102.8	#33.7	153.5	10.7
Internal Link Dist (m)		460.3			515.4			130.1			572.9	
Turn Bay Length (m)	35.0		120.0	160.0		85.0	90.0		110.0	135.0		155.0
Base Capacity (vph)	273	777	470	560	1073	571	283	1332	794	225	1276	659
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.78	0.75	0.78	0.29	0.26	0.67	0.71	0.70	0.63	0.71	0.22

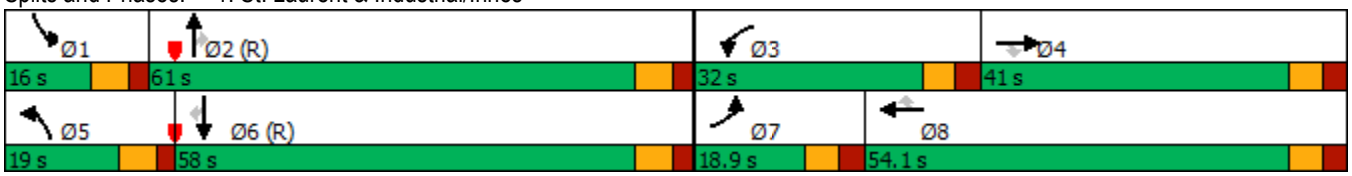
Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

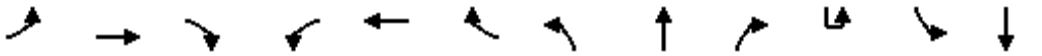
Maximum v/c Ratio: 0.85

Intersection Signal Delay: 48.3	Intersection LOS: D
Intersection Capacity Utilization 86.1%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 1: St. Laurent & Industrial/Innes





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	46	8	56	37	5	90	31	1697	69	23	93	1571
Future Volume (vph)	46	8	56	37	5	90	31	1697	69	23	93	1571
Satd. Flow (prot)	0	1614	0	0	1547	0	1695	3390	1517	0	1695	3390
Flt Permitted		0.738			0.857		0.950				0.950	
Satd. Flow (perm)	0	1202	0	0	1343	0	1681	3390	1479	0	1695	3390
Satd. Flow (RTOR)		40			74				86			
Lane Group Flow (vph)	0	110	0	0	132	0	31	1697	69	0	116	1571
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases		4			8		5	2		1	1	6
Permitted Phases	4			8					2			
Detector Phase	4	4		8	8		5	2	2	1	1	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	5.0	10.0
Minimum Split (s)	33.3	33.3		33.3	33.3		11.2	27.2	27.2	11.2	11.2	27.2
Total Split (s)	33.3	33.3		33.3	33.3		12.0	71.0	71.0	16.0	16.0	75.0
Total Split (%)	27.7%	27.7%		27.7%	27.7%		10.0%	59.0%	59.0%	13.3%	13.3%	62.3%
Yellow Time (s)	3.3	3.3		3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	1.7	1.7	2.0	2.0	1.7
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		6.3			6.3		6.2	5.9	5.9		6.2	5.9
Lead/Lag							Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	None	C-Min
Act Effct Green (s)		17.2			17.2		6.2	73.3	73.3		11.4	83.4
Actuated g/C Ratio		0.14			0.14		0.05	0.61	0.61		0.09	0.69
v/c Ratio		0.54			0.52		0.36	0.82	0.07		0.72	0.67
Control Delay		38.1			27.8		66.7	24.2	2.0		78.3	15.2
Queue Delay		0.0			0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		38.1			27.8		66.7	24.2	2.0		78.3	15.2
LOS		D			C		E	C	A		E	B
Approach Delay		38.1			27.8			24.1				18.8
Approach LOS		D			C			C				B
Queue Length 50th (m)		16.1			13.1		7.1	147.7	0.0		26.2	103.6
Queue Length 95th (m)		30.7			29.1		17.5	#232.8	4.7		#60.4	178.6
Internal Link Dist (m)		48.8			101.3			271.9				163.4
Turn Bay Length (m)							55.0		105.0		80.0	
Base Capacity (vph)		300			358		88	2066	934		161	2349
Starvation Cap Reductn		0			0		0	0	0		0	0
Spillback Cap Reductn		0			0		0	0	0		0	0
Storage Cap Reductn		0			0		0	0	0		0	0
Reduced v/c Ratio		0.37			0.37		0.35	0.82	0.07		0.72	0.67

Intersection Summary
Cycle Length: 120.3
Actuated Cycle Length: 120.3
Offset: 42 (35%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	76
Future Volume (vph)	76
Satd. Flow (prot)	1517
Flt Permitted	
Satd. Flow (perm)	1376
Satd. Flow (RTOR)	86
Lane Group Flow (vph)	76
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	10.0
Minimum Split (s)	27.2
Total Split (s)	75.0
Total Split (%)	62.3%
Yellow Time (s)	4.2
All-Red Time (s)	1.7
Lost Time Adjust (s)	0.0
Total Lost Time (s)	5.9
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Min
Act Effct Green (s)	83.4
Actuated g/C Ratio	0.69
v/c Ratio	0.08
Control Delay	2.1
Queue Delay	0.0
Total Delay	2.1
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (m)	0.0
Queue Length 95th (m)	5.3
Internal Link Dist (m)	
Turn Bay Length (m)	60.0
Base Capacity (vph)	979
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.08

Intersection Summary

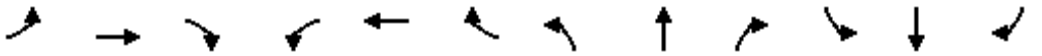
Maximum v/c Ratio: 0.82

Intersection Signal Delay: 22.2	Intersection LOS: C
Intersection Capacity Utilization 89.4%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: St. Laurent & Bourassa





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	564	301	245	109	117	252	109	796	102	159	1215	392
Future Volume (vph)	564	301	245	109	117	252	109	796	102	159	1215	392
Satd. Flow (prot)	3288	1784	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3151	1784	1477	1679	3390	1455	1687	3390	1428	1674	3390	1460
Satd. Flow (RTOR)			210			237			235			375
Lane Group Flow (vph)	564	301	245	109	117	252	109	796	102	159	1215	392
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	11.2	28.2	28.2	11.2	28.2	28.2
Total Split (s)	27.0	39.0	39.0	16.0	28.0	28.0	14.7	43.9	43.9	21.1	50.3	50.3
Total Split (%)	22.5%	32.5%	32.5%	13.3%	23.3%	23.3%	12.3%	36.6%	36.6%	17.6%	41.9%	41.9%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.9	2.0	2.0	1.9	2.0	2.0	1.8	1.7	1.7	1.8	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.7	5.7	5.6	5.7	5.7	6.0	5.9	5.9	6.0	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	21.7	27.6	27.6	10.0	16.0	16.0	11.2	44.5	44.5	14.6	48.0	48.0
Actuated g/C Ratio	0.18	0.23	0.23	0.08	0.13	0.13	0.09	0.37	0.37	0.12	0.40	0.40
v/c Ratio	0.95	0.73	0.49	0.77	0.26	0.63	0.69	0.63	0.15	0.77	0.90	0.49
Control Delay	75.5	53.5	10.9	87.2	46.5	14.4	75.9	35.0	0.5	75.4	44.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.5	53.5	10.9	87.2	46.5	14.4	75.9	35.0	0.5	75.4	44.4	5.5
LOS	E	D	B	F	D	B	E	D	A	E	D	A
Approach Delay		55.3			38.9			36.0			38.5	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	68.6	67.6	6.7	25.5	13.4	3.2	24.4	81.0	0.0	35.9	142.8	2.5
Queue Length 95th (m)	#102.7	91.0	27.1	#53.7	20.8	26.5	#59.6	110.6	0.0	#68.3	#193.1	24.0
Internal Link Dist (m)		678.5			293.4			245.7			271.9	
Turn Bay Length (m)	70.0		100.0	35.0		15.0	65.0		25.0	110.0		90.0
Base Capacity (vph)	594	495	561	146	629	463	158	1258	677	219	1354	808
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.61	0.44	0.75	0.19	0.54	0.69	0.63	0.15	0.73	0.90	0.49

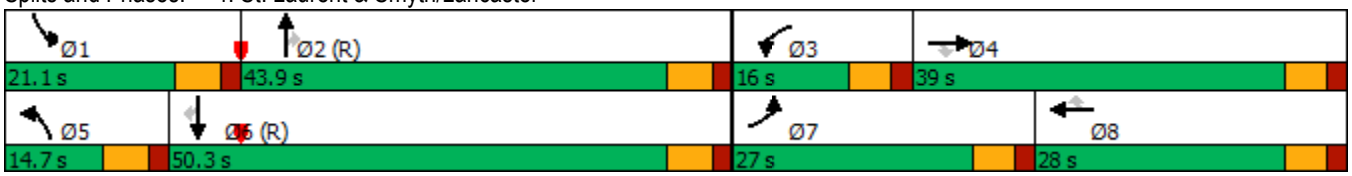
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 41 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

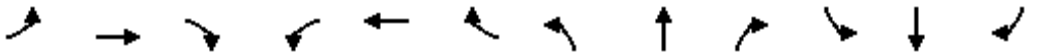
Maximum v/c Ratio: 0.95

Intersection Signal Delay: 42.2	Intersection LOS: D
Intersection Capacity Utilization 91.0%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 4: St. Laurent & Smyth/Lancaster





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	177	235	110	100	163	112	1041	90	100	845	145
Future Volume (vph)	213	177	235	110	100	163	112	1041	90	100	845	145
Satd. Flow (prot)	1695	1784	1517	1695	1597	0	1695	3390	1517	1695	3390	1517
Flt Permitted	0.201			0.646			0.222			0.151		
Satd. Flow (perm)	357	1784	1477	1139	1597	0	395	3390	1481	269	3390	1473
Satd. Flow (RTOR)			210		62				130			145
Lane Group Flow (vph)	213	177	235	110	263	0	112	1041	90	100	845	145
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	27.8	27.8	27.8	27.8		11.2	41.6	41.6	11.2	41.6	41.6
Total Split (s)	21.0	52.0	52.0	31.0	31.0		15.2	54.0	54.0	14.0	52.8	52.8
Total Split (%)	17.5%	43.3%	43.3%	25.8%	25.8%		12.7%	45.0%	45.0%	11.7%	44.0%	44.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.4	1.4	1.5	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8		5.7	5.6	5.6	5.7	5.6	5.6
Lead/Lag	Lead			Lag	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.4	42.4	42.4	20.0	20.0		61.1	52.5	52.5	59.7	51.8	51.8
Actuated g/C Ratio	0.35	0.35	0.35	0.17	0.17		0.51	0.44	0.44	0.50	0.43	0.43
v/c Ratio	0.69	0.28	0.36	0.58	0.83		0.38	0.70	0.12	0.43	0.58	0.20
Control Delay	40.1	28.1	6.3	57.6	57.7		18.2	31.9	1.7	20.6	29.1	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	28.1	6.3	57.6	57.7		18.2	31.9	1.7	20.6	29.1	4.5
LOS	D	C	A	E	E		B	C	A	C	C	A
Approach Delay		24.0			57.6			28.5			25.1	
Approach LOS		C			E			C			C	
Queue Length 50th (m)	34.3	27.7	3.6	23.9	46.4		13.4	112.6	0.0	11.8	85.0	0.0
Queue Length 95th (m)	#55.2	45.0	19.9	41.2	73.6		22.8	135.2	4.0	20.8	104.6	12.4
Internal Link Dist (m)		480.6			437.7			572.9			582.7	
Turn Bay Length (m)	70.0		200.0	65.0			65.0		65.0	75.0		100.0
Base Capacity (vph)	315	691	701	239	384		309	1500	727	237	1476	723
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.26	0.34	0.46	0.68		0.36	0.69	0.12	0.42	0.57	0.20

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 49 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

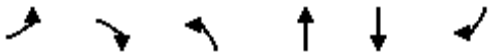
Maximum v/c Ratio: 0.83

Intersection Signal Delay: 29.8	Intersection LOS: C
Intersection Capacity Utilization 84.5%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 5: St. Laurent & Belfast





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	674	116	46	376	779	798
Future Volume (vph)	674	116	46	376	779	798
Satd. Flow (prot)	3288	1517	1695	3390	3390	1517
Flt Permitted	0.950		0.236			
Satd. Flow (perm)	3288	1483	420	3390	3390	1481
Satd. Flow (RTOR)		78				798
Lane Group Flow (vph)	674	116	46	376	779	798
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	24.0	26.5	26.5
Total Split (s)	30.0	30.0	11.0	40.0	29.0	29.0
Total Split (%)	42.9%	42.9%	15.7%	57.1%	41.4%	41.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	19.6	19.6	38.9	38.9	31.9	31.9
Actuated g/C Ratio	0.28	0.28	0.56	0.56	0.46	0.46
v/c Ratio	0.73	0.25	0.13	0.20	0.50	0.72
Control Delay	27.6	8.8	9.3	8.8	17.2	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	8.8	9.3	8.8	17.2	6.3
LOS	C	A	A	A	B	A
Approach Delay	24.9			8.8	11.7	
Approach LOS	C			A	B	
Queue Length 50th (m)	41.1	3.7	2.5	11.7	41.3	0.0
Queue Length 95th (m)	52.4	13.2	7.6	21.3	63.5	28.4
Internal Link Dist (m)	174.1			99.9	245.7	
Turn Bay Length (m)		15.0	65.0			90.0
Base Capacity (vph)	1127	559	342	1885	1545	1109
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.21	0.13	0.20	0.50	0.72

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 27 (39%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 66.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Russell/St. Laurent & St. Laurent (south leg)



Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	110	0	1767	1740	120
Future Vol, veh/h	0	110	0	1767	1740	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	110	0	1767	1740	120

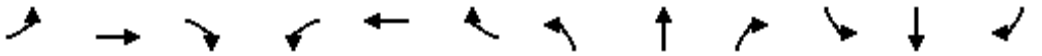
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	870	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	295	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	295	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	295	-	-
HCM Lane V/C Ratio	-	0.373	-	-
HCM Control Delay (s)	-	24.3	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	1.7	-	-

APPENDIX M

SYNCHRO ANALYSIS: FUTURE PROJECTED INTERSECTION PERFORMANCE



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	191	109	638	773	251	215	1098	371	121	806	152
Future Volume (vph)	83	191	109	638	773	251	215	1098	371	121	806	152
Satd. Flow (prot)	3288	3390	1517	3288	3390	1517	3288	3390	1517	3288	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3264	3390	1479	3233	3390	1479	3264	3390	1473	3272	3390	1473
Satd. Flow (RTOR)			180			154			371			180
Lane Group Flow (vph)	83	191	109	638	773	251	215	1098	371	121	806	152
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	38.6	38.6	11.6	38.6	38.6	11.3	37.6	37.6	11.3	37.6	37.6
Total Split (s)	14.2	38.6	38.6	36.0	60.4	60.4	17.4	52.7	52.7	12.7	48.0	48.0
Total Split (%)	10.1%	27.6%	27.6%	25.7%	43.1%	43.1%	12.4%	37.6%	37.6%	9.1%	34.3%	34.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.1	2.4	2.4	2.1	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.3	6.6	6.6	6.3	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	7.4	18.8	18.8	28.9	40.3	40.3	13.4	56.7	56.7	9.5	52.8	52.8
Actuated g/C Ratio	0.05	0.13	0.13	0.21	0.29	0.29	0.10	0.40	0.40	0.07	0.38	0.38
v/c Ratio	0.48	0.42	0.31	0.94	0.79	0.47	0.68	0.80	0.45	0.54	0.63	0.23
Control Delay	73.9	56.8	2.3	77.0	51.8	16.9	72.5	43.2	5.0	72.0	40.1	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.2	0.0	0.0	0.0
Total Delay	73.9	56.8	2.3	77.0	51.8	16.9	72.5	54.3	5.2	72.0	40.1	3.5
LOS	E	E	A	E	D	B	E	D	A	E	D	A
Approach Delay		45.0			56.2			45.8			38.5	
Approach LOS		D			E			D			D	
Queue Length 50th (m)	11.7	26.1	0.0	90.1	105.0	21.0	29.7	141.5	0.0	16.8	96.7	0.0
Queue Length 95th (m)	20.5	33.9	0.0	#124.0	110.0	39.7	#51.1	#205.2	22.8	#34.5	133.6	10.1
Internal Link Dist (m)		460.3			515.4			130.1			572.9	
Turn Bay Length (m)	35.0		120.0	160.0		85.0	90.0		110.0	135.0		155.0
Base Capacity (vph)	178	774	476	690	1302	663	315	1372	817	223	1277	667
Starvation Cap Reductn	0	0	0	0	0	0	0	263	84	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.25	0.23	0.92	0.59	0.38	0.68	0.99	0.51	0.54	0.63	0.23

