



Elmvale Acres Shopping Centre Redevelopment - Phase 1

Transportation Impact Assessment Study Report



January 2019

Elmvale Acres Shopping Centre Redevelopment–Phase 1
Transportation Impact Assessment Study Report

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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

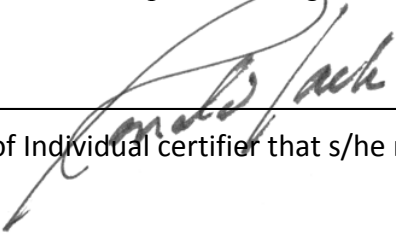
1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation 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 registered² 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.

Dated at Ottawa this 24 day of January, 2019.
(City)

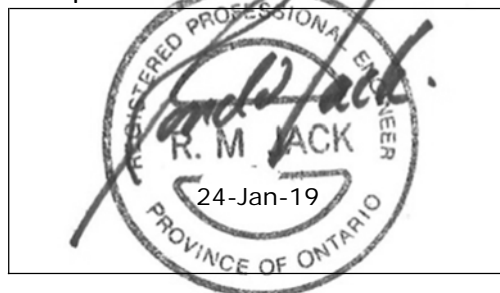
Name: Ronald Jack
(Please Print)

Professional Title: Senior Transportation Engineer


Signature of Individual certifier that s/he meets the above four criteria

Office Contact Information (Please Print)
Address: 1223 Michael Street
City / Postal Code: Ottawa K1J 7T2
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Stamp



Scoping Report

1. SCREENING FORM

The Screening Form prepared for Phase 1 development at the Elmvale Acres Shopping Centre confirmed the need for a Transportation Impact Assessment (TIA) as it met the Trip Generation, Location and Safety triggers.

The screening form and correspondences are provided in Appendix A.

2. DESCRIPTION OF PROPOSED DEVELOPMENT

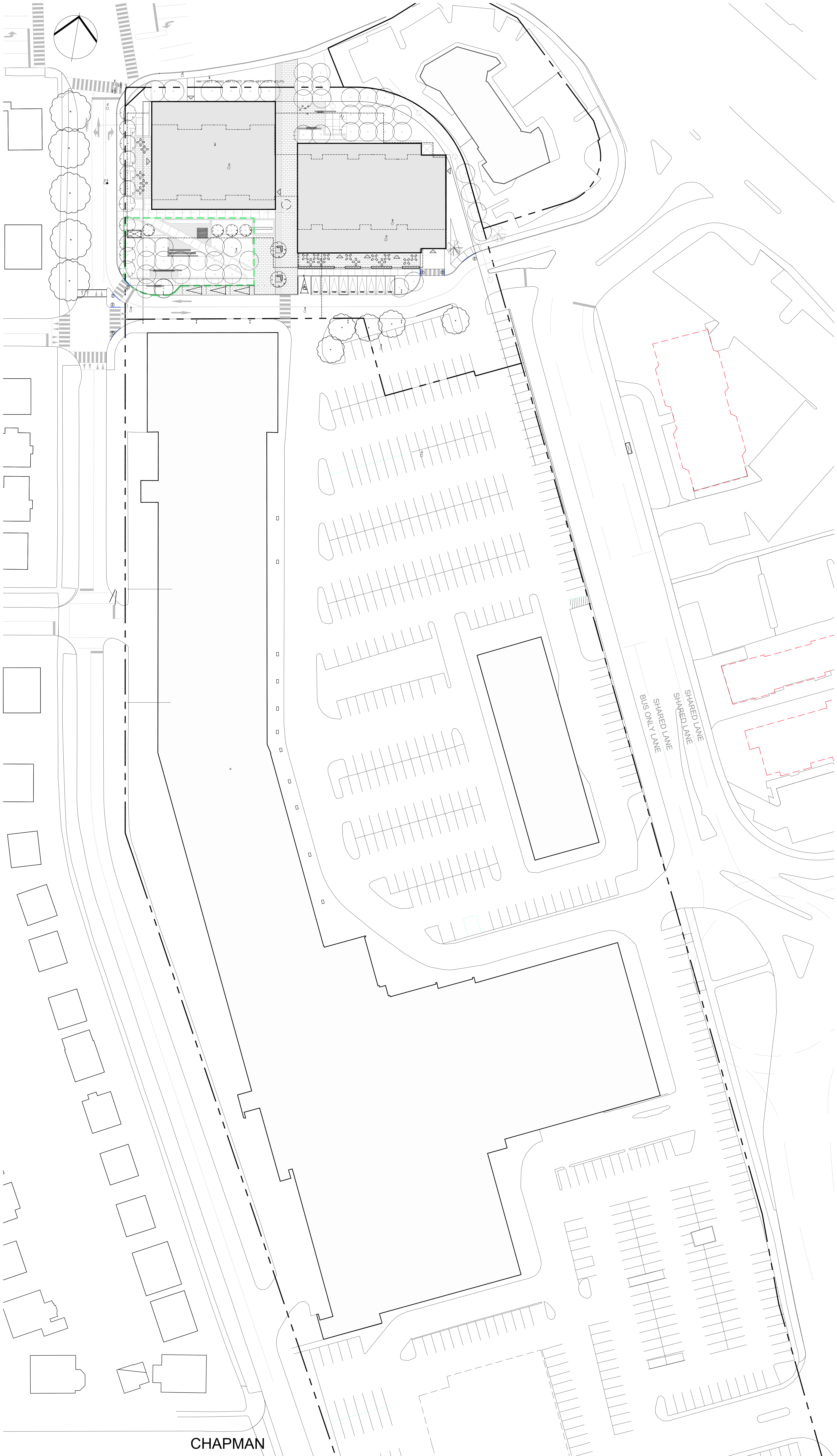
2.1. PROPOSED DEVELOPMENT

RIOCAN is proposing to build Phase 1 of the proposed Elmvale Shopping Centre expansion located at 1910 St. Laurent Boulevard. Phase 1 consists of a residential apartment tower with 168 apartment units, approximately 1100 m² of retail, a 140-spaces two-level garage, and 38 surface parking spaces. The proposal includes using existing driveway connections to Othello Avenue and to St. Laurent Boulevard, however, the existing one-way driveway entrance from Smyth Road would be eliminated. The proposal also replaces an existing 466 m² restaurant (Kelseys). However, the proposed retail development includes space for a similar size restaurant. As such, the net increase in proposed retail will be 651 m². The site is in Ward 18, Alta Vista, and is designated as Arterial Mainstreet Zone, according to Part 10, sec. 185-186 of the Zoning By-Law No. 2008-250. The site local context is illustrated in Figure 1.

Figure 1: Local Context



For this study, horizon years have been assumed to be the year 2021, representing Phase 1 build-out and, depending on background growth analysis, year 2026, representing the plus five years horizon. The Site Plan is provided in Figure 2.



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3. EXISTING CONDITIONS

3.1. AREA ROAD NETWORK

Smyth Road is an east-west arterial roadway with a four-lane cross-section within the study area. It extends from George McIlraith Bridge in the west, where it continues as Main Street, and St. Laurent Boulevard in the east, where it continues as Lancaster Road. The protected right-of-way for this corridor is 26 m. Within the study area, the posted speed limit is 50 km/h and its right-of-way protection policy is 26 m.

St. Laurent Boulevard is a north-south arterial roadway north of Russell Road and a collector roadway west of Russell Road. Within the study area, St. Laurent Boulevard has a four-lane cross-section with auxiliary turn lanes provided at major intersections. It extends from Sandridge Road in the north to Don Reid Drive in the south. Within the study area, the posted speed limit is 50 km/h and its right-of-way protection policy is 37.5 m.

Lancaster Road is an east-west collector roadway with a two-lane cross-section. It extends from St. Laurent Boulevard in the west, where it continues as Smyth Road, and Walkley Road in the south. Within the study area, the unposted (default) speed limit is 50 km/h.

Russell Road is a discontinuous north-south roadway with a section operating between Industrial Avenue and Smyth Road as a collector roadway and another section operating south of St. Laurent Boulevard as an arterial roadway. It has a two-lane cross-section and its full extent is between Industrial Avenue in the north and Ramsayville Road in the south. The protected right-of-way for this corridor is 37.5 m. Within the study area, the posted speed limit is 50 km/h.

Pleasant Park Road is an east-west collector roadway with a two-lane cross-section. It extends from Riverside Drive in the west and St. Laurent Boulevard in the east. Within the study area, the unposted (default) speed limit is 50 km/h. Heavy trucks are prohibited on Pleasant Park Road, despite this, local truck trips (i.e. delivery trucks, moving trucks, etc.) are required to access the Loblaws loading bay.

Othello Avenue is a north-south local roadway with a two-lane cross-section. It extends from Smyth Road in the north to Pleasant Park Road in the south. Within the study area, the unposted speed limit is understood to be 50 km/h. Heavy trucks are prohibited on Othello Avenue, however, local truck trips (i.e. delivery trucks, moving trucks, etc.) are required to access the Loblaws loading bay.

Local Streets. West of the site are four local east-west streets that connect to Othello. They are two lanes wide with on-street parking and they are STOP sign controlled on their approach to Othello. Their peak hour traffic volume are less than 60veh/h two-way total.

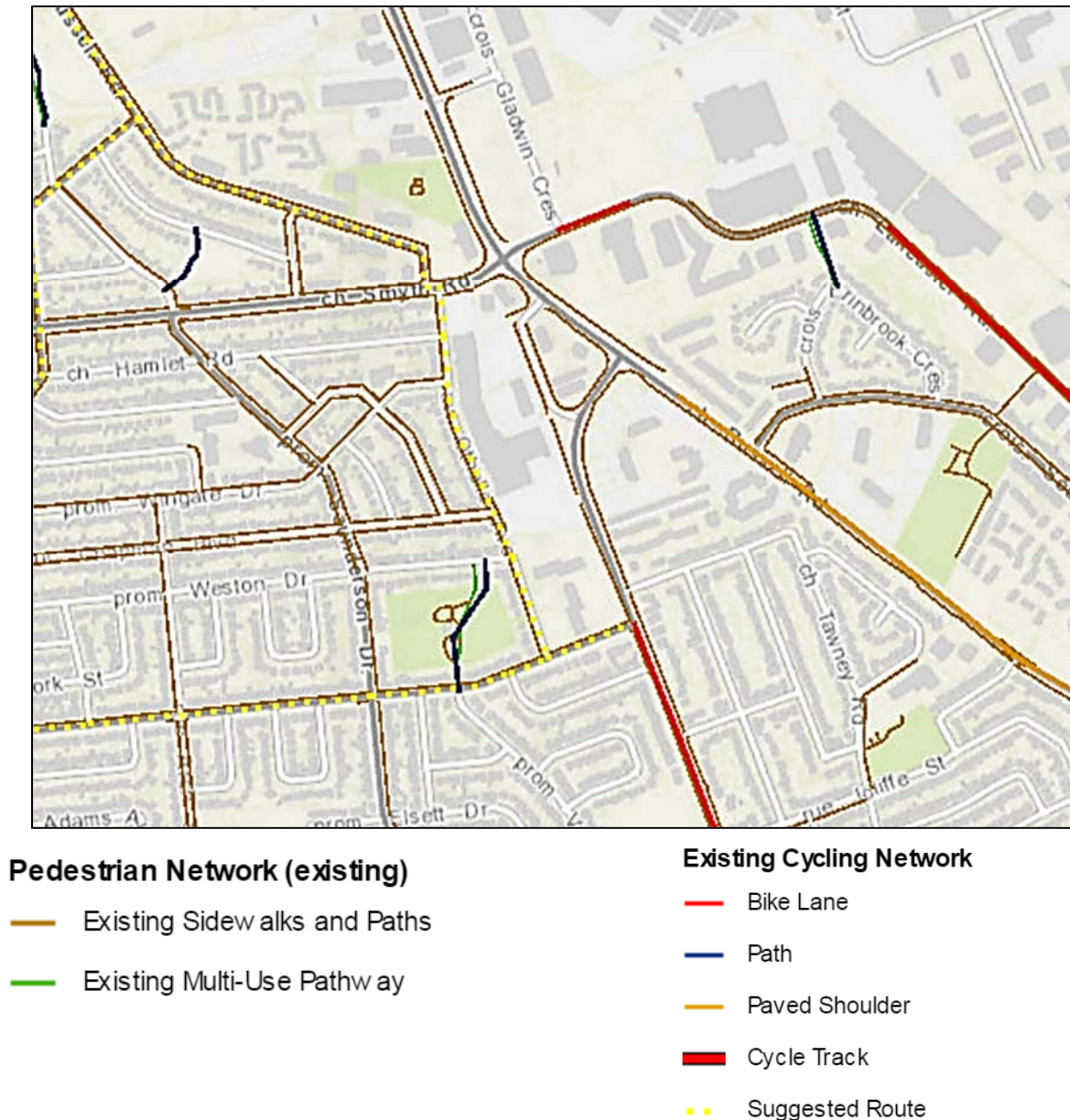
3.2. PEDESTRIAN AND CYCLING NETWORK

Sidewalks are currently provided along both sides of St. Laurent Boulevard and Smyth Road. Sidewalks are provided on the west side of Othello Avenue, on the north side of Pleasant Park Road, and on the south side of Lancaster Road. Sidewalks and crosswalks are also provided through the existing development to facilitate access to the existing commercial developments and to the Transit Station that is located along the east side of the site.

Per the City's Cycling Plan, there is an existing suggested route along Russell Road, connecting to Othello Avenue, and Pleasant Park Road. Additionally, a paved shoulder is provided on Russell Road south of the St. Laurent Boulevard Intersection. A cycle track has recently been constructed on both sides of St. Laurent Boulevard, north of Smyth Road, which continues as a curbside bike lane to Russell Road intersection.

Figure 3 depicts the existing cycling and pedestrian facilities within the Study Area.

Figure 3: Area Pedestrian and Cycling Network



<http://maps.ottawa.ca/geottawa/>, accessed August 8th, 2018.

It is noteworthy that during field visits to the study area, a southbound powered-wheelchair user was spotted on St. Laurent Boulevard roadway between the Transit Loop intersection and the Elmvale Shopping Centre Southern access (Figure 4). Substandard pedestrian facilities at the west approach of the St. Laurent Boulevard/Transit Loop intersection as well as indirect sidewalk connections might be discouraging reduced-mobility users of using the southbound sidewalk on St. Laurent Boulevard at this location. Further study is suggested by the City at this location.

Figure 4: Location of SB Powered Wheelchair User on Roadway

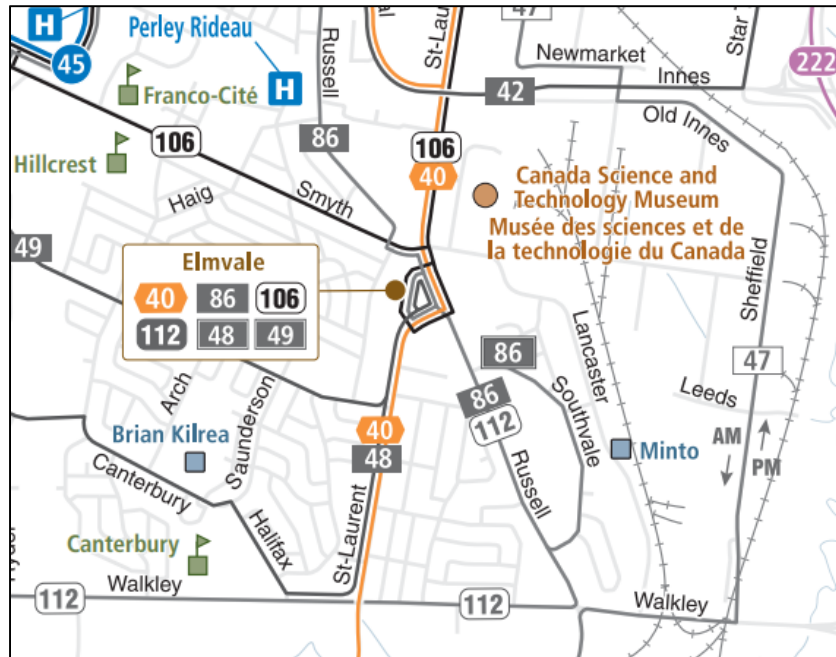


3.3. TRANSIT NETWORK

The subject site includes a transit loop providing local transit service (Routes #86, #106, #112, #40, #48 and #49) to/from the sites frontage to St. Laurent Boulevard. The 2013 City of Ottawa Transportation Master Plan identifies St. Laurent Boulevard as a Bus Rapid Transit/Transit Priority Corridor. The existing transit network is illustrated in Figure 5.

It is noteworthy that the City has recently completed the construction of new transit lanes on St. Laurent Boulevard (one bus-only lane in each direction) from north of Industrial Avenue to south of Smyth Road. The reconstruction also included bicycle tracks on both sides of St. Laurent Boulevard, and improvements to the parking lot entrance near Elmvale transit station.

Figure 5: Area Transit Network

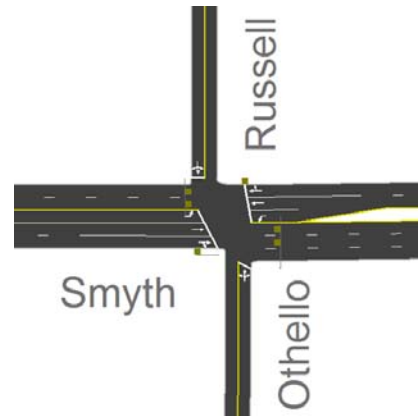


www.octranspo.ca, accessed August 8th, 2018.

3.4. EXISTING STUDY AREA INTERSECTION

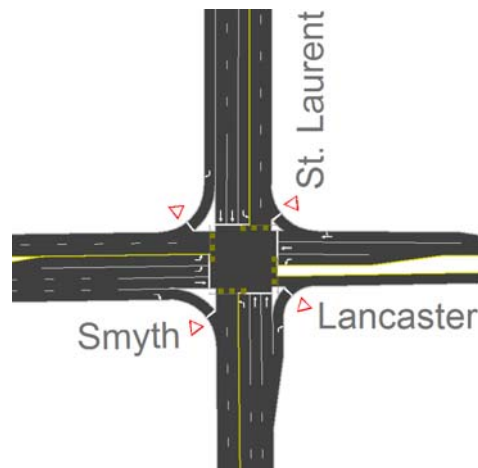
Smyth/Russell/Othello

The Smyth/Russell/Othello intersection is a signalized four-legged intersection. The eastbound and westbound approaches consist of a single left-turn lane, a through lane and a shared through/right-turn lane. The northbound and southbound approaches consist of a single full-movement lane. The southbound leg is offset by approximately 20 m. All movements are permitted at this location. In the east and westbound directions, right-turns on red lights are not permitted.



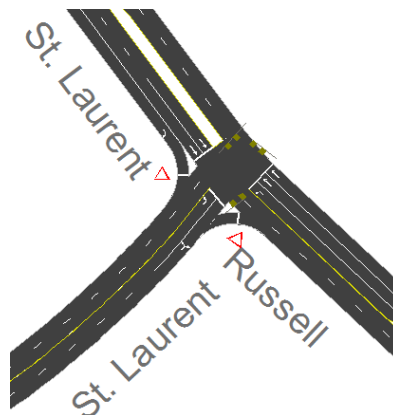
St. Laurent/Lancaster/Smyth

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



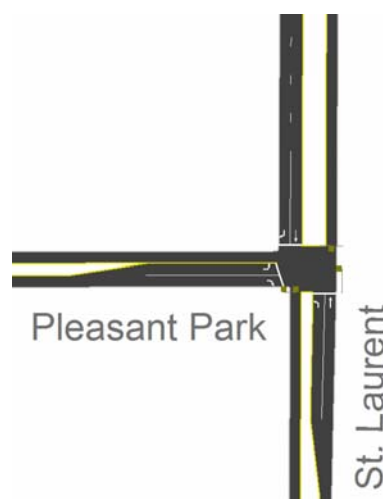
St. Laurent/Russell

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



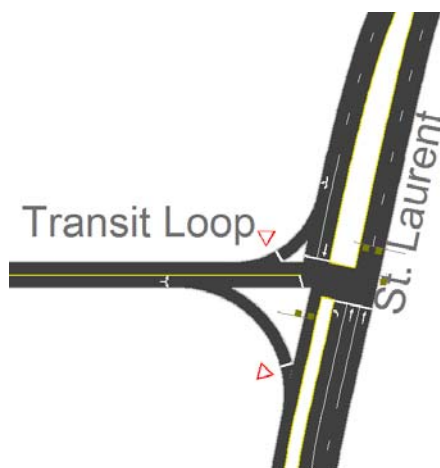
St. Laurent/Pleasant Park

The St. Laurent/Pleasant Park intersection is a signalized three-legged intersection. The northbound approach consists of a single left-turn lane and a single through lane. The southbound approach consists of a single through lane and a right-turn lane. The eastbound approach consists of a single left-turn lane and a single right-turn lane. All movements are permitted at this location.



St. Laurent/Transit Loop

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



3.5. EXISTING INTERSECTION VOLUMES

To examine the existing traffic network, turning movement counts were requested from the City of Ottawa. Where data was unavailable turning movement count surveys were undertaken. Table 1 below documents the date of each count that was used.

Table 1: Turning Movement Count Data Summary

Count Location	Date Counted
Hamlet Rd-Site & Othello Ave	Tuesday, July 21, 2015
Smyth Rd E/Lancaster Rd @ St. Laurent Blvd	Thursday, May 29, 2014
Othello Ave & Pleasant Park Rd	Tuesday, July 14, 2015
Othello Ave & Site	(Wednesday & Thursday), July (15 & 16), 2015
Othello Ave-Russell Rd & Smyth Rd	Wednesday, August 1, 2012
Pleasant Park Rd & St. Laurent Blvd	Tuesday, May 4, 2010
Russell Rd & St. Laurent Towers	(Wednesday & Thursday), September (2&3), 2015
St. Laurent Blvd & Site	(Wednesday & Thursday), July (15&16), 2015
St. Laurent Blvd & St. Laurent Blvd (Minor)	(Wednesday & Thursday), July (22 & 23), 2015
Othello Ave & Chapman Dr.	Tuesday, February 28, 2017
Othello Ave & Wingate Dr.	Tuesday, October 3, 2018

The table above shows that the counts were undertaken several years apart. To adjust for the difference in data collection years a 1% background growth rate / annum was applied along the Arterial Roads to reflect growth outside of the Study Area up to 2017. Figure 6 illustrates the adjusted AM and PM peak hour volumes at the Study Area intersections. Turning movement count sheets have been included in Appendix B.

Figure 6: Existing Peak Hour Traffic Volumes

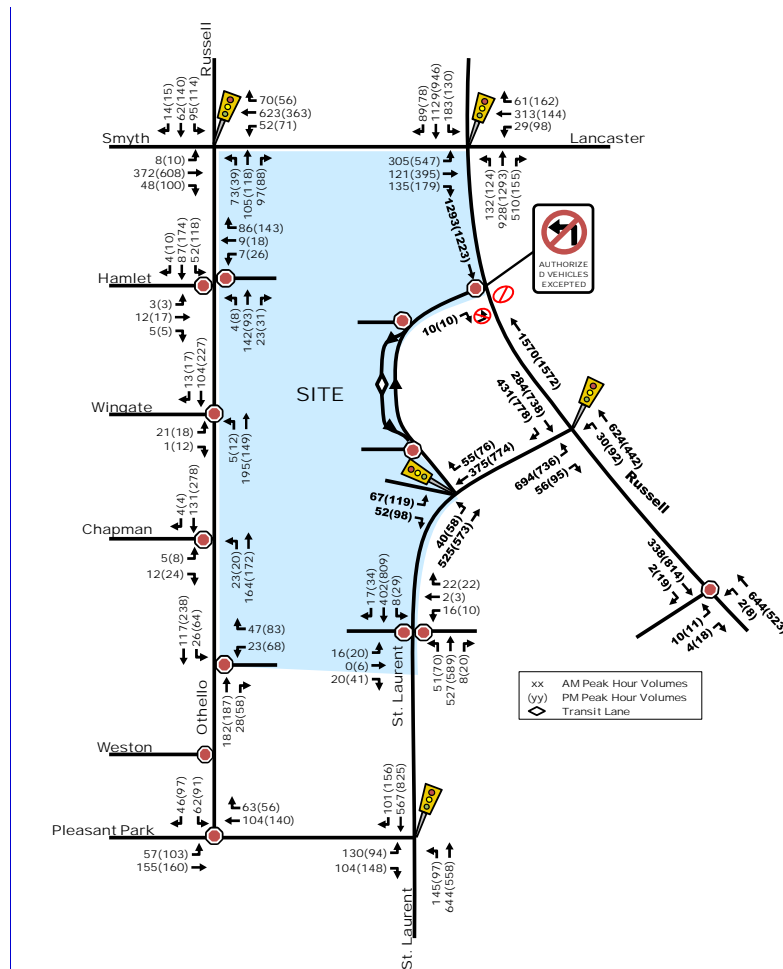


Table 2 summarizes the operational analysis of existing traffic conditions based on the Synchro (V9) traffic analysis software. The signalized intersections were assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LOS) for the critical movement(s). The signalized intersections, overall, were assessed based on weighted

v/c ratio. The unsignalized intersections were assessed by examining the maximum delay on any one of the approaches. The SYNCHRO model output of existing conditions is provided within Appendix C.

Table 2: Operational Analysis - Existing Conditions

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Othello/Russell/Smyth (TCS)	D(D)	0.86(0.84)	NBT(SBT)	28.2(45.0)	A(B)	0.59(0.68)
St. Laurent/Smyth/Lancaster (TCS)	D(F)	0.83(1.07)	EBL(NBT)	41.0(60.6)	C(E)	0.79(0.99)
Russell/St. Laurent (TCS)	C(C)	0.73(0.73)	EBL(EBL)	14.7(16.5)	B(C)	0.64(0.73)
St. Laurent/Transit Loop (TCS)	A(A)	0.32(0.53)	EBL(EBL)	7.8(8.0)	A(A)	0.25(0.45)
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane. TWSC - Two Way Stop Control, with stop signs on the minor approach. Or stop control on a single leg of a T intersection AWSC - All Way Stop Control TCS - Traffic Control Signal						

The Study area's signalized intersections generally operate with good levels of service (LoS) and reasonable V/C and delay. The intersection of St. Laurent/Smyth/Lancaster is an exception to this. The intersection was shown to operate with LOS E in the PM peak hour, with an overall v/c ratio of 0.99. Additionally, on the northbound through movement the existing volume was shown to exceed the theoretical capacity of the through movement.

The study area's unsignalized intersections are shown to operate with minimal delays and good levels of service, however, there is a known operational issue on northbound Othello between the Smyth/Othello intersection to the Site/Othello driveway. During peak periods, the northbound queues have been observed to extend back through and beyond the Site/Othello driveway. This delay/queue causes two problems. The queue can block access/egress to/from the site and the delay can cause traffic to short-cut via Hamlet Road as an alternative to waiting for a green light at the Smyth/Othello intersection. Previous study in support of a Secondary Plan and Rezoning for the overall Site identified the need for a second northbound lane from the Site Driveway north to the signalized Smyth intersection. This lane would be for northbound right-turning traffic and it would significantly reduce northbound queuing and delay. It was identified as a Phase 1 requirement, and its design would need to be compatible with the City's larger plan to acquire property and properly align the Russel/Smyth/Othello intersection. Also, previously identified as a Phase 1 requirement was the redesign of the Site/Othello intersection to eliminate the potential for site-traffic to use Hamlet Road to access/egress the site.

3.6. EXISTING ROAD SAFETY CONDITIONS

Collision history for study area (2013 to 2017, inclusive) was obtained from the City of Ottawa. A total of 169 collisions have been reported within the study area. The majority (75%, or 126) of collisions involved property damage while the remaining (25%, or 43) collisions involved non-fatal injuries.

Regarding the type of collision, rear end accounted for 49% (or 82 collisions) of collisions, angle accounted for 21% (or 35 collisions) of collisions, turning movement accounted for 11% (or 19 collisions), sideswipe accounted for 9% (or 16 collisions), single vehicle other accounted for 8% (or 13 collisions), other accounted for 2% (or 3 collisions) of collisions and single vehicle (Unattended vehicle) accounted for 1% (or 1 collision) of collisions.

Over the five-year period, collisions observed at the following locations include:

- **St. Laurent Boulevard at Lancaster Road at Smyth Road** - A total of 71 collisions were registered. The types of collisions cited by police included: rear end (65% or 46 collisions), sideswipe (16% or 11 collisions), angle (8% or 6 collisions),

single vehicle other (6% or 4 collisions), turning movement (4% or 3 collisions) and other (1% or 1 collision). The majority of rear end collisions involved property damage only, which indicates low speeds;

- **Russell Road S at St. Laurent Boulevard** - A total of 47 collisions were registered. The types of collisions cited by police included: turning movement, rear end and angle (30% or 14 collisions each); single vehicle other (6% or 3 collisions) and sideswipe (4% or 2 collisions) and sideswipe (3% or 1 collisions). There were 2 registered collisions involving a pedestrian: one included an eastbound-left vehicle and one a northbound-through vehicle. The majority of turning movement collisions involved northbound left vehicles colliding with southbound through vehicles;
- **Pleasant Park Road at St. Laurent Boulevard** - A total of 29 collisions were registered. The types of collisions cited by police included: rear end (55% or 16 collisions), single vehicle other (21% or 6 collisions), sideswipe (7% or 2 collisions), angle (7% or 2 collisions), turning movement (7% or 2 collisions) and other (3% or 1 collision). There were 6 registered collisions involving a pedestrian, 5 of which included an eastbound-left vehicle and one northbound-through vehicle. The majority of rear end collisions were property damage only, which indicates low speeds;
- **St. Laurent Boulevard at St. Laurent Boulevard Service** - A total of 5 collisions were registered. The types of collisions cited by police included: rear end (80% or 4 collisions) and angle (20% or 1 collision);
- **Hamlet Road at Othello Avenue** - A total of 4 angle collisions were registered;
- **Othello Avenue at Pleasant Park Road** - A total of 3 angle collisions were registered;
- **Chapman Boulevard at Othello Avenue** - 1 collision was registered under category “other”;
- **Othello Avenue, Weston Drive to Pleasant Park Road** - A total of 3 collisions were registered. The types of collisions cited by police included: rear end (33% or 1 collisions), sideswipe (33% or 1 collisions) and single vehicle unattended (33% or 1 collision);
- **Othello Avenue, Hamlet Road to Smyth Road** - A total of 2 angle collisions were registered;
- **Othello Avenue, Wingate Drive to Chapman Boulevard** - 1 rear end collision was registered;
- **Othello Avenue, Hamlet Road to Wingate Drive** - 1 angle collision was registered.

A standard unit of measure for assessing collisions at an intersection is based on the number collisions per million entering vehicles (MEV). The reported collision rate for the study area intersections are as follows:

- Pleasant Park Road at St. Laurent Boulevard - 0.98 MEV;
- Russell Road S at St. Laurent Boulevard - 0.90 MEV;
- Smyth Road at Lancaster Road at St. Laurent Boulevard - 0.82 MEV;
- Hamlet Road at Othello Avenue - 0.36 MEV;
- Othello Avenue, Weston Drive to Pleasant Park Road - 0.27 MEV;
- St. Laurent Boulevard at St. Laurent Boulevard Service - 0.20 MEV;
- Othello Avenue at Pleasant Park Road - 0.20 MEV;
- Othello Avenue, Hamlet Road to Smyth Road - 0.18 MEV;
- Chapman Boulevard at Othello Avenue - 0.09 MEV;
- Othello Avenue, Wingate Drive to Chapman Boulevard - 0.09 MEV; and
- Othello Avenue, Hamlet Road to Wingate Drive - 0.09 MEV.

Based on the available data, there does not appear to be any prevailing safety issues within the study area. It is suggested that the City considers measures to increase visibility of/protect pedestrians crossing at Pleasant Park/St. Laurent intersection and Russell Road/St. Laurent intersection, given the left-hook collisions registered. The source of the collision data is provided by the City of Ottawa and related analysis is provided within Appendix D.

3.7. EXISTING AREA TRAFFIC MANAGEMENT MEASURES

Traffic management measures within the area of study exist at the Transit Loop located at the site driveway connection to St. Laurent Boulevard. This includes prohibiting eastbound left-turns from the site to prevent vehicles entering the bus-only lane for northbound left-turning buses on St. Laurent and also to prohibit left-turns at St. Laurent Boulevard/Transit Loop-north.