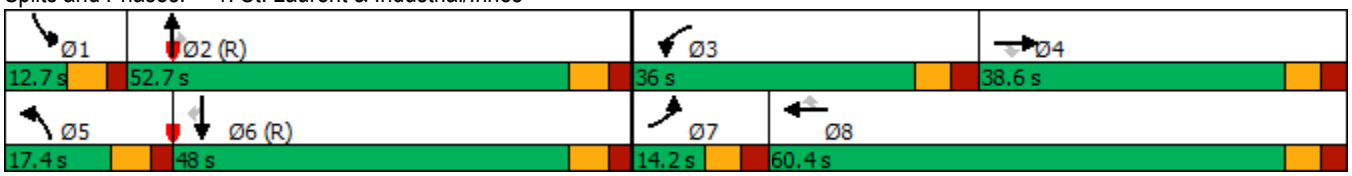
Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

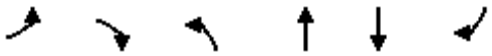
Maximum v/c Ratio: 0.94

Intersection Signal Delay: 47.7	Intersection LOS: D
Intersection Capacity Utilization 90.7%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 1: St. Laurent & Industrial/Innes





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	137	29	17	1542	1583	69
Future Volume (vph)	137	29	17	1542	1583	69
Satd. Flow (prot)	1659	0	1695	3390	3390	1517
Flt Permitted	0.960		0.950			
Satd. Flow (perm)	1623	0	1686	3390	3390	1407
Satd. Flow (RTOR)	8					18
Lane Group Flow (vph)	166	0	17	1542	1583	69
Turn Type	Perm		Prot	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4					6
Detector Phase	4		5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		5.0	10.0	10.0	10.0
Minimum Split (s)	32.0		11.3	29.9	29.9	29.9
Total Split (s)	32.0		11.3	88.0	76.7	76.7
Total Split (%)	26.7%		9.4%	73.3%	63.9%	63.9%
Yellow Time (s)	3.0		4.2	4.2	4.2	4.2
All-Red Time (s)	2.0		2.1	1.7	1.7	1.7
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		6.3	5.9	5.9	5.9
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None		None	C-Min	C-Min	C-Min
Act Effct Green (s)	17.7		6.1	91.4	86.4	86.4
Actuated g/C Ratio	0.15		0.05	0.76	0.72	0.72
v/c Ratio	0.68		0.20	0.60	0.65	0.07
Control Delay	58.8		60.4	8.2	12.7	6.2
Queue Delay	0.0		0.0	0.8	2.7	0.0
Total Delay	58.8		60.4	9.0	15.4	6.2
LOS	E		E	A	B	A
Approach Delay	58.8			9.6	15.0	
Approach LOS	E			A	B	
Queue Length 50th (m)	35.9		3.9	68.9	72.3	2.5
Queue Length 95th (m)	53.5		11.6	121.7	173.2	11.1
Internal Link Dist (m)	152.0			163.4	130.1	
Turn Bay Length (m)			40.0			15.0
Base Capacity (vph)	371		85	2582	2440	1018
Starvation Cap Reductn	0		0	651	710	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.45		0.20	0.80	0.92	0.07

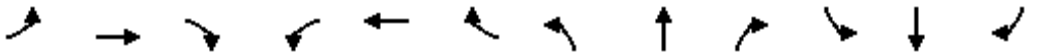
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: St. Laurent & Site Access





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	10	90	37	6	110	56	1399	49	126	1335	96
Future Volume (vph)	50	10	90	37	6	110	56	1399	49	126	1335	96
Satd. Flow (prot)	0	1583	0	0	1548	0	1695	3390	1517	1695	3390	1517
Flt Permitted		0.717			0.805		0.950			0.950		
Satd. Flow (perm)	0	1146	0	0	1257	0	1684	3390	1438	1688	3390	1418
Satd. Flow (RTOR)		58			99				86			86
Lane Group Flow (vph)	0	150	0	0	153	0	56	1399	49	126	1335	96
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	33.3	33.3		33.3	33.3		11.2	27.2	27.2	11.2	27.2	27.2
Total Split (s)	33.3	33.3		33.3	33.3		15.0	66.0	66.0	21.0	72.0	72.0
Total Split (%)	27.7%	27.7%		27.7%	27.7%		12.5%	54.9%	54.9%	17.5%	59.9%	59.9%
Yellow Time (s)	3.3	3.3		3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	1.7	1.7	2.0	1.7	1.7
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3			6.3		6.2	5.9	5.9	6.2	5.9	5.9
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		15.9			15.9		8.5	72.8	72.8	13.2	79.9	79.9
Actuated g/C Ratio		0.13			0.13		0.07	0.61	0.61	0.11	0.66	0.66
v/c Ratio		0.75			0.61		0.47	0.68	0.05	0.68	0.59	0.10
Control Delay		51.4			28.4		66.3	19.8	0.9	69.4	14.6	3.2
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.6	0.0
Total Delay		51.4			28.4		66.3	19.8	0.9	69.4	15.2	3.2
LOS		D			C		E	B	A	E	B	A
Approach Delay		51.4			28.4			21.0			18.8	
Approach LOS		D			C			C			B	
Queue Length 50th (m)		21.6			11.9		12.8	107.7	0.0	28.8	87.7	0.8
Queue Length 95th (m)		39.9			30.1		26.5	174.5	1.7	48.7	143.8	8.6
Internal Link Dist (m)		48.8			101.3			271.9			163.4	
Turn Bay Length (m)							55.0		105.0	80.0		60.0
Base Capacity (vph)		302			358		130	2052	904	213	2252	971
Starvation Cap Reductn		0			0		0	0	0	0	493	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		0.50			0.43		0.43	0.68	0.05	0.59	0.76	0.10

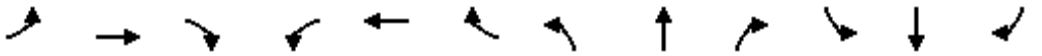
Intersection Summary
Cycle Length: 120.3
Actuated Cycle Length: 120.3
Offset: 113 (94%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 21.7	Intersection LOS: C
Intersection Capacity Utilization 81.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: St. Laurent & Bourassa





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	332	110	102	33	288	111	173	1178	100	143	619	670
Future Volume (vph)	332	110	102	33	288	111	173	1178	100	143	619	670
Satd. Flow (prot)	3288	1784	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3240	1784	1467	1664	3390	1479	1683	3390	1443	1687	3390	1470
Satd. Flow (RTOR)			132			183			181			325
Lane Group Flow (vph)	332	110	102	33	288	111	173	1178	100	143	619	670
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	11.2	28.2	28.2	11.2	28.2	28.2
Total Split (s)	19.0	35.0	35.0	12.0	28.0	28.0	22.0	55.0	55.0	18.0	51.0	51.0
Total Split (%)	15.8%	29.2%	29.2%	10.0%	23.3%	23.3%	18.3%	45.8%	45.8%	15.0%	42.5%	42.5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.9	2.0	2.0	1.9	2.0	2.0	1.8	1.7	1.7	1.8	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.7	5.7	5.6	5.7	5.7	6.0	5.9	5.9	6.0	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	14.5	28.5	28.5	6.5	15.9	15.9	16.4	52.1	52.1	14.4	50.0	50.0
Actuated g/C Ratio	0.12	0.24	0.24	0.05	0.13	0.13	0.14	0.43	0.43	0.12	0.42	0.42
v/c Ratio	0.84	0.26	0.23	0.36	0.64	0.31	0.75	0.80	0.14	0.71	0.44	0.84
Control Delay	70.9	40.0	4.0	66.0	55.6	2.4	69.4	35.4	0.4	70.0	27.2	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	40.0	4.0	66.0	55.6	2.4	69.4	35.4	0.4	70.0	27.2	27.3
LOS	E	D	A	E	E	A	E	D	A	E	C	C
Approach Delay		52.1			42.7			37.0			31.5	
Approach LOS		D			D			D			C	
Queue Length 50th (m)	39.9	22.7	0.0	7.6	34.5	0.0	39.0	128.3	0.0	32.1	55.0	79.9
Queue Length 95th (m)	#66.2	36.8	7.8	18.3	45.9	0.4	#72.5	159.5	0.0	#68.2	74.9	#162.4
Internal Link Dist (m)		678.5			293.4			245.7			271.9	
Turn Bay Length (m)	70.0		100.0	35.0		15.0	65.0		25.0	110.0		90.0
Base Capacity (vph)	396	460	476	94	629	423	245	1470	728	205	1412	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.24	0.21	0.35	0.46	0.26	0.71	0.80	0.14	0.70	0.44	0.84

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 110 (92%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

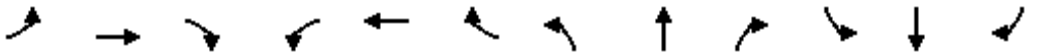
Maximum v/c Ratio: 0.84

Intersection Signal Delay: 37.7	Intersection LOS: D
Intersection Capacity Utilization 82.8%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 4: St. Laurent & Smyth/Lancaster





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	66	89	45	146	98	127	924	66	86	829	198
Future Volume (vph)	49	66	89	45	146	98	127	924	66	86	829	198
Satd. Flow (prot)	1695	1784	1517	1695	1668	0	1695	3390	1517	1695	3390	1517
Flt Permitted	0.257			0.714			0.249			0.237		
Satd. Flow (perm)	458	1784	1494	1270	1668	0	444	3390	1480	423	3390	1489
Satd. Flow (RTOR)			89		27				130			198
Lane Group Flow (vph)	49	66	89	45	244	0	127	924	66	86	829	198
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	27.8	27.8	27.8	27.8		11.2	41.6	41.6	11.2	41.6	41.6
Total Split (s)	11.0	48.0	48.0	37.0	37.0		17.0	58.0	58.0	14.0	55.0	55.0
Total Split (%)	9.2%	40.0%	40.0%	30.8%	30.8%		14.2%	48.3%	48.3%	11.7%	45.8%	45.8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.4	1.4	1.5	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8		5.7	5.6	5.6	5.7	5.6	5.6
Lead/Lag	Lead			Lag	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	33.3	33.3	33.3	21.1	21.1		71.9	63.7	63.7	68.2	60.1	60.1
Actuated g/C Ratio	0.28	0.28	0.28	0.18	0.18		0.60	0.53	0.53	0.57	0.50	0.50
v/c Ratio	0.23	0.13	0.19	0.20	0.77		0.35	0.51	0.08	0.26	0.49	0.23
Control Delay	29.9	29.0	6.0	41.9	57.7		14.3	23.1	0.2	13.9	23.9	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	29.0	6.0	41.9	57.7		14.3	23.1	0.2	13.9	23.9	4.1
LOS	C	C	A	D	E		B	C	A	B	C	A
Approach Delay		19.2			55.2			20.8			19.6	
Approach LOS		B			E			C			B	
Queue Length 50th (m)	8.3	11.3	0.0	9.2	49.4		12.0	77.3	0.0	7.9	68.4	0.0
Queue Length 95th (m)	15.4	19.3	10.2	18.4	72.1		25.6	120.0	0.0	18.4	108.1	15.2
Internal Link Dist (m)		480.6			437.7			572.9			582.7	
Turn Bay Length (m)	70.0		200.0	65.0			65.0		65.0	75.0		100.0
Base Capacity (vph)	215	639	592	330	453		392	1837	861	339	1731	857
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	0.23	0.10	0.15	0.14	0.54		0.32	0.50	0.08	0.25	0.48	0.23

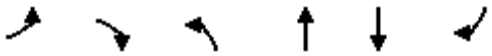
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 100 (83%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 23.8	Intersection LOS: C
Intersection Capacity Utilization 71.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: St. Laurent & Belfast





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	687	46	76	681	308	476
Future Volume (vph)	687	46	76	681	308	476
Satd. Flow (prot)	3288	1517	1695	3390	3390	1517
Flt Permitted	0.950		0.470			
Satd. Flow (perm)	3288	1485	835	3390	3390	1485
Satd. Flow (RTOR)		30				476
Lane Group Flow (vph)	687	46	76	681	308	476
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	24.0	26.5	26.5
Total Split (s)	30.0	30.0	11.0	40.0	29.0	29.0
Total Split (%)	42.9%	42.9%	15.7%	57.1%	41.4%	41.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	19.9	19.9	38.6	38.6	28.5	28.5
Actuated g/C Ratio	0.28	0.28	0.55	0.55	0.41	0.41
v/c Ratio	0.73	0.10	0.14	0.36	0.22	0.54
Control Delay	27.3	9.4	9.4	10.2	16.4	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	9.4	9.4	10.2	16.4	4.8
LOS	C	A	A	B	B	A
Approach Delay	26.2			10.2	9.3	
Approach LOS	C			B	A	
Queue Length 50th (m)	41.7	1.5	4.3	23.9	14.2	0.0
Queue Length 95th (m)	52.4	7.3	11.4	40.7	25.9	19.7
Internal Link Dist (m)	174.1			99.9	245.7	
Turn Bay Length (m)		15.0	65.0			90.0
Base Capacity (vph)	1135	532	543	1876	1414	896
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.09	0.14	0.36	0.22	0.53

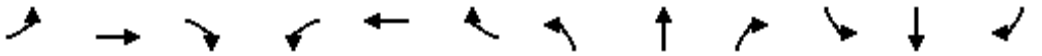
Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 56.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Russell/St. Laurent & St. Laurent (south leg)





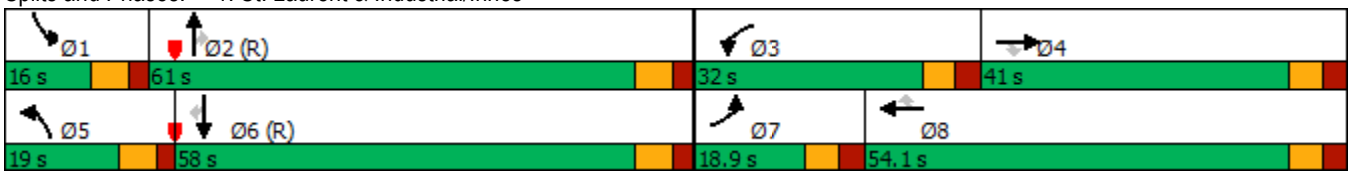
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	576	337	426	291	140	196	922	538	135	944	140
Future Volume (vph)	147	576	337	426	291	140	196	922	538	135	944	140
Satd. Flow (prot)	3288	3390	1517	3288	3390	1517	3288	3390	1517	3288	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3237	3390	1478	3254	3390	1478	3256	3390	1462	3255	3390	1461
Satd. Flow (RTOR)			168			140			354			168
Lane Group Flow (vph)	147	576	337	426	291	140	196	922	538	135	944	140
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	38.6	38.6	11.6	38.6	38.6	11.3	37.6	37.6	11.3	37.6	37.6
Total Split (s)	18.9	41.0	41.0	32.0	54.1	54.1	19.0	61.0	61.0	16.0	58.0	58.0
Total Split (%)	12.6%	27.3%	27.3%	21.3%	36.1%	36.1%	12.7%	40.7%	40.7%	10.7%	38.7%	38.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.1	2.4	2.4	2.1	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.3	6.6	6.6	6.3	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	11.2	30.6	30.6	23.3	42.7	42.7	12.6	60.2	60.2	9.8	57.4	57.4
Actuated g/C Ratio	0.07	0.20	0.20	0.16	0.28	0.28	0.08	0.40	0.40	0.07	0.38	0.38
v/c Ratio	0.60	0.83	0.77	0.84	0.30	0.27	0.71	0.68	0.67	0.63	0.73	0.21
Control Delay	77.6	68.2	40.1	76.3	42.1	6.7	81.7	41.3	17.4	81.6	44.9	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.8	0.0	0.0	0.0
Total Delay	77.6	68.2	40.1	76.3	42.1	6.7	81.7	44.1	18.2	81.6	44.9	3.0
LOS	E	E	D	E	D	A	F	D	B	F	D	A
Approach Delay		60.6			53.3			40.1			44.1	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	22.1	86.8	49.3	63.6	35.3	0.0	29.4	123.2	46.7	20.3	131.2	0.0
Queue Length 95th (m)	33.9	105.8	85.3	82.1	46.5	15.4	43.4	151.3	94.2	32.1	161.6	8.9
Internal Link Dist (m)		460.3			515.4			130.1			572.9	
Turn Bay Length (m)	35.0		120.0	160.0		85.0	90.0		110.0	135.0		155.0
Base Capacity (vph)	269	777	468	556	1073	563	285	1360	798	222	1298	663
Starvation Cap Reductn	0	0	0	0	0	0	0	316	81	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.74	0.72	0.77	0.27	0.25	0.69	0.88	0.75	0.61	0.73	0.21

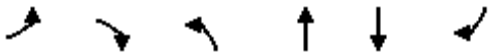
Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 48.1	Intersection LOS: D
Intersection Capacity Utilization 87.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: St. Laurent & Industrial/Innes





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	82	27	43	1648	1676	171
Future Volume (vph)	82	27	43	1648	1676	171
Satd. Flow (prot)	1646	0	1695	3390	3390	1517
Flt Permitted	0.964		0.950			
Satd. Flow (perm)	1613	0	1687	3390	3390	1407
Satd. Flow (RTOR)	13					42
Lane Group Flow (vph)	109	0	43	1648	1676	171
Turn Type	Perm		Prot	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4					6
Detector Phase	4		5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		5.0	10.0	10.0	10.0
Minimum Split (s)	32.0		11.3	29.9	29.9	29.9
Total Split (s)	32.0		11.4	88.0	76.6	76.6
Total Split (%)	26.7%		9.5%	73.3%	63.8%	63.8%
Yellow Time (s)	3.0		4.2	4.2	4.2	4.2
All-Red Time (s)	2.0		2.1	1.7	1.7	1.7
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		6.3	5.9	5.9	5.9
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None		None	C-Min	C-Min	C-Min
Act Effct Green (s)	14.9		7.4	94.2	82.9	82.9
Actuated g/C Ratio	0.12		0.06	0.78	0.69	0.69
v/c Ratio	0.51		0.41	0.62	0.72	0.17
Control Delay	50.2		66.5	7.6	15.6	6.8
Queue Delay	0.0		0.0	0.9	3.9	0.0
Total Delay	50.2		66.5	8.5	19.5	6.8
LOS	D		E	A	B	A
Approach Delay	50.2			10.0	18.3	
Approach LOS	D			A	B	
Queue Length 50th (m)	21.9		9.8	62.1	119.4	9.7
Queue Length 95th (m)	35.0		#27.4	138.3	193.8	23.8
Internal Link Dist (m)	152.0			163.4	130.1	
Turn Bay Length (m)			40.0			15.0
Base Capacity (vph)	373		104	2660	2342	985
Starvation Cap Reductn	0		0	655	570	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.29		0.41	0.82	0.95	0.17

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 2: St. Laurent & Site Access



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	8	56	37	5	90	31	1644	69	93	1464	76
Future Volume (vph)	46	8	56	37	5	90	31	1644	69	93	1464	76
Satd. Flow (prot)	0	1613	0	0	1542	0	1695	3390	1517	1695	3390	1517
Flt Permitted		0.738			0.857		0.950			0.950		
Satd. Flow (perm)	0	1199	0	0	1338	0	1673	3390	1460	1693	3390	1333
Satd. Flow (RTOR)		40			83				86			86
Lane Group Flow (vph)	0	110	0	0	132	0	31	1644	69	93	1464	76
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	33.3	33.3		33.3	33.3		11.2	27.2	27.2	11.2	27.2	27.2
Total Split (s)	33.3	33.3		33.3	33.3		12.0	71.0	71.0	16.0	75.0	75.0
Total Split (%)	27.7%	27.7%		27.7%	27.7%		10.0%	59.0%	59.0%	13.3%	62.3%	62.3%
Yellow Time (s)	3.3	3.3		3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	1.7	1.7	2.0	1.7	1.7
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3			6.3		6.2	5.9	5.9	6.2	5.9	5.9
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		17.2			17.2		6.2	74.8	74.8	10.0	83.4	83.4
Actuated g/C Ratio		0.14			0.14		0.05	0.62	0.62	0.08	0.69	0.69
v/c Ratio		0.54			0.50		0.36	0.78	0.07	0.66	0.62	0.08
Control Delay		38.2			24.6		66.7	21.9	2.0	76.0	14.1	2.1
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.8	0.0
Total Delay		38.2			24.6		66.7	21.9	2.0	76.0	14.9	2.1
LOS		D			C		E	C	A	E	B	A
Approach Delay		38.2			24.6			22.0			17.8	
Approach LOS		D			C			C			B	
Queue Length 50th (m)		16.1			11.0		7.1	129.6	0.0	21.2	91.1	0.0
Queue Length 95th (m)		30.8			27.0		17.5	211.8	4.7	#45.7	157.2	5.3
Internal Link Dist (m)		48.8			101.3			271.9			163.4	
Turn Bay Length (m)							55.0		105.0	80.0		60.0
Base Capacity (vph)		300			364		88	2106	939	147	2349	950
Starvation Cap Reductn		0			0		0	0	0	0	517	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		0.37			0.36		0.35	0.78	0.07	0.63	0.80	0.08

Intersection Summary
Cycle Length: 120.3
Actuated Cycle Length: 120.3
Offset: 42 (35%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

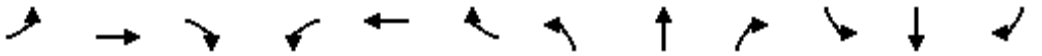
Maximum v/c Ratio: 0.78

Intersection Signal Delay: 20.7	Intersection LOS: C
Intersection Capacity Utilization 87.1%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: St. Laurent & Bourassa





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	546	286	233	104	111	239	67	777	97	152	1133	364
Future Volume (vph)	546	286	233	104	111	239	67	777	97	152	1133	364
Satd. Flow (prot)	3288	1784	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3150	1784	1477	1678	3390	1455	1681	3390	1421	1673	3390	1433
Satd. Flow (RTOR)			215			237			235			364
Lane Group Flow (vph)	546	286	233	104	111	239	67	777	97	152	1133	364
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	11.2	28.2	28.2	11.2	28.2	28.2
Total Split (s)	27.0	39.0	39.0	16.0	28.0	28.0	14.7	43.9	43.9	21.1	50.3	50.3
Total Split (%)	22.5%	32.5%	32.5%	13.3%	23.3%	23.3%	12.3%	36.6%	36.6%	17.6%	41.9%	41.9%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.9	2.0	2.0	1.9	2.0	2.0	1.8	1.7	1.7	1.8	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.7	5.7	5.6	5.7	5.7	6.0	5.9	5.9	6.0	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	22.1	27.5	27.5	10.1	15.5	15.5	8.6	44.9	44.9	14.3	53.1	53.1
Actuated g/C Ratio	0.18	0.23	0.23	0.08	0.13	0.13	0.07	0.37	0.37	0.12	0.44	0.44
v/c Ratio	0.90	0.70	0.46	0.73	0.25	0.61	0.55	0.61	0.14	0.75	0.76	0.44
Control Delay	67.6	51.8	9.2	82.1	46.8	12.6	71.3	34.4	0.4	74.0	34.1	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.6	51.8	9.2	82.1	46.8	12.6	71.3	34.4	0.4	74.0	34.1	4.4
LOS	E	D	A	F	D	B	E	C	A	E	C	A
Approach Delay		50.6			36.9			33.5			31.2	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	65.9	64.4	3.4	24.2	12.8	0.4	15.3	76.6	0.0	34.4	117.6	0.0
Queue Length 95th (m)	#97.9	86.5	22.8	#50.2	20.0	22.2	30.4	107.4	0.0	#62.8	#171.4	19.2
Internal Link Dist (m)		678.5			293.4			245.7			271.9	
Turn Bay Length (m)	70.0		100.0	35.0		15.0	65.0		25.0	110.0		90.0
Base Capacity (vph)	606	495	565	148	629	463	128	1268	678	218	1500	836
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.58	0.41	0.70	0.18	0.52	0.52	0.61	0.14	0.70	0.76	0.44

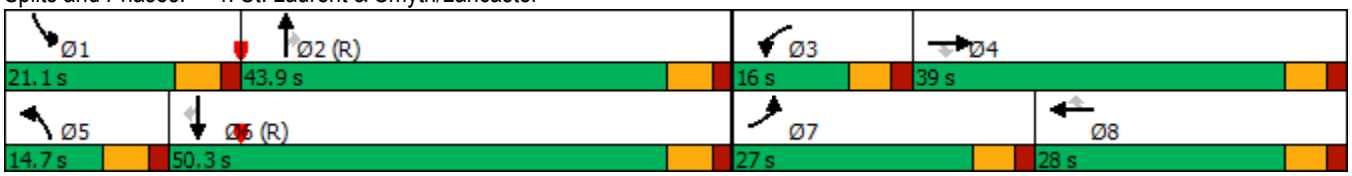
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 41 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

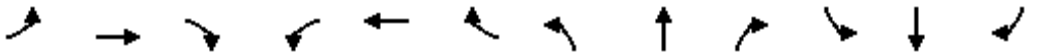
Maximum v/c Ratio: 0.90

Intersection Signal Delay: 37.4	Intersection LOS: D
Intersection Capacity Utilization 85.8%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 4: St. Laurent & Smyth/Lancaster





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	203	169	229	105	95	155	107	1013	85	95	878	138
Future Volume (vph)	203	169	229	105	95	155	107	1013	85	95	878	138
Satd. Flow (prot)	1695	1784	1517	1695	1597	0	1695	3390	1517	1695	3390	1517
Flt Permitted	0.213			0.650			0.212			0.164		
Satd. Flow (perm)	379	1784	1477	1146	1597	0	377	3390	1477	293	3390	1468
Satd. Flow (RTOR)			205		62				130			138
Lane Group Flow (vph)	203	169	229	105	250	0	107	1013	85	95	878	138
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	27.8	27.8	27.8	27.8		11.2	41.6	41.6	11.2	41.6	41.6
Total Split (s)	21.0	52.0	52.0	31.0	31.0		15.2	54.0	54.0	14.0	52.8	52.8
Total Split (%)	17.5%	43.3%	43.3%	25.8%	25.8%		12.7%	45.0%	45.0%	11.7%	44.0%	44.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.4	1.4	1.5	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8		5.7	5.6	5.6	5.7	5.6	5.6
Lead/Lag	Lead			Lag	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	41.7	41.7	41.7	19.3	19.3		61.7	53.0	53.0	60.5	52.5	52.5
Actuated g/C Ratio	0.35	0.35	0.35	0.16	0.16		0.51	0.44	0.44	0.50	0.44	0.44
v/c Ratio	0.65	0.27	0.35	0.57	0.81		0.37	0.68	0.12	0.39	0.59	0.19
Control Delay	38.0	28.2	6.2	57.8	56.0		18.0	30.9	1.4	19.2	29.2	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	28.2	6.2	57.8	56.0		18.0	30.9	1.4	19.2	29.2	4.6
LOS	D	C	A	E	E		B	C	A	B	C	A
Approach Delay		23.2			56.5			27.7			25.3	
Approach LOS		C			E			C			C	
Queue Length 50th (m)	33.4	27.0	3.5	23.0	43.3		12.3	105.1	0.0	10.8	86.7	0.0
Queue Length 95th (m)	51.8	43.0	19.5	39.3	69.0		22.0	130.3	3.0	20.0	110.0	12.3
Internal Link Dist (m)		480.6			437.7			572.9			582.7	
Turn Bay Length (m)	70.0		200.0	65.0			65.0		65.0	75.0		100.0
Base Capacity (vph)	319	691	698	240	384		303	1518	733	251	1498	726
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.24	0.33	0.44	0.65		0.35	0.67	0.12	0.38	0.59	0.19

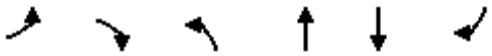
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 49 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 29.2	Intersection LOS: C
Intersection Capacity Utilization 82.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: St. Laurent & Belfast





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	632	110	44	349	729	748
Future Volume (vph)	632	110	44	349	729	748
Satd. Flow (prot)	3288	1517	1695	3390	3390	1517
Flt Permitted	0.950		0.262			
Satd. Flow (perm)	3288	1483	466	3390	3390	1481
Satd. Flow (RTOR)		79				748
Lane Group Flow (vph)	632	110	44	349	729	748
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	24.0	26.5	26.5
Total Split (s)	30.0	30.0	11.0	40.0	29.0	29.0
Total Split (%)	42.9%	42.9%	15.7%	57.1%	41.4%	41.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	18.9	18.9	39.6	39.6	32.6	32.6
Actuated g/C Ratio	0.27	0.27	0.57	0.57	0.47	0.47
v/c Ratio	0.71	0.24	0.12	0.18	0.46	0.69
Control Delay	27.6	8.5	8.9	8.4	16.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	8.5	8.9	8.4	16.3	5.6
LOS	C	A	A	A	B	A
Approach Delay	24.7			8.4	10.9	
Approach LOS	C			A	B	
Queue Length 50th (m)	38.6	3.0	2.3	10.4	37.2	0.0
Queue Length 95th (m)	49.0	12.3	7.3	19.6	58.8	26.0
Internal Link Dist (m)	174.1			99.9	245.7	
Turn Bay Length (m)		15.0	65.0			90.0
Base Capacity (vph)	1127	560	369	1919	1577	1089
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.20	0.12	0.18	0.46	0.69