4. PLANNED CONDITIONS

4.1. PLANNED STUDY AREA TRANSPORTATION NETWORK CHANGES

St. Laurent Transit Priority and Bus-Rapid-Transit Measures

Schedule D of the City of Ottawa Transportation Master Plan identifies isolated Transit Priority measures on St. Laurent Boulevard, from Smyth Road to Walkley Road and on Smyth Road, from St. Laurent Boulevard to Roger Guindon Avenue. Bus-Rapid-Transit measures with at-grade crossings are identified on Russell Road from Smyth Road to Walkley Road.

Future Cycling Facilities

The 2013 City of Ottawa Cycling Plan envisions Smyth Road west of St. Laurent Boulevard and Russell Road south of Smyth Road as a Cycling Spine Routes. The latter extends north from Smyth Road along St. Laurent Boulevard. Local routes are identified on Othello Avenue between Pleasant Park and Smyth Road, St. Laurent Boulevard south of Russell Road, Pleasant Park west of St. Laurent Boulevard and the shopping centre transit loop.

Ward 18 Alta Vista - Construction Program

Within the ward Construction Program road resurfacing of the Othello Avenue, between Pleasant Park and Smyth Road is programmed for years 2018 to 2021.

4.2. OTHER AREA DEVELOPMENTS

According to a review performed using the In My Neighbourhood City of Ottawa application for new developments, no other area developments have been identified for this site.

4.3. TRANSIT

As mentioned previously, transit is served within the area with a transit station on the east side of the shopping Centre (frontage to St. Laurent Boulevard), including routes #86, #106, #112, #40, #48 and #49).

4.4. NETWORK CONCEPT

To determine the regional network capacity, a screenline analysis was undertaken. This exercise draws an imaginary line across several roads and looks at the roadway capacity across this point. While each road is tabulated individually, the theory behind a screenline is the total capacity that is available in the network and the trip demands will normalize across each link. For this Study a screenline just north of Smyth Road was selected, crossing Russell Road and St. Laurent Boulevard. Figure 7 below illustrates the screenline volumes.

Figure 7: Existing Screenline

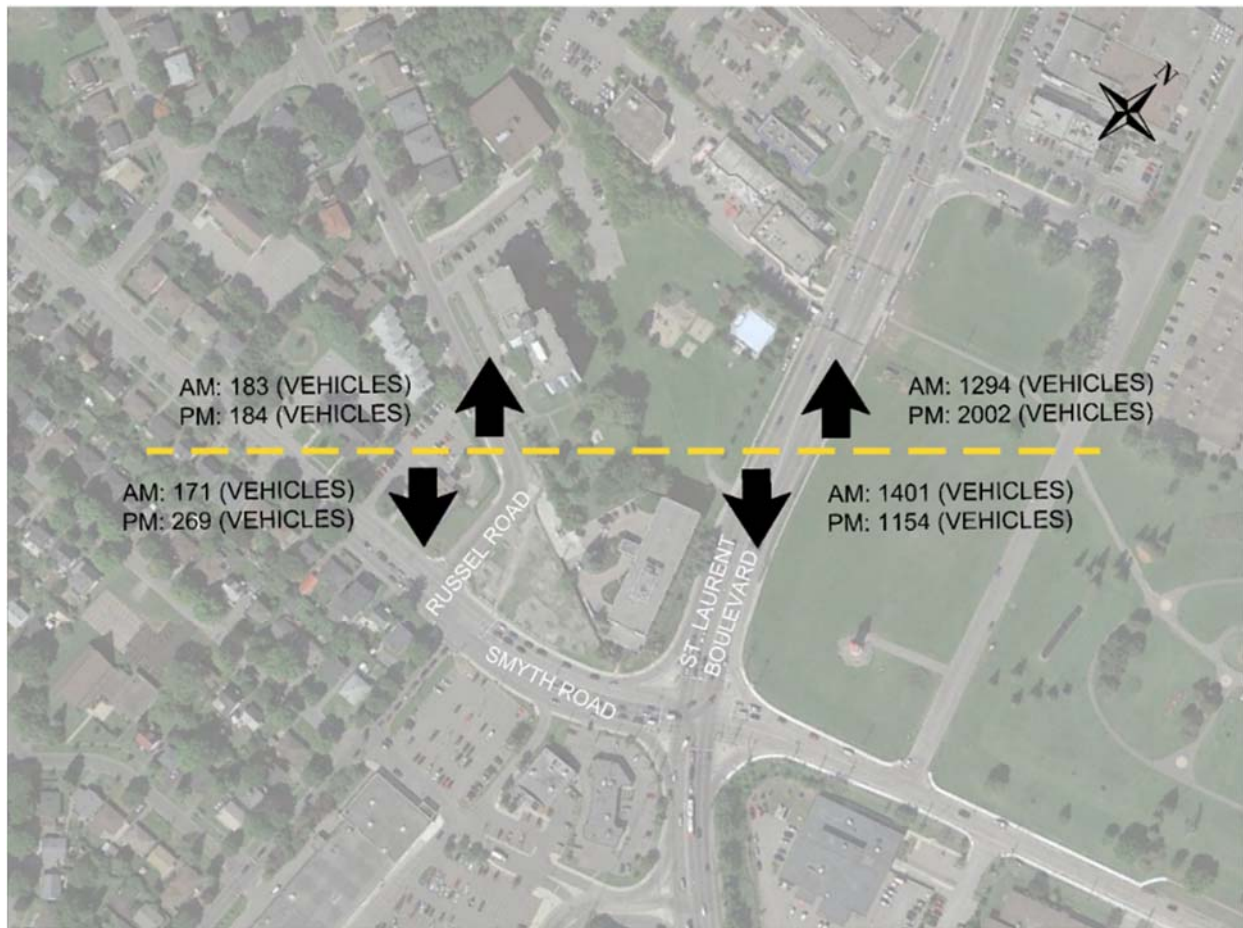


Table 3: Existing Screenline Analysis

Screenline			Direction	Peak	Vehicles	v/c
Station	# Lanes	Capacity				
Russell Road	1	800	Northbound	AM	183	0.23
				PM	184	0.23
			Southbound	AM	171	0.21
				PM	269	0.34
St. Laurent Boulevard	2	2000	Northbound	AM	1294	0.65
				PM	2002	1.00
			Southbound	AM	1401	0.70
				PM	1154	0.58
Total	3	2800	Northbound	AM	1477	0.53
				PM	2186	0.78
			Southbound	AM	1572	0.56
				PM	1423	0.51

As shown in the foregoing table, the existing screenline is operating with an overall maximum v/c ratio of 0.78 and, therefore, there is residual capacity available to accommodate additional traffic growth / development. The station at St. Laurent Road is at capacity during the PM peak hour in the northbound direction.

4.5. INTERSECTION DESIGN

The proposed Phase 1 development will access through existing driveways to/from Othello Avenue, via the Othello /Smyth signalized intersection and to/from St. Laurent Boulevard, via channelized right-turns from St. Laurent Boulevard. The ensuing strategy analysis will review and document any related access/design requirements. As noted in Section 3.5, modifications are expected at the Othello/Site Driveway intersection and on Othello Avenue between the Site Driveway and Smyth Road.

5. TIME PERIODS

Given the land use of the proposed development, the weekday morning and afternoon peak hours will be analyzed.

6. HORIZON YEARS

For the purposes of this analysis the site full build-out date is assumed to be year 2021. Depending on the background growth analysis, the plus five years horizon will be analyzed for year 2026.

7. EXEMPTIONS REVIEW

Based on the foregoing analysis and review of the existing conditions, it is recommended that any future work within the context of this TIA excludes the following modules and elements summarized in Table 4.

Table 4: Exemptions Review Summary

Module	Element	Exemption Consideration
4.1 Development Design	4.1.3 New Street Networks	Not required for applications involving site plans.
4.2 Parking	4.2.2 Spillover Parking	With 178 parking spaces proposed for Phase 1, the site is noted to meet the City's minimum By-Law requirements (153 stalls). As such, parking is not expected to spill out of the site.
4.8 Review of Network Concept	All elements	This development is not expected to generate 200-person trips more than the permitted zoning for the site.

In addition to the above recommendations of the Exemptions Review, the following exemptions are also proposed for both Step 3 – Forecasting and Step 4 – Analysis and are summarized in Table 5.

Table 5: Additional Recommended Exemptions Summary

Module	Element	Exemption Consideration
4.7 Transit	4.7.2 Transit Priority	The proposed development will use an existing driveway connecting to the St. Laurent Boulevard transit loop. The 2017 CTS prepared by Parsons analyzed full build-out of the site and identified transit priority measures required by OC Transpo at the adjacent Transit Loop. This access point was improved by implementing transit priority measures in 2017 and, as such, it will not require additional screening for transit priority measures.

8. DEVELOPMENT GENERATED TRAVEL DEMAND

8.1. TRIP GENERATION AND MODE SHARES

8.1.1. TRIP GENERATION

The proposed redevelopment includes 168 residential units and a net additional 651 m² (6,306 ft²) of retail uses. It has been assumed that 10% of the trips generated by the retail uses will be internal. As such, a 10% reduction factor has been applied to the projected retail trips to account for internal trips that do not cause an increase in traffic in the adjacent transportation network. Also, it has been assumed that retail uses will not be open during the morning peak hour and will, therefore, not generate trips during this time period.

Appropriate vehicle trip generation rates for the proposed retail uses were obtained from the ITE Trip Generation Manual, 10th Edition. Vehicle trip generation rates for residential uses were obtained from the TRANS Trip Generation Study. Vehicle trip generation rates are summarized in Table 6.

Table 6: Vehicle Trip Generation Rates for Retail and Residential Uses

Land Use	Data Source	Trip Rate	
		AM Peak	PM Peak
Shopping Centre	ITE 820	0	$Ln(T) = 0.74Ln(x) + 2.89$
High Rise Apartment	TRANS STUDY	0.24	0.27

As ITE trip generation surveys only record vehicle trips and typically reflect highly suburban locations (with little to no access by travel modes other than private automobiles), adjustment factors appropriate to the Ottawa study area context were applied to attain estimates of person trips for the proposed phase 1 development.

Using the ITE and TRANS Study trip generation rates, the total amount of vehicle trips generated by the proposed development were projected and the results are summarized in Table 7. To convert ITE vehicle trip rates to person trips, an auto occupancy factor and a non-auto trip factor were applied to the ITE vehicle trip rates. Our review of available literature suggests that a combined factor of approximately 1.3 is considered reasonable 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%. As such, the person trip generation for the subject development is summarized in Table 7.

Table 7: Phase 1 Development Person Trip Generation

Land Use	Data Source	Area	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)		
			In	Out	Total	In	Out	Total
		ft ²	-	-		48%	52%	
Shopping Center	ITE 820	6,306 ft ²				43	48	91
		Units	24%	76%		62%	38%	
High Rise Apartment	TRANS STUDY	168	23	86	109	68	45	113
Total			23	86	109	111	93	204
Note: The net added retail area is 6,306 ft ² . Considering 10% of retail trips are assumed to be internal, a 10% reduction factor has been applied to the net added retail area to discount those internal trips that will not cause an increase of vehicular traffic on the adjacent road network.								

8.1.2. MODE SHARES

Using the Person-Trips projected in Table 7, the modal share percentages from the 2017 Elmvale Shopping Centre Community Transportation Study for retail uses and Trip Generation TRANS Study apartments modal share for residential uses, the modal share for the proposed Phase 1 development is summarized in Table 8 to Table 10.

Table 8: Phase 1 Development Residential Trip Generation by Mode of Transportation

Travel Mode	AM Mode Share	AM Peak (persons/h)			PM Mode Share	PM Peak (persons/h)		
		In	Out	Total		In	Out	Total
Auto Driver	37%	9	31	40	40%	27	18	45
Auto Passenger	8%	1	7	8	9%	6	4	10
Transit	41%	10	35	45	37%	26	16	42
Non-motorized	14%	3	13	16	14%	9	7	16
Total People Trips	100%	23	86	109	100%	68	45	113
Total 'New' Residential Auto Trips		9	31	40		27	18	45

Table 9: Phase 1 Development Retail Trip Generation by Mode of Transportation

Travel Mode	Mode Share	AM Peak (Persons/h)			PM Peak (Persons/h)		
		In	Out	Total	In	Out	Total
Auto Driver	40%	0	0	0	18	20	38
Auto Passenger	10%	0	0	0	4	5	9
Transit	35%	0	0	0	15	16	31
Non-motorized	15%	0	0	0	6	7	13
Total People Trips	100%	0	0	0	43	48	91
Less Pass-by (10%)		0	0	0	-2	-2	-4
Total 'New' Shopping Center Auto Trips		0	0	0	16	18	34

Table 10: Phase 1 Development Total Trip Generation by Mode of Transportation

Travel Mode	AM Peak (Persons/h)			PM Peak (Persons/h)		
	In	Out	Total	In	Out	Total
Auto Driver	9	31	40	45	38	83
Auto Passenger	1	7	8	10	9	19
Transit	10	35	45	41	32	73
Non-motorized	3	13	16	15	14	29
Total Person Trips	23	86	109	111	93	204
Total 'New' Phase 1 Auto Trips	9	31	40	43	36	79

As shown in Table 7 and Table 8, based on the Modified ITE's Person-Trip Generation method and the 2017 Elmvale Shopping Centre Community Transportation Study, the proposed Phase 1 is projected to generate between 109 and 204 two-way person-trips per hour during the weekday peak hours. Of these totals approximately 40 to 83 two-way vehicles per hour will be accessing/leaving the site during the weekday peak hours and 45 to 73 two-way trips will be made by transit. Approximately 16 to 29 two-way trips are expected to be made in active transportation modes during the peak hours for this phase.

8.2. TRIP DISTRIBUTION

Considering the adjacent road network and our knowledge of the area, the site trip distribution is outlined next:

Residential trips (AM and PM)

Residential trips are anticipated to move to/from the arterial network, centers of employment, shopping centres and leisure destinations. Such areas/networks can be mostly found north of the site, including downtown Ottawa, the Ottawa Train Yards, Highway 417 and St. Laurent Mall. Other significant areas are located to the south of the site with the Ottawa Business Park located south of Walkley Road and Walkley Road itself which connects to Highway 417. Some additional activity areas can be found to the west via Smyth Road at the Ottawa Hospital General Campus and Ottawa Hospital Riverside Campus.

- (From/To) the North: 45%;
- (From/To) the South: 30%;
- (From/To) the West: 25%.

Retail trips (PM)

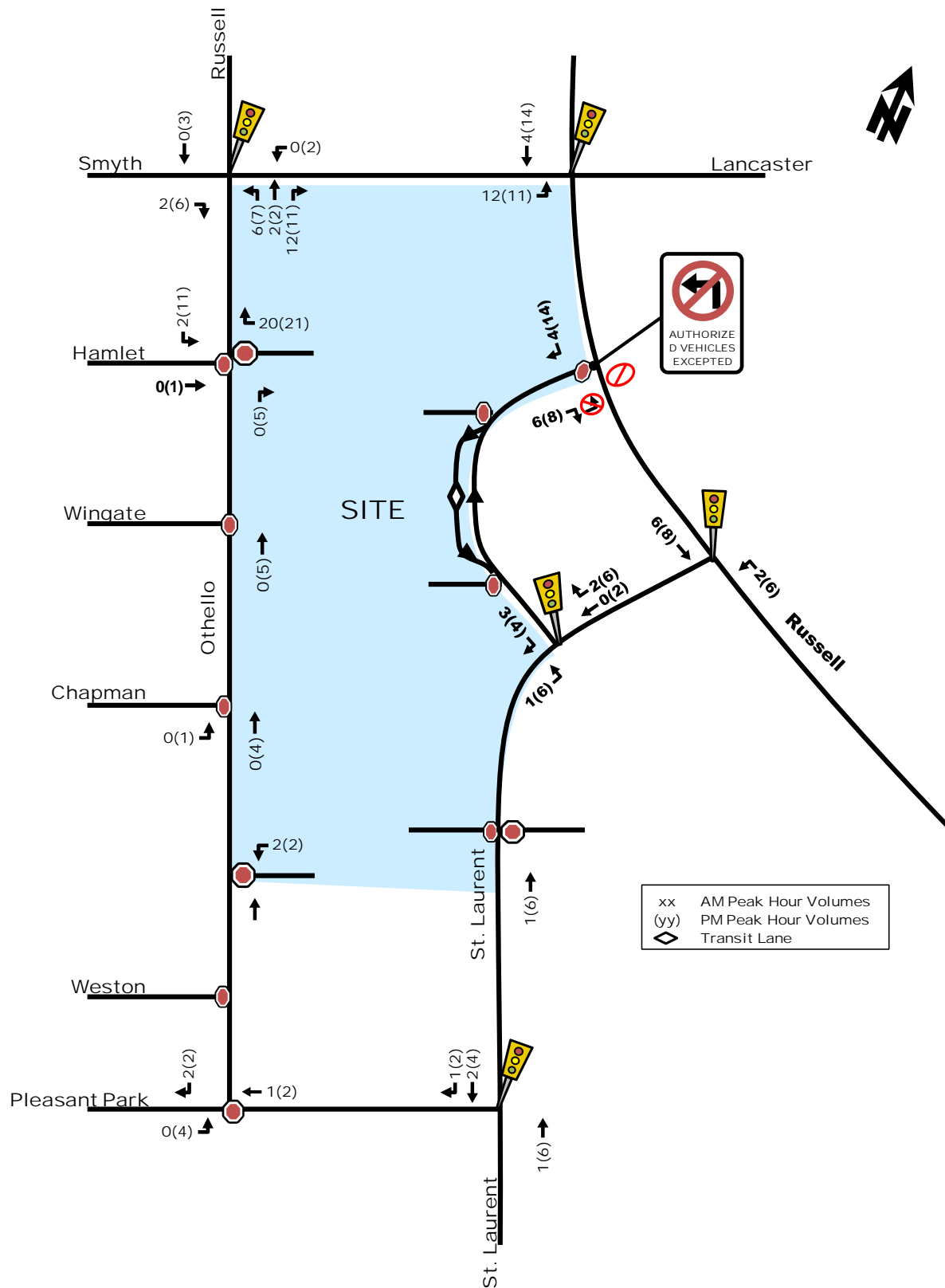
Retail trips are anticipated to move mainly to/from adjacent communities and employment centres. Again, activity centres to the north and to the south are expected to generate a significant portion of trips to/from the site via St. Laurent Boulevard, followed by activity centres and residential communities to the west via Smyth Road. Retail uses within the site are also expected to serve the proposed residential units. As such, a portion of trips attracted are anticipated to be internal.

- (From/To) the North: 30%;
- (From/To) the South and Southwest: 40%;
- (From/To) the West: 20%;
- 10% assumed to be internal.

8.3. TRIP ASSIGNMENT

Based on this distribution, site-generated traffic for Phase 1 development (2021) was assigned to the existing adjacent network and is illustrated in Figure 8.

Figure 8: Phase 1-Generated Traffic (year 2021)



9. BACKGROUND NETWORK TRAVEL DEMAND

9.1. TRANSPORTATION NETWORK PLANS

The transportation network changes have been discussed within Section 4.1.

9.2. BACKGROUND GROWTH

The following background traffic growth through the immediate study area (summarized in Table 11) was calculated based on historical traffic count data (years 2009, 2012, 2014 and 2016) provided by the City of Ottawa at the St. Laurent/Lancaster/Smyth intersection. Detailed analysis of the background growth is included in Appendix E.

Table 11: St. Laurent/Lancaster/Smyth Historical Background Growth (2009 – 2016)

Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	-1.12%	-0.11%	-2.45%	-1.19%	-1.00%
AM Peak	-1.44%	0.09%	-1.21%	-1.15%	-0.89%
PM Peak	-2.20%	-1.68%	-3.04%	-1.65%	-2.06%

As show in Table 11, in past years St. Laurent Boulevard and Smyth Road have experienced approximate annual growth in traffic volume of -2.20% to 0.09% and -3.04% to -1.15%, respectively. As a conservative estimate, the subsequent analysis of future conditions will assume a 0% annual growth rate along St. Laurent Boulevard and Smyth Road. As such, the Phase 1 plus five years horizon will not be analyzed, as it is the same as the foregoing 2021 Phase 1 build-out year scenario.

9.2.1. PROJECTED BACKGROUND 2021 OPERATIONS

As mentioned in Section 9.2, historical traffic growth in the area during the past 10 years has shown a decreasing trend. As a conservative estimate for the purposes of this study, a 0% background growth has been assumed. As such, 2021 background traffic operations on the adjacent network is expected to be similar to the existing traffic operations (see Section 3.5 and Figure 6).

9.3. OTHER AREA DEVELOPMENTS

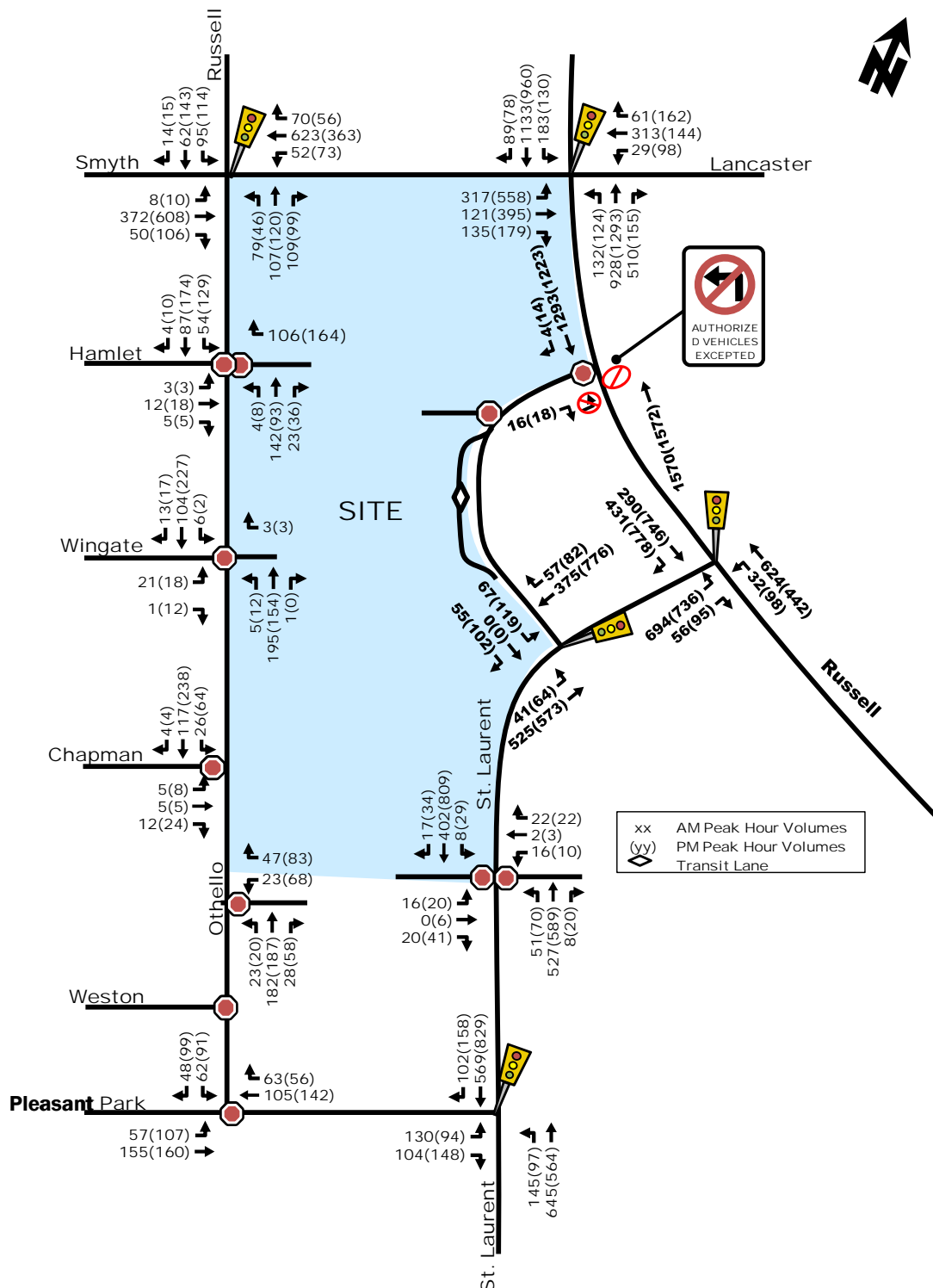
As mentioned in Section 4.2, no other area developments have been identified for this site.

10. FUTURE NETWORK TRAVEL DEMAND

10.1. TOTAL PROJECTED 2021 PEAK HOUR TRAFFIC VOLUMES

The projected total 2021 traffic volumes were derived by superimposing the projected Phase 1 generated trips (Figure 8) onto the 2021 background growth. The resulting projected total 2021 traffic volumes are illustrated in Figure 9.

Figure 9: Total Projected 2021 Traffic Volumes



Considering that a proposed northbound right-turn only lane is being recommended at the current Othello/Smyth/Russell intersection, synchro analysis has been performed for year 2021 by applying a 0% background growth and including the proposed right-out access at Hamlet/Othello intersection. Total projected 2021 intersection performance is summarized in Table 10 and the SYNCHRO model output of background 2021 conditions is provided within Appendix F.

Table 12: Total Projected 2021 Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or max delay (s)	Movement	Delay (s)	LoS	v/c
Othello/Russell/Smyth (S)	C(D)	0.72(0.84)	NBT(SBT)	25.3(42.5)	A(B)	0.52(0.63)
St. Laurent/Smyth/Lancaster	D(F)	0.86(1.07)	EBL(NBT)	40.4(61.8)	C(F)	0.80(1.00)
Russell/St. Laurent	C(C)	0.73(0.73)	EBL(EBL)	14.7(16.5)	B(C)	0.64(0.73)
St. Laurent/Transit Loop	A(A)	0.33(0.54)	EBL(EBL)	7.7(8.2)	A(A)	0.26(0.46)
St. Laurent/Site (U)	C(D)	17.0(28.8)	WB(EB)	-	-	-
Othello/Site (U)	B(B)	10.4(13.5)	WB(WB)	-	-	-
Othello/Hamlet/Site (U)	B(C)	11.6(14.9)	EB(EB)	-	-	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane. (S) - Signalized Intersection. (U) - Unsignalized Intersection.						

As shown in Table 12, the significant majority of intersections ‘as a whole’ are projected to operate at an acceptable LoS ‘D’ or better. The St. Laurent/Smyth/Lancaster intersection ‘as a whole’ is projected to operate at an acceptable LoS ‘C’ during the weekday morning peak hour and at a congested LoS ‘E’ (same as existing conditions) during the weekday afternoon peak hour. With regard to the ‘critical movements’, all study area intersections’ critical movements are operating at an acceptable LoS ‘D’ or better. The St. Laurent/Smyth/Lancaster intersection northbound through movement is projected to operate at a congested LoS ‘F’ during the afternoon peak hour (same as existing conditions).

Regarding northbound queues at the Othello/Russell/Smyth intersection, the addition of a northbound right-turn lane on Othello at the Othello/Russell/Smyth intersection resulted in a significant reduction of northbound queues, according to SYNCHRO 10.1 model results. Table 13 summarizes the projected northbound queues results on Othello Avenue at the Othello/Russell/Smyth intersection.

Table 13: Projected Queues on Othello Avenue between Hamlet Road and Smyth Road

Weekday Peak Hour	50th NBT Queue (m)	95th NBT Queue (m)	SBL veh/minute	D - 95th Queue (m)
AM	45	65	1	-2
PM	39.7	59.3	3	3.7
Note: “D” is the distance between Othello/Site driveway center to Smyth Road south side (approximately 63 m).				

As observed in Table 1, the addition of the NBR lane to Othello Avenue at Smyth/Othello intersection will result in only 5% of NBT queues on Othello backing to Othello/Site driveway. For this condition, projected SBL traffic volumes at Othello/Site driveway are unlikely to queue back to Smyth Road (storage length of approximately 63 m), as they do not currently do so with only one NB lane. As such, the proposed addition of a NBR lane on Othello at the Smyth/Othello intersection is a significant improvement over existing conditions.

Based on the 0% background growth identified, the Phase 1 plus five years horizon will not be analyzed, as it is the same as the ensuing 2021 Phase 1 build-out year scenario.

10.2. NEIGHBOURHOOD TRANSPORTATION MANAGEMENT STUDY

The Secondary Plan identifies the need for the conduct of a Neighbourhood Transportation Management (NTM) Study at some point during the site development process in response to community concerns regarding speeding and cut-through traffic. Initially, these concerns have been partially responded to with the development of a “complete street” concept plan for Othello which includes additional sidewalks, pedestrian crosswalks, bulb-outs, raised intersections and in some

locations, turning movement restrictions. For Phase 1 development, which is the focus of this TIA study, elements of the complete street concept are being proposed for the Othello/Site Driveway/Hamlet intersection to calm traffic, improve the pedestrian environment and direct traffic away from the community and its local streets. These modifications are discussed in detail in the ensuing Section 12.4. They also address the NTM measures for Phase 1 development as per Module 4.6 of the City's TIA Guidelines.

With regard to the proposed turn restrictions at the Phase 1 Site driveway intersection with Othello, the community/City have requested that the outbound movement from the site be physically restricted to a right-turn only. While this will prevent traffic exiting the shopping centre from travelling on Othello south of the driveway and from travelling west on Hamlet, it also inconveniences many of those local residents living in the neighbourhood immediately west of the site who shop at the plaza. If they use this site driveway to return home, they would have to turn right on Othello, wait in the queue for the light at Smyth to turn green, travel west on Smyth and then turn left on either Saunderson Drive or Haig Drive to wind their way home. This route is likely more circuitous and could result in a greater amount of actual vehicle travel on local streets.

Alternatively, local residents could travel through the full length of the site to reach the south driveway to then connect to Othello before they wind their way home using various local streets. It is suggested that the residents/City look very closely at this proposed site driveway turn restriction and the implications on the resultant travel patterns of local residents before a solution is finalized.

With regard to the community concerns about cut-through traffic and speeding, we are not aware of any data available that qualifies either. What we do know from the available traffic counts is that peak hour volumes on the local streets that intersect Othello are quite low. As depicted on Figure 6, the following are the existing peak hour two-way traffic volumes (rounded) for the three adjacent east-west local streets, and as can be seen, these volumes are at appropriate levels for local streets. In fact they are only 50% of the City's guideline threshold for local street volumes.

Table 14: Two-Way Peak Hour Traffic Volume on Local Streets (veh/h)

Street	Morning Peak Hour	Afternoon Peak Hour
Hamlet Road	30	50
Wingate Drive	40	60
Chapman Boulevard	45	60

So, while the foregoing volumes are well within acceptable limits for local street volumes, the vehicle speeds and the percentage of through traffic are unknown. These types of data are typically collected as part of a City-initiated Area Traffic Calming Study or an Area Transportation Management Study. As real data is required to properly separate fact from perception and accurately identify problems and potential solutions, extensive data collection is typically required. This would include speed surveys on each street of concern and license plate surveys on all entrance/exit points to the community to properly differentiate between local traffic and cut-through traffic. Until this data is collected and analysed, it is recommended that no traffic management/traffic calming measures be implemented on the area's local streets (other than Othello) as they may not be warranted, or the impact of the solution may be worse than the problem with regard to the mobility impacts on local residents.

As such, prior to Phases 2,3 and 4 of site development proceeding, the City and developer need to discuss the scope of an Area Transportation Management Study and determine who is best to conduct such a study to ensure the public's acceptance of its findings.

11.DEMAND RATIONALIZATION

Considering adjacent area transportation network, background growth trends and that less than 80 vehicle-trips per peak hour are projected for Phase 1, it is not anticipated that demand rationalization of Phase 1 will be required. Nevertheless, opportunities for transportation demand management (TDM) will be explored in the strategy report.

12. ANALYSIS

12.1. DEVELOPMENT DESIGN

The proposed Phase 1 Site Plan includes a setback of 5.0 meters on Othello Avenue and of 4.0 meters to Smyth Road. Both setbacks are proposed as green spaces with tree plantings, enhancing the walking experience for people on the east and south sidewalks of Othello Avenue and Smyth Road, respectively. A 6.2 m north-south interlocked central pathway is proposed between the retail area and the amenity area. This interlocked pathway connects the Smyth Road south sidewalk to the Phase 1 residential entrance, to the retail suites and to the existing commercial building and existing surface parking. An east-west 3.75 m interlocked pathway is also proposed between the Othello east sidewalk and the retail suites entrances, via the central interlocked pathway. The proposed interlocked pedestrian pathways are noted to improve walking porosity in the area and adequately connect the proposed residential, retail, POPS and surface parking areas. Adequate connectivity is also noted towards the OC Transpo bus stops located adjacent to the Smyth Road north and south sidewalks, approximately 60 m and 100 m to the west of the proposed central interlocked pathway. Further improvement to pedestrian connectivity would include formalizing crosswalks towards the existing mall building to the south and towards the Elmvale Mall transit station (located 200 m southeast of the proposed residential entrance) via existing sidewalks, with appropriate treatments at the proposed garage access. The following Figure 10: Phase 1 Landscape Plan includes all the forgoing plus the proposed modifications at the Othello/Site Driveway/Hamlet Intersection.