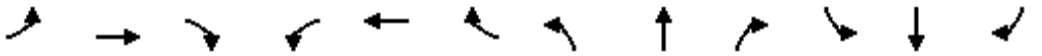
Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 27 (39%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 63.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Russell/St. Laurent & St. Laurent (south leg)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	201	115	670	812	264	225	1150	389	127	846	159
Future Volume (vph)	86	201	115	670	812	264	225	1150	389	127	846	159
Satd. Flow (prot)	3288	3390	1517	3288	3390	1517	3288	3390	1517	3288	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3265	3390	1479	3234	3390	1479	3266	3390	1473	3273	3390	1473
Satd. Flow (RTOR)			180			151			381			180
Lane Group Flow (vph)	86	201	115	670	812	264	225	1150	389	127	846	159
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	38.6	38.6	11.6	38.6	38.6	11.3	37.6	37.6	11.3	37.6	37.6
Total Split (s)	14.2	38.6	38.6	36.0	60.4	60.4	17.4	52.7	52.7	12.7	48.0	48.0
Total Split (%)	10.1%	27.6%	27.6%	25.7%	43.1%	43.1%	12.4%	37.6%	37.6%	9.1%	34.3%	34.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.1	2.4	2.4	2.1	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.3	6.6	6.6	6.3	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	7.4	20.1	20.1	29.4	42.1	42.1	14.0	54.5	54.5	9.8	50.4	50.4
Actuated g/C Ratio	0.05	0.14	0.14	0.21	0.30	0.30	0.10	0.39	0.39	0.07	0.36	0.36
v/c Ratio	0.50	0.41	0.31	0.97	0.80	0.48	0.69	0.87	0.48	0.55	0.69	0.25
Control Delay	74.6	55.5	2.6	82.4	50.8	18.1	71.8	48.6	5.7	71.8	43.3	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.3	0.2	0.0	0.0	0.0
Total Delay	74.6	55.5	2.6	82.4	50.8	18.1	71.8	79.9	5.9	71.8	43.3	4.2
LOS	E	E	A	F	D	B	E	E	A	E	D	A
Approach Delay		44.5			58.0			62.6			41.0	
Approach LOS		D			E			E			D	
Queue Length 50th (m)	12.1	27.2	0.0	95.8	110.1	24.6	31.0	155.4	1.4	17.6	106.1	0.0
Queue Length 95th (m)	21.1	35.5	0.9	#133.7	116.8	44.2	#54.6	#221.2	25.9	#36.7	141.8	11.8
Internal Link Dist (m)		460.3			515.4			130.1			572.9	
Turn Bay Length (m)	35.0		120.0	160.0		85.0	90.0		110.0	135.0		155.0
Base Capacity (vph)	178	774	476	690	1302	661	327	1320	806	231	1220	645
Starvation Cap Reductn	0	0	0	0	0	0	0	235	73	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.26	0.24	0.97	0.62	0.40	0.69	1.06	0.53	0.55	0.69	0.25

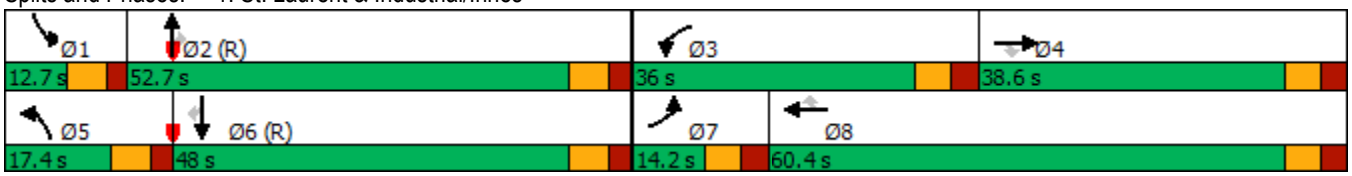
Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

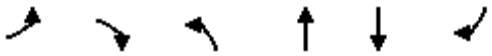
Maximum v/c Ratio: 0.97

Intersection Signal Delay: 54.7	Intersection LOS: D
Intersection Capacity Utilization 93.2%	ICU Level of Service F
Analysis Period (min) 15	

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

Splits and Phases: 1: St. Laurent & Industrial/Innes





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	137	29	17	1621	1662	69
Future Volume (vph)	137	29	17	1621	1662	69
Satd. Flow (prot)	1659	0	1695	3390	3390	1517
Flt Permitted	0.960		0.950			
Satd. Flow (perm)	1623	0	1687	3390	3390	1407
Satd. Flow (RTOR)	8					17
Lane Group Flow (vph)	166	0	17	1621	1662	69
Turn Type	Perm		Prot	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4					6
Detector Phase	4		5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		5.0	10.0	10.0	10.0
Minimum Split (s)	32.0		11.3	29.9	29.9	29.9
Total Split (s)	32.0		11.3	88.0	76.7	76.7
Total Split (%)	26.7%		9.4%	73.3%	63.9%	63.9%
Yellow Time (s)	3.0		4.2	4.2	4.2	4.2
All-Red Time (s)	2.0		2.1	1.7	1.7	1.7
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		6.3	5.9	5.9	5.9
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None		None	C-Min	C-Min	C-Min
Act Effct Green (s)	17.7		6.1	91.4	86.4	86.4
Actuated g/C Ratio	0.15		0.05	0.76	0.72	0.72
v/c Ratio	0.68		0.20	0.63	0.68	0.07
Control Delay	58.8		60.4	8.7	13.5	6.3
Queue Delay	0.0		0.0	0.9	3.8	0.0
Total Delay	58.8		60.4	9.7	17.4	6.3
LOS	E		E	A	B	A
Approach Delay	58.8			10.2	16.9	
Approach LOS	E			B	B	
Queue Length 50th (m)	35.9		3.9	75.7	79.4	2.5
Queue Length 95th (m)	53.5		11.6	134.0	190.0	11.2
Internal Link Dist (m)	152.0			163.4	130.1	
Turn Bay Length (m)			40.0			15.0
Base Capacity (vph)	371		85	2582	2440	1017
Starvation Cap Reductn	0		0	621	677	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.45		0.20	0.83	0.94	0.07

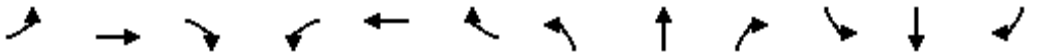
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 15.8	Intersection LOS: B
Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: St. Laurent & Site Access





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	10	90	37	6	110	56	1469	49	126	1403	96
Future Volume (vph)	50	10	90	37	6	110	56	1469	49	126	1403	96
Satd. Flow (prot)	0	1583	0	0	1548	0	1695	3390	1517	1695	3390	1517
Flt Permitted		0.717			0.805		0.950			0.950		
Satd. Flow (perm)	0	1146	0	0	1257	0	1685	3390	1438	1689	3390	1418
Satd. Flow (RTOR)		58			99				86			86
Lane Group Flow (vph)	0	150	0	0	153	0	56	1469	49	126	1403	96
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	33.3	33.3		33.3	33.3		11.2	27.2	27.2	11.2	27.2	27.2
Total Split (s)	33.3	33.3		33.3	33.3		15.0	66.0	66.0	21.0	72.0	72.0
Total Split (%)	27.7%	27.7%		27.7%	27.7%		12.5%	54.9%	54.9%	17.5%	59.9%	59.9%
Yellow Time (s)	3.3	3.3		3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	1.7	1.7	2.0	1.7	1.7
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3			6.3		6.2	5.9	5.9	6.2	5.9	5.9
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		15.9			15.9		8.5	72.8	72.8	13.2	79.9	79.9
Actuated g/C Ratio		0.13			0.13		0.07	0.61	0.61	0.11	0.66	0.66
v/c Ratio		0.75			0.61		0.47	0.72	0.05	0.68	0.62	0.10
Control Delay		51.4			28.4		66.3	20.9	0.9	69.4	15.2	3.2
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.7	0.0
Total Delay		51.4			28.4		66.3	20.9	0.9	69.4	15.9	3.2
LOS		D			C		E	C	A	E	B	A
Approach Delay		51.4			28.4			21.8			19.3	
Approach LOS		D			C			C			B	
Queue Length 50th (m)		21.6			11.9		12.8	117.4	0.0	28.8	95.3	0.8
Queue Length 95th (m)		39.9			30.1		26.5	189.8	1.7	48.7	156.0	8.6
Internal Link Dist (m)		48.8			101.3			271.9			163.4	
Turn Bay Length (m)							55.0		105.0	80.0		60.0
Base Capacity (vph)		302			358		130	2052	904	213	2252	971
Starvation Cap Reductn		0			0		0	0	0	0	476	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		0.50			0.43		0.43	0.72	0.05	0.59	0.79	0.10

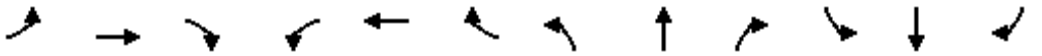
Intersection Summary
Cycle Length: 120.3
Actuated Cycle Length: 120.3
Offset: 113 (94%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 22.2	Intersection LOS: C
Intersection Capacity Utilization 83.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: St. Laurent & Bourassa





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	348	116	107	35	303	117	183	1237	105	150	651	704
Future Volume (vph)	348	116	107	35	303	117	183	1237	105	150	651	704
Satd. Flow (prot)	3288	1784	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3241	1784	1467	1664	3390	1479	1684	3390	1443	1688	3390	1470
Satd. Flow (RTOR)			132			183			181			313
Lane Group Flow (vph)	348	116	107	35	303	117	183	1237	105	150	651	704
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	11.2	28.2	28.2	11.2	28.2	28.2
Total Split (s)	19.0	35.0	35.0	12.0	28.0	28.0	22.0	55.0	55.0	18.0	51.0	51.0
Total Split (%)	15.8%	29.2%	29.2%	10.0%	23.3%	23.3%	18.3%	45.8%	45.8%	15.0%	42.5%	42.5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.9	2.0	2.0	1.9	2.0	2.0	1.8	1.7	1.7	1.8	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.7	5.7	5.6	5.7	5.7	6.0	5.9	5.9	6.0	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	14.3	29.0	29.0	6.3	16.3	16.3	17.1	51.3	51.3	14.9	49.1	49.1
Actuated g/C Ratio	0.12	0.24	0.24	0.05	0.14	0.14	0.14	0.43	0.43	0.12	0.41	0.41
v/c Ratio	0.89	0.27	0.24	0.40	0.66	0.33	0.76	0.85	0.15	0.72	0.47	0.90
Control Delay	77.4	40.0	4.8	68.4	55.8	3.1	69.7	38.5	0.4	70.0	28.1	34.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.4	40.0	4.8	68.4	55.8	3.1	69.7	38.5	0.4	70.0	28.1	34.4
LOS	E	D	A	E	E	A	E	D	A	E	C	C
Approach Delay		56.2			43.2			39.6			35.2	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	42.6	23.9	0.0	8.1	36.2	0.0	41.1	139.1	0.0	33.5	58.8	96.8
Queue Length 95th (m)	#70.8	38.6	8.9	18.8	48.2	2.0	#78.3	#174.4	0.0	#72.1	79.2	#184.1
Internal Link Dist (m)		678.5			293.4			245.7			271.9	
Turn Bay Length (m)	70.0		100.0	35.0		15.0	65.0		25.0	110.0		90.0
Base Capacity (vph)	391	464	479	91	629	423	250	1450	720	209	1388	786
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.25	0.22	0.38	0.48	0.28	0.73	0.85	0.15	0.72	0.47	0.90

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 110 (92%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

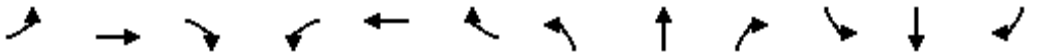
Maximum v/c Ratio: 0.90

Intersection Signal Delay: 40.7	Intersection LOS: D
Intersection Capacity Utilization 85.7%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 4: St. Laurent & Smyth/Lancaster





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	69	94	47	153	103	133	967	69	91	870	208
Future Volume (vph)	51	69	94	47	153	103	133	967	69	91	870	208
Satd. Flow (prot)	1695	1784	1517	1695	1668	0	1695	3390	1517	1695	3390	1517
Flt Permitted	0.250			0.712			0.234			0.213		
Satd. Flow (perm)	446	1784	1494	1267	1668	0	417	3390	1480	380	3390	1489
Satd. Flow (RTOR)			94		27				130			208
Lane Group Flow (vph)	51	69	94	47	256	0	133	967	69	91	870	208
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	27.8	27.8	27.8	27.8		11.2	41.6	41.6	11.2	41.6	41.6
Total Split (s)	11.0	48.0	48.0	37.0	37.0		17.0	58.0	58.0	14.0	55.0	55.0
Total Split (%)	9.2%	40.0%	40.0%	30.8%	30.8%		14.2%	48.3%	48.3%	11.7%	45.8%	45.8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.4	1.4	1.5	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8		5.7	5.6	5.6	5.7	5.6	5.6
Lead/Lag	Lead			Lag	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	33.6	33.6	33.6	22.0	22.0		70.7	61.2	61.2	67.6	59.7	59.7
Actuated g/C Ratio	0.28	0.28	0.28	0.18	0.18		0.59	0.51	0.51	0.56	0.50	0.50
v/c Ratio	0.24	0.14	0.19	0.20	0.78		0.38	0.56	0.08	0.30	0.52	0.25
Control Delay	30.4	29.2	6.1	41.1	57.8		14.9	24.1	0.2	14.5	24.4	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	29.2	6.1	41.1	57.8		14.9	24.1	0.2	14.5	24.4	3.9
LOS	C	C	A	D	E		B	C	A	B	C	A
Approach Delay		19.3			55.2			21.7			20.0	
Approach LOS		B			E			C			B	
Queue Length 50th (m)	8.6	11.7	0.0	9.5	52.1		12.9	84.2	0.0	8.6	74.5	0.0
Queue Length 95th (m)	16.3	20.6	10.7	18.9	75.0		25.6	121.2	0.0	18.4	110.6	14.7
Internal Link Dist (m)		480.6			437.7			572.9			582.7	
Turn Bay Length (m)	70.0		200.0	65.0			65.0		65.0	75.0		100.0
Base Capacity (vph)	209	633	591	329	453		375	1750	827	312	1705	852
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	0.24	0.11	0.16	0.14	0.57		0.35	0.55	0.08	0.29	0.51	0.24

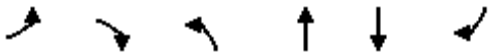
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 100 (83%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 24.4	Intersection LOS: C
Intersection Capacity Utilization 72.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: St. Laurent & Belfast





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	723	48	80	716	324	500
Future Volume (vph)	723	48	80	716	324	500
Satd. Flow (prot)	3288	1517	1695	3390	3390	1517
Flt Permitted	0.950		0.461			
Satd. Flow (perm)	3288	1485	819	3390	3390	1485
Satd. Flow (RTOR)		30				500
Lane Group Flow (vph)	723	48	80	716	324	500
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	24.0	26.5	26.5
Total Split (s)	30.0	30.0	11.0	40.0	29.0	29.0
Total Split (%)	42.9%	42.9%	15.7%	57.1%	41.4%	41.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	20.6	20.6	37.9	37.9	28.0	28.0
Actuated g/C Ratio	0.29	0.29	0.54	0.54	0.40	0.40
v/c Ratio	0.75	0.10	0.15	0.39	0.24	0.56
Control Delay	27.2	9.2	9.9	10.9	16.7	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	9.2	9.9	10.9	16.7	4.9
LOS	C	A	A	B	B	A
Approach Delay	26.1			10.8	9.5	
Approach LOS	C			B	A	
Queue Length 50th (m)	43.8	1.7	4.6	26.2	15.3	0.0
Queue Length 95th (m)	54.6	7.5	12.2	44.3	26.6	20.0
Internal Link Dist (m)	174.1			99.9	245.7	
Turn Bay Length (m)		15.0	65.0			90.0
Base Capacity (vph)	1142	535	526	1850	1393	904
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.09	0.15	0.39	0.23	0.55

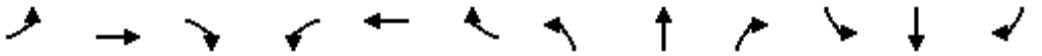
Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Russell/St. Laurent & St. Laurent (south leg)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	606	354	447	306	148	205	967	564	142	987	147
Future Volume (vph)	155	606	354	447	306	148	205	967	564	142	987	147
Satd. Flow (prot)	3288	3390	1517	3288	3390	1517	3288	3390	1517	3288	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3238	3390	1478	3255	3390	1478	3258	3390	1462	3257	3390	1461
Satd. Flow (RTOR)			168			148			350			168
Lane Group Flow (vph)	155	606	354	447	306	148	205	967	564	142	987	147
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	38.6	38.6	11.6	38.6	38.6	11.3	37.6	37.6	11.3	37.6	37.6
Total Split (s)	18.9	41.0	41.0	32.0	54.1	54.1	19.0	61.0	61.0	16.0	58.0	58.0
Total Split (%)	12.6%	27.3%	27.3%	21.3%	36.1%	36.1%	12.7%	40.7%	40.7%	10.7%	38.7%	38.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.1	2.4	2.4	2.1	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.3	6.6	6.6	6.3	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	11.4	31.5	31.5	23.9	44.0	44.0	12.8	58.5	58.5	10.0	55.7	55.7
Actuated g/C Ratio	0.08	0.21	0.21	0.16	0.29	0.29	0.09	0.39	0.39	0.07	0.37	0.37
v/c Ratio	0.62	0.85	0.80	0.85	0.31	0.28	0.73	0.73	0.72	0.65	0.78	0.23
Control Delay	78.4	69.2	43.0	77.3	41.4	6.6	82.2	44.1	20.6	82.2	48.3	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.9	0.0	0.0	0.0
Total Delay	78.4	69.2	43.0	77.3	41.4	6.6	82.2	48.0	21.5	82.2	48.3	3.8
LOS	E	E	D	E	D	A	F	D	C	F	D	A
Approach Delay		62.1			53.5			43.4			46.9	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	23.2	90.6	54.3	66.5	36.3	0.0	30.7	136.8	59.8	21.3	145.4	0.0
Queue Length 95th (m)	35.4	112.1	93.0	86.2	48.8	15.7	#47.3	161.3	108.5	#33.7	171.2	10.8
Internal Link Dist (m)		460.3			515.4			130.1			572.9	
Turn Bay Length (m)	35.0		120.0	160.0		85.0	90.0		110.0	135.0		155.0
Base Capacity (vph)	269	777	468	557	1073	569	289	1327	785	225	1264	650
Starvation Cap Reductn	0	0	0	0	0	0	0	272	64	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.78	0.76	0.80	0.29	0.26	0.71	0.92	0.78	0.63	0.78	0.23

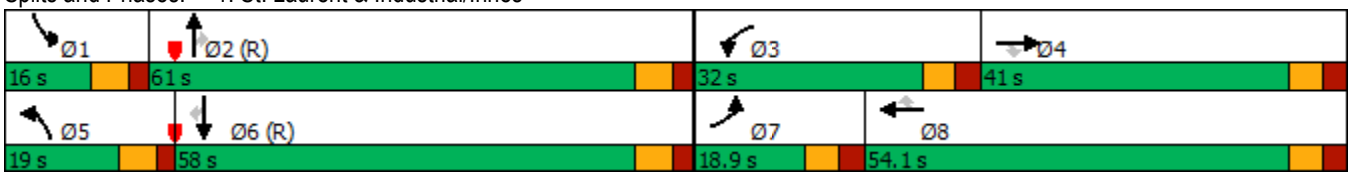
Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

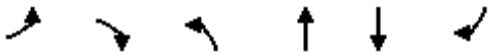
Maximum v/c Ratio: 0.85

Intersection Signal Delay: 50.3	Intersection LOS: D
Intersection Capacity Utilization 90.4%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 1: St. Laurent & Industrial/Innes





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	82	27	43	1733	1759	171
Future Volume (vph)	82	27	43	1733	1759	171
Satd. Flow (prot)	1646	0	1695	3390	3390	1517
Flt Permitted	0.964		0.950			
Satd. Flow (perm)	1613	0	1688	3390	3390	1407
Satd. Flow (RTOR)	13					40
Lane Group Flow (vph)	109	0	43	1733	1759	171
Turn Type	Perm		Prot	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4					6
Detector Phase	4		5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		5.0	10.0	10.0	10.0
Minimum Split (s)	32.0		11.3	29.9	29.9	29.9
Total Split (s)	32.0		12.0	88.0	76.0	76.0
Total Split (%)	26.7%		10.0%	73.3%	63.3%	63.3%
Yellow Time (s)	3.0		4.2	4.2	4.2	4.2
All-Red Time (s)	2.0		2.1	1.7	1.7	1.7
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		6.3	5.9	5.9	5.9
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None		None	C-Min	C-Min	C-Min
Act Effct Green (s)	14.9		7.4	94.2	82.8	82.8
Actuated g/C Ratio	0.12		0.06	0.78	0.69	0.69
v/c Ratio	0.51		0.41	0.65	0.75	0.17
Control Delay	50.2		66.3	8.1	16.8	7.0
Queue Delay	0.0		0.0	1.1	6.7	0.0
Total Delay	50.2		66.3	9.2	23.5	7.0
LOS	D		E	A	C	A
Approach Delay	50.2			10.6	22.0	
Approach LOS	D			B	C	
Queue Length 50th (m)	21.9		9.8	68.6	131.4	9.9
Queue Length 95th (m)	35.0		#25.4	152.9	217.0	24.4
Internal Link Dist (m)	152.0			163.4	130.1	
Turn Bay Length (m)			40.0			15.0
Base Capacity (vph)	373		105	2660	2340	983
Starvation Cap Reductn	0		0	621	539	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.29		0.41	0.85	0.98	0.17

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

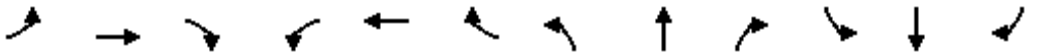
Maximum v/c Ratio: 0.75

Intersection Signal Delay: 17.5	Intersection LOS: B
Intersection Capacity Utilization 75.6%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 2: St. Laurent & Site Access





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	8	56	37	5	90	31	1725	69	93	1539	76
Future Volume (vph)	46	8	56	37	5	90	31	1725	69	93	1539	76
Satd. Flow (prot)	0	1613	0	0	1542	0	1695	3390	1517	1695	3390	1517
Flt Permitted		0.738			0.857		0.950			0.950		
Satd. Flow (perm)	0	1199	0	0	1338	0	1675	3390	1460	1693	3390	1333
Satd. Flow (RTOR)		40			83				86			86
Lane Group Flow (vph)	0	110	0	0	132	0	31	1725	69	93	1539	76
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	33.3	33.3		33.3	33.3		11.2	27.2	27.2	11.2	27.2	27.2
Total Split (s)	33.3	33.3		33.3	33.3		12.0	71.0	71.0	16.0	75.0	75.0
Total Split (%)	27.7%	27.7%		27.7%	27.7%		10.0%	59.0%	59.0%	13.3%	62.3%	62.3%
Yellow Time (s)	3.3	3.3		3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	1.7	1.7	2.0	1.7	1.7
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3			6.3		6.2	5.9	5.9	6.2	5.9	5.9
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		17.2			17.2		6.2	74.8	74.8	10.0	83.4	83.4
Actuated g/C Ratio		0.14			0.14		0.05	0.62	0.62	0.08	0.69	0.69
v/c Ratio		0.54			0.50		0.36	0.82	0.07	0.66	0.66	0.08
Control Delay		38.2			24.6		66.7	23.6	2.0	76.0	14.9	2.1
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	1.0	0.0
Total Delay		38.2			24.6		66.7	23.6	2.0	76.0	15.9	2.1
LOS		D			C		E	C	A	E	B	A
Approach Delay		38.2			24.6			23.5			18.5	
Approach LOS		D			C			C			B	
Queue Length 50th (m)		16.1			11.0		7.1	142.6	0.0	21.2	99.6	0.0
Queue Length 95th (m)		30.8			27.0		17.5	#251.2	4.7	#45.7	171.8	5.3
Internal Link Dist (m)		48.8			101.3			271.9			163.4	
Turn Bay Length (m)							55.0		105.0	80.0		60.0
Base Capacity (vph)		300			364		88	2106	939	147	2349	950
Starvation Cap Reductn		0			0		0	0	0	0	496	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		0.37			0.36		0.35	0.82	0.07	0.63	0.83	0.08

Intersection Summary
Cycle Length: 120.3
Actuated Cycle Length: 120.3
Offset: 42 (35%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

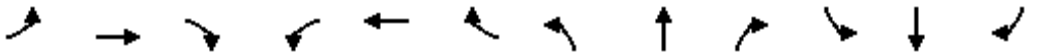
Maximum v/c Ratio: 0.82

Intersection Signal Delay: 21.7	Intersection LOS: C
Intersection Capacity Utilization 89.5%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: St. Laurent & Bourassa





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	573	301	245	109	117	252	72	815	102	159	1191	383
Future Volume (vph)	573	301	245	109	117	252	72	815	102	159	1191	383
Satd. Flow (prot)	3288	1784	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3151	1784	1477	1679	3390	1455	1682	3390	1421	1674	3390	1433
Satd. Flow (RTOR)			210			237			235			374
Lane Group Flow (vph)	573	301	245	109	117	252	72	815	102	159	1191	383
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	11.2	28.2	28.2	11.2	28.2	28.2
Total Split (s)	27.0	39.0	39.0	16.0	28.0	28.0	14.7	43.9	43.9	21.1	50.3	50.3
Total Split (%)	22.5%	32.5%	32.5%	13.3%	23.3%	23.3%	12.3%	36.6%	36.6%	17.6%	41.9%	41.9%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.9	2.0	2.0	1.9	2.0	2.0	1.8	1.7	1.7	1.8	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.7	5.7	5.6	5.7	5.7	6.0	5.9	5.9	6.0	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	21.9	27.9	27.9	10.0	16.0	16.0	8.7	44.3	44.3	14.6	52.6	52.6
Actuated g/C Ratio	0.18	0.23	0.23	0.08	0.13	0.13	0.07	0.37	0.37	0.12	0.44	0.44
v/c Ratio	0.95	0.73	0.49	0.77	0.26	0.63	0.59	0.65	0.15	0.77	0.80	0.46
Control Delay	75.9	52.9	10.8	87.2	46.5	14.4	73.2	35.6	0.5	75.4	36.1	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.9	52.9	10.8	87.2	46.5	14.4	73.2	35.6	0.5	75.4	36.1	4.9
LOS	E	D	B	F	D	B	E	D	A	E	D	A
Approach Delay		55.5			38.9			34.7			32.8	
Approach LOS		E			D			C			C	
Queue Length 50th (m)	70.0	67.6	6.7	25.5	13.4	3.2	16.4	83.5	0.0	35.9	130.0	1.2
Queue Length 95th (m)	#105.2	91.0	27.1	#53.7	20.8	26.5	#35.1	113.9	0.0	#68.3	#186.9	21.9
Internal Link Dist (m)		678.5			293.4			245.7			271.9	
Turn Bay Length (m)	70.0		100.0	35.0		15.0	65.0		25.0	110.0		90.0
Base Capacity (vph)	601	495	561	146	629	463	129	1251	672	219	1487	838
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.61	0.44	0.75	0.19	0.54	0.56	0.65	0.15	0.73	0.80	0.46

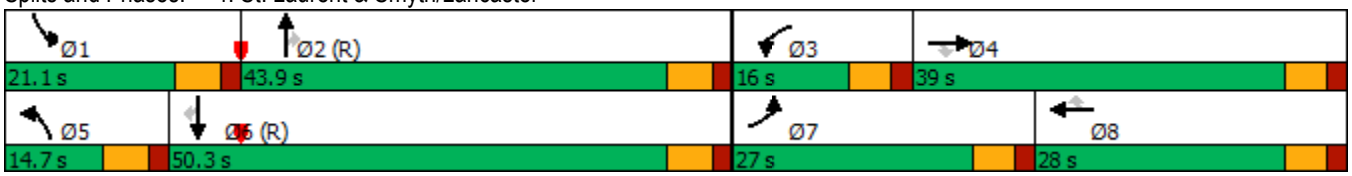
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 41 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

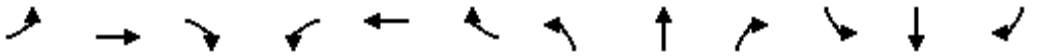
Maximum v/c Ratio: 0.95

Intersection Signal Delay: 39.8	Intersection LOS: D
Intersection Capacity Utilization 88.4%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 4: St. Laurent & Smyth/Lancaster





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	177	240	110	100	163	113	1063	90	100	918	145
Future Volume (vph)	213	177	240	110	100	163	113	1063	90	100	918	145
Satd. Flow (prot)	1695	1784	1517	1695	1597	0	1695	3390	1517	1695	3390	1517
Flt Permitted	0.201			0.646			0.192			0.144		
Satd. Flow (perm)	357	1784	1477	1139	1597	0	342	3390	1477	257	3390	1468
Satd. Flow (RTOR)			199		62				130			145
Lane Group Flow (vph)	213	177	240	110	263	0	113	1063	90	100	918	145
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	27.8	27.8	27.8	27.8		11.2	41.6	41.6	11.2	41.6	41.6
Total Split (s)	21.0	52.0	52.0	31.0	31.0		15.2	54.0	54.0	14.0	52.8	52.8
Total Split (%)	17.5%	43.3%	43.3%	25.8%	25.8%		12.7%	45.0%	45.0%	11.7%	44.0%	44.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.4	1.4	1.5	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8		5.7	5.6	5.6	5.7	5.6	5.6
Lead/Lag	Lead			Lag	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.2	42.2	42.2	20.0	20.0		61.3	52.6	52.6	59.8	51.9	51.9
Actuated g/C Ratio	0.35	0.35	0.35	0.17	0.17		0.51	0.44	0.44	0.50	0.43	0.43
v/c Ratio	0.69	0.28	0.37	0.58	0.83		0.41	0.72	0.12	0.45	0.63	0.20
Control Delay	40.4	28.2	7.4	57.6	57.7		19.1	32.2	1.7	21.0	30.2	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	28.2	7.4	57.6	57.7		19.1	32.2	1.7	21.0	30.2	4.5
LOS	D	C	A	E	E		B	C	A	C	C	A
Approach Delay		24.4			57.6			28.9			26.2	
Approach LOS		C			E			C			C	
Queue Length 50th (m)	34.3	27.7	5.9	23.9	46.4		13.5	116.1	0.0	11.8	95.3	0.0
Queue Length 95th (m)	#55.2	45.0	23.3	41.2	73.6		23.1	139.1	4.0	20.8	116.4	12.4
Internal Link Dist (m)		480.6			437.7			572.9			582.7	
Turn Bay Length (m)	70.0		200.0	65.0			65.0		65.0	75.0		100.0
Base Capacity (vph)	313	689	693	239	384		286	1500	726	232	1476	721
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.26	0.35	0.46	0.68		0.40	0.71	0.12	0.43	0.62	0.20

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 49 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

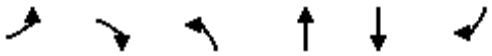
Maximum v/c Ratio: 0.83

Intersection Signal Delay: 30.3	Intersection LOS: C
Intersection Capacity Utilization 85.1%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 5: St. Laurent & Belfast