Vehicular access is envisioned via the existing 6.7 m wide Elmvale Mall private two-way roadway, which connects to the proposed 38 surface parking spaces and to the 6.0 m wide underground garage ramp, at the southeast corner of the at-grade retail area. The proposal includes a 4.5 m wide, 25 m long delivery lane at the far eastern side of the Phase 1 Site and a 6.0 m wide and 20 m long temporary north-south loading area adjacent to the north-south interlocked central pathway, which is understood to be for occasional use by small trucks. It is suggested that the three parallel parking spaces located between the Othello and the interlocked central pathway are moved 2.0 m to the west for small truck access to the temporary loading area purposes. No issues are noted for access of municipal and emergency services HSU vehicles. Also, the proposed layout of the road network is consistent with traffic calming principles and is considered appropriate for safe sharing of the road with cyclists.

The underground garage consists of two levels connected by a 6.6 m wide ramp that transitions from a 13% slope to a 18.5% and then back to a 13% slope. The steepest portion is sustained along 12m of the ramp, approximately. The City's Private Approach By-Law states that a private approach may be greater than 6% but shall not exceed 12% provided that a subsurface melting device sufficient to keep the private approach free of ice at all times is installed and properly maintained. Given that the average ramp connects to a private road/lane and not a City Street, and as there are good sight lines at the top of the ramp, the proposed ramp grades will function acceptably provided appropriate pedestrian signage is installed, a subsurface melting device is installed for ramps exposed to ice/snow, and the appropriate transition grades are provided. Parking stalls dimensions are noted as 5.2 m long and 2.6 m wide with 6.7 m two-way aisles, meeting City of Ottawa By-Law requirements.

Figure 10: Phase 1 Landscape and Road Modification Plan



ELMVALE RIOCAN DEVELOPMENT - PHASE 1
LANDSCAPE PLAN / PLAN DU PAYSAGE

OCTOBER 2018
SCALE 1:200



12.2. PARKING SUPPLY

The proposed Phase 1 development includes 38 surface parking spaces, 140 underground parking spaces and 87 bike parking spaces. As per the City of Ottawa Zoning By-law 2008-250 Consolidation Part 4, the Phase 1 development is required to provide 84 parking spaces for residents, 31 parking spaces for visitors, 38 parking spaces for retail and 87 bicycle parking spaces. With 178 proposed vehicle parking spaces and 87 bicycle parking spaces, the Phase 1 development is meeting the City of Ottawa parking requirements.

12.3. BOUNDARY STREET

12.3.1. EXISTING CONDITIONS

Given the development's location within the general urban area and on a bicycle spine route, the target levels of service for pedestrians and cyclists are PLoS 'C' and BLoS 'C', respectively. There are currently no MMLoS targets for transit on Smyth Road or Othello Avenue. The target levels of service for trucks on Smyth Road are TrLoS 'D'. The multi-modal level of service analysis for the existing road segments adjacent to the site is summarized in Table 15, with detailed analysis provided in Appendix G.

Table 15: MMLoS – Othello Avenue and Smyth Road Adjacent to the Site

Road Segment	Level of Service					
	Pedestrian (PLoS)		Bicycle (BLoS)		Truck (TKLoS)	
	PLoS	Target	BLoS	Target	TrLoS	Target
Existing Conditions						
Smyth Road	E	C	F	C	A	D
Othello Avenue	F	C	D	C	-	No target

The MMLoS road segment analysis shows that existing conditions on the east side of Othello Avenue and south side of Smyth Road does not meet MMLoS area targets for pedestrians and cyclists. To meet the target PLoS 'C' and BLoS 'C' for Othello Avenue, adjacent to Phase 1 Site, the following are identified:

- Regarding pedestrians, providing a 2.0 m sidewalk with 0.5 m boulevard would result in PLoS 'C', meeting the area MMLoS targets,
- Regarding Cyclists, reducing operating speed to 40 km/h or less and providing a median refuge island at Site access (as part of the right-out proposal at Hamlet/Othello/Site Access intersection) would result in BLoS 'B', meeting area MMLoS targets.

To meet the target PLoS 'C' and BLoS 'C' for Smyth Road south side, adjacent to Phase 1 Site, the following are identified:

- Regarding pedestrians, adding a 0.5 m boulevard to the existing 2.0 m sidewalk and reducing operating speeds to 40 km/h would result in PLoS 'C', achieving MMLoS area targets,
- Regarding cyclists, implementing a curbside bike lane and lowering the operation speed to 40 km/h would result in BLoS 'D', not meeting area MMLoS targets,
 - Further, reducing the number of lanes to two (which can be achieved by shortening the right-turn lane provided at St. Laurent / Lancaster / Smyth intersection, given that the proposal includes the elimination of the Smyth Road Elmvale Mall parking access), would result in BLoS 'C', achieving the area MMLoS targets. This modification would require a pocket bike lane at St. Laurent / Lancaster / Smyth intersection.

The foregoing opportunities are identified only, and it is the City's decision to determine if they wish to implement any or all of them. Providing a sidewalk on the east side of Othello from the site driveway north to Smyth is a recommended

improvement, however, the foregoing speed reductions and lane reductions may be problematic, as would the 0.5 m boulevard addition to the existing sidewalk locations.

12.4. SITE ACCESS INTERSECTION DESIGN

Access to the Phase 1 development will be mainly via the existing site driveway connection at the Othello/Hamlet unsignalized intersection, located approximately 70 m south of the Smyth/Othello signalized intersection and via the existing right-in/right-out connection to Russel Road. The proposed geometry for the Othello access, includes a 50 m throat length, one westbound lane with a right-out exit and a median refuge in the northeast quadrant. The southbound lane will remain as is, however, north of the site driveway, between the site driveway and the Smyth intersection, Othello will be widened to include a 3.5m wide northbound right-turn lane, as depicted in Figure 2 and Figure 11. A Pedestrian Crossover (PXO) is also recommended on the south leg of Othello at Hamlet.

As summarized in Table 12, the Othello/Hamlet access intersection and its proposed configuration is projected to operate at an acceptable LoS 'B' and 'C' during the morning and afternoon weekday peak hours. It is noteworthy that these modifications are consistent with both the long-term Othello Avenue complete street concept (Appendix H) and the City-approved Secondary Plan (Appendix I). Key components of these Phase 1 road modifications include:

- Provision of a 3.5m wide northbound right-turn lane;
- Right-turn channel on the site driveway intersection with Othello to prohibit outbound through and left-turn movements. The proposed design accommodates an HSU truck;
- New 2.0m wide concrete sidewalk on the east side north of the site driveway;
- Replacement of the west side sidewalk with a 1.8 to 2.0m wide concrete sidewalk (existing tree locations will determine width) from Smyth south to Othello;
- A pedestrian crossover (PXO) on the south leg of Othello at Hamlet.
- A pedestrian crosswalk across the west leg of Hamlet at Othello;
- A blub-out at the southwest corner of the intersection, and
- A raised intersection.

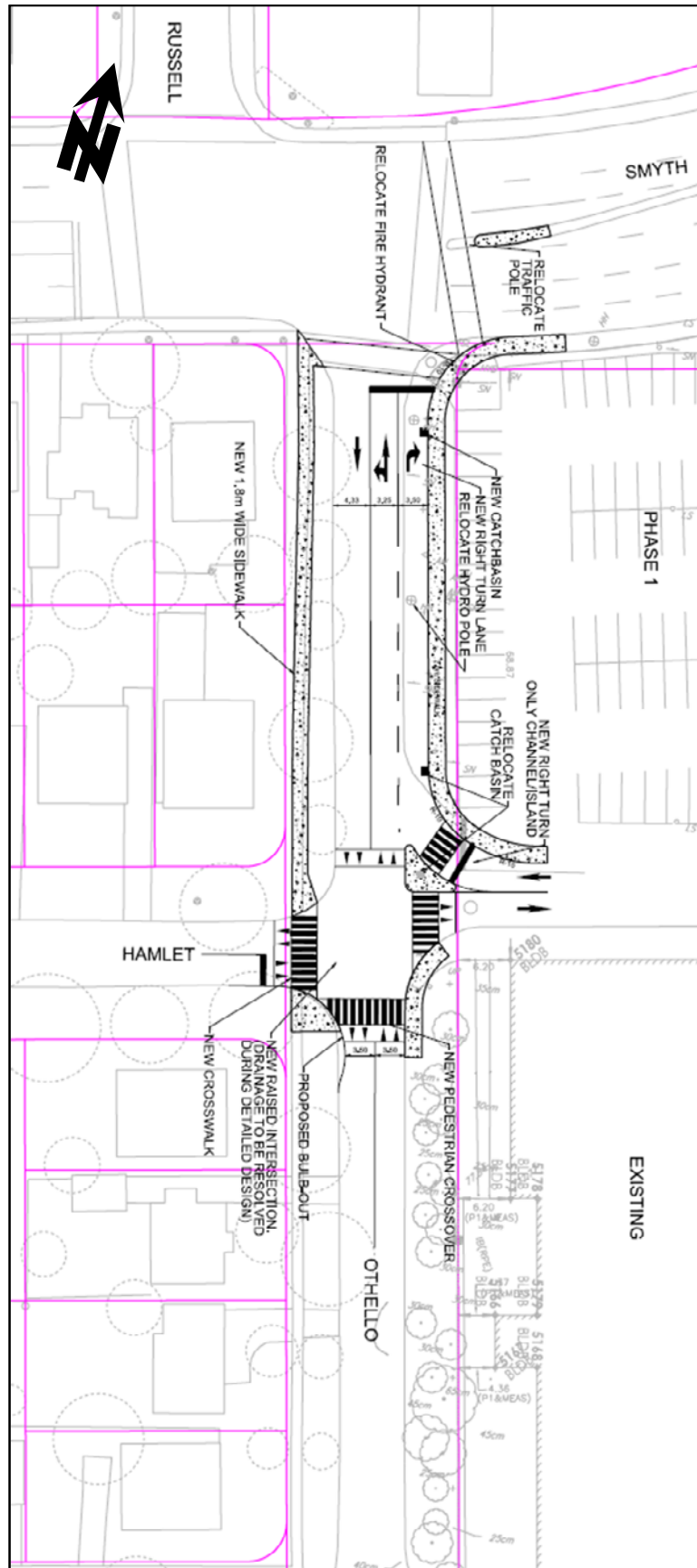
12.5. TRANSPORTATION DEMAND MANAGEMENT

As discussed in Section 8, the Phase 1 development is projected to generate approximately 109 to 204 person-trips during the weekday morning and afternoon peak hours, of which 61 to 102 are projected to be made by foot, bicycle or transit. In order to support the use of sustainable modes of transportation, and considering the relatively low travel demand expected for this phase, the following optional TDM post-occupancy measures were identified for Phase 1 development residential uses:

- Display local area maps with walking/cycling access routes and key destinations at major entrances;
- Display relevant transit schedules and route maps at entrances;
- Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in within the first 6 months after pre-sales/sales initiation, to encourage residents to use transit; and
- Consider car sharing spaces, a car charging station and a VRTUCAR station within the project.

The corresponding optional post-occupancy TDM measures checklist is included in Appendix J.

Figure 11: Proposed Phase 1 Roadway Modifications



12.6. NEIGHBOURHOOD TRAFFIC MANAGEMENT

Primary access routes to Phase 1 development include Smyth Road and St. Laurent Boulevard, which are designated arterial roads, and Othello Avenue, which is a designated local road. Existing traffic volumes on Othello Avenue are already above the local road guidelines 120 veh/h threshold. The Phase 1 future projected volumes would increase traffic on Othello Avenue north of the site driveway by approximately 25 to 35 veh/h during peak hours, as depicted in Figure 8. To mitigate any further impacts to Othello Avenue and to the Othello/Russell/Smyth signalized intersection, and to be consistent with the Othello Complete Street staging plans as per the approved Secondary Plan, the proposed Phase 1 modifications include all the measures summarized in Section 12.4 and depicted in Figure 11. With regard to a future Area Traffic Management Study, this has been previously discussed in Section 10.2.

As summarized in Table 10, the addition of a second northbound lane on Othello approaching Smyth would result in the Othello/Russell/Smyth signalized intersection operating at an acceptable LOS 'C' and LOS 'D', during the weekday morning and afternoon peak hours, respectively.

12.7. TRANSIT

12.7.1. ROUTE CAPACITY

Figure 12 depicts the location of nearby eastbound, westbound, northbound and southbound transit stops and

Table 16 summarizes the estimated Phase 1 demanded seats on-vehicle for the corresponding transit stops.

Figure 12: Nearby Transit Stops Locations

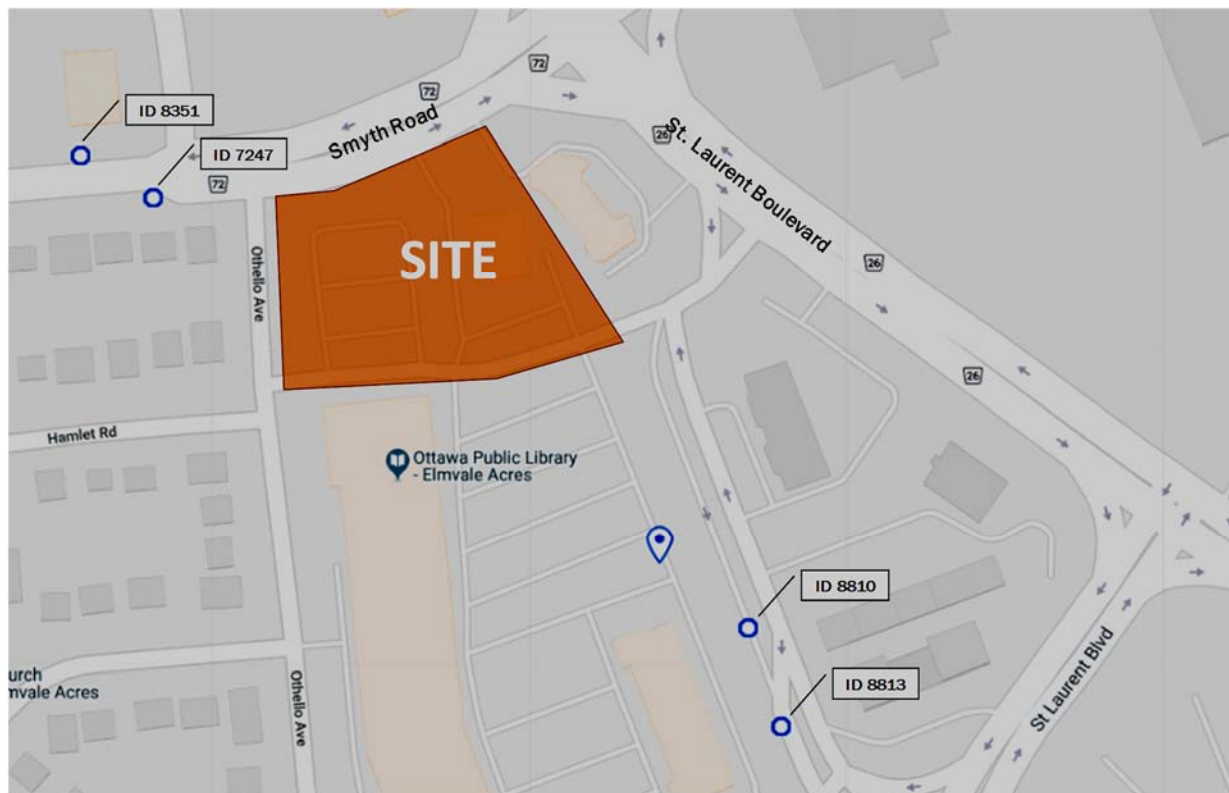


Table 16: Transit Capacity at Adjacent Transit Stops

Stop	Direction	Average Frequency (Buses/Hr)		Total Capacity (Seats/hr)	Capacity Demanded by Phase 1 (%)
7247	Eastbound	PM	4	220	8%
8810	Northbound/Southbound	PM	4	300	18%
8813	Northbound/Southbound	PM	2	150	18%
8351	Westbound	PM	4	220	8%
Note: Bus capacity is assumed to be 55 seats for a single bus, 75 seats for an articulated bus and 90 seats for a double decker bus.					

As outlined within Section 8, the forecasted ‘new’ two-way transit trips are estimated to be 45 trips (10 in, 35 out) during the AM peak and 73 trips (41 in, 32 out) during the PM peak. During the PM peak, the two-way transit trips represent approximately 73% of an articulated bus (75 passengers). By distributing transit trips as described in Section 8.2, it can be seen that Phase 1-generated transit trips are less than 20% of the estimated capacity in each direction. As such, the additional forecasted transit trips can be accommodated on the existing transit network.

12.7.2. TRANSIT PRIORITY

The proposed Phase 1 Development will use an existing driveway connecting to the St. Laurent Boulevard transit loop. The 2017 Community Transportation Study prepared by Parsons identified transit priority measures required by OC Transpo at the adjacent Transit Loop, at the St. Laurent Boulevard/Russell Road intersection and at the St. Laurent Boulevard /Transit Loop intersection as part of the full build-out of Elmvale Shopping Centre Redevelopment. As such, these measures are considered supportive of future phases of the Elmvale Shopping Centre Redevelopment and their timing is best determined by OC Transpo. No additional required transit priority measures are identified, for Phase 1 development.

12.8. INTERSECTION DESIGN

The MMLOS analysis for the St. Laurent/Lancaster/Smyth and Smyth/Russel/Othello signalized intersections is summarized in Table 17. The existing detailed MMLOS analysis is provided as Appendix K.

Table 17: MMLOS – Signalized Study Area Intersections

Intersection	Level of Service					
	Pedestrian (PLOS)		Bicycle (BLOS)		Truck (TKLOS)	
	PLOS	Target	BLOS	Target	TKLOS	Target
Existing Conditions						
St. Laurent/Lancaster/Smyth	F	C	F	C	C	D
Smyth/Russel/Othello	F	C	F	C	E	No Target

The MMLOS analysis shows that the existing St. Laurent/Lancaster/Smyth and Smyth/Russel/Othello signalized intersections are currently below the area targets for pedestrian LoS and bicycle LoS. The following discussion regarding possible improvements are offered for consideration by the City.

With regard to pedestrians – In general, high pedestrian level of service is difficult to achieve at signalized intersections larger than 2-lane roads. At the St. Laurent/Lancaster/Smyth signalized intersection, pedestrians must cross 7 lanes of traffic if they wish to cross St. Laurent Boulevard or Lancaster Road and 6 lanes if the wish to cross Smyth Road. With restrictions on both left and right-turns, pedestrian leading intervals and Zebra stripe hi-vis markings, the PLOS would only be improved to a LoS ‘E’ on St. Laurent Boulevard and to LoS ‘C’ on Smyth Road. Given the nature of the two corridors, it is unlikely that turn restrictions are feasible for this intersection.

At the Smyth/Russel/Othello signalized intersection, pedestrians must cross 5 or more lanes of traffic if they wish to cross Smyth Road. Implementing restrictions on both left and right-turns, pedestrian leading intervals, Zebra stripe hi-vis markings and reducing corner radii, would result in PLoS 'D'. Given the access needs of the surrounding communities and retail activities, it is unlikely that turn restrictions are feasible for this intersection.

With regard to Bicyclists – the lack of protected facilities at intersections and the high-speeds of adjacent traffic create low levels of service for bicycle users. The recent reconstruction of St. Laurent Boulevard north of Smyth Road, which included the provision of cycle tracks and left-turn boxes, results in BLoS 'A' for the north approach, meeting area targets. Should similar measures be applied to the south approach, BLoS 'A' could also be obtained. For the east approach, BLoS 'C' can be achieved by providing a pocket bike lane 50 m from the intersection. For the west approach, BLoS 'C' can be achieved by providing a cycletrack with two-stage left-turns.

At the Smyth/Russel/Othello signalized intersection, the lack of protected facilities at intersections and the high-speeds of adjacent traffic on Smyth Road result in low levels of service for bicycle users. Providing Curb Bike Lanes on the north, east, west approaches and a pocket bike lane on the south approach with 2-stage left-turn boxes for WBL and EBL cyclists and a 40 km/h speed limit on Othello Avenue would result in BLoS 'C', meeting area targets.

13. SUMMARY OF PHASE 1 IMPACTS AND RELATED MODIFICATIONS

Based on the results summarized herein the following conclusions are offered:

Proposed Site

- The Phase 1 Development will consist of 168 apartment units and approximately 1117 m² of ground level retail. Given the proposed development replaces an existing 466 m² restaurant (Kelseys), the net increase in retail will be 651 m². The proposal includes existing driveway connections to Othello Avenue and to St. Laurent Boulevard, however, the existing one-way driveway entrance from Smyth Road would be eliminated;
- In total, the Phase 1 development is anticipated to generate approximately 109 and 204 two-way person trips during the AM and PM weekday peak hours, respectively and split into the following modal shares:
 - 40 auto trips (9 in, 31 out) during the AM peak and 83 auto trips (45 in, 38 out) during the PM peak;
 - 45 transit trips (10 in, 35 out) during the AM peak and 73 transit trips (41 in, 32 out) during the PM peak; and
 - 16 active mode trips (3 in, 13 out) during the AM peak and 29 active mode trips (15 in, 14 out) during the PM peak.
- A total of 178 parking spaces will be provided within the Phase 1 development, of which 38 will be surface parking spaces and 140 will be in a two-level underground garage; and
- A total of 84 bicycle parking spaces will be provided, meeting zoning requirements.

Site Plan

- Vehicular access is envisioned via the existing 6.7 m wide Elmvalle Mall private two-way roadway, which connects to the proposed 38 surface parking spaces and to the 6.0 m wide underground garage ramp, located at the southeast corner of the ground retail area. These are considered sufficient to accommodate the subject development vehicle demand;
- The proposal includes a 4.5 m wide, 25 m long delivery lane at the far eastern side of the Phase 1 Site;
- No issues are noted for access of municipal and emergency services HSU vehicles;
- The proposed layout of the road network is noted to be consistent with traffic calming principles and is considered appropriate for safe sharing of the road with cyclists. Considering the envisioned ultimate cycling network, it is suggested that surface bicycle parking spaces are provided with convenient access to main entrances and well-used areas, as per City of Ottawa Bicycle Parking Space Provisions;

- The proposed interlocked pedestrian pathways are noted to improve walking porosity in the area and adequately connect the proposed residential, retail, POPS and surface parking areas. A further improvement to pedestrian connectivity would include formalizing crosswalks towards the existing commercial building to the south and towards the Elmvale Mall transit station;
- The underground garage consists of two levels connected by a 6.6 m wide ramp. Parking stalls dimensions are noted as 5.2 m long and 2.6 m wide with 6.7 m two-way aisles, meeting City of Ottawa By-Law requirements.

Transit

- Adequate connectivity is noted towards the OC Transpo bus stops located on Smyth Road north and south sidewalks, approximately 60 m and 100 m to the west of the Phase 1 site;
- A further improvement to transit connectivity would include formalizing crosswalks towards the existing commercial building to the south and towards the Elmvale Mall transit station;
- Phase 1-generated transit trips are projected to be less than 15% of the estimated capacity in each direction. As such, existing capacity exists on the current transit service in the area to accommodate the Phase 1 forecasted transit trips;
- Transit priority measures pertaining to the Transit Loop and adjacent intersections at St. Laurent/Russell and St. Laurent/ T. Loop were identified by the 2017 CTS as supportive of full build-out of the Elmvale Shopping Centre Redevelopment, but these are not required for Phase 1 development. No additional transit priority measures are identified for the Phase 1 development.

Network Performance

- St. Laurent Boulevard and Smyth Road have experienced in recent years approximate annual growths in traffic volume of -2.20% to 0.09% and -3.04% to -1.15%, respectively. As a conservative estimate, the subsequent analysis of future conditions will assume a 0% annual growth rate along St. Laurent Boulevard and Smyth Road;
- On Phase 1 build-out year 2021, the significant majority of intersections 'as a whole' are projected to operate at an acceptable LoS 'D' or better:
 - The St. Laurent/Smyth/Lancaster intersection 'as a whole' is projected to operate at an acceptable LoS 'C' during the weekday morning peak hour and at a congested LoS 'E' (same as existing conditions) during the weekday afternoon peak hour; and
 - The St. Laurent/Smyth/Lancaster intersection northbound through movement is projected to operate at a congested LoS 'F' during the afternoon peak hour.

Neighbourhood Traffic Management

- Existing volumes on Othello Avenue are over the City of Ottawa 120 veh/h guideline threshold for local roads. The Phase 1 future projected volumes would increase traffic on Othello Avenue north of Hamlet by less than 35 veh/h two-way total;
- Existing volumes on the local streets west of Othello are less than 60 veh/h, which is 50% of the City's guideline for the threshold volume on local streets;
- To mitigate any further impacts to Othello Avenue and to the Othello/Russell/Smyth signalized intersection, Phase 1 development includes:
 - The addition of a 3.5m wide northbound right-turn lane on Othello, between Hamlet and Smyth;
 - Site egress at the Hamlet/Othello intersection to operate as a right-out only. All inbound traffic movements at this intersection to be permitted. It should be highlighted while this community/City proposed restriction would reduce site-generated traffic from using Othello south of the site driveway and from using Hamlet, it would also result in local residents who shop at the plaza having a more circuitous route home, likely resulting in increased travel on other local streets;
 - A 2.0m wide sidewalk on the east side from the site driveway north to Smyth;
 - A 1.8 to 2.0m, wide sidewalk on the west side of Othello from Hamlet north to Smyth;
 - A pedestrian crossover (PXO) on the south leg of Othello at Hamlet;
 - A pedestrian crosswalk on the west leg of Hamlet at Othello;

- A bulb-out at the southwest corner of the Othello/Side Driveway/ Hamlet intersection; and
- A raised intersection.

These NTM measures would result in the Othello/Russell/Smyth signalized intersection operating at an acceptable LOS 'C' and LOS 'D', and the unsignalized Othello/Site Driveway/Hamlet intersection operation at an acceptable LOS 'B' and LOS 'C' during the weekday morning and afternoon peak hours, respectively, and are therefore deemed sufficient.

- As current volumes on the adjacent east-west local streets are well below the City's guideline threshold, and as traffic diversion and calming measures are identified as part of Phase 1 for the Othello/Site Driveway/Hamlet intersection to address existing and Phase 1 traffic, an Area Traffic Management Study has not been conducted for the Phase 1 Site Plan Application. It is best done as part of Phase 2/3/4 development and it will require fairly extensive data collection to quantify vehicle speeds and cut-through so as to clarify the facts. This is critical so that problems, if any, are correctly identified, and proper measures are correctly identified along with the net impact on local residents' mobility. In some instances, traffic calming and/or traffic restrictions are warranted, and in others, the proposed solution may be worse than the problem as for its impact on local residents; and
- With regard to the Area Traffic Management Study, it is recommended that further discussion is required between the City, developer and the Community to properly scope the study and to determine who is best to conduct the study given the data collection requirements and the importance of public acceptance of its findings. Typically, these studies are the responsibility of the City.

Boundary Streets and Intersection Design

- The MMLoS road segment analysis shows that existing conditions on the east side of Othello Avenue and south side of Smyth Road do not meet MMLoS area targets for pedestrians and cyclists (PLOS'C' and BLOS'C', respectively);
- To meet the target PLOS 'C' and BLOS 'C' for **Othello Avenue**, adjacent to Phase 1 Site, the following are identified:
 - Regarding pedestrians, providing a 2.0 m sidewalk with a 0.5 m boulevard would result in PLOS 'C', meeting the area MMLoS targets; and
 - Regarding cyclists, reducing operating speed to 40 km/h or less and providing a median refuge island at Site access (as part of the right-out proposal at Hamlet/Othello/Site Access intersection) would result in BLOS 'B', meeting area MMLoS targets.
- To meet the target PLOS 'C' and BLOS 'C' for **Smyth Road** south side, adjacent to Phase 1 Site, the following are identified:
 - Regarding pedestrians, adding a 0.5 m boulevard to the existing 2.0 m sidewalk and reducing operating speeds to 40 km/h would result in PLOS 'C', achieving MMLoS area targets,
 - Regarding cyclists, implementing a curbside bike lane and lowering the operation speed to 40 km/h would result in BLOS 'D', below area MMLoS targets. Further, reducing the number of lanes to two (which can be achieved by shortening the right-turn lane provided at St. Laurent / Lancaster / Smyth intersection, given that the proposal includes the elimination of the Smyth Road Elmvale Mall parking access), would result in BLOS 'C', achieving the area MMLoS targets. This modification would require a pocket bike lane at St. Laurent / Lancaster / Smyth intersection.

In review of the foregoing, the identified changes to Smyth are not part of the project, but those identified for Othello will be phased in as appropriate.

The 2017 Community Transportation Study and the subsequent City-approved Elmvale Acres Shopping Centre Secondary Plan identified a complete street concept plan and a possible staging plan for roadway modifications along Othello Avenue. Consistent with these documents, the following has been recommended for the Othello/Site Driveway/Hamlet Intersection as part of the Phase 1 development project;

- Provision of a 3.5m wide northbound right-turn lane from the site driveway north to Smyth;
- Right-turn channel on the site driveway intersection with Othello to prohibit outbound through and left-turn movements. This channel accommodates an HSU truck;
- New 2.0m wide concrete sidewalk on the east side north of the site driveway;

- Replacement of the existing west side sidewalk with a 1.8m to 2.0m wide cement sidewalk from Smyth south to Hamlet;
- A pedestrian crossover (PXO) on the south leg of Othello at Hamlet;
- A pedestrian crosswalk on the west leg of Hamlet at Othello;
- A bulb-out at the southwest corner of the intersection; and
- A raised intersection.

Based on the foregoing conclusions, this report satisfies the TIA requirements for Elmvale Shopping Centre Phase 1 redevelopment and the Site Plan is recommended from a transportation perspective.

Prepared By:



Andrés Peña, M.Sc.
Engineer in Training

Reviewed By



Ronald Jack, P.Eng.
Senior Transportation Engineer

Appendix A

Screening Form

City of Ottawa 2017 TIA Guidelines

Date

15-Aug-18

TIA Screening Form

Project

Phase 1 Expansion at Elmvale Acres

Project Number

Shopping Centre

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	1910 St. Laurent Boulevard
Description of location	Within Elmvale Acres Shopping Centre, with Phase 1 located at the southwest corner of Smyth/Othello intersections.
Land Use	Residential apartments and retail.
Development Size	168 apartment units, 11,690 ft ² of retail and 189 Parking Spaces.
Number of Accesses and Locations	One to Othello and one to St. Laurent.
Development Phasing	First of three phases.
Buildout Year	Likely 2021/22 for Phase 1.
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger

Land Use Type	Townhomes or Apartments
Development Size	168 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)	No	Bounded by these types of streets but no new driveway proposed.
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	Yes	
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;	No	
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	Yes	
The development includes a drive-thru facility	No	
Safety Trigger Met?	Yes	

**Re: Elmvale Redevelopment, Phase 1
Transportation Impact Assessment – Response to Comments**

January 24, 2019

1. INTRODUCTION

The following transportation-related comments were received by the City (January 2019) in response to the Elmvale Redevelopment, Phase 1 Transportation Impact Assessment Strategy Report submitted in December 2018. Responses to these city comments are provided herein.

2. CITY COMMENTS

General Comments/ Site Plan Comments

Comment 1: The City will be resurfacing Othello Avenue in 2019. We will instruct our road renewal group to pave from Hamlet Road south to Pleasant Park Drive, leaving Smyth Road to Hamlet. Through the RMA works we ask that Smyth to Hamlet resurfacing be part of the developers works and cost. Please include this work in your RMA

Response 1: *The RMA has been updated to reflect the subject resurfacing.*

Comment 2: No construction traffic is to utilize Othello Avenue, and we will condition the approval as such.

Response 2: *Noted. Proponent has been advised and this will be passed on to the contractor.*

Traffic and Transportation Comments

Comment 1: There are proposed changes in the existing roadway geometry for the purpose of modifications to existing TCS, [Smyth/Othello]. The City of Ottawa Traffic Signal Design and Specification Unit is required to complete a review for traffic signal plant re-design, provide the actual re-design, and a new design layout for new TCS.

If the proposed traffic signals are warranted/approved for installation, or/and modifications to existing TCS are approved, and RMA approved, please forward an approved geometry detail design drawings (dwg digital format in NAD 83 coordinates) including base mapping, existing and new underground utilities/sewers, new/existing catch basins locations, Turn-Radius Modeling and approved pavement markings drawings in separate files for detail traffic plant design lay out.

The proponent will be responsible for all costs of putting new signal on line, i.e. Bell com, in case the signal is not warranted. Please send all digital (CADD) design files to Peter.Grajcar@ottawa.ca 613-580-2424 ext. 23035.

Response 1: *Noted and the appropriate detailed design drawings will be provided when available.*

Comment 2: The Synchro analysis provided was limited to existing conditions. Provide projected Synchro analysis for review and comment. The submitted Synchro analysis for existing PM conditions file contains fatal errors and will not run traffic simulation. Revise and resubmit.

Response 2: *Total Projected 2021 conditions SYNCHRO file is attached, and analysis is included in Section 10 of the revised TIA Report.*

Comment 3: Background growth analysis should not be limited to one intersection. Analysis should encompass the network. Provide 5-year horizon analysis if growth exceeds 0% across the network.

Response 3: Considering the Elmvale SC Phase 1 location and the adjacent arterial network (Smyth Road and St. Laurent Boulevard), it is considered that the Smyth/St. Laurent /Lancaster intersection historical traffic growth constitutes an adequate proxy of growth rates on the adjacent arterial network. No new area developments were identified via "My Neighborhood" City of Ottawa Application within the area of study. Given the consolidated communities adjacent to Othello Avenue and Pleasant Park Road, no additional background growth is expected on these collector roads.

Comment 4: Naming of Appendix E Charts is ambiguous. Provide clarification.

Response 4: Naming has been corrected. Charts refer to historical traffic counts at the Smyth/St. Laurent/Lancaster intersection. See previous comment.

Comment 5: 16. Table 12 indicates LOS E for St Laurent/Smyth/Lancaster as a whole. LOS is F.

Response 5: Table 12 in the revised TIA report has been corrected.

Transit

Comment 1: Relocated bus stop on Demonstration Plan from Planning Rational acceptable. Standard drawings SC11 and SC12 to be referenced when stop will be relocated.

Response 1: RIOCAN has been notified.

Transportation Engineering Services

Comment 1: Provide largest vehicle turning template for the access on Othello Avenue.

Response 1: Vehicle turning templates are attached for an HSU vehicle which was the design vehicle used for this location.

Comment 2: Regardless of the ramp being located on private property, 18.5% slope is too high for driver comfort. Please ensure the ramp does not exceed 12%.

Response 2: The architect has reviewed the ramp design and has been able to achieve an approximate 15.5%. This is the minimum achievable and is considered acceptable given the relatively low traffic volumes and the good sight lines at the top of ramp. A variance will be required.

Comment 3: Please contact Traffic Management (Kunjan Ghimire) for review of the pedestrian crossover (PXO) selection and design.

Response 3: Based on the combination of projected traffic volumes, number of lanes and posted speed on Othello, OTM Book 15 Table 7 – Pedestrian Crossover Selection Matrix, indicates a Level 2 Type D Pedestrian Crossover would be required.

Comment 4: The design of the channelized right turn requires further review. The WB RT movement should be a yield-controlled movement.

Response 4: The RMA drawings have been updated to reflect changes to yield control

Public Comments

Comment 1: Some residents have concerns with restriction from vehicular movement from the Shopping Centre to Hamlet / while others appreciate this restriction.

Response 1: *The restrictions have been requested by some area residents and supported by the City. The proponent is OK with either restrictions or no restrictions. The plan is to proceed with the restrictions unless advised otherwise by the City.*

Comment 2: Some residents like the transportation improvements to Othello Ave

Response 2: *These are currently proposed from Othello north to Smyth. Any other potential modifications south of Othello will be addressed during future phases of site development*

Comment 3: Concerns remain on cut through traffic from Pleasant to Smyth (truck traffic / delivery trucks)

Response 3: *The Phase 1 modifications to Othello and the site driveway will direct all site-exiting traffic at this location north to Smyth away from local streets. Future phases of site redevelopment will further address the truck traffic issue along Othello.*

Comment 4: Alignment of Russell / Othello / Smyth needs to be completed asap

Response 4: *Noted. This is a City issue/topic and they have identified the need for the realignment, however, its timing is undefined at this time.*

Comment 5: The new proposed right turn lane only from Othello to Smyth is appreciated

Response 5: *Noted.*

Appendix B

City of Ottawa Traffic Data



Public Works - Traffic Services

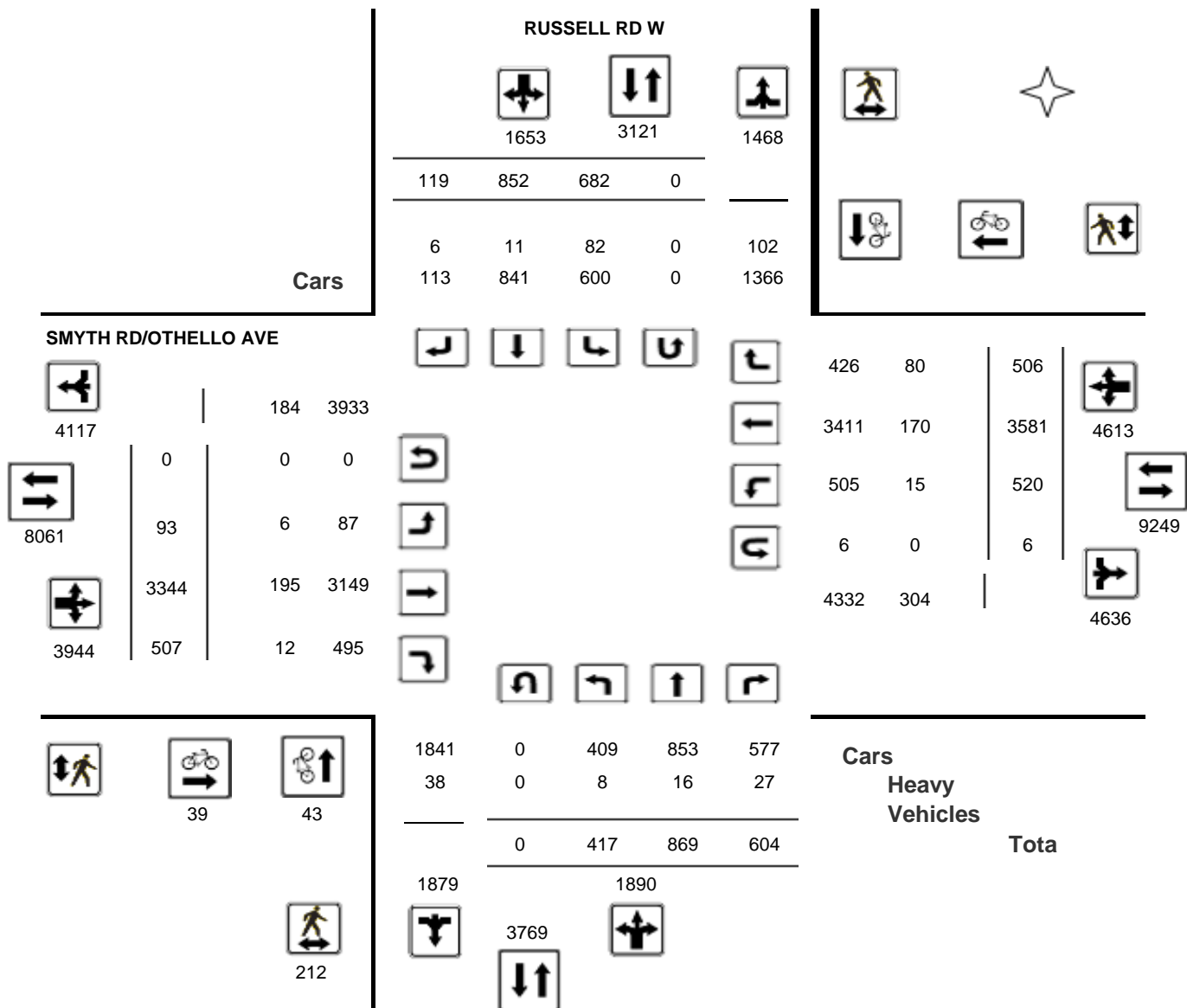
Turning Movement Count - Full Study Diagram

SMYTH RD/OTHELLO AVE @ RUSSELL RD W

Survey Date: 01-Aug-12

WO#: 31019

Device:



Comments



Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram

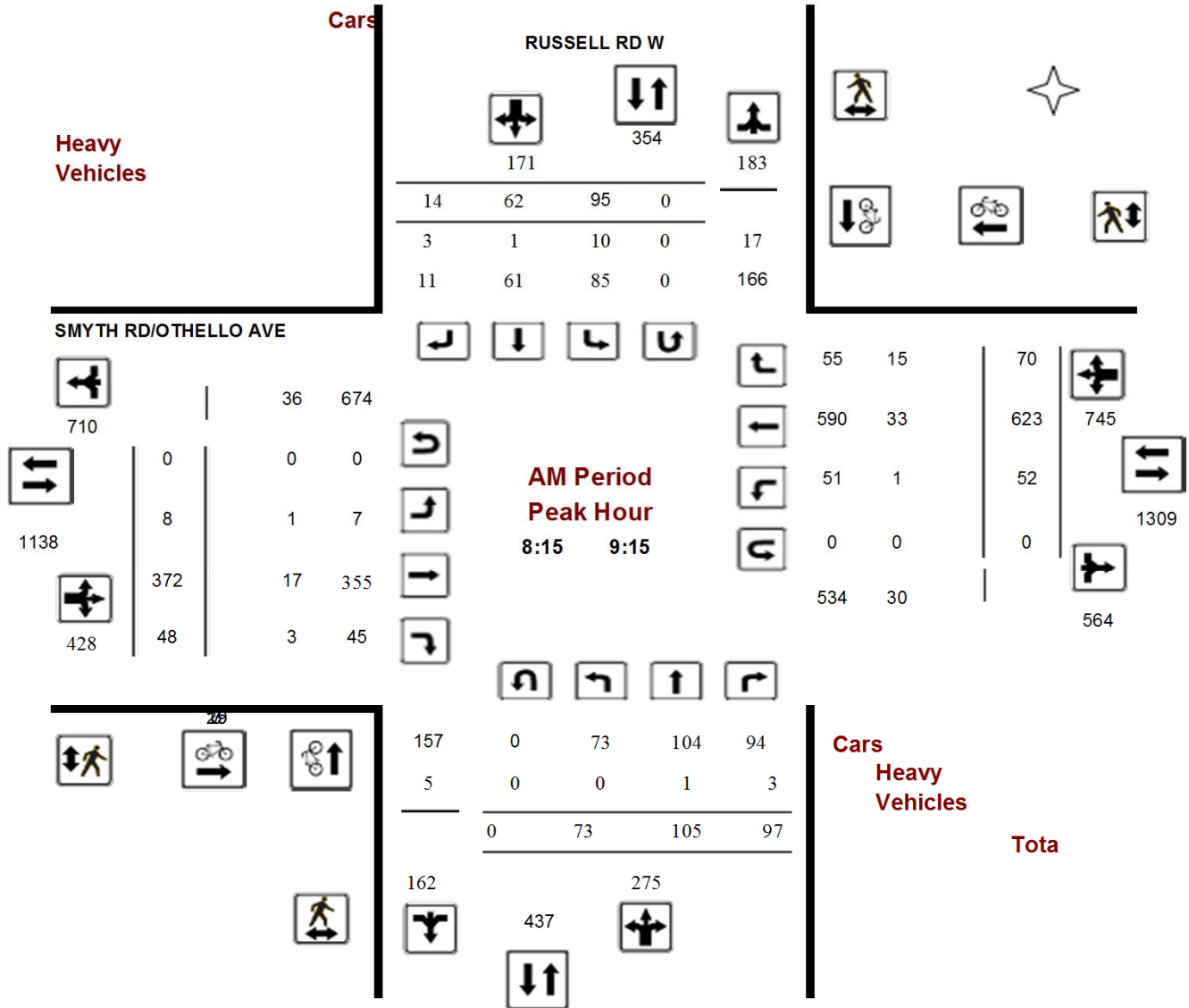
SMYTH RD/OTHELLO AVE @ RUSSELL RD W

Survey Date: 01-Aug-12

Start Time: 7:00

WO No: 31019

Device:






Comments

Heavy
Vehicles




Cars

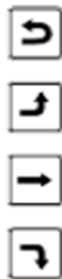
RUSSELL RD W

		
216	428	212
16	115	85
1	1	6
15	114	79
0	0	0
14	198	

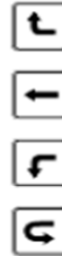


SMYTH RD/OTHELLO AVE




	29	457
486	0	0
	22	20
966	395	370
	63	63
480		

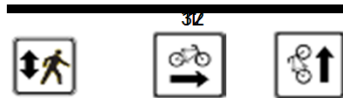


MD Period
Peak Hour
12:15 13:15








75	7
391	23
68	2
1	0
549	33

82	
414	567
70	
1	1149
	
	582



312

			
245	0	51	103
3	0	5	5
0	56	108	101

248	265
	
513	
	

Cars
Heavy
Vehicles




Tota

Comments

Heavy
Vehicles




Cars

RUSSELL RD W

				
269	453	184		
15	140	114	0	
0	1	14	0	12
15	139	100	0	172



SMYTH RD/OTHELLO AVE

		14	403
417			
	0	0	0
1135	10	0	10
	608	19	589
718	100	4	96



PM Period
Peak Hour
15:45 16:45



45 11

350 13

70 1

2 0

776 36

56

363

71

2



812

1304



305

0

38

117

85

6

0

1

1

3

0 39 118 88

311



556



245



Cars
Heavy
Vehicles

Tota

Comments



Public Works - Traffic Services

Work Order
31019

Turning Movement Count - Full Study Summary Report

SMYTH RD/OTHELLO AVE @ RUSSELL RD W

Survey Date: 01-Aug-12

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 6

AADT Factor
0.90

Full Study

		RUSSELL RD W									SMYTH RD/OTHELLO AVE									
		Northbound				Southbound				Eastbound				Westbound						Grand Total
Period		LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TO	STR TOT	
7:00 8:00		37	65	39	141	43	71	9	123	264	7	343	16	366	33	660	50	743	1109	1373
8:00 9:00		74	104	82	260	77	64	16	157	417	5	359	45	409	44	674	64	782	1191	1608
9:00 10:00		54	70	75	199	96	66	14	176	375	16	397	48	461	50	445	75	570	1031	1406
11:30 12:30		41	115	86	242	82	99	25	206	448	12	432	74	518	82	344	59	485	1003	1451
12:30 13:30		58	126	104	288	77	121	11	209	497	25	361	56	442	64	424	83	571	1013	1510
15:00 16:00		46	160	50	256	104	120	22	246	502	21	570	71	662	79	369	54	502	1164	1666
16:00 17:00		34	128	77	239	106	160	10	276	515	5	545	130	680	82	342	48	472	1152	1667
17:00 18:00		73	101	91	265	97	151	12	260	525	2	337	67	406	86	323	73	482	888	1413
Total		417	869	604	1890	682	852	119	1653	3543	93	3344	507	3944	520	3581	506	4607	8551	12094
Equ 12Hr		579	1207	839	2625	947	1184	165	2296	4921	129	4648	704	5481	722	4977	703	6402	11883	16804
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																				1.39
Avg 12Hr		521	1087	755	2363	852	1065	148	2066	4429	116	4183	633	4932	649	4479	632	5761	10694	15123
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																				0.90
Avg 24Hr		682	1423	989	3095	1116	1395	193	2706	5801	151	5479	829	6460	850	5867	827	7546	14009	19811
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																				1.31

Comments:

Note: U-Turns are included in Totals.

2015-Jul-06



Public Works - Traffic Services

W.O. 31019

Turning Movement Count - 15 Minute Summary Report

SMYTH RD/OTHELLO AVE @ RUSSELL RD W

Survey Date: 01-Aug-12

Total Observed U-Turns

Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 6

RUSSELL RD W

SMYTH RD/OTHELLO AVE

		Northbound			Southbound			Eastbound			Westbound									Grand Total
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	
7:00 7:15		8	10	6	24	7	10	1	18	42	1	79	5	85	10	159	10	179	264	306
7:15 7:30		10	9	10	29	10	19	2	31	60	4	109	4	117	8	148	5	161	278	338
7:30 7:45		12	24	17	53	4	18	2	24	77	1	82	2	85	4	169	11	184	269	346
7:45 8:00		7	22	6	35	22	24	4	50	85	1	73	5	79	11	184	24	219	298	383
8:00 8:15		18	17	7	42	12	18	4	34	76	1	72	6	79	11	185	15	211	290	366
8:15 8:30		16	29	22	67	19	19	6	44	111	1	88	13	102	6	161	19	186	288	399
8:30 8:45		14	18	28	60	25	15	2	42	102	0	83	17	100	7	167	13	187	287	389
8:45 9:00		26	40	25	91	21	12	4	37	128	3	116	9	128	20	161	17	198	326	454
9:00 9:15		17	18	22	57	30	16	2	48	105	4	85	9	98	19	134	21	174	272	377
9:15 9:30		10	11	14	35	21	18	5	44	79	2	47	6	55	9	103	17	129	184	263
9:30 9:45		12	20	16	48	15	16	3	34	82	4	150	15	169	15	90	16	121	290	372
9:45 10:00		15	21	23	59	30	16	4	50	109	6	115	18	139	7	118	21	146	285	394
11:30 11:45		8	23	26	57	23	22	3	48	105	2	109	9	120	26	75	11	113	233	338
11:45 12:00		12	23	25	60	17	28	8	53	113	4	97	30	131	17	91	18	126	257	370
12:00 12:15		9	41	15	65	17	23	7	47	112	5	113	18	136	17	100	16	134	270	382
12:15 12:30		12	28	20	60	25	26	7	58	118	1	113	17	131	22	78	14	114	245	363
12:30 12:45		11	22	23	56	20	16	4	40	96	3	76	19	98	12	104	19	135	233	329
12:45 13:00		18	27	28	73	19	36	3	58	131	8	108	10	126	24	120	20	165	291	422
13:00 13:15		15	31	30	76	21	37	2	60	136	10	98	17	125	12	112	29	153	278	414
13:15 13:30		14	46	23	83	17	32	2	51	134	4	79	10	93	16	88	15	119	212	346
15:00 15:15		15	67	14	96	15	28	5	48	144	2	150	12	164	14	109	11	134	298	442
15:15 15:30		8	37	6	51	32	34	5	71	122	9	150	20	179	25	91	17	134	313	435
15:30 15:45		11	35	12	58	26	26	5	57	115	4	115	22	141	25	86	14	125	266	381
15:45 16:00		12	21	18	51	31	32	7	70	121	6	155	17	178	15	83	12	110	288	409
16:00 16:15		6	32	29	67	29	28	4	61	128	1	142	28	171	23	98	15	138	309	437
16:15 16:30		9	27	19	55	30	43	2	75	130	3	183	22	208	21	101	11	133	341	471
16:30 16:45		12	38	22	72	24	37	2	63	135	0	128	33	161	12	81	18	111	272	407
16:45 17:00		7	31	7	45	23	52	2	77	122	1	92	47	140	26	62	4	92	232	354
17:00 17:15		19	25	24	68	30	45	0	75	143	2	77	24	103	22	86	32	140	243	386
17:15 17:30		23	28	19	70	31	45	6	82	152	0	123	14	137	27	80	16	123	260	412
17:30 17:45		17	33	34	84	17	31	1	49	133	0	74	14	88	23	80	14	117	205	338
17:45 18:00		14	15	14	43	19	30	5	54	97	0	63	15	78	14	77	11	102	180	277
TOTAL:		417	869	604	1890	682	852	119	1653	3543	93	3344	507	3944	520	3581	506	4613	8557	12100

Note: U-Turns are included in Totals.

Comment:



Public Works - Traffic Services

W.O.
31019

Turning Movement Count - Heavy Vehicle Report

SMYTH RD/OTHELLO AVE @ RUSSELL RD W

Survey Date: 01-Aug-12

RUSSELL RD W										SMYTH RD/OTHELLO AVE										Grand Total
Time Period	Northbound			N TOT	Southbound			S TOT	STR TOT	Eastbound			E TOT	Westbound			W TOT	STR TOT		
	LT	ST	RT		LT	ST	RT			LT	ST	RT		LT	ST	RT				
7:00	8:00	1	1	3	5	8	1	0	9	14	2	20	0	22	4	31	9	44	66	80
8:00	9:00	1	1	2	4	7	1	3	11	15	0	16	3	19	1	37	13	51	70	85
9:00	10:00	0	1	7	8	15	2	1	18	26	1	27	0	28	0	21	10	31	59	85
11:30	12:30	1	1	5	7	6	2	1	9	16	0	23	2	25	3	17	8	28	53	69
12:30	13:30	4	6	5	15	5	2	0	7	22	2	34	0	36	3	26	8	37	73	95
15:00	16:00	0	5	0	5	14	1	0	15	20	1	36	3	40	2	14	11	27	67	87
16:00	17:00	1	1	3	5	13	1	0	14	19	0	21	3	24	1	10	11	22	46	65
17:00	18:00	0	0	2	2	14	1	1	16	18	0	18	1	19	1	14	10	25	44	62
Total :		8	16	27	51	82	11	6	99	150	6	195	12	213	15	170	80	265	478	628

Heavy Vehicles are vehicles having one rear axle with four or more wheels, or having two or more rear axles. These vehicles include most O.C. Transpo, school and inter-city buses. Further, they ARE included in the Turning Movement Count Summary.



Public Works - Traffic Services
Turning Movement Count - Cyclist Volume Report

Work Order
31019

SMYTH RD/OTHELLO AVE @ RUSSELL RD W

Count Date: 01-Aug-12

Start Time: 7:00

		RUSSELL RD W			SMYTH RD/OTHELLO AVE			Grand Total
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
7:00 8:00		6	4	10	5	6	11	21
8:00 9:00		2	9	11	6	2	8	19
9:00 10:00		13	2	15	14	3	17	32
11:30 12:30		0	2	2	2	1	3	5
12:30 13:30		1	4	5	1	2	3	8
15:00 16:00		4	5	9	3	3	6	15
16:00 17:00		8	5	13	5	15	20	33
17:00 18:00		9	5	14	3	17	20	34
Total		43	36	79	39	49	88	167

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

2015-Jul-06

Page 1 of 1



Public Works - Traffic Services

Work Order
31019

Turning Movement Count - Pedestrian Volume Report

SMYTH RD/OTHELLO AVE @ RUSSELL RD W

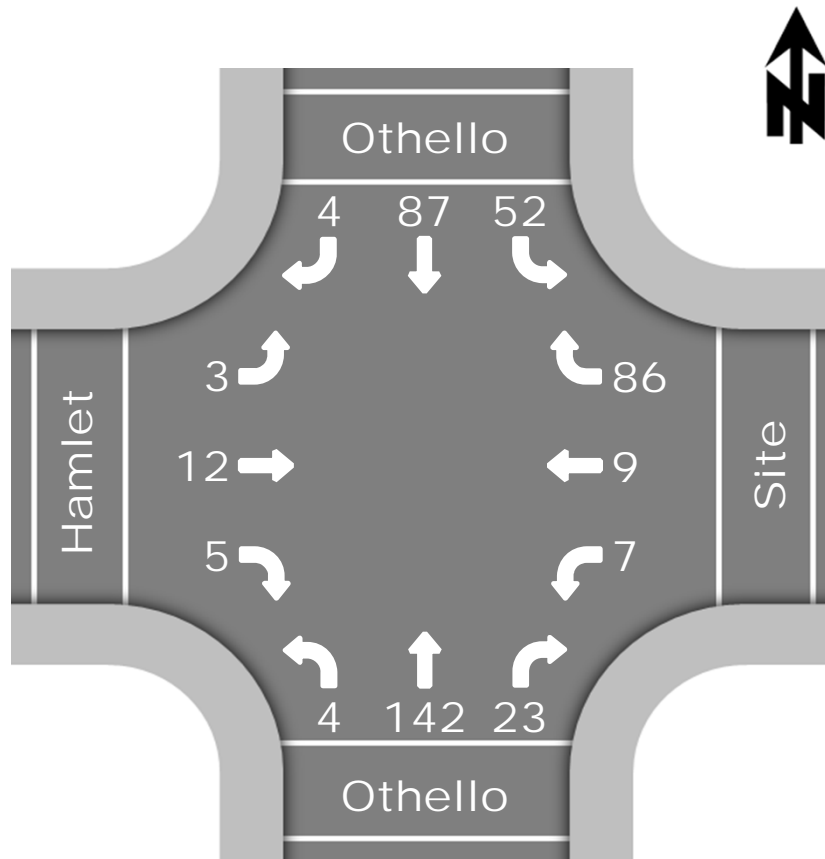
Count Date: 01-Aug-12

Start Time: 7:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
7:00 7:15	0	0	0	2	2	4	4
7:15 7:30	2	3	5	2	4	6	11
7:30 7:45	1	0	1	1	3	4	5
7:45 8:00	5	3	8	3	5	8	16
7:00 8:00	8	6	14	8	14	22	36
8:00 8:15	0	1	1	5	7	12	13
8:15 8:30	7	3	10	5	9	14	24
8:30 8:45	9	0	9	11	16	27	36
8:45 9:00	4	2	6	1	13	14	20
8:00 9:00	20	6	26	22	45	67	93
9:00 9:15	5	3	8	2	18	20	28
9:15 9:30	11	1	12	5	13	18	30
9:30 9:45	10	2	12	5	23	28	40
9:45 10:00	21	1	22	7	19	26	48
9:00 10:00	47	7	54	19	73	92	146
11:30 11:45	5	2	7	2	11	13	20
11:45 12:00	9	4	13	4	23	27	40
12:00 12:15	17	9	26	1	29	30	56
12:15 12:30	5	2	7	1	16	17	24
11:30 12:30	36	17	53	8	79	87	140
12:30 12:45	5	1	6	2	16	18	24
12:45 13:00	12	2	14	8	18	26	40
13:00 13:15	15	1	16	1	23	24	40
13:15 13:30	11	4	15	9	24	33	48
12:30 13:30	43	8	51	20	81	101	152
15:00 15:15	4	2	6	0	24	24	30
15:15 15:30	7	0	7	2	16	18	25
15:30 15:45	7	1	8	3	22	25	33
15:45 16:00	7	0	7	5	18	23	30
15:00 16:00	25	3	28	10	80	90	118
16:00 16:15	6	5	11	7	30	37	48
16:15 16:30	13	2	15	5	23	28	43
16:30 16:45	1	0	1	1	14	15	16
16:45 17:00	5	0	5	0	20	20	25
16:00 17:00	25	7	32	13	87	100	132
17:00 17:15	0	1	1	3	16	19	20
17:15 17:30	6	0	6	2	14	16	22
17:30 17:45	0	0	0	5	9	14	14
17:45 18:00	2	2	4	3	8	11	15
17:00 18:00	8	3	11	13	47	60	71
Total	212	57	269	113	506	619	888

Comment:

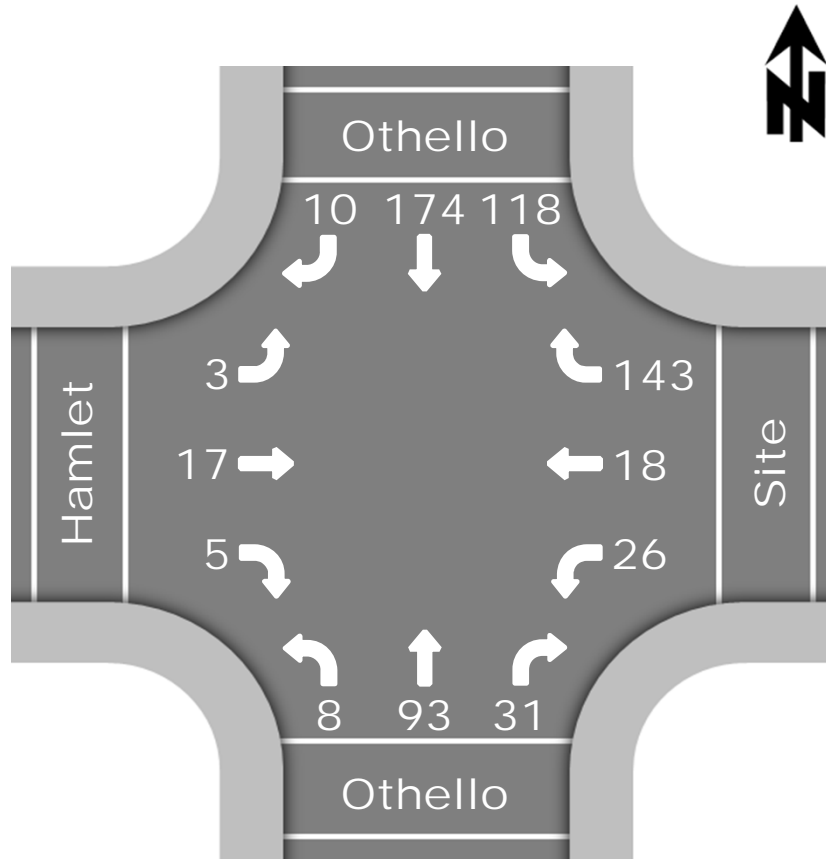
Intersection: Hamlet Rd-Site & Othello Ave
Date: July 21, 2015
Observer: Alex Buck
Weather: Overcast
Time: 8:00 AM - 9:00 AM



TIME	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
8:00 AM	0	30	8	10	21	1	0	0	0	2	0	25
8:15 AM	3	35	5	14	19	0	0	5	2	1	1	19
8:30 AM	1	43	5	11	25	0	1	4	2	0	4	20
8:45 AM	0	34	5	17	22	3	2	3	1	4	4	22
TOTAL	4	142	23	52	87	4	3	12	5	7	9	86

Notes: Northbound queue at Othello/Smyth intersection spills back into Hamlet/Othello intersection but the queue clears during the northbound green phase at the Othello/Smyth intersection.

Intersection: Hamlet Rd-Site & Othello Ave
Date: July 21, 2015
Observer: Alex Buck
Weather: Sunny, Clear
Time: 4:30 PM - 5:30 PM



TIME	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
4:30 PM	3	21	8	36	37	4	1	7	2	5	5	35
4:45 PM	3	18	5	29	44	2	1	3	1	6	5	36
5:00 PM	2	25	10	28	50	3	0	6	2	9	4	42
5:15 PM	0	29	8	25	43	1	1	1	0	6	4	30
TOTAL	8	93	31	118	174	10	3	17	5	26	18	143

Notes: Northbound queue at Othello/Smyth intersection spills back into Hamlet/Othello intersection but the queue clears during the northbound green phase at the Othello/Smyth intersection.