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	665	116	46	367	767	786
Future Volume (vph)	665	116	46	367	767	786
Satd. Flow (prot)	3288	1517	1695	3390	3390	1517
Flt Permitted	0.950		0.243			
Satd. Flow (perm)	3288	1483	432	3390	3390	1481
Satd. Flow (RTOR)		79				786
Lane Group Flow (vph)	665	116	46	367	767	786
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	24.0	26.5	26.5
Total Split (s)	30.0	30.0	11.0	40.0	29.0	29.0
Total Split (%)	42.9%	42.9%	15.7%	57.1%	41.4%	41.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	19.4	19.4	39.1	39.1	32.1	32.1
Actuated g/C Ratio	0.28	0.28	0.56	0.56	0.46	0.46
v/c Ratio	0.73	0.25	0.13	0.19	0.49	0.71
Control Delay	27.6	8.7	9.2	8.7	17.0	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	8.7	9.2	8.7	17.0	6.1
LOS	C	A	A	A	B	A
Approach Delay	24.8			8.7	11.5	
Approach LOS	C			A	B	
Queue Length 50th (m)	40.5	3.6	2.5	11.3	40.3	0.0
Queue Length 95th (m)	51.7	13.1	7.6	20.7	62.5	27.8
Internal Link Dist (m)	174.1			99.9	245.7	
Turn Bay Length (m)		15.0	65.0			90.0
Base Capacity (vph)	1127	560	349	1893	1552	1104
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.21	0.13	0.19	0.49	0.71

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 27 (39%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 65.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Russell/St. Laurent & St. Laurent (south leg)



APPENDIX N

SIM TRAFFIC RESULTS

Intersection: 1: St. Laurent & Industrial/Innes

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	L
Maximum Queue (m)	36.9	41.7	60.9	54.8	42.9	163.7	167.5	537.3	535.2	92.4	52.5	97.4
Average Queue (m)	8.3	22.1	29.8	22.0	4.2	158.7	164.4	463.0	450.4	27.1	29.3	70.2
95th Queue (m)	28.6	41.2	49.2	42.4	24.3	186.3	182.6	690.6	694.2	77.6	47.6	125.4
Link Distance (m)			467.1	467.1				523.3	523.3			
Upstream Blk Time (%)								63	25			
Queuing Penalty (veh)								0	0			
Storage Bay Dist (m)	35.0	35.0			120.0	160.0	160.0			85.0	90.0	90.0
Storage Blk Time (%)	0	4	9			11	68	1	3	0	0	0
Queuing Penalty (veh)	0	4	8			45	276	6	8	0	0	1

Intersection: 1: St. Laurent & Industrial/Innes

Movement	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	R
Maximum Queue (m)	133.2	138.7	117.5	38.0	127.4	204.7	330.5	150.3
Average Queue (m)	117.9	118.6	71.6	17.7	32.0	110.3	136.0	25.3
95th Queue (m)	150.5	152.5	159.9	33.1	92.1	186.5	252.1	114.9
Link Distance (m)	126.1	126.1				569.7	569.7	
Upstream Blk Time (%)	12	11					0	
Queuing Penalty (veh)	105	101					1	
Storage Bay Dist (m)			110.0	135.0	135.0			155.0
Storage Blk Time (%)	29	21	0		0	4	9	0
Queuing Penalty (veh)	64	80	1		0	6	14	0

Intersection: 2: St. Laurent & Site Access

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	LR	L	T	T	T	T	R
Maximum Queue (m)	79.0	44.7	178.0	177.4	139.5	146.0	22.5
Average Queue (m)	39.9	9.3	134.9	140.6	82.9	114.7	6.1
95th Queue (m)	71.0	30.2	209.4	211.2	152.8	174.2	21.7
Link Distance (m)	155.5		172.7	172.7	126.1	126.1	
Upstream Blk Time (%)			3	4	3	19	
Queuing Penalty (veh)			26	35	20	157	
Storage Bay Dist (m)		40.0					15.0
Storage Blk Time (%)			32			36	0
Queuing Penalty (veh)			5			25	1

Intersection: 3: St. Laurent & Bourassa

Movement	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	L	T	T	R	L	T	T	R
Maximum Queue (m)	56.1	60.5	62.3	245.1	257.7	112.5	83.8	181.1	180.1	67.5
Average Queue (m)	26.6	27.9	22.0	153.4	161.6	25.0	28.4	100.7	159.0	23.0
95th Queue (m)	49.8	51.0	56.8	257.2	267.3	101.9	63.8	192.7	211.8	70.4
Link Distance (m)	55.0	111.2		269.0	269.0			172.7	172.7	
Upstream Blk Time (%)	2			1	3			1	6	
Queuing Penalty (veh)	0			10	29			12	49	
Storage Bay Dist (m)			55.0			105.0	80.0			60.0
Storage Blk Time (%)			0	32	26	0	0	3	25	0
Queuing Penalty (veh)			0	18	13	0	0	3	24	0

Intersection: 4: St. Laurent & Smyth/Lancaster

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	74.0	127.5	50.6	20.8	38.0	42.4	146.8	22.6	72.4	204.1	208.2	32.5
Average Queue (m)	43.0	58.9	22.4	2.5	10.6	37.7	79.5	20.5	58.9	121.1	127.0	13.3
95th Queue (m)	74.2	140.7	42.9	13.0	27.6	53.4	130.5	27.1	87.7	190.7	193.3	38.8
Link Distance (m)		689.8	689.8				299.1			239.7	239.7	
Upstream Blk Time (%)										0	0	
Queuing Penalty (veh)										2	1	
Storage Bay Dist (m)	70.0			100.0	35.0	35.0		15.0	65.0			25.0
Storage Blk Time (%)	4	9			0	6	59	2	4	29	48	0
Queuing Penalty (veh)	7	15			0	17	179	8	23	53	50	1

Intersection: 4: St. Laurent & Smyth/Lancaster

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	62.4	66.8	133.4	97.4
Average Queue (m)	29.7	31.7	60.0	21.9
95th Queue (m)	54.2	56.6	102.0	78.7
Link Distance (m)		269.0	269.0	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	110.0			90.0
Storage Blk Time (%)			1	0
Queuing Penalty (veh)			6	1

Intersection: 5: St. Laurent & Belfast

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	T	R	L	T	T
Maximum Queue (m)	27.7	37.6	14.3	72.4	173.2	69.9	156.4	396.2	50.7	41.6	92.1	100.8
Average Queue (m)	11.1	13.5	1.1	23.3	85.2	21.3	41.9	64.5	5.3	13.2	41.4	46.4
95th Queue (m)	23.2	28.5	10.4	67.0	168.1	49.1	113.2	246.5	36.3	28.3	72.6	79.2
Link Distance (m)		488.3			445.6		569.7	569.7			596.0	596.0
Upstream Blk Time (%)								1				
Queuing Penalty (veh)								5				
Storage Bay Dist (m)	70.0		200.0	65.0		65.0			65.0	75.0		
Storage Blk Time (%)				0	34		3	4	0		1	0
Queuing Penalty (veh)				0	16		4	2	0		0	0

Intersection: 5: St. Laurent & Belfast

Movement	SB
Directions Served	R
Maximum Queue (m)	21.3
Average Queue (m)	0.7
95th Queue (m)	15.0
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	100.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 6: Russell/St. Laurent & St. Laurent (south leg)

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	L	R	L	T	T	T	T
Maximum Queue (m)	81.8	76.5	22.6	29.7	64.9	87.0	45.9	84.8
Average Queue (m)	50.4	41.2	14.1	10.1	22.9	42.0	15.5	17.3
95th Queue (m)	73.7	66.7	26.5	22.2	51.9	69.3	34.5	54.4
Link Distance (m)	183.7	183.7				115.6	239.7	239.7
Upstream Blk Time (%)						0		
Queuing Penalty (veh)						0		
Storage Bay Dist (m)			15.0	65.0	65.0			
Storage Blk Time (%)		35	0	0	0	1		
Queuing Penalty (veh)		17	2	0	0	4		

Network Summary

Network wide Queuing Penalty: 1563

Intersection: 1: St. Laurent & Industrial/Innes

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	L
Maximum Queue (m)	38.5	42.5	153.0	153.6	121.2	163.7	167.5	469.9	449.3	37.0	54.7	97.4
Average Queue (m)	23.8	36.7	94.7	87.3	60.6	150.6	156.5	287.8	252.2	8.3	27.7	51.2
95th Queue (m)	46.2	51.5	140.1	133.4	116.1	197.6	198.9	564.5	533.9	27.2	46.9	104.5
Link Distance (m)			467.1	467.1				523.3	523.3			
Upstream Blk Time (%)								7	2			
Queuing Penalty (veh)								0	0			
Storage Bay Dist (m)	35.0	35.0			120.0	160.0	160.0			85.0	90.0	90.0
Storage Blk Time (%)	2	18	53	1	1	12	57	2			0	0
Queuing Penalty (veh)	7	53	81	4	3	19	88	7			0	0

Intersection: 1: St. Laurent & Industrial/Innes

Movement	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	R
Maximum Queue (m)	131.3	137.1	117.5	42.8	142.4	402.7	542.2	162.5
Average Queue (m)	98.4	98.7	67.7	21.6	67.7	239.8	274.5	86.0
95th Queue (m)	135.8	138.0	132.3	37.5	166.5	456.4	510.5	217.6
Link Distance (m)	126.1	126.1				569.7	569.7	
Upstream Blk Time (%)	2	2				0	2	
Queuing Penalty (veh)	20	22				2	11	
Storage Bay Dist (m)			110.0	135.0	135.0			155.0
Storage Blk Time (%)	14	6	0		0	33	42	0
Queuing Penalty (veh)	28	35	2		0	47	62	1

Intersection: 2: St. Laurent & Site Access

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	LR	L	T	T	T	T	R
Maximum Queue (m)	51.1	43.1	140.4	149.5	133.3	148.3	22.6
Average Queue (m)	23.1	14.0	37.5	47.5	93.7	123.7	10.9
95th Queue (m)	44.1	30.4	97.0	111.5	158.7	185.6	27.3
Link Distance (m)	155.5		172.7	172.7	126.1	126.1	
Upstream Blk Time (%)			0	0	4	25	
Queuing Penalty (veh)			0	1	33	224	
Storage Bay Dist (m)		40.0					15.0
Storage Blk Time (%)			6			31	1
Queuing Penalty (veh)			3			53	5

Intersection: 3: St. Laurent & Bourassa

Movement	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	L	T	T	R	L	T	T	R
Maximum Queue (m)	48.5	54.4	62.1	209.5	266.9	112.5	60.4	147.2	158.6	67.5
Average Queue (m)	22.9	27.8	13.7	133.5	152.6	23.9	22.7	61.5	86.0	19.9
95th Queue (m)	42.0	48.7	40.3	213.0	242.6	99.4	43.7	116.9	141.0	63.8
Link Distance (m)	55.0	111.2		269.0	269.0			172.7	172.7	
Upstream Blk Time (%)	0			0	0			0	0	
Queuing Penalty (veh)	0			0	2			1	1	
Storage Bay Dist (m)			55.0			105.0	80.0			60.0
Storage Blk Time (%)			0	26	19	0		3	25	0
Queuing Penalty (veh)			0	8	13	0		2	19	0

Intersection: 4: St. Laurent & Smyth/Lancaster

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	77.4	211.7	135.3	88.1	37.5	42.4	107.1	22.6	68.5	105.7	118.6	32.5
Average Queue (m)	67.8	117.4	60.2	27.0	24.5	21.6	42.5	20.5	18.6	59.4	69.5	14.0
95th Queue (m)	89.4	248.9	118.1	62.1	38.1	51.8	86.9	24.8	45.6	92.9	107.1	39.3
Link Distance (m)		689.8	689.8				299.1			239.7	239.7	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	70.0			100.0	35.0	35.0		15.0	65.0			25.0
Storage Blk Time (%)	13	28	1	0	5	4	22	10		6	36	0
Queuing Penalty (veh)	36	80	2	0	16	13	93	23		4	37	1

Intersection: 4: St. Laurent & Smyth/Lancaster

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	83.2	234.5	266.2	97.5
Average Queue (m)	33.4	88.7	143.1	55.1
95th Queue (m)	62.6	204.5	275.7	134.4
Link Distance (m)		269.0	269.0	
Upstream Blk Time (%)		0	1	
Queuing Penalty (veh)		0	10	
Storage Bay Dist (m)	110.0			90.0
Storage Blk Time (%)		1	15	0
Queuing Penalty (veh)		1	59	1

Intersection: 5: St. Laurent & Belfast

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	T	R	L	T	T
Maximum Queue (m)	72.8	73.4	49.8	72.4	209.2	72.4	211.8	314.2	72.5	72.6	102.4	105.6
Average Queue (m)	39.2	31.2	15.1	48.1	94.9	27.2	67.5	88.2	15.0	20.3	57.9	59.0
95th Queue (m)	63.9	56.2	39.6	88.2	199.4	62.7	161.7	274.7	62.9	47.1	96.0	98.5
Link Distance (m)		488.3			445.6		569.7	569.7			596.0	596.0
Upstream Blk Time (%)								0				
Queuing Penalty (veh)								2				
Storage Bay Dist (m)	70.0		200.0	65.0		65.0			65.0	75.0		
Storage Blk Time (%)	1	0		1	36	0	11	11	0	0	3	1
Queuing Penalty (veh)	3	1		3	40	0	12	10	0	0	3	1

Intersection: 5: St. Laurent & Belfast

Movement	SB
Directions Served	R
Maximum Queue (m)	39.9
Average Queue (m)	3.1
95th Queue (m)	32.5
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	100.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 6: Russell/St. Laurent & St. Laurent (south leg)

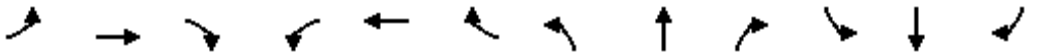
Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	L	T	T	T	T	R
Maximum Queue (m)	85.2	86.2	22.7	19.3	31.4	48.0	70.1	164.7	24.1
Average Queue (m)	44.7	44.7	18.7	8.2	6.4	21.0	30.4	37.1	0.8
95th Queue (m)	68.0	73.3	25.0	16.8	19.7	39.1	56.0	110.9	15.3
Link Distance (m)	183.7	183.7				115.6	239.7	239.7	
Upstream Blk Time (%)								0	
Queuing Penalty (veh)								0	
Storage Bay Dist (m)			15.0	65.0	65.0				90.0
Storage Blk Time (%)		39	1			0		0	0
Queuing Penalty (veh)		46	4			0		0	0

Network Summary

Network wide Queuing Penalty: 1361

APPENDIX O

SYNCHRO ANALYSIS: CUSTOM MODE SHARE NOT MET INTERSECTION PERFORMANCE



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	201	119	672	812	264	235	1174	399	127	856	159
Future Volume (vph)	86	201	119	672	812	264	235	1174	399	127	856	159
Satd. Flow (prot)	3288	3390	1517	3288	3390	1517	3288	3390	1517	3288	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3265	3390	1479	3234	3390	1479	3266	3390	1473	3274	3390	1473
Satd. Flow (RTOR)			180			150			383			180
Lane Group Flow (vph)	86	201	119	672	812	264	235	1174	399	127	856	159
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	38.6	38.6	11.6	38.6	38.6	11.3	37.6	37.6	11.3	37.6	37.6
Total Split (s)	14.2	38.6	38.6	36.0	60.4	60.4	17.4	52.7	52.7	12.7	48.0	48.0
Total Split (%)	10.1%	27.6%	27.6%	25.7%	43.1%	43.1%	12.4%	37.6%	37.6%	9.1%	34.3%	34.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.1	2.4	2.4	2.1	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.3	6.6	6.6	6.3	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	7.4	20.1	20.1	29.4	42.1	42.1	14.5	54.5	54.5	9.8	49.8	49.8
Actuated g/C Ratio	0.05	0.14	0.14	0.21	0.30	0.30	0.10	0.39	0.39	0.07	0.36	0.36
v/c Ratio	0.50	0.41	0.33	0.97	0.80	0.48	0.69	0.89	0.49	0.55	0.71	0.25
Control Delay	74.6	55.5	3.1	83.0	50.8	18.3	71.1	50.1	6.1	71.8	44.2	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.3	0.2	0.0	0.0	0.0
Total Delay	74.6	55.5	3.1	83.0	50.8	18.3	71.1	88.4	6.3	71.8	44.2	4.3
LOS	E	E	A	F	D	B	E	F	A	E	D	A
Approach Delay		44.2			58.3			68.0			41.7	
Approach LOS		D			E			E			D	
Queue Length 50th (m)	12.1	27.2	0.0	96.1	110.1	24.9	32.3	160.5	2.7	17.6	108.6	0.0
Queue Length 95th (m)	21.1	35.5	2.0	#134.3	116.8	44.5	#58.2	#228.5	28.4	#36.7	143.9	11.8
Internal Link Dist (m)		460.3			515.4			130.1			572.9	
Turn Bay Length (m)	35.0		120.0	160.0		85.0	90.0		110.0	135.0		155.0
Base Capacity (vph)	178	774	476	690	1302	660	341	1320	807	231	1206	640
Starvation Cap Reductn	0	0	0	0	0	0	0	232	72	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.26	0.25	0.97	0.62	0.40	0.69	1.08	0.54	0.55	0.71	0.25