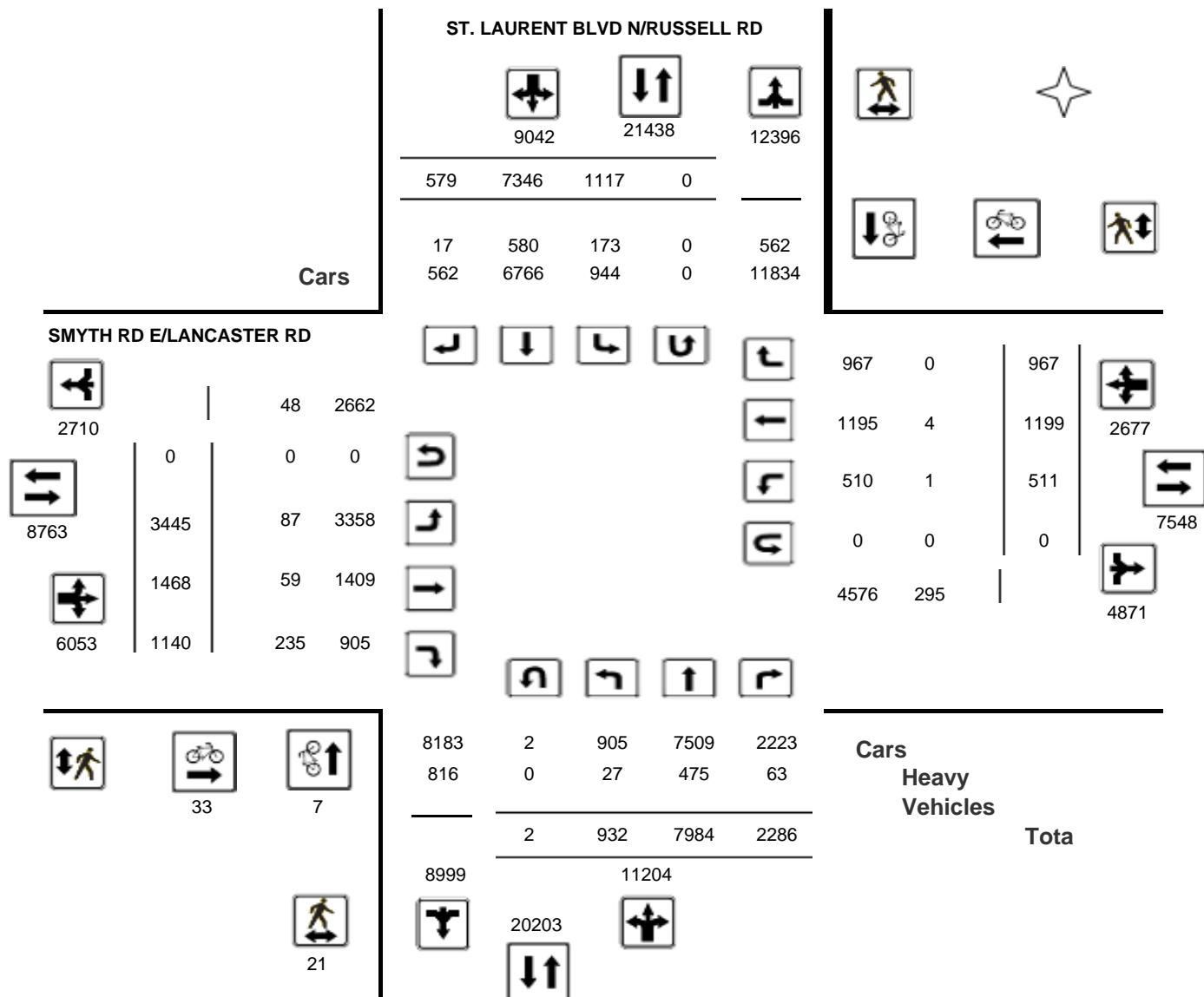
Public Works - Traffic Services

Turning Movement Count - Full Study Diagram

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

Survey Date: 29-May-14

WO#: 1024
Device: Jamar
Technologies,
Inc



Comments



Public Works - Traffic Services

Turning Movement Count - Peak Hour Diagram

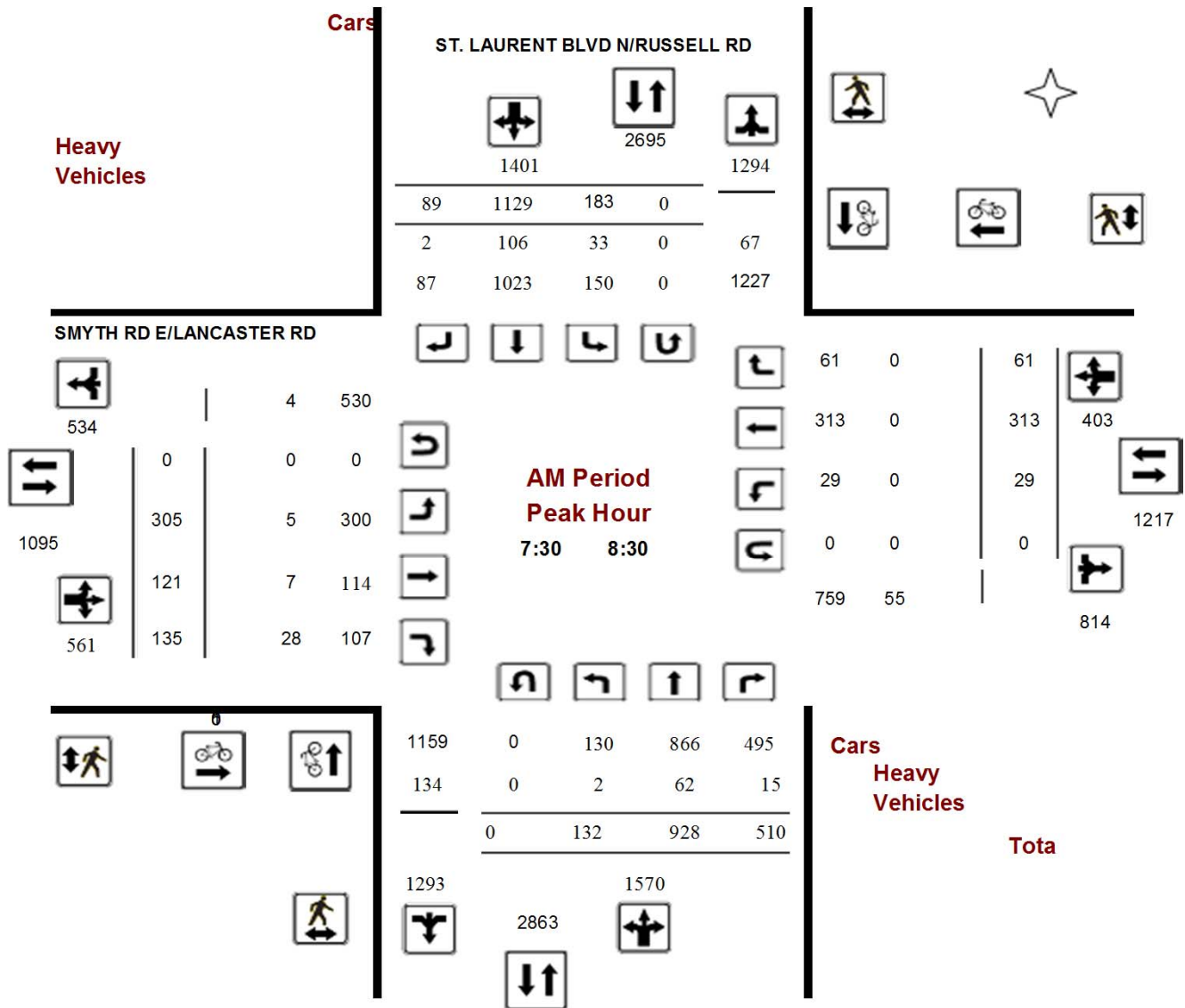
SMYTH RD E/LANCASTER RD @ ST. LAURENT BLVD N/R

Survey Date: 29-May-14

Start Time: 7:00

WO No: 1024

Device: Jamar Technologies, Inc






Comments

Heavy
Vehicles




Cars

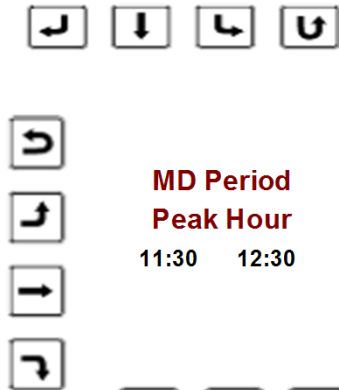
ST. LAURENT BLVD N/RUSSELL RD

		
1085	2633	1548
57	914	114
0	65	18
57	849	96
0	0	68
57	849	96
0	0	1480










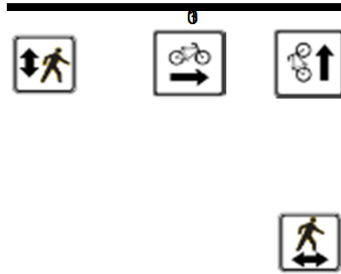
SMYTH RD E/LANCASTER RD








	266	4	262
	0	0	0
983	466	11	455
	111	9	102
717	140	24	116



MD Period
Peak Hour
11:30 12:30

	164	0	164
	103	0	103
	63	0	63
	0	0	0
404	36	0	440
	330	770	
			
			



			
1028	0	102	861
89	0	4	57
0	106	918	215
1117	2356	1239	
			

Cars
Heavy
Vehicles




Tota

Comments

Cars




Heavy
Vehicles

ST. LAURENT BLVD N/RUSSELL RD

				
	1154	3156	2002	
78	946	130	0	
2	65	18	0	71
76	881	112	0	1931



SMYTH RD E/LANCASTER RD

		8	338
346			
	0	0	0
1467	547	8	539
	395	8	387
1121	179	28	151



162 0

144 0

98 0

0 0

654 26

162

144

98

0



1084

680

PM Period
Peak Hour
16:15 17:15



1131	1	118	1230	155
93	0	6	63	0
1	124	1293	155	

1224



2797



1573



Cars

Heavy
Vehicles

Tota

Comments



Public Works - Traffic Services

Work Order
1024

Turning Movement Count - Full Study Summary Report

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

Survey Date: 29-May-14

Total Observed U-Turns

AADT Factor

Northbound: 2 Southbound: 0
Eastbound: 0 Westbound: 0
0.90

Full Study

		ST. LAURENT BLVD N/RUSSELL RD									SMYTH RD E/LANCASTER RD											Grand Total
		Northbound				Southbound					Eastbound				Westbound							
Period		LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TO	STR TOT			
7:00	8:00	119	876	493	1488	162	1028	82	1272	2760	232	90	121	443	29	319	56	404	847	3607		
8:00	9:00	155	853	527	1535	190	1106	95	1391	2926	323	124	123	570	25	247	81	353	923	3849		
9:00	10:00	134	739	298	1171	140	818	65	1023	2194	332	119	118	569	49	94	83	226	795	2989		
11:30	12:30	106	918	215	1239	114	914	57	1085	2324	466	111	140	717	63	103	164	330	1047	3371		
12:30	13:30	103	1021	243	1367	123	815	63	1001	2368	436	104	155	695	47	90	135	272	967	3335		
15:00	16:00	94	1157	229	1480	135	873	77	1085	2565	582	316	159	1057	106	94	120	320	1377	3942		
16:00	17:00	126	1258	160	1544	120	956	80	1156	2700	546	418	175	1139	105	132	151	388	1527	4227		
17:00	18:00	95	1162	121	1378	133	836	60	1029	2407	528	186	149	863	87	120	177	384	1247	3654		
Total		932	7984	2286	11202	1117	7346	579	9042	20244	3445	1468	1140	6053	511	1199	967	2677	8730	28974		
Equ 12Hr		1295	11097	3177	15569	1552	10210	804	12566	28135	4788	2040	1584	8412	710	1666	1344	3720	12132	40267		
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.															1.39							
Avg 12Hr		1165	9987	2859	14011	1396	9189	723	11309	25321	4309	1836	1425	7570	639	1499	1209	3348	10918	36240		
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.															0.90							
Avg 24Hr		1526	13082	3745	18354	1828	12037	947	14814	33170	5644	2405	1866	9916	837	1963	1583	4385	14302	47474		
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.															1.31							

Comments:

Note: U-Turns are included in Totals.

2015-Jul-06



Public Works - Traffic Services

W.O.

1024

Turning Movement Count - 15 Minute Summary Report

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

Survey Date: 29-May-14

Total Observed U-Turns

Northbound: 2 Southbound: 0
Eastbound: 0 Westbound: 0

ST. LAURENT BLVD N/RUSSELL RD

SMYTH RD E/LANCASTER RD

Time Period		Northbound				Southbound				Eastbound				Westbound				W TOT		STR TOT		Grand Total	
		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT						
7:00	7:15	23	158	104	285	28	198	16	242	527	36	16	21	73	6	78	15	99	172	699			
7:15	7:30	27	231	144	402	37	254	24	315	717	47	20	29	96	6	72	15	93	189	906			
7:30	7:45	30	229	121	380	46	262	21	329	709	79	23	39	141	8	81	11	100	241	950			
7:45	8:00	39	258	124	421	51	314	21	386	807	70	31	32	133	9	88	15	112	245	1052			
8:00	8:15	33	220	137	390	37	288	24	349	739	91	31	32	154	6	75	13	94	248	987			
8:15	8:30	30	221	128	379	49	265	23	337	716	65	36	32	133	6	69	22	97	230	946			
8:30	8:45	45	202	99	346	53	286	20	359	705	78	22	30	130	5	52	25	82	212	917			
8:45	9:00	47	210	163	420	51	267	28	346	766	89	35	29	153	8	51	21	80	233	999			
9:00	9:15	42	194	82	318	41	215	24	280	598	93	38	42	173	14	18	11	43	216	814			
9:15	9:30	30	196	82	308	32	216	16	264	572	84	31	20	135	15	28	23	66	201	773			
9:30	9:45	31	171	76	278	32	185	13	230	508	90	21	30	141	11	27	25	63	204	712			
9:45	10:00	31	178	58	267	35	202	12	249	516	65	29	26	120	9	21	24	54	174	690			
11:30	11:45	22	234	67	323	30	235	11	276	599	119	28	30	177	19	24	38	81	258	857			
11:45	12:00	26	210	63	299	24	238	11	273	572	127	28	30	185	7	25	40	72	257	829			
12:00	12:15	31	252	37	320	26	222	20	268	588	125	28	39	192	23	35	48	106	298	886			
12:15	12:30	27	222	48	297	34	219	15	268	565	95	27	41	163	14	19	38	71	234	799			
12:30	12:45	22	243	47	312	30	210	18	258	570	124	36	45	205	17	26	34	77	282	852			
12:45	13:00	29	219	72	320	35	214	17	266	586	103	29	33	165	15	24	34	73	238	824			
13:00	13:15	21	313	52	386	22	180	12	214	600	108	21	47	176	4	20	33	57	233	833			
13:15	13:30	31	246	72	349	36	211	16	263	612	101	18	30	149	11	20	34	65	214	826			
15:00	15:15	33	260	52	345	37	200	16	253	598	153	59	29	241	36	27	40	103	344	942			
15:15	15:30	17	302	59	378	34	240	26	300	678	173	79	37	289	24	21	28	73	362	1040			
15:30	15:45	13	308	75	396	33	256	14	303	699	132	86	54	272	32	21	26	79	351	1050			
15:45	16:00	31	287	43	361	31	177	21	229	590	124	92	39	255	14	25	26	65	320	910			
16:00	16:15	37	288	31	356	34	248	14	296	652	145	89	28	262	36	30	52	118	380	1032			
16:15	16:30	28	320	35	383	22	219	21	262	645	145	104	50	299	25	28	28	81	380	1025			
16:30	16:45	31	349	55	435	39	258	22	319	754	150	93	46	289	21	36	42	99	388	1142			
16:45	17:00	30	301	39	370	25	231	23	279	649	106	132	51	289	23	38	29	90	379	1028			
17:00	17:15	35	323	26	385	44	238	12	294	679	146	66	32	244	29	42	63	134	378	1057			
17:15	17:30	28	339	26	394	44	213	25	282	676	130	45	44	219	29	37	35	101	320	996			
17:30	17:45	12	264	36	312	26	204	12	242	554	120	41	41	202	7	17	38	62	264	818			
17:45	18:00	20	236	33	289	19	181	11	211	500	132	34	32	198	22	24	41	87	285	785			
TOTAL:		932	7984	2286	11204	1117	7346	579	9042	20246	3445	1468	1140	6053	511	1199	967	2677	8730	28976			

Note: U-Turns are included in Totals.

Comment:

2015-Jul-06

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Public Works - Traffic Services

W.O.
1024

Turning Movement Count - Heavy Vehicle Report

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

Survey Date: 29-May-14

ST. LAURENT BLVD N/RUSSELL RD										SMYTH RD E/LANCASTER RD										Grand Total
Time Period	Northbound				Southbound				S TOT	STR TOT	Eastbound				Westbound				W TOT	
	LT	ST	RT	N TOT	LT	ST	RT	LT			ST	RT	E TOT	LT	ST	RT	R TOT			
7:00	8:00	3	55	12	70	24	74	1	99	169	2	7	27	36	0	0	0	0	36	205
8:00	9:00	5	65	11	81	41	108	4	153	234	18	4	31	53	0	0	0	0	53	287
9:00	10:00	2	56	9	67	23	102	4	129	196	21	8	38	67	0	0	0	0	67	263
11:30	12:30	4	57	9	70	18	65	0	83	153	11	9	24	44	0	0	0	0	44	197
12:30	13:30	2	54	3	59	14	64	0	78	137	11	12	24	47	0	0	0	0	47	184
15:00	16:00	3	73	18	94	19	57	4	80	174	10	10	37	57	0	3	0	3	60	234
16:00	17:00	3	58	1	62	20	64	3	87	149	6	8	24	38	1	1	0	2	40	189
17:00	18:00	5	57	0	62	14	46	1	61	123	8	1	30	39	0	0	0	0	39	162
Total :		27	475	63	565	173	580	17	770	1335	87	59	235	381	1	4	0	5	386	1721

Heavy Vehicles are vehicles having one rear axle with four or more wheels, or having two or more rear axles. These vehicles include most O.C. Transpo, school and inter-city buses. Further, they ARE included in the Turning Movement Count Summary.



Public Works - Traffic Services
Turning Movement Count - Cyclist Volume Report

Work Order
1024

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

Count Date: 29-May-14

Start Time: 7:00

		ST. LAURENT BLVD N/RUSSELL RD			SMYTH RD E/LANCASTER RD			Grand Total
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
7:00 8:00		0	2	2	5	1	6	8
8:00 9:00		0	2	2	9	1	10	12
9:00 10:00		0	1	1	5	0	5	6
11:30 12:30		0	0	0	3	0	3	3
12:30 13:30		0	2	2	1	0	1	3
15:00 16:00		3	1	4	1	0	1	5
16:00 17:00		2	3	5	4	0	4	9
17:00 18:00		2	2	4	5	0	5	9
Total		7	13	20	33	2	35	55

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

2015-Jul-06

Page 1 of 1



Public Works - Traffic Services

Work Order

1024

Turning Movement Count - Pedestrian Volume Report

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

Count Date: 29-May-14

Start Time: 7:00

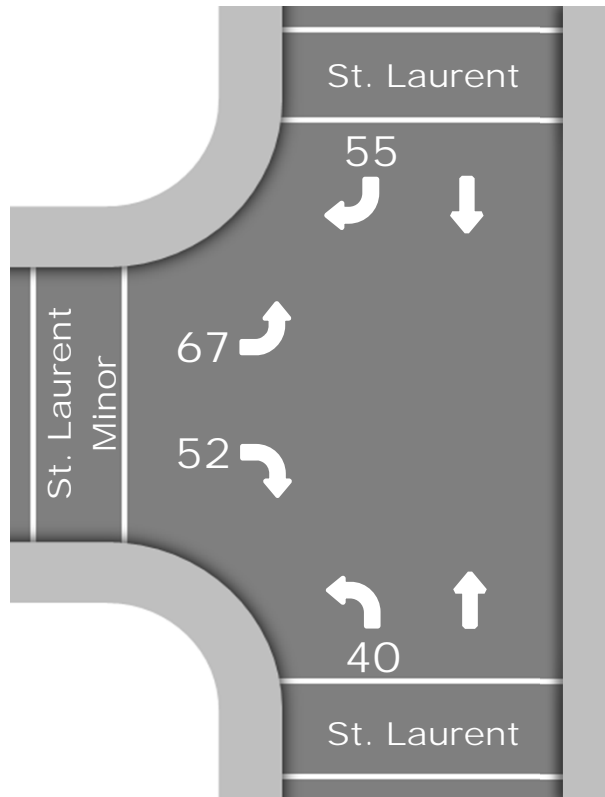
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
7:00 7:15	0	3	3	0	2	2	5
7:15 7:30	1	0	1	0	0	0	1
7:30 7:45	0	3	3	0	0	0	3
7:45 8:00	0	4	4	0	0	0	4
7:00 8:00	1	10	11	0	2	2	13
8:00 8:15	0	2	2	0	1	1	3
8:15 8:30	1	1	2	0	0	0	2
8:30 8:45	0	3	3	1	0	1	4
8:45 9:00	1	4	5	2	2	4	9
8:00 9:00	2	10	12	3	3	6	18
9:00 9:15	3	6	9	0	2	2	11
9:15 9:30	0	0	0	0	0	0	0
9:30 9:45	0	2	2	1	0	1	3
9:45 10:00	0	0	0	0	0	0	0
9:00 10:00	3	8	11	1	2	3	14
11:30 11:45	0	2	2	0	2	2	4
11:45 12:00	0	7	7	0	3	3	10
12:00 12:15	0	7	7	1	3	4	11
12:15 12:30	0	0	0	0	0	0	0
11:30 12:30	0	16	16	1	8	9	25
12:30 12:45	0	3	3	0	0	0	3
12:45 13:00	0	4	4	0	3	3	7
13:00 13:15	0	1	1	0	1	1	2
13:15 13:30	0	2	2	0	2	2	4
12:30 13:30	0	10	10	0	6	6	16
15:00 15:15	3	1	4	0	1	1	5
15:15 15:30	0	2	2	0	0	0	2
15:30 15:45	10	1	11	0	2	2	13
15:45 16:00	1	3	4	3	0	3	7
15:00 16:00	14	7	21	3	3	6	27
16:00 16:15	0	0	0	0	1	1	1
16:15 16:30	0	5	5	0	0	0	5
16:30 16:45	0	2	2	0	1	1	3
16:45 17:00	1	5	6	8	1	9	15
16:00 17:00	1	12	13	8	3	11	24
17:00 17:15	0	4	4	0	5	5	9
17:15 17:30	0	2	2	1	3	4	6
17:30 17:45	0	5	5	0	4	4	9
17:45 18:00	0	0	0	0	3	3	3
17:00 18:00	0	11	11	1	15	16	27
Total	21	84	105	17	42	59	164

Comment:

2015-Jul-06

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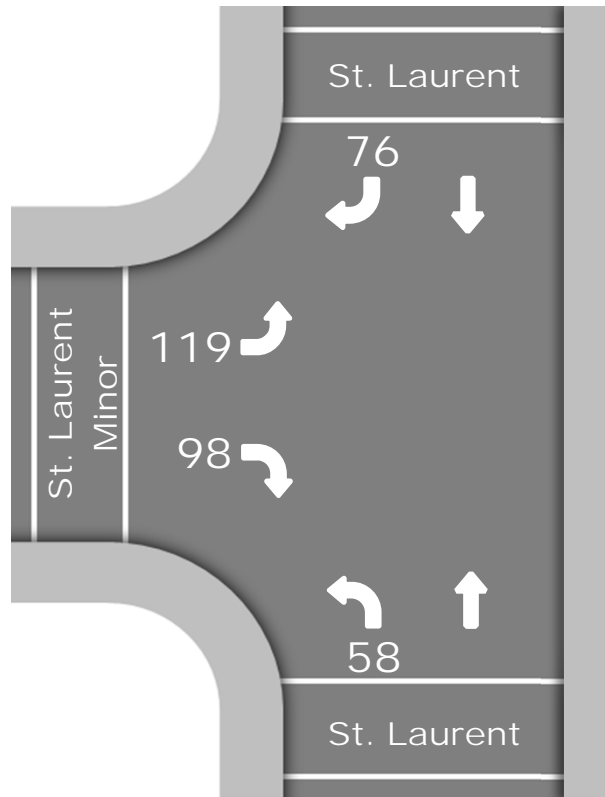
Intersection: St. Laurent Blvd & St. Laurent Blvd (Minor)
Date: July 23, 2015
Observer: Alex Buck
Weather: Sunny, Clear
Time: 8:00 AM - 9:00 AM



TIME	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
8:00 AM	10	0	0	0	0	8	11	0	11	0	0	0
8:15 AM	12	0	0	0	0	18	16	0	14	0	0	0
8:30 AM	12	0	0	0	0	11	25	0	15	0	0	0
8:45 AM	6	0	0	0	0	18	15	0	12	0	0	0
TOTAL	40					55	67		52			

Notes:

Intersection: St. Laurent Blvd & St. Laurent Blvd (Minor)
Date: July 22, 2015
Observer: Alex Buck
Weather: Overcast
Time: 4:30 PM - 5:30 PM





















TIME	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
4:30 PM	12	0	0	0	0	16	23	0	22	0	0	0
4:45 PM	14	0	0	0	0	22	28	0	23	0	0	0
5:00 PM	19	0	0	0	0	19	37	0	22	0	0	0
5:15 PM	13	0	0	0	0	19	31	0	31	0	0	0
TOTAL	58					76	119		98			

Notes:










Appendix C

SYNCHRO Capacity Analysis: Existing Conditions

















Existing - AM
6: St. Laurent & Site

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	20	16	2	22	51	527	8	8	402	17
Future Volume (Veh/h)	16	0	20	16	2	22	51	527	8	8	402	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	17	0	21	17	2	23	54	555	8	8	423	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								243			129	
pX, platoon unblocked												
vC, conflicting volume	858	1119	220	916	1124	282	441			563		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	858	1119	220	916	1124	282	441			563		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	97	92	99	97	95			99		
cM capacity (veh/h)	230	194	783	212	193	716	1115			1005		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	38	42	54	370	193	8	282	159				
Volume Left	17	17	54	0	0	8	0	0				
Volume Right	21	23	0	0	8	0	0	18				
cSH	378	342	1115	1700	1700	1005	1700	1700				
Volume to Capacity	0.10	0.12	0.05	0.22	0.11	0.01	0.17	0.09				
Queue Length 95th (m)	2.5	3.2	1.2	0.0	0.0	0.2	0.0	0.0				
Control Delay (s)	15.6	17.0	8.4	0.0	0.0	8.6	0.0	0.0				
Lane LOS	C	C	A			A						
Approach Delay (s)	15.6	17.0	0.7			0.2						
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			32.3%		ICU Level of Service				A			
Analysis Period (min)			15									










Existing - AM
8: Pleasant Park & Othello

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	57	155	104	63	62	46
Future Volume (vph)	57	155	104	63	62	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	60	163	109	66	65	48
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	223	175	113			
Volume Left (vph)	60	0	65			
Volume Right (vph)	0	66	48			
Hadj (s)	0.09	-0.19	-0.11			
Departure Headway (s)	4.5	4.2	4.7			
Degree Utilization, x	0.28	0.21	0.15			
Capacity (veh/h)	785	811	712			
Control Delay (s)	9.1	8.3	8.5			
Approach Delay (s)	9.1	8.3	8.5			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			38.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Existing - AM
10: Othello & Hamlet/Site










												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	12	5	7	9	86	4	142	23	52	87	4
Future Volume (Veh/h)	3	12	5	7	9	86	4	142	23	52	87	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	13	5	7	9	91	4	149	24	55	92	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)											81	
pX, platoon unblocked												
vC, conflicting volume	468	385	94	384	375	161	96			173		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	468	385	94	384	375	161	96			173		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	99	98	90	100			96		
cM capacity (veh/h)	433	526	963	542	533	884	1498			1404		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	21	107	177	151								
Volume Left	3	7	4	55								
Volume Right	5	91	24	4								
cSH	570	806	1498	1404								
Volume to Capacity	0.04	0.13	0.00	0.04								
Queue Length 95th (m)	0.9	3.5	0.1	0.9								
Control Delay (s)	11.6	10.1	0.2	3.0								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.6	10.1	0.2	3.0								
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			35.1%		ICU Level of Service				A			
Analysis Period (min)			15									

Existing - AM
13: Othello & Site



















						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	23	42	117	28	21	70
Future Volume (Veh/h)	23	42	117	28	21	70
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	24	44	123	29	22	74
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	256	138			152	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	256	138			152	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	95			98	
cM capacity (veh/h)	722	911			1429	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	68	152	96			
Volume Left	24	0	22			
Volume Right	44	29	0			
cSH	834	1700	1429			
Volume to Capacity	0.08	0.09	0.02			
Queue Length 95th (m)	2.0	0.0	0.4			
Control Delay (s)	9.7	0.0	1.8			
Lane LOS	A		A			
Approach Delay (s)	9.7	0.0	1.8			
Approach LOS	A					
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			27.5%	ICU Level of Service		A
Analysis Period (min)			15			

Existing - AM










14: Russell & St. Laurent Towers

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	4	2	644	338	2
Future Volume (Veh/h)	10	4	2	644	338	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	4	2	678	356	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)					216	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	1039	357	358			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1005	272	273			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	99	100			
cM capacity (veh/h)	249	714	1201			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	15	680	358			
Volume Left	11	2	0			
Volume Right	4	0	2			
cSH	301	1201	1700			
Volume to Capacity	0.05	0.00	0.21			
Queue Length 95th (m)	1.2	0.0	0.0			
Control Delay (s)	17.6	0.0	0.0			
Lane LOS	C	A				
Approach Delay (s)	17.6	0.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			47.5%	ICU Level of Service		A
Analysis Period (min)			15			

















Existing - PM
6: St. Laurent & Site

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	6	41	10	3	22	70	589	20	29	809	34
Future Volume (Veh/h)	20	6	41	10	3	22	70	589	20	29	809	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	6	43	11	3	23	74	620	21	31	852	36
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								243			129	
pX, platoon unblocked	0.88	0.88	0.88	0.88	0.88		0.88					
vC, conflicting volume	1414	1721	444	1312	1728	320	888			641		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1200	1548	98	1084	1557	320	602			641		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	93	95	91	97	97	91			97		
cM capacity (veh/h)	106	88	826	124	87	675	855			939		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	70	37	74	413	228	31	568	320				
Volume Left	21	11	74	0	0	31	0	0				
Volume Right	43	23	0	0	21	0	0	36				
cSH	220	235	855	1700	1700	939	1700	1700				
Volume to Capacity	0.32	0.16	0.09	0.24	0.13	0.03	0.33	0.19				
Queue Length 95th (m)	9.9	4.2	2.2	0.0	0.0	0.8	0.0	0.0				
Control Delay (s)	28.8	23.2	9.6	0.0	0.0	9.0	0.0	0.0				
Lane LOS	D	C	A			A						
Approach Delay (s)	28.8	23.2	1.0			0.3						
Approach LOS	D	C										
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			44.4%		ICU Level of Service				A			
Analysis Period (min)			15									










Existing - PM
8: Pleasant Park & Othello

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	103	160	140	56	91	97
Future Volume (vph)	103	160	140	56	91	97
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	108	168	147	59	96	102
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	276	206	198			
Volume Left (vph)	108	0	96			
Volume Right (vph)	0	59	102			
Hadj (s)	0.11	-0.14	-0.18			
Departure Headway (s)	4.8	4.6	4.9			
Degree Utilization, x	0.37	0.26	0.27			
Capacity (veh/h)	716	736	686			
Control Delay (s)	10.5	9.3	9.6			
Approach Delay (s)	10.5	9.3	9.6			
Approach LOS	B	A	A			
Intersection Summary						
Delay			9.9			
Level of Service			A			
Intersection Capacity Utilization			47.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Existing - PM
10: Othello & Hamlet/Site










												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	17	5	26	18	143	8	93	31	118	174	10
Future Volume (Veh/h)	3	17	5	26	18	143	8	93	31	118	174	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	18	5	27	19	151	8	98	33	124	183	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)											81	
pX, platoon unblocked	0.99	0.99	0.99	0.99	0.99		0.99					
vC, conflicting volume	728	584	188	581	572	114	194			131		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	717	571	170	568	560	114	176			131		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	95	99	93	95	84	99			91		
cM capacity (veh/h)	256	386	861	382	392	938	1381			1454		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	26	197	139	318								
Volume Left	3	27	8	124								
Volume Right	5	151	33	11								
cSH	406	703	1381	1454								
Volume to Capacity	0.06	0.28	0.01	0.09								
Queue Length 95th (m)	1.6	8.7	0.1	2.1								
Control Delay (s)	14.5	12.1	0.5	3.5								
Lane LOS	B	B	A	A								
Approach Delay (s)	14.5	12.1	0.5	3.5								
Approach LOS	B	B										
Intersection Summary												
Average Delay			5.8									
Intersection Capacity Utilization			51.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Existing - PM
13: Othello & Site

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	68	78	98	58	59	158
Future Volume (Veh/h)	68	78	98	58	59	158
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	72	82	103	61	62	166
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	424	134			164	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	424	134			164	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	91			96	
cM capacity (veh/h)	561	916			1414	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	154	164	228			
Volume Left	72	0	62			
Volume Right	82	61	0			
cSH	707	1700	1414			
Volume to Capacity	0.22	0.10	0.04			
Queue Length 95th (m)	6.3	0.0	1.0			
Control Delay (s)	11.5	0.0	2.4			
Lane LOS	B		A			
Approach Delay (s)	11.5	0.0	2.4			
Approach LOS	B					
Intersection Summary						
Average Delay			4.2			
Intersection Capacity Utilization			40.4%	ICU Level of Service		A
Analysis Period (min)			15			



















Existing - PM

14: Russell & St. Laurent Towers

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	18	8	523	814	19
Future Volume (Veh/h)	11	18	8	523	814	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	19	8	551	857	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)					212	
pX, platoon unblocked	0.68	0.68	0.68			
vC, conflicting volume	1434	867	877			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1403	569	584			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	95	99			
cM capacity (veh/h)	104	355	674			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	31	559	877			
Volume Left	12	8	0			
Volume Right	19	0	20			
cSH	183	674	1700			
Volume to Capacity	0.17	0.01	0.52			
Queue Length 95th (m)	4.5	0.3	0.0			
Control Delay (s)	28.7	0.3	0.0			
Lane LOS	D	A				
Approach Delay (s)	28.7	0.3	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			56.4%	ICU Level of Service		B
Analysis Period (min)			15			