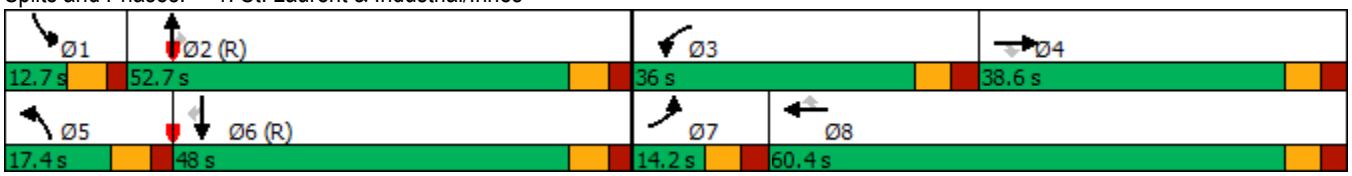
Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

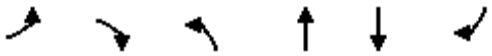
Maximum v/c Ratio: 0.97

Intersection Signal Delay: 56.9	Intersection LOS: E
Intersection Capacity Utilization 93.9%	ICU Level of Service F
Analysis Period (min) 15	

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

Splits and Phases: 1: St. Laurent & Industrial/Innes





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	182	37	20	1621	1662	85
Future Volume (vph)	182	37	20	1621	1662	85
Satd. Flow (prot)	1661	0	1695	3390	3390	1517
Flt Permitted	0.960		0.950			
Satd. Flow (perm)	1625	0	1687	3390	3390	1407
Satd. Flow (RTOR)	8					21
Lane Group Flow (vph)	219	0	20	1621	1662	85
Turn Type	Perm		Prot	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4					6
Detector Phase	4		5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		5.0	10.0	10.0	10.0
Minimum Split (s)	32.0		11.3	29.9	29.9	29.9
Total Split (s)	32.0		11.3	88.0	76.7	76.7
Total Split (%)	26.7%		9.4%	73.3%	63.9%	63.9%
Yellow Time (s)	3.0		4.2	4.2	4.2	4.2
All-Red Time (s)	2.0		2.1	1.7	1.7	1.7
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		6.3	5.9	5.9	5.9
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None		None	C-Min	C-Min	C-Min
Act Effct Green (s)	20.6		6.2	88.5	83.5	83.5
Actuated g/C Ratio	0.17		0.05	0.74	0.70	0.70
v/c Ratio	0.77		0.23	0.65	0.71	0.09
Control Delay	62.9		61.3	10.2	15.3	6.8
Queue Delay	0.0		0.0	1.1	5.9	0.0
Total Delay	62.9		61.3	11.3	21.3	6.8
LOS	E		E	B	C	A
Approach Delay	62.9			11.9	20.6	
Approach LOS	E			B	C	
Queue Length 50th (m)	47.8		4.6	89.2	93.5	3.7
Queue Length 95th (m)	70.4		12.8	134.0	190.0	13.1
Internal Link Dist (m)	152.0			163.4	130.1	
Turn Bay Length (m)			40.0			15.0
Base Capacity (vph)	371		87	2500	2357	984
Starvation Cap Reductn	0		0	583	639	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.59		0.23	0.85	0.97	0.09

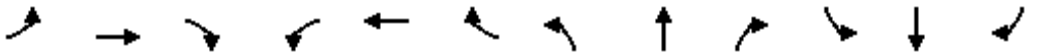
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 75.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: St. Laurent & Site Access





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	10	90	37	6	110	56	1472	49	126	1411	96
Future Volume (vph)	50	10	90	37	6	110	56	1472	49	126	1411	96
Satd. Flow (prot)	0	1583	0	0	1548	0	1695	3390	1517	1695	3390	1517
Flt Permitted		0.717			0.805		0.950			0.950		
Satd. Flow (perm)	0	1146	0	0	1257	0	1685	3390	1438	1689	3390	1418
Satd. Flow (RTOR)		58			99				86			86
Lane Group Flow (vph)	0	150	0	0	153	0	56	1472	49	126	1411	96
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	33.3	33.3		33.3	33.3		11.2	27.2	27.2	11.2	27.2	27.2
Total Split (s)	33.3	33.3		33.3	33.3		15.0	66.0	66.0	21.0	72.0	72.0
Total Split (%)	27.7%	27.7%		27.7%	27.7%		12.5%	54.9%	54.9%	17.5%	59.9%	59.9%
Yellow Time (s)	3.3	3.3		3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	1.7	1.7	2.0	1.7	1.7
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3			6.3		6.2	5.9	5.9	6.2	5.9	5.9
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		15.9			15.9		8.5	72.8	72.8	13.2	79.9	79.9
Actuated g/C Ratio		0.13			0.13		0.07	0.61	0.61	0.11	0.66	0.66
v/c Ratio		0.75			0.61		0.47	0.72	0.05	0.68	0.63	0.10
Control Delay		51.4			28.4		66.3	20.9	0.9	69.4	15.3	3.2
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.8	0.0
Total Delay		51.4			28.4		66.3	20.9	0.9	69.4	16.0	3.2
LOS		D			C		E	C	A	E	B	A
Approach Delay		51.4			28.4			21.9			19.4	
Approach LOS		D			C			C			B	
Queue Length 50th (m)		21.6			11.9		12.8	117.8	0.0	28.8	96.3	0.8
Queue Length 95th (m)		39.9			30.1		26.5	190.3	1.7	48.7	157.4	8.6
Internal Link Dist (m)		48.8			101.3			271.9			163.4	
Turn Bay Length (m)							55.0		105.0	80.0		60.0
Base Capacity (vph)		302			358		130	2052	904	213	2252	971
Starvation Cap Reductn		0			0		0	0	0	0	474	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		0.50			0.43		0.43	0.72	0.05	0.59	0.79	0.10

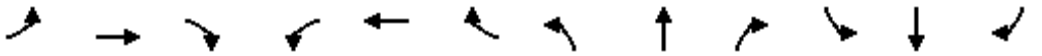
Intersection Summary
Cycle Length: 120.3
Actuated Cycle Length: 120.3
Offset: 113 (94%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 22.3	Intersection LOS: C
Intersection Capacity Utilization 83.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: St. Laurent & Bourassa





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	116	107	35	303	117	183	1239	105	150	657	706
Future Volume (vph)	349	116	107	35	303	117	183	1239	105	150	657	706
Satd. Flow (prot)	3288	1784	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3241	1784	1467	1664	3390	1479	1684	3390	1443	1688	3390	1470
Satd. Flow (RTOR)			132			183			181			313
Lane Group Flow (vph)	349	116	107	35	303	117	183	1239	105	150	657	706
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	11.2	28.2	28.2	11.2	28.2	28.2
Total Split (s)	19.0	35.0	35.0	12.0	28.0	28.0	22.0	55.0	55.0	18.0	51.0	51.0
Total Split (%)	15.8%	29.2%	29.2%	10.0%	23.3%	23.3%	18.3%	45.8%	45.8%	15.0%	42.5%	42.5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.9	2.0	2.0	1.9	2.0	2.0	1.8	1.7	1.7	1.8	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.7	5.7	5.6	5.7	5.7	6.0	5.9	5.9	6.0	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	14.1	28.9	28.9	6.3	16.3	16.3	17.1	51.5	51.5	14.9	49.3	49.3
Actuated g/C Ratio	0.12	0.24	0.24	0.05	0.14	0.14	0.14	0.43	0.43	0.12	0.41	0.41
v/c Ratio	0.90	0.27	0.24	0.40	0.66	0.33	0.76	0.85	0.15	0.72	0.47	0.90
Control Delay	79.3	40.1	4.8	68.4	55.8	3.1	69.7	38.4	0.4	70.0	28.0	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.3	40.1	4.8	68.4	55.8	3.1	69.7	38.4	0.4	70.0	28.0	34.5
LOS	E	D	A	E	E	A	E	D	A	E	C	C
Approach Delay		57.4			43.2			39.5			35.2	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	42.7	23.9	0.0	8.1	36.2	0.0	41.1	139.5	0.0	33.5	59.6	97.5
Queue Length 95th (m)	#71.0	38.6	8.9	18.8	48.2	2.0	#78.3	#174.7	0.0	#72.1	80.0	#185.1
Internal Link Dist (m)		678.5			293.4			245.7			271.9	
Turn Bay Length (m)	70.0		100.0	35.0		15.0	65.0		25.0	110.0		90.0
Base Capacity (vph)	387	462	477	91	629	423	250	1454	722	209	1392	787
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.25	0.22	0.38	0.48	0.28	0.73	0.85	0.15	0.72	0.47	0.90

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 110 (92%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

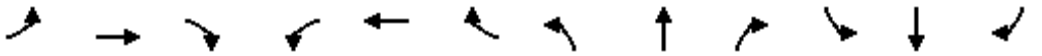
Maximum v/c Ratio: 0.90

Intersection Signal Delay: 40.8	Intersection LOS: D
Intersection Capacity Utilization 85.8%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 4: St. Laurent & Smyth/Lancaster





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	69	95	47	153	103	135	988	69	91	880	208
Future Volume (vph)	51	69	95	47	153	103	135	988	69	91	880	208
Satd. Flow (prot)	1695	1784	1517	1695	1668	0	1695	3390	1517	1695	3390	1517
Flt Permitted	0.250			0.712			0.231			0.206		
Satd. Flow (perm)	446	1784	1494	1267	1668	0	412	3390	1480	368	3390	1489
Satd. Flow (RTOR)			95		27				130			208
Lane Group Flow (vph)	51	69	95	47	256	0	135	988	69	91	880	208
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	27.8	27.8	27.8	27.8		11.2	41.6	41.6	11.2	41.6	41.6
Total Split (s)	11.0	48.0	48.0	37.0	37.0		17.0	58.0	58.0	14.0	55.0	55.0
Total Split (%)	9.2%	40.0%	40.0%	30.8%	30.8%		14.2%	48.3%	48.3%	11.7%	45.8%	45.8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.4	1.4	1.5	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8		5.7	5.6	5.6	5.7	5.6	5.6
Lead/Lag	Lead			Lag	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	33.4	33.4	33.4	22.0	22.0		70.9	61.4	61.4	67.8	59.9	59.9
Actuated g/C Ratio	0.28	0.28	0.28	0.18	0.18		0.59	0.51	0.51	0.56	0.50	0.50
v/c Ratio	0.25	0.14	0.20	0.20	0.78		0.39	0.57	0.08	0.31	0.52	0.25
Control Delay	30.8	29.5	6.1	41.1	57.8		14.8	24.1	0.2	14.4	24.3	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	29.5	6.1	41.1	57.8		14.8	24.1	0.2	14.4	24.3	3.9
LOS	C	C	A	D	E		B	C	A	B	C	A
Approach Delay		19.5			55.2			21.7			19.9	
Approach LOS		B			E			C			B	
Queue Length 50th (m)	8.6	11.7	0.0	9.5	52.1		13.1	86.8	0.0	8.6	75.8	0.0
Queue Length 95th (m)	16.6	21.0	11.0	18.9	75.0		25.4	122.7	0.0	18.0	110.3	14.5
Internal Link Dist (m)		480.6			437.7			572.9			582.7	
Turn Bay Length (m)	70.0		200.0	65.0			65.0		65.0	75.0		100.0
Base Capacity (vph)	206	630	588	329	453		373	1750	827	307	1704	852
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	0.25	0.11	0.16	0.14	0.57		0.36	0.56	0.08	0.30	0.52	0.24

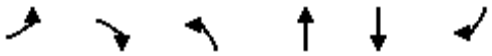
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 100 (83%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 24.3	Intersection LOS: C
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: St. Laurent & Belfast





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	724	48	80	717	327	502
Future Volume (vph)	724	48	80	717	327	502
Satd. Flow (prot)	3288	1517	1695	3390	3390	1517
Flt Permitted	0.950		0.460			
Satd. Flow (perm)	3288	1485	817	3390	3390	1485
Satd. Flow (RTOR)		30				502
Lane Group Flow (vph)	724	48	80	717	327	502
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	24.0	26.5	26.5
Total Split (s)	30.0	30.0	11.0	40.0	29.0	29.0
Total Split (%)	42.9%	42.9%	15.7%	57.1%	41.4%	41.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	20.6	20.6	37.9	37.9	28.0	28.0
Actuated g/C Ratio	0.29	0.29	0.54	0.54	0.40	0.40
v/c Ratio	0.75	0.10	0.15	0.39	0.24	0.56
Control Delay	27.2	9.2	9.9	10.9	16.7	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	9.2	9.9	10.9	16.7	4.9
LOS	C	A	A	B	B	A
Approach Delay	26.1			10.8	9.5	
Approach LOS	C			B	A	
Queue Length 50th (m)	43.9	1.7	4.6	26.2	15.4	0.0
Queue Length 95th (m)	54.6	7.5	12.2	44.3	26.9	19.7
Internal Link Dist (m)	174.1			99.9	245.7	
Turn Bay Length (m)		15.0	65.0			90.0
Base Capacity (vph)	1142	535	524	1850	1392	906
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.09	0.15	0.39	0.23	0.55

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Russell/St. Laurent & St. Laurent (south leg)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	606	369	455	306	148	210	979	569	142	1029	147
Future Volume (vph)	155	606	369	455	306	148	210	979	569	142	1029	147
Satd. Flow (prot)	3288	3390	1517	3288	3390	1517	3288	3390	1517	3288	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3238	3390	1478	3255	3390	1478	3260	3390	1462	3258	3390	1461
Satd. Flow (RTOR)			168			148			350			168
Lane Group Flow (vph)	155	606	369	455	306	148	210	979	569	142	1029	147
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.6	38.6	38.6	11.6	38.6	38.6	11.3	37.6	37.6	11.3	37.6	37.6
Total Split (s)	18.9	41.0	41.0	32.0	54.1	54.1	19.0	61.0	61.0	16.0	58.0	58.0
Total Split (%)	12.6%	27.3%	27.3%	21.3%	36.1%	36.1%	12.7%	40.7%	40.7%	10.7%	38.7%	38.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.1	2.4	2.4	2.1	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6	6.6	6.3	6.6	6.6	6.3	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	11.4	31.7	31.7	24.0	44.3	44.3	12.7	58.4	58.4	9.8	55.5	55.5
Actuated g/C Ratio	0.08	0.21	0.21	0.16	0.30	0.30	0.08	0.39	0.39	0.07	0.37	0.37
v/c Ratio	0.62	0.85	0.83	0.87	0.31	0.27	0.76	0.74	0.73	0.66	0.82	0.23
Control Delay	78.5	68.6	46.6	78.4	41.3	6.6	84.3	44.5	21.0	83.5	50.1	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	1.1	0.0	0.0	0.0
Total Delay	78.5	68.6	46.6	78.4	41.3	6.6	84.3	50.5	22.1	83.5	50.1	3.8
LOS	E	E	D	E	D	A	F	D	C	F	D	A
Approach Delay		62.8			54.2			45.4			48.5	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	23.3	90.6	59.7	68.1	36.4	0.0	31.8	137.1	60.6	21.5	152.0	0.0
Queue Length 95th (m)	35.4	112.1	#102.0	#89.2	48.8	15.7	#49.2	163.9	111.1	#33.7	181.2	10.8
Internal Link Dist (m)		460.3			515.4			130.1			572.9	
Turn Bay Length (m)	35.0		120.0	160.0		85.0	90.0		110.0	135.0		155.0
Base Capacity (vph)	269	777	468	556	1073	569	285	1319	783	220	1254	646
Starvation Cap Reductn	0	0	0	0	0	0	0	286	70	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.78	0.79	0.82	0.29	0.26	0.74	0.95	0.80	0.65	0.82	0.23

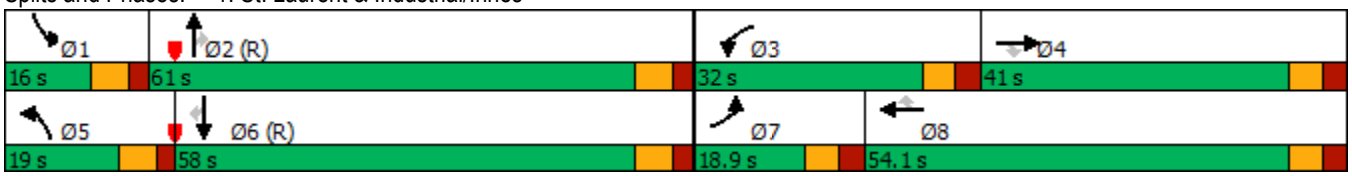
Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

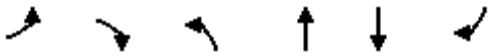
Maximum v/c Ratio: 0.87

Intersection Signal Delay: 51.6	Intersection LOS: D
Intersection Capacity Utilization 92.0%	ICU Level of Service F
Analysis Period (min) 15	

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

Splits and Phases: 1: St. Laurent & Industrial/Innes





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	105	31	54	1733	1759	236
Future Volume (vph)	105	31	54	1733	1759	236
Satd. Flow (prot)	1649	0	1695	3390	3390	1517
Flt Permitted	0.963		0.950			
Satd. Flow (perm)	1615	0	1688	3390	3390	1407
Satd. Flow (RTOR)	11					55
Lane Group Flow (vph)	136	0	54	1733	1759	236
Turn Type	Perm		Prot	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4					6
Detector Phase	4		5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		5.0	10.0	10.0	10.0
Minimum Split (s)	32.0		11.3	29.9	29.9	29.9
Total Split (s)	32.0		12.0	88.0	76.0	76.0
Total Split (%)	26.7%		10.0%	73.3%	63.3%	63.3%
Yellow Time (s)	3.0		4.2	4.2	4.2	4.2
All-Red Time (s)	2.0		2.1	1.7	1.7	1.7
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		6.3	5.9	5.9	5.9
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None		None	C-Min	C-Min	C-Min
Act Effct Green (s)	16.2		8.2	92.9	80.9	80.9
Actuated g/C Ratio	0.14		0.07	0.77	0.67	0.67
v/c Ratio	0.60		0.47	0.66	0.77	0.24
Control Delay	54.6		67.6	8.8	18.5	8.0
Queue Delay	0.0		0.0	1.2	8.9	0.0
Total Delay	54.6		67.6	9.9	27.4	8.0
LOS	D		E	A	C	A
Approach Delay	54.6			11.7	25.1	
Approach LOS	D			B	C	
Queue Length 50th (m)	28.5		12.3	77.3	144.7	15.6
Queue Length 95th (m)	43.6		#33.2	152.9	217.0	33.5
Internal Link Dist (m)	152.0			163.4	130.1	
Turn Bay Length (m)			40.0			15.0
Base Capacity (vph)	371		115	2624	2285	966
Starvation Cap Reductn	0		0	600	509	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.37		0.47	0.86	0.99	0.24

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

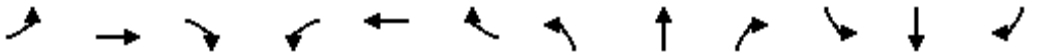
Maximum v/c Ratio: 0.77

Intersection Signal Delay: 20.0	Intersection LOS: B
Intersection Capacity Utilization 75.8%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 2: St. Laurent & Site Access





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	8	56	37	5	90	31	1736	69	93	1543	76
Future Volume (vph)	46	8	56	37	5	90	31	1736	69	93	1543	76
Satd. Flow (prot)	0	1613	0	0	1542	0	1695	3390	1517	1695	3390	1517
Flt Permitted		0.738			0.857		0.950			0.950		
Satd. Flow (perm)	0	1199	0	0	1338	0	1675	3390	1460	1693	3390	1333
Satd. Flow (RTOR)		40			83				86			86
Lane Group Flow (vph)	0	110	0	0	132	0	31	1736	69	93	1543	76
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	33.3	33.3		33.3	33.3		11.2	27.2	27.2	11.2	27.2	27.2
Total Split (s)	33.3	33.3		33.3	33.3		12.0	71.0	71.0	16.0	75.0	75.0
Total Split (%)	27.7%	27.7%		27.7%	27.7%		10.0%	59.0%	59.0%	13.3%	62.3%	62.3%
Yellow Time (s)	3.3	3.3		3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	1.7	1.7	2.0	1.7	1.7
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.3			6.3		6.2	5.9	5.9	6.2	5.9	5.9
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		17.2			17.2		6.2	74.8	74.8	10.0	83.4	83.4
Actuated g/C Ratio		0.14			0.14		0.05	0.62	0.62	0.08	0.69	0.69
v/c Ratio		0.54			0.50		0.36	0.82	0.07	0.66	0.66	0.08
Control Delay		38.2			24.6		66.7	23.8	2.0	76.0	14.9	2.1
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	1.0	0.0
Total Delay		38.2			24.6		66.7	23.8	2.0	76.0	15.9	2.1
LOS		D			C		E	C	A	E	B	A
Approach Delay		38.2			24.6			23.7			18.6	
Approach LOS		D			C			C			B	
Queue Length 50th (m)		16.1			11.0		7.1	144.3	0.0	21.2	100.2	0.0
Queue Length 95th (m)		30.8			27.0		17.5	#254.1	4.7	#45.7	172.5	5.3
Internal Link Dist (m)		48.8			101.3			271.9			163.4	
Turn Bay Length (m)							55.0		105.0	80.0		60.0
Base Capacity (vph)		300			364		88	2106	939	147	2349	950
Starvation Cap Reductn		0			0		0	0	0	0	494	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		0.37			0.36		0.35	0.82	0.07	0.63	0.83	0.08

Intersection Summary
Cycle Length: 120.3
Actuated Cycle Length: 120.3
Offset: 42 (35%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

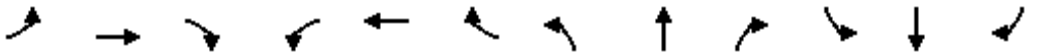
Maximum v/c Ratio: 0.82

Intersection Signal Delay: 21.8	Intersection LOS: C
Intersection Capacity Utilization 89.8%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: St. Laurent & Bourassa





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	577	301	245	109	117	252	72	822	102	159	1194	384
Future Volume (vph)	577	301	245	109	117	252	72	822	102	159	1194	384
Satd. Flow (prot)	3288	1784	1517	1695	3390	1517	1695	3390	1517	1695	3390	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3151	1784	1477	1679	3390	1455	1682	3390	1421	1674	3390	1433
Satd. Flow (RTOR)			210			237			235			374
Lane Group Flow (vph)	577	301	245	109	117	252	72	822	102	159	1194	384
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	11.2	28.2	28.2	11.2	28.2	28.2
Total Split (s)	27.0	39.0	39.0	16.0	28.0	28.0	14.7	43.9	43.9	21.1	50.3	50.3
Total Split (%)	22.5%	32.5%	32.5%	13.3%	23.3%	23.3%	12.3%	36.6%	36.6%	17.6%	41.9%	41.9%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	1.9	2.0	2.0	1.9	2.0	2.0	1.8	1.7	1.7	1.8	1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.7	5.7	5.6	5.7	5.7	6.0	5.9	5.9	6.0	5.9	5.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	22.1	28.1	28.1	10.0	16.0	16.0	8.7	44.1	44.1	14.6	52.5	52.5
Actuated g/C Ratio	0.18	0.23	0.23	0.08	0.13	0.13	0.07	0.37	0.37	0.12	0.44	0.44
v/c Ratio	0.95	0.72	0.48	0.77	0.26	0.63	0.59	0.66	0.15	0.77	0.81	0.46
Control Delay	75.5	52.6	10.8	87.2	46.5	14.4	73.2	35.9	0.5	75.4	36.3	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.5	52.6	10.8	87.2	46.5	14.4	73.2	35.9	0.5	75.4	36.3	4.9
LOS	E	D	B	F	D	B	E	D	A	E	D	A
Approach Delay		55.2			38.9			35.0			33.0	
Approach LOS		E			D			C			C	
Queue Length 50th (m)	70.4	67.6	6.7	25.5	13.4	3.2	16.4	84.5	0.0	35.9	130.4	1.4
Queue Length 95th (m)	#106.2	91.0	27.1	#53.7	20.8	26.5	#35.1	115.1	0.0	#68.3	#187.6	22.5
Internal Link Dist (m)		678.5			293.4			245.7			271.9	
Turn Bay Length (m)	70.0		100.0	35.0		15.0	65.0		25.0	110.0		90.0
Base Capacity (vph)	606	495	561	146	629	463	129	1245	670	219	1482	836
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.61	0.44	0.75	0.19	0.54	0.56	0.66	0.15	0.73	0.81	0.46

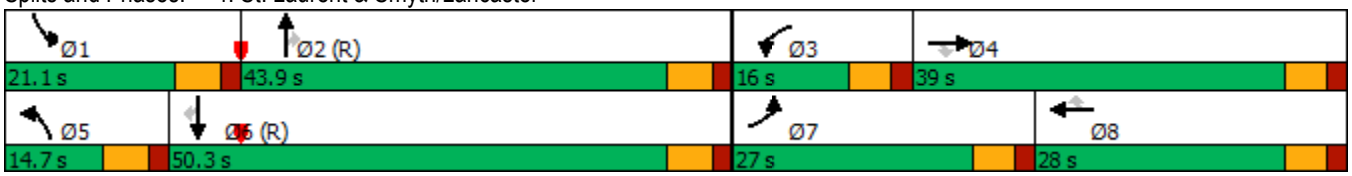
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 41 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

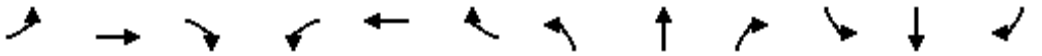
Maximum v/c Ratio: 0.95

Intersection Signal Delay: 39.9	Intersection LOS: D
Intersection Capacity Utilization 88.6%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 4: St. Laurent & Smyth/Lancaster





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	177	244	110	100	163	114	1074	90	100	956	145
Future Volume (vph)	213	177	244	110	100	163	114	1074	90	100	956	145
Satd. Flow (prot)	1695	1784	1517	1695	1597	0	1695	3390	1517	1695	3390	1517
Flt Permitted	0.201			0.646			0.177			0.140		
Satd. Flow (perm)	357	1784	1477	1139	1597	0	315	3390	1477	250	3390	1468
Satd. Flow (RTOR)			195		62				130			145
Lane Group Flow (vph)	213	177	244	110	263	0	114	1074	90	100	956	145
Turn Type	pm+pt	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Detector Phase	7	4	4	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.0	27.8	27.8	27.8	27.8		11.2	41.6	41.6	11.2	41.6	41.6
Total Split (s)	21.0	52.0	52.0	31.0	31.0		15.2	54.0	54.0	14.0	52.8	52.8
Total Split (%)	17.5%	43.3%	43.3%	25.8%	25.8%		12.7%	45.0%	45.0%	11.7%	44.0%	44.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		1.5	1.4	1.4	1.5	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.8		5.7	5.6	5.6	5.7	5.6	5.6
Lead/Lag	Lead			Lag	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.2	42.2	42.2	20.0	20.0		61.3	52.6	52.6	59.9	51.9	51.9
Actuated g/C Ratio	0.35	0.35	0.35	0.17	0.17		0.51	0.44	0.44	0.50	0.43	0.43
v/c Ratio	0.69	0.28	0.38	0.58	0.83		0.44	0.72	0.12	0.45	0.65	0.20
Control Delay	40.5	28.2	8.0	57.6	57.7		19.7	32.4	1.7	21.2	30.9	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	28.2	8.0	57.6	57.7		19.7	32.4	1.7	21.2	30.9	4.5
LOS	D	C	A	E	E		B	C	A	C	C	A
Approach Delay		24.6			57.6			29.1			26.9	
Approach LOS		C			E			C			C	
Queue Length 50th (m)	34.3	27.7	7.1	23.9	46.4		13.6	117.9	0.0	11.8	100.8	0.0
Queue Length 95th (m)	#55.2	45.0	25.3	41.2	73.6		23.3	141.0	4.0	20.8	122.8	12.4
Internal Link Dist (m)		480.6			437.7			572.9			582.7	
Turn Bay Length (m)	70.0		200.0	65.0			65.0		65.0	75.0		100.0
Base Capacity (vph)	313	689	690	239	384		274	1500	726	229	1475	721
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.26	0.35	0.46	0.68		0.42	0.72	0.12	0.44	0.65	0.20

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 49 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

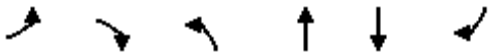
Maximum v/c Ratio: 0.83

Intersection Signal Delay: 30.6	Intersection LOS: C
Intersection Capacity Utilization 85.5%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 5: St. Laurent & Belfast





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	669	116	46	370	769	787
Future Volume (vph)	669	116	46	370	769	787
Satd. Flow (prot)	3288	1517	1695	3390	3390	1517
Flt Permitted	0.950		0.241			
Satd. Flow (perm)	3288	1483	429	3390	3390	1481
Satd. Flow (RTOR)		78				787
Lane Group Flow (vph)	669	116	46	370	769	787
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	11.0	24.0	26.5	26.5
Total Split (s)	30.0	30.0	11.0	40.0	29.0	29.0
Total Split (%)	42.9%	42.9%	15.7%	57.1%	41.4%	41.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.5	5.5	5.5	5.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	19.5	19.5	39.0	39.0	32.0	32.0
Actuated g/C Ratio	0.28	0.28	0.56	0.56	0.46	0.46
v/c Ratio	0.73	0.25	0.13	0.20	0.50	0.71
Control Delay	27.7	8.8	9.3	8.7	17.0	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	8.8	9.3	8.7	17.0	6.2
LOS	C	A	A	A	B	A
Approach Delay	24.9			8.8	11.5	
Approach LOS	C			A	B	
Queue Length 50th (m)	40.8	3.7	2.5	11.4	40.6	0.0
Queue Length 95th (m)	52.0	13.2	7.6	20.8	62.6	27.6
Internal Link Dist (m)	174.1			99.9	245.7	
Turn Bay Length (m)		15.0	65.0			90.0
Base Capacity (vph)	1127	559	347	1890	1549	1104
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.21	0.13	0.20	0.50	0.71

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 27 (39%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 65.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Russell/St. Laurent & St. Laurent (south leg)