Existing - AM

1: Othello/Russell & Smyth

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	372	48	52	623	70	73	105	97	95	62	14
Future Volume (vph)	8	372	48	52	623	70	73	105	97	95	62	14
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	392	51	55	656	74	77	111	102	100	65	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	443	0	55	730	0	0	290	0	0	180	0
Turn Type	Perm	NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			6		4	4		3	3	
Permitted Phases	2			6								
Detector Phase	2	2		6	6		4	4		3	3	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.8	33.8		33.8	33.8		31.0	31.0		29.2	29.2	
Total Split (s)	59.0	59.0		59.0	59.0		31.0	31.0		30.0	30.0	
Total Split (%)	49.2%	49.2%		49.2%	49.2%		25.8%	25.8%		25.0%	25.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.5	3.5		3.5	3.5		3.7	3.7		3.9	3.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.8	6.8		6.8	6.8			7.0			7.2	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	57.4	57.4		57.4	57.4			24.3			17.3	
Actuated g/C Ratio	0.48	0.48		0.48	0.48			0.20			0.14	
v/c Ratio	0.03	0.28		0.14	0.46			0.86			0.72	
Control Delay	20.0	19.7		9.2	11.0			69.7			63.9	
Queue Delay	0.0	0.0		0.0	0.6			0.0			0.0	
Total Delay	20.0	19.7		9.2	11.6			69.7			63.9	
LOS	B	B		A	B			E			E	
Approach Delay		19.7			11.4			69.7			63.9	
Approach LOS		B			B			E			E	
Queue Length 50th (m)	1.0	32.7		3.0	63.7			64.1			40.2	
Queue Length 95th (m)	4.2	45.8		6.3	78.2			#113.3			61.3	
Internal Link Dist (m)		150.3			108.3			56.8			170.5	
Turn Bay Length (m)	55.0			12.0								
Base Capacity (vph)	263	1602		404	1603			352			328	
Starvation Cap Reductn	0	0		0	485			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.28		0.14	0.65			0.82			0.55	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 75 (63%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 29.1

Intersection LOS: C

Intersection Capacity Utilization 65.4%

ICU Level of Service C





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: 1: Othello/Russell & Smyth

 Ø2 (R)	 Ø3	 Ø4
59 s	30 s	31 s
 Ø6 (R)		
59 s		

Existing - AM

2: St. Laurent & Smyth/Lancaster

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	121	135	29	313	61	132	928	510	183	1129	89
Future Volume (vph)	305	121	135	29	313	61	132	928	510	183	1129	89
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	321	127	142	31	329	64	139	977	537	193	1188	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	321	127	142	31	329	64	139	977	537	193	1188	94
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)	10.6	27.7	27.7	10.6	27.7	27.7	11.0	27.9	27.9	11.0	27.9	27.9
Total Split (s)	20.0	32.4	32.4	15.6	28.0	28.0	20.0	52.0	52.0	20.0	52.0	52.0
Total Split (%)	16.7%	27.0%	27.0%	13.0%	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-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	14.1	28.1	28.1	7.7	17.1	17.1	14.0	47.8	47.8	17.9	51.6	51.6
Actuated g/C Ratio	0.12	0.23	0.23	0.06	0.14	0.14	0.12	0.40	0.40	0.15	0.43	0.43
v/c Ratio	0.83	0.30	0.31	0.29	0.68	0.19	0.70	0.72	0.75	0.77	0.82	0.13
Control Delay	77.6	56.8	23.9	59.7	56.1	1.3	69.6	33.4	26.3	69.7	36.8	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.6	56.8	23.9	59.7	56.1	1.3	69.6	33.4	26.3	69.7	36.8	2.0
LOS	E	E	C	E	E	A	E	C	C	E	D	A
Approach Delay		60.2			48.1			34.2			38.8	
Approach LOS		E			D			C			D	
Queue Length 50th (m)	39.0	28.8	7.1	7.1	39.3	0.0	33.1	103.2	64.9	43.5	130.1	0.0
Queue Length 95th (m)	m#58.6	m44.6	m21.5	16.8	52.0	0.0	#60.0	120.7	108.5	#91.0	#179.9	4.9
Internal Link Dist (m)		108.3			148.1			67.3			155.2	
Turn Bay Length (m)	55.0			30.0		10.0			20.0	110.0		85.0
Base Capacity (vph)	394	434	476	141	629	389	212	1349	714	252	1457	726
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.29	0.30	0.22	0.52	0.16	0.66	0.72	0.75	0.77	0.82	0.13

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: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 41.0

Intersection LOS: D

Intersection Capacity Utilization 78.3%

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: 2: St. Laurent & Smyth/Lancaster

					
Ø1	Ø2 (R)	Ø3	Ø4	Ø5	Ø6 (R)
20 s	52 s	15.6 s	32.4 s	20 s	28 s

Existing - AM
4: Russell & St. Laurent




						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	694	56	30	624	284	431
Future Volume (vph)	694	56	30	624	284	431
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	731	59	32	657	299	454
Shared Lane Traffic (%)						
Lane Group Flow (vph)	790	0	32	657	299	454
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0
Minimum Split (s)	30.0		15.5	15.5	24.5	24.5
Total Split (s)	30.0		30.0	30.0	30.0	30.0
Total Split (%)	50.0%		50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.3		3.3	3.3	3.3	3.3
All-Red Time (s)	2.7		2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	19.6		28.9	28.9	28.9	28.9
Actuated g/C Ratio	0.33		0.48	0.48	0.48	0.48
v/c Ratio	0.73		0.07	0.40	0.18	0.47
Control Delay	22.1		10.6	11.8	11.6	8.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	22.1		10.6	11.8	11.6	8.3
LOS	C		B	B	B	A
Approach Delay	22.1			11.7	9.6	
Approach LOS	C			B	A	
Queue Length 50th (m)	25.1		1.8	23.3	20.1	32.6
Queue Length 95th (m)	63.0		6.5	39.3	m30.3	m60.2
Internal Link Dist (m)	126.3			111.3	153.9	
Turn Bay Length (m)			60.0			90.0
Base Capacity (vph)	1319		488	1631	1631	965
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.60		0.07	0.40	0.18	0.47

Intersection Summary











Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 14.7
 Intersection Capacity Utilization 53.6%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 4: Russell & St. Laurent

 Ø2 (R)	 Ø4
30 s	30 s
 Ø6 (R)	
30 s	




Existing - AM
5: St. Laurent & Transit Loop

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	67	52	40	525	375	55
Future Volume (vph)	67	52	40	525	375	55
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	71	55	42	553	395	58
Shared Lane Traffic (%)						
Lane Group Flow (vph)	126	0	42	553	453	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Detector Phase	4		2	2	6	
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	
Minimum Split (s)	29.4		28.4	28.4	28.4	
Total Split (s)	30.0		30.0	30.0	30.0	
Total Split (%)	50.0%		50.0%	50.0%	50.0%	
Yellow Time (s)	3.3		3.3	3.3	3.3	
All-Red Time (s)	2.1		2.1	2.1	2.1	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.4		5.4	5.4	5.4	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		C-Max	C-Max	C-Max	
Act Effct Green (s)	12.8		40.6	40.6	40.6	
Actuated g/C Ratio	0.21		0.68	0.68	0.68	
v/c Ratio	0.32		0.07	0.24	0.20	
Control Delay	13.2		5.2	5.3	9.7	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	13.2		5.2	5.3	9.7	
LOS	B		A	A	A	
Approach Delay	13.2			5.3	9.7	
Approach LOS	B			A	A	
Queue Length 50th (m)	6.9		1.6	14.7	15.2	
Queue Length 95th (m)	13.4		m4.8	30.4	37.8	
Internal Link Dist (m)	24.2			105.1	126.3	
Turn Bay Length (m)			60.0			
Base Capacity (vph)	702		592	2291	2259	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.18		0.07	0.24	0.20	

Intersection Summary













Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 45 (75%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.32
 Intersection Signal Delay: 7.8
 Intersection Capacity Utilization 43.0%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: St. Laurent & Transit Loop

 Ø2 (R)	 Ø4
30 s	30 s
 Ø6 (R)	
30 s	

Existing - AM

7: St. Laurent & Pleasant Park

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	130	104	145	644	567	101
Future Volume (vph)	130	104	145	644	567	101
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	109	153	678	597	106
Shared Lane Traffic (%)						
Lane Group Flow (vph)	137	109	153	678	597	106
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	24.5	24.5	15.5	15.5	24.5	24.5
Total Split (s)	25.0	25.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.2	12.2	41.0	41.0	41.0	41.0
Actuated g/C Ratio	0.20	0.20	0.68	0.68	0.68	0.68
v/c Ratio	0.40	0.28	0.33	0.56	0.49	0.10
Control Delay	23.4	6.2	9.6	10.5	6.2	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	6.2	9.6	10.5	6.2	0.4
LOS	C	A	A	B	A	A
Approach Delay	15.7			10.3	5.3	
Approach LOS	B			B	A	
Queue Length 50th (m)	13.8	0.0	6.3	35.0	25.3	0.2
Queue Length 95th (m)	22.4	8.7	24.1	#97.8	30.2	0.1
Internal Link Dist (m)	138.9			102.6	218.8	
Turn Bay Length (m)	40.0		40.0			
Base Capacity (vph)	550	566	466	1219	1219	1070
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	0.25	0.19	0.33	0.56	0.49	0.10

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 62.1%



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: 7: St. Laurent & Pleasant Park

		
Ø2 (R)		Ø4
35 s		25 s
		
Ø6 (R)		
35 s		

Existing - PM

1: Othello/Russell & Smyth

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	608	100	71	363	56	39	118	88	114	140	15
Future Volume (vph)	10	608	100	71	363	56	39	118	88	114	140	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	640	105	75	382	59	41	124	93	120	147	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	745	0	75	441	0	0	258	0	0	283	0
Turn Type	Perm	NA		pm+pt	NA		Split	NA		Split	NA	
Protected Phases		2		1	6		4	4		3	3	
Permitted Phases	2			6								
Detector Phase	2	2		1	6		4	4		3	3	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.8	33.8		10.6	33.8		31.0	31.0		29.2	29.2	
Total Split (s)	41.0	41.0		13.0	54.0		32.0	32.0		34.0	34.0	
Total Split (%)	34.2%	34.2%		10.8%	45.0%		26.7%	26.7%		28.3%	28.3%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	3.5	3.5		2.3	3.5		3.7	3.7		3.9	3.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.8	6.8		5.6	6.8			7.0			7.2	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	42.9	42.9		54.8	53.6			22.1			23.3	
Actuated g/C Ratio	0.36	0.36		0.46	0.45			0.18			0.19	
v/c Ratio	0.03	0.62		0.30	0.30			0.83			0.84	
Control Delay	31.4	36.5		38.5	37.3			69.5			67.1	
Queue Delay	0.0	0.1		0.0	0.0			0.0			0.1	
Total Delay	31.4	36.6		38.5	37.3			69.5			67.2	
LOS	C	D		D	D			E			E	
Approach Delay		36.5			37.5			69.5			67.2	
Approach LOS		D			D			E			E	
Queue Length 50th (m)	1.8	81.2		15.3	48.0			58.1			63.3	
Queue Length 95th (m)	6.5	106.2		m26.3	m63.3			#92.0			#93.9	
Internal Link Dist (m)		150.3			108.2			56.8			170.5	
Turn Bay Length (m)	55.0			12.0								
Base Capacity (vph)	316	1197		254	1491			350			388	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	35		0	0			0			2	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.64		0.30	0.30			0.74			0.73	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 82 (68%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 46.3

Intersection LOS: D

Intersection Capacity Utilization 75.3%

ICU Level of Service D

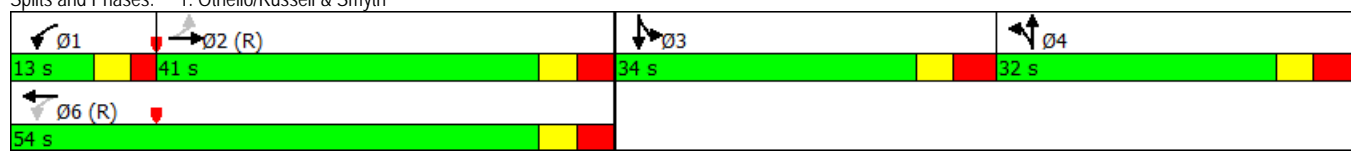
Analysis Period (min) 15

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: 1: Othello/Russell & Smyth



Existing - PM

2: St. Laurent & Smyth/Lancaster

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	547	395	179	98	144	162	124	1293	155	130	946	78
Future Volume (vph)	547	395	179	98	144	162	124	1293	155	130	946	78
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	576	416	188	103	152	171	131	1361	163	137	996	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	576	416	188	103	152	171	131	1361	163	137	996	82
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)	10.6	27.7	27.7	10.6	27.7	27.7	11.0	27.9	27.9	11.0	27.9	27.9
Total Split (s)	26.0	38.4	38.4	15.6	28.0	28.0	17.0	49.0	49.0	17.0	49.0	49.0
Total Split (%)	21.7%	32.0%	32.0%	13.0%	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-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	20.4	30.9	30.9	9.6	20.1	20.1	11.2	44.9	44.9	11.4	45.1	45.1
Actuated g/C Ratio	0.17	0.26	0.26	0.08	0.17	0.17	0.09	0.37	0.37	0.10	0.38	0.38
v/c Ratio	1.03	0.91	0.36	0.76	0.27	0.42	0.83	1.07	0.24	0.86	0.78	0.12
Control Delay	87.2	58.0	4.1	86.6	44.0	8.4	87.6	81.6	4.6	94.8	39.0	0.4
Queue Delay	0.0	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.2	67.2	4.1	86.6	44.0	8.4	87.6	81.6	4.6	94.8	39.0	0.4
LOS	F	E	A	F	D	A	F	F	A	F	D	A
Approach Delay		66.9			40.0			74.5			42.7	
Approach LOS		E			D			E			D	
Queue Length 50th (m)	~62.5	99.1	8.7	24.1	16.2	0.0	31.5	~188.7	2.7	32.4	111.0	0.0
Queue Length 95th (m)	#106.8	#148.0	m10.0	#51.2	26.0	15.7	#66.0	#233.7	11.8	#68.8	137.4	0.0
Internal Link Dist (m)		108.2			148.1			67.3			155.2	
Turn Bay Length (m)	55.0			30.0		10.0			20.0	110.0		85.0
Base Capacity (vph)	558	486	550	141	629	430	159	1268	680	160	1274	682
Starvation Cap Reductn	0	51	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.96	0.34	0.73	0.24	0.40	0.82	1.07	0.24	0.86	0.78	0.12

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: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 60.6

Intersection LOS: E

Intersection Capacity Utilization 92.3%

ICU Level of Service F

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: 2: St. Laurent & Smyth/Lancaster

					
Ø1	Ø2 (R)		Ø3	Ø4	
17 s	49 s		15.6 s	38.4 s	
					
Ø5	Ø6 (R)		Ø7	Ø8	
17 s	49 s		26 s	28 s	

Existing - PM
4: Russell & St. Laurent

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	 			 	 	
Traffic Volume (vph)	736	95	92	442	738	778
Future Volume (vph)	736	95	92	442	738	778
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	775	100	97	465	777	819
Shared Lane Traffic (%)						
Lane Group Flow (vph)	875	0	97	465	777	819
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	10.0
Minimum Split (s)	30.0		15.5	15.5	24.5	24.5
Total Split (s)	33.0		27.0	27.0	27.0	27.0
Total Split (%)	55.0%		45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.3		3.3	3.3	3.3	3.3
All-Red Time (s)	2.7		2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	21.6		26.9	26.9	26.9	26.9
Actuated g/C Ratio	0.36		0.45	0.45	0.45	0.45
v/c Ratio	0.73		0.40	0.31	0.51	0.72
Control Delay	15.1		20.1	12.3	18.3	18.1
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	15.1		20.1	12.3	18.3	18.1
LOS	B		C	B	B	B
Approach Delay	15.1			13.7	18.2	
Approach LOS	B			B	B	
Queue Length 50th (m)	41.7		6.8	16.3	69.9	131.0
Queue Length 95th (m)	14.8		#23.0	29.8	92.1	171.6
Internal Link Dist (m)	126.3			108.0	153.9	
Turn Bay Length (m)			60.0			90.0
Base Capacity (vph)	1484		240	1519	1519	1132
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.59		0.40	0.31	0.51	0.72

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 27 (45%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 16.5

Intersection LOS: B

Intersection Capacity Utilization 69.3%




ICU Level of Service C

Analysis Period (min) 15











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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Russell & St. Laurent

 Ø2 (R)	 Ø4
27 s	33 s
 Ø6 (R)	
27 s	




Existing - PM
5: St. Laurent & Transit Loop

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	119	98	58	573	774	76
Future Volume (vph)	119	98	58	573	774	76
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	125	103	61	603	815	80
Shared Lane Traffic (%)						
Lane Group Flow (vph)	228	0	61	603	895	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Detector Phase	4		2	2	6	
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	10.0	
Minimum Split (s)	29.4		28.4	28.4	28.4	
Total Split (s)	30.0		30.0	30.0	30.0	
Total Split (%)	50.0%		50.0%	50.0%	50.0%	
Yellow Time (s)	3.3		3.3	3.3	3.3	
All-Red Time (s)	2.1		2.1	2.1	2.1	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.4		5.4	5.4	5.4	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		C-Max	C-Max	C-Max	
Act Effct Green (s)	13.7		35.5	35.5	35.5	
Actuated g/C Ratio	0.23		0.59	0.59	0.59	
v/c Ratio	0.53		0.20	0.30	0.45	
Control Delay	16.7		8.2	6.1	7.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	16.7		8.2	6.1	7.1	
LOS	B		A	A	A	
Approach Delay	16.7			6.3	7.1	
Approach LOS	B			A	A	
Queue Length 50th (m)	15.1		1.9	11.0	17.9	
Queue Length 95th (m)	23.6		m6.7	21.8	45.0	
Internal Link Dist (m)	24.2			105.1	126.3	
Turn Bay Length (m)			60.0			
Base Capacity (vph)	713		305	2004	1987	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.32		0.20	0.30	0.45	

Intersection Summary













Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 45 (75%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 8.0
 Intersection Capacity Utilization 60.3%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: St. Laurent & Transit Loop

 Ø2 (R)	 Ø4
30 s	30 s
 Ø6 (R)	
30 s	

Existing - PM

7: St. Laurent & Pleasant Park

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	94	148	97	558	825	156
Future Volume (vph)	94	148	97	558	825	156
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	156	102	587	868	164
Shared Lane Traffic (%)						
Lane Group Flow (vph)	99	156	102	587	868	164
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	24.5	24.5	15.5	15.5	24.5	24.5
Total Split (s)	25.0	25.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	11.8	11.8	41.4	41.4	41.4	41.4
Actuated g/C Ratio	0.20	0.20	0.69	0.69	0.69	0.69
v/c Ratio	0.30	0.41	0.38	0.48	0.71	0.15
Control Delay	21.9	11.1	13.6	8.6	17.7	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	11.1	13.6	8.6	17.7	2.9
LOS	C	B	B	A	B	A
Approach Delay	15.3			9.3	15.4	
Approach LOS	B			A	B	
Queue Length 50th (m)	9.8	4.9	4.4	27.7	124.3	7.2
Queue Length 95th (m)	17.0	15.0	#26.0	74.6	#174.6	6.2
Internal Link Dist (m)	138.9			102.6	218.8	
Turn Bay Length (m)	40.0		40.0			
Base Capacity (vph)	550	563	271	1230	1230	1097
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	0.18	0.28	0.38	0.48	0.71	0.15

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 23 (38%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 13.3

Intersection LOS: B

Intersection Capacity Utilization 76.3%



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: 7: St. Laurent & Pleasant Park

		
Ø2 (R)		Ø4
35 s		25 s
		
Ø6 (R)		
35 s		

Appendix D

Collision Data Analysis

Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	66	9	16	27	0	4	1	3	126
Non-fatal injury	16	10	0	8	0	9	0	0	43
Non reportable	0	0	0	0	0	0	0	0	0
Total	82	19	16	35	0	13	1	3	169
	#1 or 49%	#3 or 11%	#4 or 9%	#2 or 21%	#8 or 0%	#5 or 8%	#7 or 1%	#6 or 2%	

75%
25%
0%
100%

PLEASANT PARK RD/ST. LAURENT BLVD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	29	16,209	1825	0.98

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	12	1	2	2	0	0	0	1	18
Non-fatal injury	4	1	0	0	0	6	0	0	11
Non reportable	0	0	0	0	0	0	0	0	0
Total	16	2	2	2	0	6	0	1	29
	55%	7%	7%	7%	0%	21%	0%	3%	

62%
38%
0%
100%

RUSSELL RD S/ST. LAURENT BLVD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	47	28,556	1825	0.90

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	12	6	2	9	0	1	0	0	30
Non-fatal injury	2	8	0	5	0	2	0	0	17
Non reportable	0	0	0	0	0	0	0	0	0
Total	14	14	2	14	0	3	0	0	47
	30%	30%	4%	30%	0%	6%	0%	0%	

64%
36%
0%
100%

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

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	71	47,474	1825	0.82

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	38	2	11	4	0	3	0	1	59
Non-fatal injury	8	1	0	2	0	1	0	0	12
Non reportable	0	0	0	0	0	0	0	0	0
Total	46	3	11	6	0	4	0	1	71
	65%	4%	16%	8%	0%	6%	0%	1%	

83%
17%
0%
100%

ST. LAURENT BLVD /ST. LAURENT BLVD SERVICE

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	5	13,660	1825	0.20

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	3	0	0	1	0	0	0	0	4
Non-fatal injury	1	0	0	0	0	0	0	0	1
Non reportable	0	0	0	0	0	0	0	0	0
Total	4	0	0	1	0	0	0	0	5
	80%	0%	0%	20%	0%	0%	0%	0%	

80%
20%
0%
100%

HAMLET RD/OTHELLO AVE

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	4	6,169	1825	0.36

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	0	0	0	4	0	0	0	0	4
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non reportable	0	0	0	0	0	0	0	0	0
Total	0	0	0	4	0	0	0	0	4
	0%	0%	0%	100%	0%	0%	0%	0%	

100%
0%
0%
100%

CHAPMAN BLVD/OTHELLO AVE

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	1	6,169	1825	0.09

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	0	0	0	0	0	0	0	1	1
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non reportable	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	1
	0%	0%	0%	0%	0%	0%	0%	100%	

100%
0%
0%
100%

OTHELLO AVE/PLEASANT PARK RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	3	8,131	1825	0.20

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	0	0	0	3	0	0	0	0	3
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non reportable	0	0	0	0	0	0	0	0	0
Total	0	0	0	3	0	0	0	0	3
	0%	0%	0%	100%	0%	0%	0%	0%	

100%
0%
0%
100%

OTHELLO AVE, WESTON DR to PLEASANT PARK RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	3	6,169	1825	0.27

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	0	0	0	1	0	3
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non reportable	0	0	0	0	0	0	0	0	0
Total	1	0	1	0	0	0	1	0	3
	33%	0%	33%	0%	0%	0%	33%	0%	

100%
0%
0%
100%

OTHELLO AVE , HAMLET RD to SMYTH RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	2	6,169	1825	0.18

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

50%
50%
0%
100%

OTHELLO AVE, WINGATE DR to CHAPMAN BLVD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	1	6,169	1825	0.09

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	0	0	0	0	0	0	0	0	0
Non-fatal injury	1	0	0	0	0	0	0	0	1
Non reportable	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	0	1
	100%	0%	0%	0%	0%	0%	0%	0%	

0%
100%
0%
100%

OTHELLO AVE, HAMLET RD to WINGATE DR

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2013-2017	1	6,169	1825	0.09

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total
P.D. only	0	0	0	1	0	0	0	0	1
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non reportable	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	1
	0%	0%	0%	100%	0%	0%	0%	0%	

100%
0%
0%
100%



City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2013 **To:** December 31, 2017

Location: CHAPMAN BLVD @ OTHELLO AVE

Traffic Control: Stop sign

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-May-16, Fri,11:40	Rain	Other	P.D. only	Wet	North	Reversing	Truck - closed	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	

Location: HAMLET RD @ OTHELLO AVE

Traffic Control: Yield sign

Total Collisions: 4

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Feb-01, Sat,12:20	Clear	Angle	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Jun-27, Fri,16:09	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Nov-24, Thu,09:00	Snow	Angle	P.D. only	Loose snow	West	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Sep-08, Fri,15:29	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	

North Going ahead Automobile,
station wagon Other motor
vehicle

Location: OTHELLO AVE @ PLEASANT PARK RD

Traffic Control: Stop sign

Total Collisions: 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Jan-18, Wed,08:49	Freezing Rain	Angle	P.D. only	Slush	East	Turning left	School bus	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Nov-17, Fri,19:44	Clear	Angle	P.D. only	Dry	South	Unknown	Unknown	Other motor vehicle	
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2013-Sep-12, Thu,21:55	Clear	Angle	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	

Location: OTHELLO AVE @ WESTON DR

Traffic Control: Stop sign

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jan-09, Sat,16:30	Clear	Angle	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: OTHELLO AVE @ WINGATE DR

Traffic Control: Stop sign

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Feb-05, Thu,14:53	Snow	Angle	P.D. only	Packed snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

South Turning left Automobile,
station wagon Other motor
vehicle

Location: OTHELLO AVE btwn HAMLET RD & SMYTH RD

Traffic Control: No control

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-May-27, Wed,09:51	Clear	Angle	Non-fatal injury	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	
2013-Mar-21, Thu,15:19	Snow	Angle	P.D. only	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: OTHELLO AVE btwn HAMLET RD & WINGATE DR

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jul-14, Tue,17:43	Clear	Angle	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	

Location: OTHELLO AVE btwn WESTON DR & PLEASANT PARK RD

Traffic Control: No control

Total Collisions: 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Dec-25, Thu,18:52	Clear	Sideswipe	P.D. only	Dry	South	Overtaking	Pick-up truck	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jan-07, Wed,15:50	Snow	Rear end	P.D. only	Ice	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

					South	Turning left	Automobile, station wagon	Other motor vehicle
2016-Aug-02, Tue,11:15	Clear	SMV unattended vehicle	P.D. only	Dry	Unknown	Unknown	Unknown	Unattended vehicle

Location: OTHELLO AVE btwn WINGATE DR & CHAPMAN BLVD

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-May-20, Fri,15:37	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	

Location: PLEASANT PARK RD @ ST. LAURENT BLVD

Traffic Control: Traffic signal

Total Collisions: 29

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jul-30, Wed,09:19	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	
2014-Sep-25, Thu,11:33	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle	
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2014-Dec-22, Mon,13:18	Clear	Rear end	P.D. only	Dry	North	Unknown	Unknown	Other motor vehicle	
					North	Unknown	Automobile, station wagon	Other motor vehicle	
2015-May-25, Mon,17:20	Rain	Rear end	Non-fatal injury	Wet	North	Going ahead	Pick-up truck	Other motor vehicle	

					North	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Oct-13, Tue,12:29	Rain	Rear end	Non-fatal injury	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Pick-up truck	Other motor vehicle	
2015-May-06, Wed,10:30	Clear	Turning movement	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Apr-16, Thu,11:33	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Turning right	Pick-up truck	Other motor vehicle	
2015-May-26, Tue,09:45	Clear	SMV other	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Pedestrian	1
2016-Aug-28, Sun,10:58	Rain	Rear end	Non-fatal injury	Wet	North	Going ahead	Passenger van	Other motor vehicle	
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2016-Feb-01, Mon,09:45	Clear	Rear end	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Nov-03, Thu,09:30	Rain	Rear end	Non-fatal injury	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	

2017-Aug-14, Mon,16:18	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Mar-24, Fri,18:55	Snow	Rear end	P.D. only	Slush	South	Going ahead	Pick-up truck	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Apr-26, Wed,21:29	Clear	SMV other	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Pedestrian	1
2017-May-01, Mon,17:46	Rain	SMV other	Non-fatal injury	Wet	East	Turning left	Unknown	Pedestrian	1
2017-May-31, Wed,10:48	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Delivery van	Other motor vehicle	
2017-Jun-30, Fri,15:37	Rain	Rear end	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2017-Dec-12, Tue,18:06	Snow	SMV other	Non-fatal injury	Packed snow	North	Going ahead	Automobile, station wagon	Pedestrian	1
2017-Aug-02, Wed,21:01	Clear	Sideswipe	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Turning left	Truck - tank	Other motor vehicle	

2017-Aug-11, Fri,08:38	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Fire vehicle	Other motor vehicle	
					South	Slowing or stopping	Delivery van	Other motor vehicle	
2017-Dec-29, Fri,14:22	Clear	Other	P.D. only	Dry	South	Reversing	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Jan-12, Sat,15:25	Clear	SMV other	Non-fatal injury	Wet	East	Turning left	Automobile, station wagon	Pedestrian	1
2013-Feb-15, Fri,08:27	Clear	Turning movement	Non-fatal injury	Wet	North	Turning left	Pick-up truck	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Mar-20, Wed,16:49	Clear	Rear end	P.D. only	Wet	South	Going ahead	Passenger van	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2013-Mar-08, Fri,08:43	Clear	Angle	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2013-Jun-20, Thu,16:23	Clear	SMV other	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Pedestrian	1
2013-Jun-28, Fri,12:50	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Passenger van	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	

2013-Aug-25, Sun,14:30	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning left	Passenger van	Other motor vehicle
2013-Oct-08, Tue,08:53	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Turning left	Pick-up truck	Other motor vehicle

Location: RUSSELL RD S @ ST. LAURENT BLVD

Traffic Control: Traffic signal

Total Collisions: 47

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Jan-14, Tue,18:45	Clear	Rear end	P.D. only	Wet	South	Going ahead	Unknown	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Feb-14, Fri,08:01	Snow	Rear end	P.D. only	Ice	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Truck and trailer	Other motor vehicle	
2014-Feb-21, Fri,13:12	Rain	Rear end	Non-fatal injury	Wet	South	Changing lanes	Delivery van	Other motor vehicle	
					South	Turning right	Pick-up truck	Other motor vehicle	
2014-Feb-14, Fri,16:47	Snow	Rear end	P.D. only	Slush	West	Unknown	Pick-up truck	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	

2014-Jun-18, Wed,00:30	Rain	Angle	P.D. only	Wet	East	Turning right	Passenger van	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Jun-21, Sat,17:38	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2014-Jun-20, Fri,16:46	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Delivery van	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-May-15, Thu,15:30	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Jun-18, Wed,13:21	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2014-Jul-28, Mon,13:14	Rain	Angle	Non-fatal injury	Wet	East	Turning right	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2014-Aug-25, Mon,07:53	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Motorcycle	Other motor vehicle

2014-Nov-03, Mon,15:51	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2014-Dec-04, Thu,16:48	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Oct-09, Thu,18:45	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Feb-18, Wed,18:41	Snow	Rear end	P.D. only	Loose snow	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2014-Aug-24, Sun,16:02	Clear	Angle	Non-fatal injury	Dry	East	Turning left	Passenger van	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2015-Aug-19, Wed,14:50	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2015-Jun-20, Sat,19:59	Clear	Angle	Non-fatal injury	Dry	East	Turning left	Motorcycle	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Feb-02, Mon,13:23	Snow	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle

					East	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Jan-30, Fri,18:32	Clear	SMV other	Non-fatal injury	Slush	East	Turning left	Pick-up truck	Pedestrian	1
2015-Feb-03, Tue,21:27	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Jun-17, Wed,07:31	Clear	SMV other	Non-fatal injury	Dry	North	Going ahead	Truck - closed	Pedestrian	1
2015-Jul-17, Fri,18:02	Clear	SMV other	P.D. only	Dry	North	Turning left	Automobile, station wagon	Curb	
2015-Oct-01, Thu,13:12	Clear	Angle	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Passenger van	Other motor vehicle	
2015-Jun-12, Fri,14:30	Rain	Turning movement	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Unknown	Other motor vehicle	
2016-Apr-15, Fri,21:20	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Aug-02, Tue,18:22	Clear	Rear end	P.D. only	Dry	South	Turning right	Truck - closed	Other motor vehicle	
					South	Turning right	Automobile, station wagon	Other motor vehicle	

2016-Oct-25, Tue,11:05	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2015-Nov-03, Tue,18:34	Clear	Angle	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2015-Oct-20, Tue,23:00	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Nov-25, Wed,16:53	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Passenger van	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Nov-17, Tue,17:22	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Nov-28, Sat,08:19	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning left	Delivery van	Other motor vehicle
2016-Jan-21, Thu,08:21	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Passenger van	Other motor vehicle

2015-Dec-24, Thu,20:17	Clear	Turning movement	Non-fatal injury	Dry	South	Making "U" turn	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2016-Sep-13, Tue,17:23	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Sep-09, Fri,14:57	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Delivery van	Other motor vehicle
2016-Aug-16, Tue,06:11	Clear	Angle	Non-fatal injury	Dry	East	Turning right	Bicycle	Other motor vehicle
					South	Turning right	Automobile, station wagon	Cyclist
2016-Oct-01, Sat,18:06	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning left	Pick-up truck	Other motor vehicle
2017-Apr-06, Thu,14:00	Rain	Sideswipe	P.D. only	Wet	East	Turning left	Delivery van	Other motor vehicle
					East	Turning left	Pick-up truck	Other motor vehicle
2017-Apr-27, Thu,16:16	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2017-Sep-21, Thu,09:51	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle

					North	Going ahead	Tow truck	Other motor vehicle
2017-Sep-13, Wed,17:00	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2013-Jan-25, Fri,12:20	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Bicycle	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Cyclist
2013-Jan-19, Sat,02:05	Snow	Rear end	P.D. only	Slush	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2013-Mar-20, Wed,08:20	Clear	Rear end	P.D. only	Ice	North	Slowing or stopping	Pick-up truck	Skidding/sliding
					North	Stopped	Pick-up truck	Other motor vehicle
2013-Feb-10, Sun,15:24	Clear	Angle	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle

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

Traffic Control: Traffic signal

Total Collisions: 71

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Mar-27, Thu,13:02	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	

2014-Mar-30, Sun,17:20	Clear	Rear end	Non-fatal injury	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2014-Jun-15, Sun,17:45	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2014-Jul-20, Sun,15:32	Clear	Rear end	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					East	Turning left	Pick-up truck	Other motor vehicle
2014-Aug-27, Wed,21:52	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Mar-15, Sun,13:01	Clear	Rear end	P.D. only	Wet	East	Turning right	Municipal transit bus	Other motor vehicle
					East	Turning right	Pick-up truck	Other motor vehicle
2014-Oct-26, Sun,13:35	Clear	Rear end	Non-fatal injury	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2015-Jan-10, Sat,17:45	Clear	Rear end	Non-fatal injury	Wet	South	Unknown	Unknown	Other motor vehicle
					South	Stopped	Passenger van	Other motor vehicle
2015-Aug-27, Thu,15:07	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle

					East	Stopped	Automobile, station wagon	Other motor vehicle
2014-Oct-26, Sun,20:55	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2014-Dec-06, Sat,11:00	Clear	Angle	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					West	Going ahead	Passenger van	Other motor vehicle
2014-Dec-11, Thu,17:09	Clear	Rear end	Non-fatal injury	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2015-Mar-30, Mon,15:40	Rain	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2014-Dec-18, Thu,12:34	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Feb-11, Wed,11:17	Clear	Rear end	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Turning left	Municipal transit bus	Other motor vehicle
2015-Feb-03, Tue,16:03	Clear	Turning movement	Non-fatal injury	Wet	North	Turning left	Pick-up truck	Other motor vehicle

					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Oct-27, Mon,19:07	Clear	Turning movement	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					North	Turning left	Truck and trailer	Other motor vehicle
2015-Jan-30, Fri,11:46	Snow	Rear end	P.D. only	Loose snow	East	Turning left	Pick-up truck	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2015-Mar-30, Mon,20:49	Freezing Rain	Rear end	P.D. only	Ice	East	Turning right	Ambulance	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2015-Sep-12, Sat,17:21	Rain	Rear end	Non-fatal injury	Wet	South	Slowing or stopping	Pick-up truck	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-Apr-24, Fri,13:25	Clear	Rear end	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Pick-up truck	Other motor vehicle
2015-Apr-20, Mon,14:15	Rain	Rear end	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Passenger van	Other motor vehicle
2015-Feb-17, Tue,09:48	Clear	Rear end	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle

					South	Stopped	Passenger van	Other motor vehicle
2015-May-18, Mon,21:56	Clear	Angle	P.D. only	Wet	North	Going ahead	Pick-up truck	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2015-Jul-07, Tue,11:54	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2015-Mar-25, Wed,13:15	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2015-Sep-01, Tue,17:06	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
2015-Sep-10, Thu,13:13	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Delivery van	Other motor vehicle
2016-Mar-17, Thu,12:42	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Passenger van	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Oct-03, Mon,09:05	Clear	Turning movement	P.D. only	Dry	South	Making "U" turn	Automobile, station wagon	Other motor vehicle

					North	Going ahead	Pick-up truck	Other motor vehicle
2016-Jul-30, Sat,03:28	Clear	SMV other	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Skidding/sliding
2016-Jun-15, Wed,12:45	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Delivery van	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2015-Nov-03, Tue,11:36	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Turning left	Truck - dump	Other motor vehicle
2016-Jan-04, Mon,11:55	Clear	Rear end	P.D. only	Dry	East	Turning right	Truck - closed	Ran off road
					East	Turning right	Automobile, station wagon	Other motor vehicle
2016-Apr-11, Mon,12:44	Clear	Sideswipe	P.D. only	Dry	East	Turning left	Delivery van	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2016-Sep-14, Wed,16:28	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2016-Oct-03, Mon,13:20	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle

2016-Jul-04, Mon,12:30	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Farm tractor	Other motor vehicle
2016-Apr-29, Fri,17:26	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Pick-up truck	Other motor vehicle
2016-Jun-10, Fri,18:30	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2017-Jan-07, Sat,20:07	Snow	SMV other	P.D. only	Packed snow	North	Reversing	Construction equipment	Other
2017-Oct-22, Sun,14:43	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2017-Jan-12, Thu,12:23	Rain	Sideswipe	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Truck - dump	Other motor vehicle
2017-Feb-18, Sat,11:57	Clear	Sideswipe	P.D. only	Wet	North	Changing lanes	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jan-16, Mon,19:33	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle

					South	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Mar-09, Thu,18:42	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2017-Mar-16, Thu,17:03	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Municipal transit bus	Other motor vehicle
2017-Mar-17, Fri,07:50	Clear	Angle	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2017-Feb-22, Wed,14:50	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Pick-up truck	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2017-Apr-26, Wed,08:26	Clear	Rear end	P.D. only	Wet	South	Turning right	Pick-up truck	Other motor vehicle
					South	Turning right	Pick-up truck	Other motor vehicle
2017-May-26, Fri,15:40	Rain	Sideswipe	P.D. only	Wet	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2017-Jun-01, Thu,17:20	Rain	Sideswipe	P.D. only	Wet	East	Turning left	Pick-up truck	Other motor vehicle
					East	Turning left	Pick-up truck	Other motor vehicle

2017-Nov-17, Fri,13:03	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Pick-up truck	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2017-Nov-12, Sun,12:59	Clear	Rear end	P.D. only	Dry	East	Going ahead	Truck - open	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2017-Dec-18, Mon,13:03	Snow	Rear end	P.D. only	Slush	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Passenger van	Other motor vehicle
2017-Nov-24, Fri,14:41	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Sep-23, Sat,11:11	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					North	Going ahead	Passenger van	Other motor vehicle
2017-Sep-21, Thu,14:11	Clear	Rear end	Non-fatal injury	Dry	West	Turning right	Truck - open	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2013-Jan-24, Thu,10:02	Clear	Rear end	P.D. only	Ice	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle

2013-Jan-03, Thu,18:51	Snow	Angle	Non-fatal injury	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Mar-04, Mon,08:37	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Turning left	Municipal transit bus	Other motor vehicle
2013-Feb-27, Wed,13:30	Rain	Rear end	P.D. only	Loose snow	North	Turning right	Automobile, station wagon	Other motor vehicle
					North	Turning right	Passenger van	Other motor vehicle
2013-Mar-01, Fri,16:00	Snow	Angle	P.D. only	Wet	East	Turning right	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Passenger van	Other motor vehicle
2013-May-24, Fri,18:42	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2013-Apr-18, Thu,10:12	Rain	Rear end	P.D. only	Wet	South	Going ahead	Passenger van	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2013-Apr-06, Sat,22:03	Clear	Other	P.D. only	Dry	South	Reversing	Unknown	Other motor vehicle
					North	Turning left	Pick-up truck	Other motor vehicle
2013-May-31, Fri,09:20	Clear	Rear end	P.D. only	Dry	East	Turning right	Municipal transit bus	Other motor vehicle

					East	Turning right	Automobile, station wagon	Other motor vehicle
2013-Sep-11, Wed,07:45	Clear	SMV other	P.D. only	Dry	North	Turning left	Municipal transit bus	Other
2013-Sep-25, Wed,16:15	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Turning left	Motorcycle	Other motor vehicle
2013-Oct-30, Wed,08:29	Clear	Rear end	P.D. only	Wet	North	Turning left	Pick-up truck	Other motor vehicle
					North	Turning left	Municipal transit bus	Other motor vehicle
2013-Nov-01, Fri,10:12	Strong wind	SMV other	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other

Location: ST. LAURENT BLVD @ ST. LAURENT BLVD SERVICE

Traffic Control: Traffic signal

Total Collisions: 5

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Nov-21, Sat,14:17	Clear	Rear end	Non-fatal injury	Dry	South	Slowing or stopping	Pick-up truck	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Nov-03, Thu,13:30	Other	Rear end	P.D. only	Wet	North	Turning right	Automobile, station wagon	Other motor vehicle	
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Feb-03, Fri,13:08	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	

					South	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Jan-24, Thu,10:15	Clear	Rear end	P.D. only	Ice	South	Turning left	Automobile, station wagon	Other motor vehicle
					South	Turning left	Automobile, station wagon	Other motor vehicle
2013-Jul-24, Wed,16:30	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
					West	Stopped	Passenger van	Other motor vehicle

Appendix E

Background Traffic Growth Analysis

Smyth/St Laurent/ Lancaster
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2009	5-Jun	11865	9457	7059	9582	2592	2206	4754	4925	52440
2012	24-Oct	14785	11934	9034	9895	12221	4961	3384	12634	78848
2014	29-May	9042	12396	11204	8999	2677	4871	6053	2710	57952
2016	28-Jan	10206	10237	7679	7956	2457	2378	5309	5080	51302

North Leg

Year	Counts				% Change			
	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
2009	9457	11865	21322	52440				
2012	11934	14785	26719	78848	26.2%	24.6%	25.3%	50.4%
2014	12396	9042	21438	57952	3.9%	-38.8%	-19.8%	-26.5%
2016	10237	10206	20443	51302	-17.4%	12.9%	-4.6%	-11.5%

Regression Estimate	2009	10396	13032	23428
Regression Estimate	2016	11535	10125	21659
Average Annual Change		1.50%	-3.54%	-1.12%

West Leg

Year	Counts				% Change			
	EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
2009	4754	4925	9679	52440				
2012	3384	12634	16018	78848	-28.8%	156.5%	65.5%	50.4%
2014	6053	2710	8763	57952	78.9%	-78.5%	-45.3%	-26.5%
2016	5309	5080	10389	51302	-12.3%	87.5%	18.6%	-11.5%

Regression Estimate	2009	4250	7465	11716
Regression Estimate	2016	5416	5360	10776
Average Annual Change		3.52%	-4.62%	-1.19%

East Leg

Year	Counts				% Change			
	EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
2009	2206	2592	4798	52440				
2012	4961	12221	17182	78848	124.9%	371.5%	258.1%	50.4%
2014	4871	2677	7548	57952	-1.8%	-78.1%	-56.1%	-26.5%
2016	2378	2457	4835	51302	-51.2%	-8.2%	-35.9%	-11.5%

Regression Estimate	2009	3348	6046	9394
Regression Estimate	2016	3826	4069	7895
Average Annual Change		1.92%	-5.50%	-2.45%

South Leg

Year	Counts				% Change			
	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
2009	7059	9582	16641	52440				
2012	9034	9895	18929	78848	28.0%	3.3%	13.7%	50.4%
2014	11204	8999	20203	57952	24.0%	-9.1%	6.7%	-26.5%
2016	7679	7956	15635	51302	-31.5%	-11.6%	-22.6%	-11.5%

Regression Estimate	2009	7943	9984	17927
Regression Estimate	2016	9438	8349	17787
Average Annual Change		2.50%	-2.52%	-0.11%

Smyth/St Laurent/ Lancaster
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2009	5-Jun	1633	1149	1082	1045	344	338	422	949	6962
2012	24-Oct	1750	2003	1527	1043	1548	474	428	1733	10506
2014	29-May	1401	1294	1570	1293	403	814	561	534	7870
2016	28-Jan	1337	1345	1240	723	394	276	443	1070	6828

North Leg

Year	Counts				% Change			
	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
2009	1149	1633	2782	6962				
2012	2003	1750	3753	10506	74.3%	7.2%	34.9%	50.9%
2014	1294	1401	2695	7870	-35.4%	-19.9%	-28.2%	-25.1%
2016	1345	1337	2682	6828	3.9%	-4.6%	-0.5%	-13.2%

Regression Estimate	2009	1423	1718	3141
Regression Estimate	2016	1469	1367	2837
Average Annual Change		0.46%	-3.21%	-1.44%

West Leg

Year	Counts				% Change			
	EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
2009	422	949	1371	6962				
2012	428	1733	2161	10506	1.4%	82.6%	57.6%	50.9%
2014	561	534	1095	7870	31.1%	-69.2%	-49.3%	-25.1%
2016	443	1070	1513	6828	-21.0%	100.4%	38.2%	-13.2%

Regression Estimate	2009	430	1172	1602
Regression Estimate	2016	492	985	1477
Average Annual Change		1.95%	-2.45%	-1.15%

East Leg

Year	Counts				% Change			
	EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
2009	338	344	682	6962				
2012	474	1548	2022	10506	40.2%	350.0%	196.5%	50.9%
2014	814	403	1217	7870	71.7%	-74.0%	-39.8%	-25.1%
2016	276	394	670	6828	-66.1%	-2.2%	-44.9%	-13.2%

Regression Estimate	2009	435	766	1200
Regression Estimate	2016	511	591	1102
Average Annual Change		2.34%	-3.63%	-1.21%

South Leg

Year	Counts				% Change			
	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
2009	1082	1045	2127	6962				
2012	1527	1043	2570	10506	41.1%	-0.2%	20.8%	50.9%
2014	1570	1293	2863	7870	2.8%	24.0%	11.4%	-25.1%
2016	1240	723	1963	6828	-21.0%	-44.1%	-31.4%	-13.2%

Regression Estimate	2009	1244	1129	2373
Regression Estimate	2016	1451	937	2387
Average Annual Change		2.22%	-2.63%	0.09%

Smyth/St Laurent/ Lancaster
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2009	5-Jun	1751	1589	1056	1642	450	338	912	600	8338
2012	24-Oct	2157	1382	1094	1604	1748	914	651	1750	11300
2014	29-May	1154	2002	1573	1224	404	680	1121	346	8504
2016	28-Jan	1411	1453	962	1332	323	445	1016	482	7424

North Leg

Year	Counts				% Change			
	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
2009	1589	1751	3340	8338				
2012	1382	2157	3539	11300	-13.0%	23.2%	6.0%	35.5%
2014	2002	1154	3156	8504	44.9%	-46.5%	-10.8%	-24.7%
2016	1453	1411	2864	7424	-27.4%	22.3%	-9.3%	-12.7%

Regression Estimate	2009	1574	1920	3495
Regression Estimate	2016	1634	1356	2991
Average Annual Change		0.54%	-4.85%	-2.20%

West Leg

Year	Counts				% Change			
	EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
2009	912	600	1512	8338				
2012	651	1750	2401	11300	-28.6%	191.7%	58.8%	35.5%
2014	1121	346	1467	8504	72.2%	-80.2%	-38.9%	-24.7%
2016	1016	482	1498	7424	-9.4%	39.3%	2.1%	-12.7%

Regression Estimate	2009	814	1014	1827
Regression Estimate	2016	1022	605	1626
Average Annual Change		3.31%	-7.12%	-1.65%

East Leg

Year	Counts				% Change			
	EB	WB	EB+WB	INT	EB	WB	EB+WB	INT
2009	338	450	788	8338				
2012	914	1748	2662	11300	170.4%	288.4%	237.8%	35.5%
2014	680	404	1084	8504	-25.6%	-76.9%	-59.3%	-24.7%
2016	445	323	768	7424	-34.6%	-20.0%	-29.2%	-12.7%

Regression Estimate	2009	546	934	1480
Regression Estimate	2016	636	556	1192
Average Annual Change		2.20%	-7.14%	-3.04%

South Leg

Year	Counts				% Change			
	NB	SB	NB+SB	INT	NB	SB	NB+SB	INT
2009	1056	1642	2698	8338				
2012	1094	1604	2698	11300	3.6%	-2.3%	0.0%	35.5%
2014	1573	1224	2797	8504	43.8%	-23.7%	3.7%	-24.7%
2016	962	1332	2294	7424	-38.8%	8.8%	-18.0%	-12.7%

Regression Estimate	2009	1127	1661	2788
Regression Estimate	2016	1209	1268	2477
Average Annual Change		1.00%	-3.78%	-1.68%

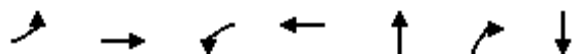
Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	-1.12%	-0.11%	-2.45%	-1.19%	-1.00%
AM Peak	-1.44%	0.09%	-1.21%	-1.15%	-0.89%
PM Peak	-2.20%	-1.68%	-3.04%	-1.65%	-2.06%

Appendix F

SYNCHRO Capacity Analysis: Total Projected 2021 Conditions

Total Projected AM
1: Othello/Russell & Smyth

09/12/2018



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Configurations							
Traffic Volume (vph)	8	372	53	623	107	111	63
Future Volume (vph)	8	372	53	623	107	111	63
Lane Group Flow (vph)	8	446	56	730	199	117	181
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA
Protected Phases		2		6	4		3
Permitted Phases	2		6			4	
Detector Phase	2	2	6	6	4	4	3
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	33.8	33.8	31.0	31.0	29.2
Total Split (s)	51.0	51.0	51.0	51.0	35.0	35.0	34.0
Total Split (%)	42.5%	42.5%	42.5%	42.5%	29.2%	29.2%	28.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	3.5	3.5	3.7	3.7	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	-3.0	0.0
Total Lost Time (s)	6.8	6.8	6.8	6.8	7.0	4.0	7.2
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None
Act Effect Green (s)	62.3	62.3	62.3	62.3	19.1	22.1	17.7
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.16	0.18	0.15
v/c Ratio	0.03	0.26	0.13	0.42	0.72	0.42	0.71
Control Delay	19.6	17.7	8.3	8.3	61.9	46.7	62.5
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	19.6	17.7	8.3	8.7	61.9	46.7	62.5
LOS	B	B	A	A	E	D	E
Approach Delay		17.7		8.7	56.3		62.5
Approach LOS		B		A	E		E
Queue Length 50th (m)	0.9	28.5	2.6	17.7	45.1	24.6	40.4
Queue Length 95th (m)	4.4	48.8	6.5	67.5	65.2	39.5	60.6
Internal Link Dist (m)		150.3		108.3	56.8		170.5
Turn Bay Length (m)	55.0		12.0				
Base Capacity (vph)	297	1733	443	1737	407	391	385
Starvation Cap Reductn	0	0	0	500	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	0.03	0.26	0.13	0.59	0.49	0.30	0.47

Intersection Summary

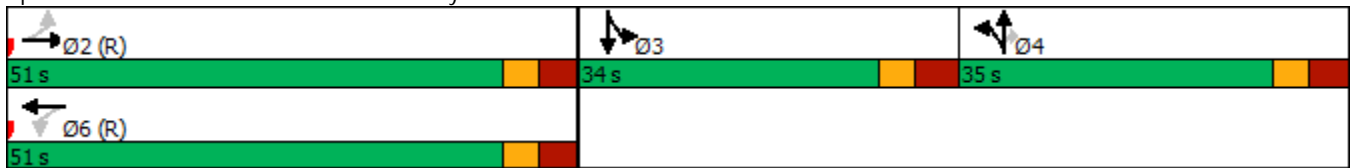
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 75 (63%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 25.3
Intersection Capacity Utilization 62.8%
Analysis Period (min) 15
Intersection LOS: C
ICU Level of Service B

Total Projected AM
1: Othello/Russell & Smyth

09/12/2018





























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

Splits and Phases: 1: Othello/Russell & Smyth



Total Projected AM
2: St. Laurent & Smyth/Lancaster

09/12/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 				 			 			 	
Traffic Volume (vph)	319	121	135	29	313	61	132	928	510	183	1147	89
Future Volume (vph)	319	121	135	29	313	61	132	928	510	183	1147	89
Lane Group Flow (vph)	336	127	142	31	329	64	139	977	537	193	1207	94
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)	10.6	27.7	27.7	10.6	27.7	27.7	11.0	27.9	27.9	11.0	27.9	27.9
Total Split (s)	20.0	32.4	32.4	15.6	28.0	28.0	20.0	52.0	52.0	20.0	52.0	52.0
Total Split (%)	16.7%	27.0%	27.0%	13.0%	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-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	14.2	28.3	28.3	7.7	17.1	17.1	14.0	47.6	47.6	17.9	51.5	51.5
Actuated g/C Ratio	0.12	0.24	0.24	0.06	0.14	0.14	0.12	0.40	0.40	0.15	0.43	0.43
v/c Ratio	0.86	0.30	0.30	0.29	0.68	0.19	0.70	0.73	0.75	0.77	0.83	0.13
Control Delay	78.3	38.0	11.0	59.7	56.1	1.3	69.6	33.6	26.4	69.7	37.6	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.3	38.0	11.0	59.7	56.1	1.3	69.6	33.6	26.4	69.7	37.6	2.0
LOS	E	D	B	E	E	A	E	C	C	E	D	A
Approach Delay		54.0			48.1			34.3			39.5	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	42.8	20.0	1.2	7.1	39.3	0.0	33.1	103.3	65.0	43.5	133.3	0.0
Queue Length 95th (m)	#63.5	44.9	17.7	16.8	52.0	0.0	#60.0	120.7	108.5	#91.0	#184.8	4.9
Internal Link Dist (m)		108.3			148.1			67.3			155.2	
Turn Bay Length (m)	55.0			30.0		10.0			20.0	110.0		85.0
Base Capacity (vph)	394	436	478	141	629	389	212	1345	713	252	1453	724
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	0.30	0.22	0.52	0.16	0.66	0.73	0.75	0.77	0.83	0.13

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: 0.86

Intersection Signal Delay: 40.4

Intersection LOS: D

Intersection Capacity Utilization 79.3%

ICU Level of Service D

Analysis Period (min) 15

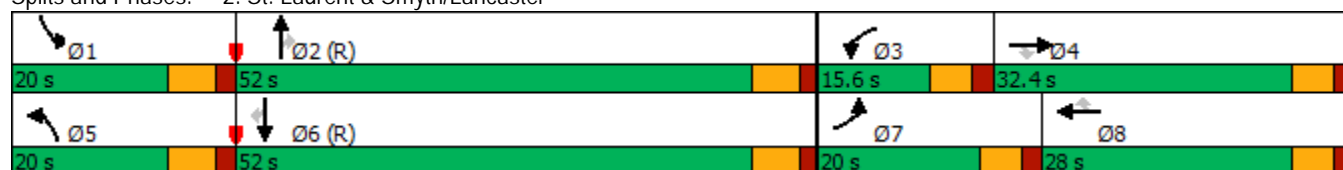
Total Projected AM

2: St. Laurent & Smyth/Lancaster

09/12/2018

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

Splits and Phases: 2: St. Laurent & Smyth/Lancaster



Total Projected AM
4: Russell & St. Laurent

09/12/2018



Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Configurations					
Traffic Volume (vph)	694	31	624	288	431
Future Volume (vph)	694	31	624	288	431
Lane Group Flow (vph)	790	33	657	303	454
Turn Type	Prot	Perm	NA	NA	Perm
Protected Phases	4		2	6	
Permitted Phases		2			6
Detector Phase	4	2	2	6	6
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.0	15.5	15.5	24.5	24.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	19.6	28.9	28.9	28.9	28.9
Actuated g/C Ratio	0.33	0.48	0.48	0.48	0.48
v/c Ratio	0.73	0.07	0.40	0.19	0.47
Control Delay	22.2	10.5	11.8	11.8	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	10.5	11.8	11.8	8.2
LOS	C	B	B	B	A
Approach Delay	22.2		11.7	9.6	
Approach LOS	C		B	A	
Queue Length 50th (m)	25.0	1.9	23.3	20.3	32.3
Queue Length 95th (m)	63.0	6.5	39.3	m30.1	m58.3
Internal Link Dist (m)	126.3		111.3	153.9	
Turn Bay Length (m)		60.0			90.0
Base Capacity (vph)	1319	487	1631	1631	965
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.60	0.07	0.40	0.19	0.47

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 14.7

Intersection LOS: B

Intersection Capacity Utilization 53.7%

ICU Level of Service A

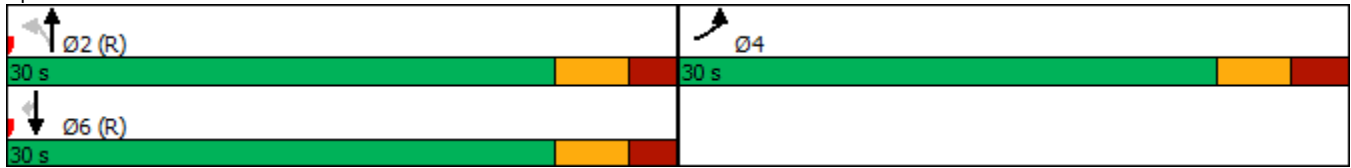
Analysis Period (min) 15

Total Projected AM
4: Russell & St. Laurent

09/12/2018

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

Splits and Phases: 4: Russell & St. Laurent



Total Projected AM
5: St. Laurent & Transit Loop

09/12/2018



Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	67	42	525	376
Future Volume (vph)	67	42	525	376
Lane Group Flow (vph)	131	44	553	454
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		2		
Detector Phase	4	2	2	6
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	29.4	28.4	28.4	28.4
Total Split (s)	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	5.4
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effect Green (s)	12.8	40.6	40.6	40.6
Actuated g/C Ratio	0.21	0.68	0.68	0.68
v/c Ratio	0.33	0.07	0.24	0.20
Control Delay	12.9	5.2	5.3	9.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.9	5.2	5.3	9.5
LOS	B	A	A	A
Approach Delay	12.9		5.3	9.5
Approach LOS	B		A	A
Queue Length 50th (m)	6.9	1.6	14.7	14.4
Queue Length 95th (m)	13.6	m5.0	30.4	36.8
Internal Link Dist (m)	24.2		105.1	126.3
Turn Bay Length (m)		60.0		
Base Capacity (vph)	703	591	2291	2259
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.07	0.24	0.20

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 45 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.33

Intersection Signal Delay: 7.7

Intersection LOS: A

Intersection Capacity Utilization 43.0%

ICU Level of Service A

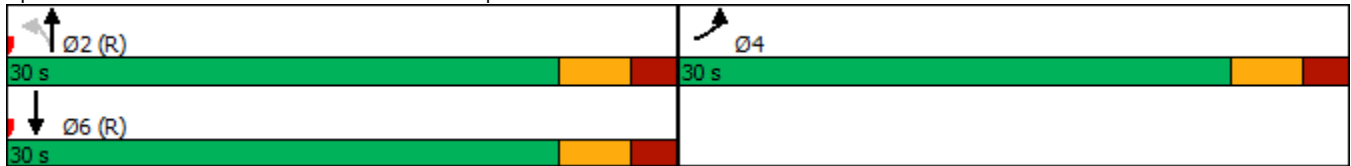
Analysis Period (min) 15

Total Projected AM
5: St. Laurent & Transit Loop

09/12/2018

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

Splits and Phases: 5: St. Laurent & Transit Loop



Total Projected AM
7: St. Laurent & Pleasant Park

09/12/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	130	104	145	644	572	101
Future Volume (vph)	130	104	145	644	572	101
Lane Group Flow (vph)	137	109	153	678	602	106
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	24.5	24.5	15.5	15.5	24.5	24.5
Total Split (s)	25.0	25.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	12.2	12.2	41.0	41.0	41.0	41.0
Actuated g/C Ratio	0.20	0.20	0.68	0.68	0.68	0.68
v/c Ratio	0.40	0.28	0.33	0.56	0.49	0.10
Control Delay	23.4	6.2	9.7	10.5	6.2	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	6.2	9.7	10.5	6.2	0.4
LOS	C	A	A	B	A	A
Approach Delay	15.7			10.3	5.3	
Approach LOS	B			B	A	
Queue Length 50th (m)	13.8	0.0	6.3	35.0	25.7	0.2
Queue Length 95th (m)	22.4	8.7	24.3	#97.8	31.0	0.1
Internal Link Dist (m)	138.9			102.6	218.8	
Turn Bay Length (m)	40.0		40.0			
Base Capacity (vph)	550	566	462	1219	1219	1070
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	0.25	0.19	0.33	0.56	0.49	0.10

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 62.3%

ICU Level of Service B

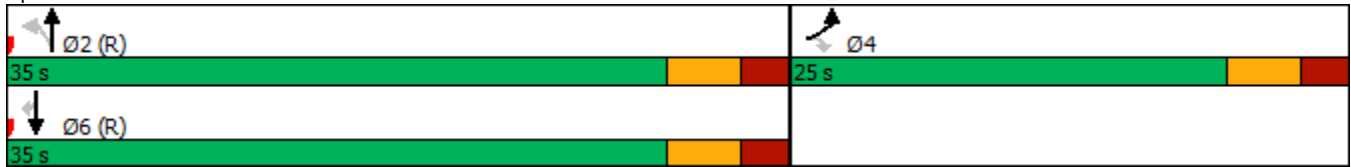
Analysis Period (min) 15

Total Projected AM
7: St. Laurent & Pleasant Park

09/12/2018



















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

Splits and Phases: 7: St. Laurent & Pleasant Park



Total Projected AM
6: St. Laurent & Site




09/12/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	20	16	2	22	51	527	8	8	402	17
Future Volume (Veh/h)	16	0	20	16	2	22	51	527	8	8	402	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	17	0	21	17	2	23	54	555	8	8	423	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								243			129	
pX, platoon unblocked												
vC, conflicting volume	858	1119	220	916	1124	282	441			563		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	858	1119	220	916	1124	282	441			563		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	97	92	99	97	95			99		
cM capacity (veh/h)	230	194	783	212	193	716	1115			1005		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	38	42	54	370	193	8	282	159				
Volume Left	17	17	54	0	0	8	0	0				
Volume Right	21	23	0	0	8	0	0	18				
cSH	378	342	1115	1700	1700	1005	1700	1700				
Volume to Capacity	0.10	0.12	0.05	0.22	0.11	0.01	0.17	0.09				
Queue Length 95th (m)	2.5	3.2	1.2	0.0	0.0	0.2	0.0	0.0				
Control Delay (s)	15.6	17.0	8.4	0.0	0.0	8.6	0.0	0.0				
Lane LOS	C	C	A			A						
Approach Delay (s)	15.6	17.0	0.7			0.2						
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			32.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Total Projected AM
8: Pleasant Park & Othello


















09/12/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	57	155	104	63	62	46
Future Volume (vph)	57	155	104	63	62	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	60	163	109	66	65	48
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	223	175	113			
Volume Left (vph)	60	0	65			
Volume Right (vph)	0	66	48			
Hadj (s)	0.09	-0.19	-0.11			
Departure Headway (s)	4.5	4.2	4.7			
Degree Utilization, x	0.28	0.21	0.15			
Capacity (veh/h)	785	811	712			
Control Delay (s)	9.1	8.3	8.5			
Approach Delay (s)	9.1	8.3	8.5			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			38.4%	ICU Level of Service	A	
Analysis Period (min)			15			










Total Projected AM
10: Othello & Hamlet/Site

09/12/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	12	5	0	0	111	4	142	24	56	87	4
Future Volume (Veh/h)	3	12	5	0	0	111	4	142	24	56	87	4
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	13	5	0	0	117	4	149	25	59	92	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												81
pX, platoon unblocked												
vC, conflicting volume	498	394	94	393	384	162	96				174	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	498	394	94	393	384	162	96				174	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	99	97	99	100	100	87	100				96	
cM capacity (veh/h)	404	518	963	534	525	883	1498				1403	
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total	3	18	117	178	155							
Volume Left	3	0	0	4	59							
Volume Right	0	5	117	25	4							
cSH	404	595	883	1498	1403							
Volume to Capacity	0.01	0.03	0.13	0.00	0.04							
Queue Length 95th (m)	0.2	0.7	3.5	0.1	1.0							
Control Delay (s)	14.0	11.2	9.7	0.2	3.1							
Lane LOS	B	B	A	A	A							
Approach Delay (s)	11.6		9.7	0.2	3.1							
Approach LOS	B		A									
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			31.4%	ICU Level of Service					A			
Analysis Period (min)			15									










Total Projected AM
13: Othello & Site

09/12/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	23	47	182	28	26	117
Future Volume (Veh/h)	23	47	182	28	26	117
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	24	49	192	29	27	123
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	384	206			221	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384	206			221	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	94			98	
cM capacity (veh/h)	607	834			1348	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	73	221	150			
Volume Left	24	0	27			
Volume Right	49	29	0			
cSH	743	1700	1348			
Volume to Capacity	0.10	0.13	0.02			
Queue Length 95th (m)	2.5	0.0	0.5			
Control Delay (s)	10.4	0.0	1.5			
Lane LOS	B		A			
Approach Delay (s)	10.4	0.0	1.5			
Approach LOS	B					
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization			34.3%	ICU Level of Service		A
Analysis Period (min)			15			

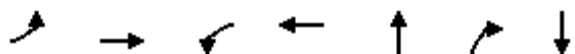
Total Projected AM
14: Russell & St. Laurent Towers

09/12/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	4	2	644	338	2
Future Volume (Veh/h)	10	4	2	644	338	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	4	2	678	356	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)					216	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	1039	357	358			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1005	272	273			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	99	100			
cM capacity (veh/h)	249	714	1201			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	15	680	358			
Volume Left	11	2	0			
Volume Right	4	0	2			
cSH	301	1201	1700			
Volume to Capacity	0.05	0.00	0.21			
Queue Length 95th (m)	1.2	0.0	0.0			
Control Delay (s)	17.6	0.0	0.0			
Lane LOS	C	A				
Approach Delay (s)	17.6	0.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay		0.3				
Intersection Capacity Utilization		47.5%		ICU Level of Service		A
Analysis Period (min)		15				

Total Projected PM
1: Othello/Russell & Smyth

09/12/2018



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Configurations							
Traffic Volume (vph)	10	608	72	363	120	100	142
Future Volume (vph)	10	608	72	363	120	100	142
Lane Group Flow (vph)	11	756	76	441	175	105	285
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	NA
Protected Phases		2	1	6	4		3
Permitted Phases	2		6			4	
Detector Phase	2	2	1	6	4	4	3
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	33.8	33.8	10.6	33.8	31.0	31.0	29.2
Total Split (s)	41.0	41.0	13.0	54.0	32.0	32.0	34.0
Total Split (%)	34.2%	34.2%	10.8%	45.0%	26.7%	26.7%	28.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	2.3	3.5	3.7	3.7	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.8	6.8	5.6	6.8	7.0	7.0	7.2
Lead/Lag	Lag	Lag	Lead		Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None
Act Effect Green (s)	47.1	47.1	59.5	58.3	17.3	17.3	23.4
Actuated g/C Ratio	0.39	0.39	0.50	0.49	0.14	0.14	0.20
v/c Ratio	0.03	0.58	0.27	0.27	0.69	0.48	0.84
Control Delay	29.9	33.0	34.4	33.6	62.5	53.5	67.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Total Delay	29.9	33.1	34.4	33.6	62.5	53.5	67.4
LOS	C	C	C	C	E	D	E
Approach Delay		33.0		33.7	59.1		67.4
Approach LOS		C		C	E		E
Queue Length 50th (m)	1.7	75.5	14.9	46.6	39.7	23.1	63.7
Queue Length 95th (m)	6.5	108.1	m26.6	m63.0	59.3	38.1	#94.6
Internal Link Dist (m)		150.3		108.2	56.8		170.5
Turn Bay Length (m)	55.0		12.0				
Base Capacity (vph)	347	1309	287	1622	366	316	388
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	34	0	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.59	0.26	0.27	0.48	0.33	0.74

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 82 (68%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 42.5
Intersection Capacity Utilization 64.2%
Analysis Period (min) 15
Intersection LOS: D
ICU Level of Service C

Total Projected PM

1: Othello/Russell & Smyth

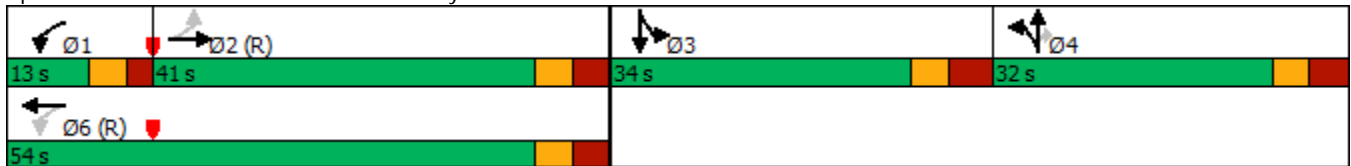
09/12/2018

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: 1: Othello/Russell & Smyth



Total Projected PM
2: St. Laurent & Smyth/Lancaster

09/12/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	559	395	179	98	144	162	124	1293	155	130	968	78
Future Volume (vph)	559	395	179	98	144	162	124	1293	155	130	968	78
Lane Group Flow (vph)	588	416	188	103	152	171	131	1361	163	137	1019	82
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)	10.6	27.7	27.7	10.6	27.7	27.7	11.0	27.9	27.9	11.0	27.9	27.9
Total Split (s)	26.0	38.4	38.4	15.6	28.0	28.0	17.0	49.0	49.0	17.0	49.0	49.0
Total Split (%)	21.7%	32.0%	32.0%	13.0%	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-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	20.4	30.9	30.9	9.6	20.1	20.1	11.2	44.9	44.9	11.4	45.1	45.1
Actuated g/C Ratio	0.17	0.26	0.26	0.08	0.17	0.17	0.09	0.37	0.37	0.10	0.38	0.38
v/c Ratio	1.05	0.91	0.36	0.76	0.27	0.42	0.83	1.07	0.24	0.86	0.80	0.12
Control Delay	93.5	60.7	5.1	86.6	44.0	8.4	87.7	81.6	4.7	94.8	39.8	0.4
Queue Delay	0.0	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.5	69.9	5.1	86.6	44.0	8.4	87.7	81.6	4.7	94.8	39.8	0.4
LOS	F	E	A	F	D	A	F	F	A	F	D	A
Approach Delay		71.3			40.0			74.5			43.3	
Approach LOS		E			D			E			D	
Queue Length 50th (m)	~78.5	99.2	13.1	24.1	16.2	0.0	31.5	~188.8	2.7	32.4	114.8	0.0
Queue Length 95th (m)	#109.6	#147.0	m9.7	#51.2	26.0	15.7	#66.1	#233.7	11.8	#68.8	141.9	0.0
Internal Link Dist (m)		108.2			148.1			67.3			155.2	
Turn Bay Length (m)	55.0			30.0		10.0			20.0	110.0		85.0
Base Capacity (vph)	558	486	550	141	629	430	159	1268	680	160	1274	682
Starvation Cap Reductn	0	51	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	1.05	0.96	0.34	0.73	0.24	0.40	0.82	1.07	0.24	0.86	0.80	0.12

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: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 61.8

Intersection LOS: E

Intersection Capacity Utilization 92.3%

ICU Level of Service F

Analysis Period (min) 15

Total Projected PM 2: St. Laurent & Smyth/Lancaster

09/12/2018

~ Volume exceeds capacity, queue is theoretically infinite.

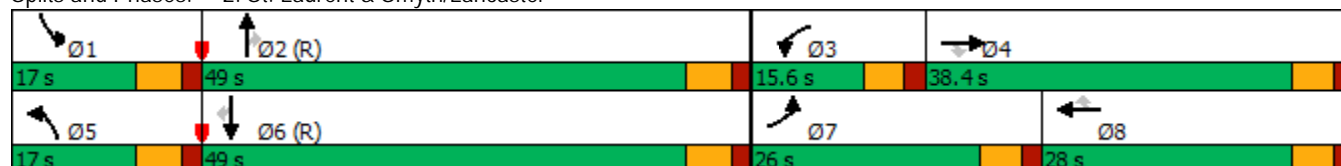
Queue shown is maximum after two cycles.

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: 2: St. Laurent & Smyth/Lancaster



Total Projected PM
4: Russell & St. Laurent

09/12/2018



Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Configurations					
Traffic Volume (vph)	736	97	442	742	778
Future Volume (vph)	736	97	442	742	778
Lane Group Flow (vph)	875	102	465	781	819
Turn Type	Prot	Perm	NA	NA	Perm
Protected Phases	4		2	6	
Permitted Phases		2			6
Detector Phase	4	2	2	6	6
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.0	15.5	15.5	24.5	24.5
Total Split (s)	33.0	27.0	27.0	27.0	27.0
Total Split (%)	55.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.5	5.5	5.5	5.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	21.6	26.9	26.9	26.9	26.9
Actuated g/C Ratio	0.36	0.45	0.45	0.45	0.45
v/c Ratio	0.73	0.43	0.31	0.51	0.72
Control Delay	15.1	21.3	12.3	18.3	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.1	21.3	12.3	18.3	18.1
LOS	B	C	B	B	B
Approach Delay	15.1		13.9	18.2	
Approach LOS	B		B	B	
Queue Length 50th (m)	41.5	7.3	16.3	70.6	132.4
Queue Length 95th (m)	14.9	#26.5	29.8	93.0	171.2
Internal Link Dist (m)	126.3		108.0	153.9	
Turn Bay Length (m)		60.0			90.0
Base Capacity (vph)	1484	239	1519	1519	1132
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.43	0.31	0.51	0.72

Intersection Summary

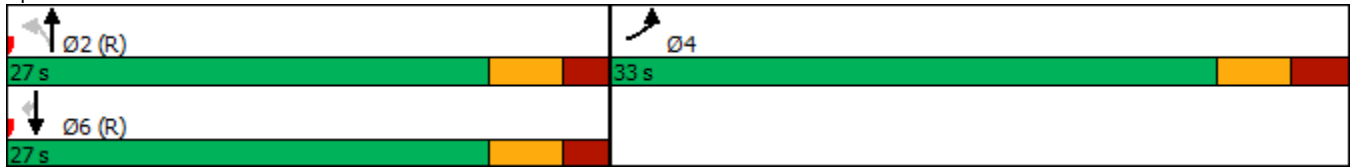
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 27 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 16.5
Intersection Capacity Utilization 69.5%
Analysis Period (min) 15
Intersection LOS: B
ICU Level of Service C

Total Projected PM
4: Russell & St. Laurent

09/12/2018

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





Splits and Phases: 4: Russell & St. Laurent



Total Projected PM
5: St. Laurent & Transit Loop

09/12/2018



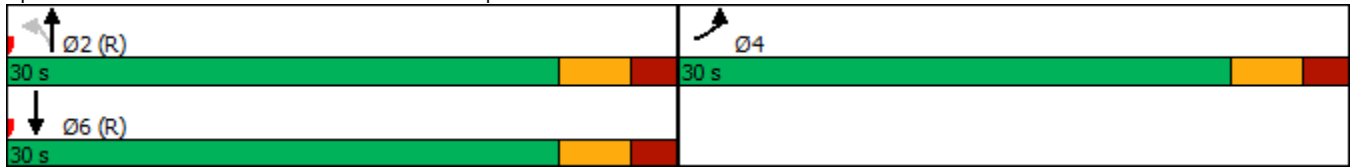
Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	119	65	573	779
Future Volume (vph)	119	65	573	779
Lane Group Flow (vph)	234	68	603	900
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		2		
Detector Phase	4	2	2	6
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	29.4	28.4	28.4	28.4
Total Split (s)	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.3	3.3	3.3	3.3
All-Red Time (s)	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	5.4
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	13.8	35.4	35.4	35.4
Actuated g/C Ratio	0.23	0.59	0.59	0.59
v/c Ratio	0.54	0.23	0.30	0.45
Control Delay	17.1	8.6	6.2	7.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.1	8.6	6.2	7.2
LOS	B	A	A	A
Approach Delay	17.1		6.4	7.2
Approach LOS	B		A	A
Queue Length 50th (m)	15.8	2.3	11.0	18.3
Queue Length 95th (m)	24.5	m7.4	22.0	45.3
Internal Link Dist (m)	24.2		105.1	126.3
Turn Bay Length (m)		60.0		
Base Capacity (vph)	712	300	1997	1980
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.23	0.30	0.45
Intersection Summary				
Cycle Length: 60				
Actuated Cycle Length: 60				
Offset: 45 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Green				
Natural Cycle: 60				
Control Type: Actuated-Coordinated				
Maximum v/c Ratio: 0.54				
Intersection Signal Delay: 8.2			Intersection LOS: A	
Intersection Capacity Utilization 60.8%			ICU Level of Service B	
Analysis Period (min) 15				

Total Projected PM
5: St. Laurent & Transit Loop

09/12/2018

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

Splits and Phases: 5: St. Laurent & Transit Loop



Total Projected PM
7: St. Laurent & Pleasant Park

09/12/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	94	148	97	561	831	156
Future Volume (vph)	94	148	97	561	831	156
Lane Group Flow (vph)	99	156	102	591	875	164
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	24.5	24.5	15.5	15.5	24.5	24.5
Total Split (s)	25.0	25.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	11.8	11.8	41.4	41.4	41.4	41.4
Actuated g/C Ratio	0.20	0.20	0.69	0.69	0.69	0.69
v/c Ratio	0.30	0.41	0.38	0.48	0.71	0.15
Control Delay	21.9	11.4	14.2	8.7	17.7	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	11.4	14.2	8.7	17.7	2.8
LOS	C	B	B	A	B	A
Approach Delay	15.5			9.5	15.3	
Approach LOS	B			A	B	
Queue Length 50th (m)	9.8	5.1	4.4	28.1	124.7	7.2
Queue Length 95th (m)	17.0	15.2	#26.5	75.6	#178.0	6.0
Internal Link Dist (m)	138.9			102.6	218.8	
Turn Bay Length (m)	40.0		40.0			
Base Capacity (vph)	550	562	265	1230	1230	1097
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	0.18	0.28	0.38	0.48	0.71	0.15

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 23 (38%), 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: 13.3

Intersection LOS: B

Intersection Capacity Utilization 76.6%

ICU Level of Service D

Analysis Period (min) 15

Total Projected PM
7: St. Laurent & Pleasant Park

09/12/2018












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

Splits and Phases: 7: St. Laurent & Pleasant Park





















Total Projected PM
3: St. Laurent

09/12/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (veh/h)	0	14	0	1572	1223	14
Future Volume (Veh/h)	0	14	0	1572	1223	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	15	0	1655	1287	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)				178	91	
pX, platoon unblocked	0.76	0.73	0.73			
vC, conflicting volume	2122	651	1287			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1541	0	661			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	80	794	676			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	15	828	828	858	444	
Volume Left	0	0	0	0	0	
Volume Right	15	0	0	0	15	
cSH	794	1700	1700	1700	1700	
Volume to Capacity	0.02	0.49	0.49	0.50	0.26	
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.0	
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	
Lane LOS	A					
Approach Delay (s)	9.6	0.0		0.0		
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			49.2%	ICU Level of Service		A
Analysis Period (min)			15			

Total Projected PM
6: St. Laurent & Site

09/12/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	6	41	10	3	22	70	589	20	29	809	34
Future Volume (Veh/h)	20	6	41	10	3	22	70	589	20	29	809	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	6	43	11	3	23	74	620	21	31	852	36
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								243			129	
pX, platoon unblocked	0.88	0.88	0.88	0.88	0.88		0.88					
vC, conflicting volume	1414	1721	444	1312	1728	320	888			641		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1200	1548	98	1084	1556	320	602			641		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	93	95	91	97	97	91			97		
cM capacity (veh/h)	106	88	827	124	87	675	855			939		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	70	37	74	413	228	31	568	320				
Volume Left	21	11	74	0	0	31	0	0				
Volume Right	43	23	0	0	21	0	0	36				
cSH	220	235	855	1700	1700	939	1700	1700				
Volume to Capacity	0.32	0.16	0.09	0.24	0.13	0.03	0.33	0.19				
Queue Length 95th (m)	9.9	4.2	2.2	0.0	0.0	0.8	0.0	0.0				
Control Delay (s)	28.8	23.2	9.6	0.0	0.0	9.0	0.0	0.0				
Lane LOS	D	C	A			A						
Approach Delay (s)	28.8	23.2	1.0			0.3						
Approach LOS	D	C										
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			44.4%		ICU Level of Service				A			
Analysis Period (min)			15									

Total Projected PM
8: Pleasant Park & Othello


















09/12/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	103	160	140	56	91	97
Future Volume (vph)	103	160	140	56	91	97
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	108	168	147	59	96	102
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	276	206	198			
Volume Left (vph)	108	0	96			
Volume Right (vph)	0	59	102			
Hadj (s)	0.11	-0.14	-0.18			
Departure Headway (s)	4.8	4.6	4.9			
Degree Utilization, x	0.37	0.26	0.27			
Capacity (veh/h)	716	736	686			
Control Delay (s)	10.5	9.3	9.6			
Approach Delay (s)	10.5	9.3	9.6			
Approach LOS	B	A	A			
Intersection Summary						
Delay			9.9			
Level of Service			A			
Intersection Capacity Utilization			47.9%	ICU Level of Service	A	
Analysis Period (min)			15			










Total Projected PM
10: Othello & Hamlet/Site

09/12/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	18	5	0	0	165	8	93	35	131	174	10
Future Volume (Veh/h)	3	18	5	0	0	165	8	93	35	131	174	10
Sign Control	Stop				Stop			Free			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	19	5	0	0	174	8	98	37	138	183	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (m)												81
pX, platoon unblocked	0.99	0.99	0.99	0.99	0.99	0.99						
vC, conflicting volume	771	616	188	612	602	116	194			135		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	762	605	173	601	592	116	179			135		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	95	99	100	100	81	99			90		
cM capacity (veh/h)	239	366	860	359	373	936	1381			1449		
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total	3	24	174	143	332							
Volume Left	3	0	0	8	138							
Volume Right	0	5	174	37	11							
cSH	239	416	936	1381	1449							
Volume to Capacity	0.01	0.06	0.19	0.01	0.10							
Queue Length 95th (m)	0.3	1.4	5.2	0.1	2.4							
Control Delay (s)	20.3	14.2	9.7	0.5	3.7							
Lane LOS	C	B	A	A	A							
Approach Delay (s)	14.9		9.7	0.5	3.7							
Approach LOS	B		A									
Intersection Summary												
Average Delay			5.0									
Intersection Capacity Utilization			39.2%	ICU Level of Service					A			
Analysis Period (min)			15									










Total Projected PM
13: Othello & Site

09/12/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	68	83	187	58	64	238
Future Volume (Veh/h)	68	83	187	58	64	238
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	72	87	197	61	67	251
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	612	228			258	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	612	228			258	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	89			95	
cM capacity (veh/h)	433	812			1307	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	159	258	318			
Volume Left	72	0	67			
Volume Right	87	61	0			
cSH	581	1700	1307			
Volume to Capacity	0.27	0.15	0.05			
Queue Length 95th (m)	8.4	0.0	1.2			
Control Delay (s)	13.5	0.0	2.0			
Lane LOS	B		A			
Approach Delay (s)	13.5	0.0	2.0			
Approach LOS	B					
Intersection Summary						
Average Delay			3.8			
Intersection Capacity Utilization			50.4%	ICU Level of Service		A
Analysis Period (min)			15			

Total Projected PM
14: Russell & St. Laurent Towers

09/12/2018

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	18	8	523	814	19
Future Volume (Veh/h)	11	18	8	523	814	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	19	8	551	857	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)					212	
pX, platoon unblocked	0.68	0.68	0.68			
vC, conflicting volume	1434	867	877			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1403	568	583			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	95	99			
cM capacity (veh/h)	103	355	674			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	31	559	877			
Volume Left	12	8	0			
Volume Right	19	0	20			
cSH	183	674	1700			
Volume to Capacity	0.17	0.01	0.52			
Queue Length 95th (m)	4.5	0.3	0.0			
Control Delay (s)	28.7	0.3	0.0			
Lane LOS	D	A				
Approach Delay (s)	28.7	0.3	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization		56.4%		ICU Level of Service		B
Analysis Period (min)		15				

Appendix G

Adjacent Road Segment Multi-modal Analysis

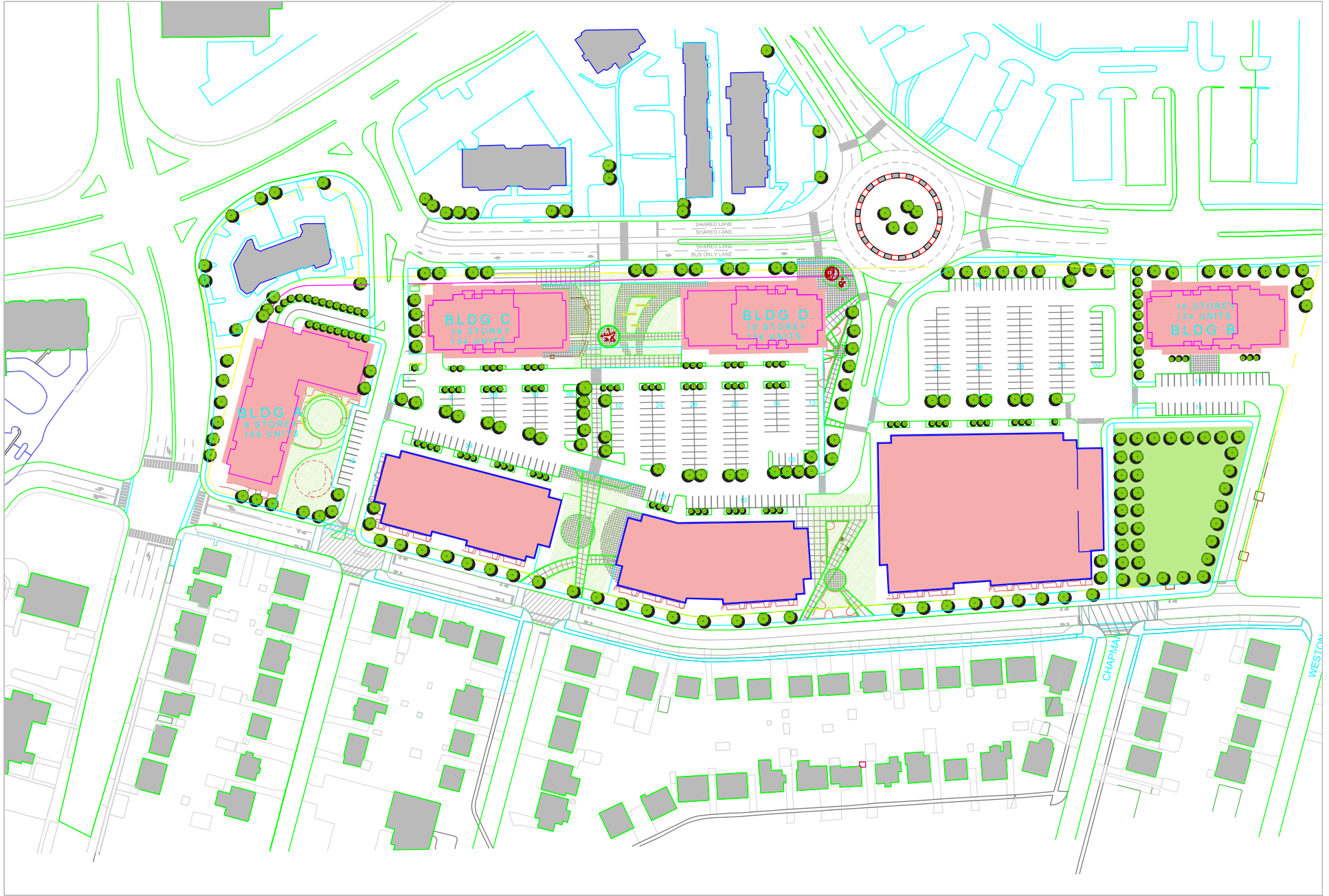
Multi-Modal Level of Service - Segments Form

Consultant	Parsons	Project	Elmvale SC Phase 1
Scenario	Existing and 2021 Conditions	Date	31-Aug-18
Comments	Existing conditions and improvements		

SEGMENTS		Street A	Othello Existing	Othello 2021	Smyth Existing	Smyth 2021
			1	2	3	4
Pedestrian	Sidewalk Width	E	no sidewalk	≥ 2 m	≥ 2 m	≥ 2 m
	Boulevard Width		n/a	< 0.5	< 0.5	< 0.5
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000	> 3000	> 3000
	Operating Speed		> 30 to 50 km/h	> 30 to 50 km/h	> 50 to 60 km/h	> 30 to 50 km/h
	On-Street Parking		no	no	no	no
	Exposure to Traffic PLoS		F	C	E	C
	Effective Sidewalk Width			2.0 m	2.0 m	2.0 m
	Pedestrian Volume		250 ped/hr	250 ped/hr	250 ped/hr	250 ped/hr
Bicycle		F				
	Crowding PLoS		-	B	B	B
	Level of Service		-	C	E	C
	Type of Cycling Facility		Mixed Traffic	Mixed Traffic	Mixed Traffic	Curbside Bike Lane
	Number of Travel Lanes		≤ 2 (no centreline)	2-3 lanes total	≥ 6 lanes total	2 ea. dir. (w median)
	Operating Speed		≥ 50 to 60 km/h	≤ 40 km/h	≥ 50 to 60 km/h	≤ 50 km/h
	# of Lanes & Operating Speed LoS		D	B	F	C
	Bike Lane (+ Parking Lane) Width					≥1.5 to <1.8 m
	Bike Lane Width LoS		-	-	-	B
	Bike Lane Blockages					
	Blockage LoS		-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	≥ 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes	≤ 3 lanes	≤ 3 lanes
	Sidestreet Operating Speed		≤ 40 km/h	≤ 40 km/h	>50 to 60 km/h	>50 to 60 km/h
Truck	Unsignalized Crossing - Lowest LoS		A	A	C	C
	Level of Service		D	B	F	C
	Truck Lane Width	A			≤ 3.5 m	≤ 3.5 m
	Travel Lanes per Direction				> 1	> 1
	Level of Service		-	-	A	A

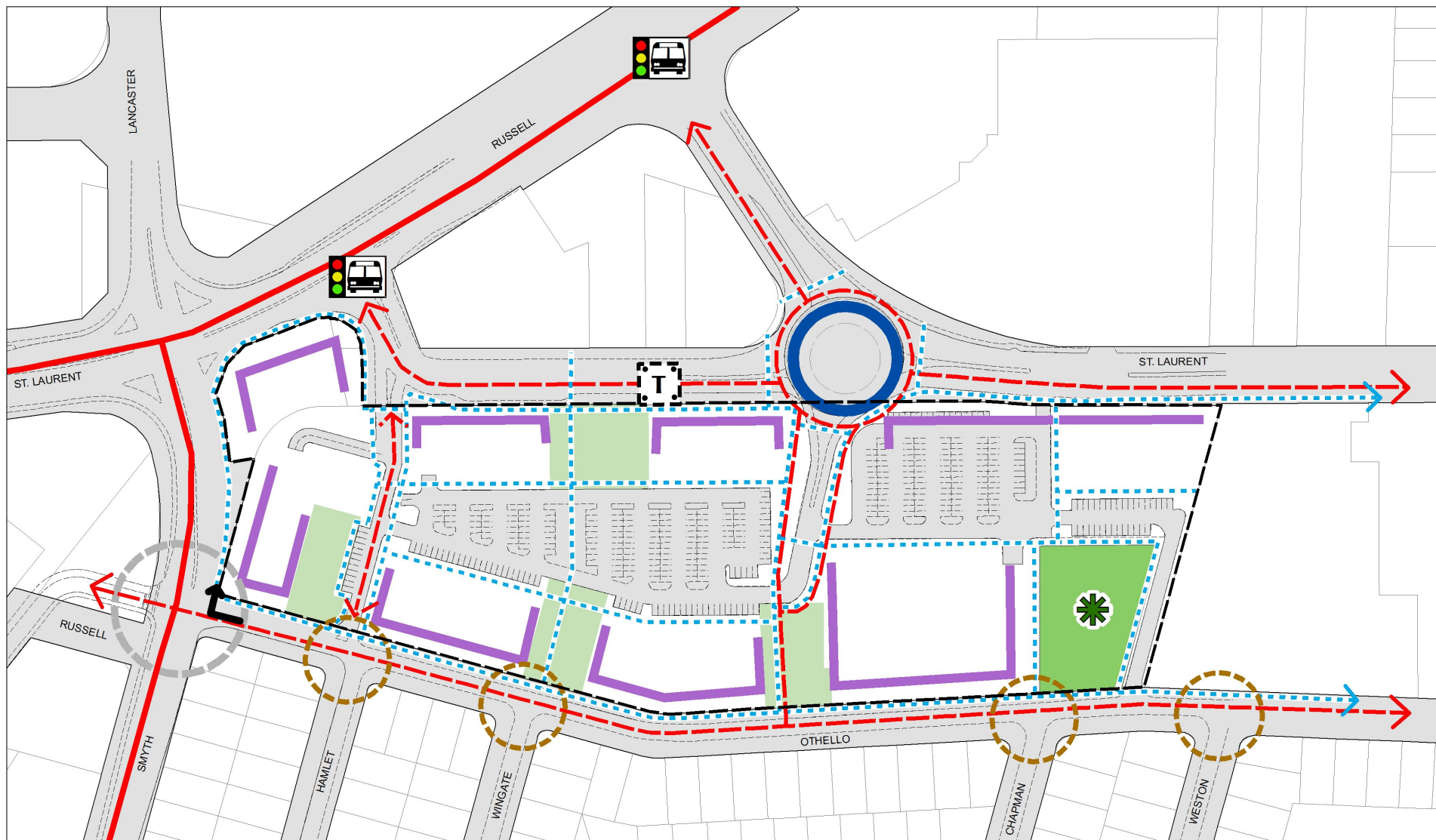
Appendix H

Othello Complete Street Concept



Appendix I

Elmvale Acres Shopping Centre Secondary Plan – Schedule D: Public Realm and Transportation



Elmvale Acres Shopping Centre / Centre commercial Elmvale Acres

SECONDARY PLAN - Volume 2A
Schedule D - Public Realm and Transportation

PLAN SECONDAIRE - Volume 2A
Annexe D - Domaine public et transports



Secondary Plan Boundary /
Limite du plan secondaire

PUBLIC REALM AND TRANSPORTATION / DOMAINE PUBLIC ET TRANSPORTS



Park /
Parc



Privately Owned Public Space (POPS) /
Espace public appartenant à des intérêts privés



Pedestrian Connection /
Lien piétonnier



Cycling Connection /
Lien cyclable



Roundabout /
Carrefour giratoire



Re-aligned / Signalized Intersection /
Nouveau tracé de l'intersection avec signalisation



Raised Intersection /
Intersection surélevée



Transit Only Traffic Signal /
Feu de circulation – passage réservé
au transport en commun



Active Frontage /
Façade active



Designated Right-Turn Lane /
Voie réservée aux virages à droite



Transit Stop - Bus /
Arrêt d'autobus du transport en commun



Existing Cycling Spine Route /
Circuit principale existante

0 25 50 75 Meters

Prepared by: Planning, Infrastructure and Economic Development Department, GIS and Data Management
Préparé par: Services de la planification, de l'infrastructure et du développement économique, SIG et Gestion des données

Appendix J

Optional Post-Occupancy TDM Measures Checklist

Introduction

The City of Ottawa's *Transportation Impact Assessment (TIA) Guidelines* (specifically Module 4.3—Transportation Demand Management) requires proponents of qualifying developments to assess the context, need and opportunity for transportation demand management (TDM) measures at their development. The guidelines require that proponents complete the City's **TDM Measures Checklist**, at a minimum, to identify any TDM measures being proposed.

The remaining sections of this document are:

- Using the Checklist
- Glossary
- TDM Measures Checklist: Non-Residential Developments
- TDM Measures Checklist: Residential developments

Readers are encouraged to contact the City of Ottawa's TDM Officer for any guidance and assistance they require to complete this checklist.

Using the Checklist

The City's *TIA Guidelines* are designed so that *Module 3.1—Development-Generated Travel Demand*, *Module 4.1—Development Design*, and *Module 4.2—Parking* are complete before a proponent begins *Module 4.3—Transportation Demand Management*.

Within Module 4.3, *Element 4.3.1—Context for TDM* and *Element 4.3.2—Need and Opportunity* are intended to create an understanding of the need for any TDM measures, and of the results they are expected to achieve or support. Once those two elements are complete, proponents begin *Element 4.3.3—TDM Program* that requires proponents to identify proposed TDM measures using the **TDM Measures Checklist**, at a minimum. The *TIA Guidelines* note that the City may require additional analysis for large or complex development proposals, or those that represent a higher degree of performance risk; as well, proponents proposing TDM measures for a new development must also propose an implementation plan that addresses planning and coordination, funding and human resources, timelines for action, performance targets and monitoring requirements.

This **TDM Measures Checklist** document includes two actual checklists, one for non-residential developments (office, institutional, retail or industrial) and one for residential developments (multi-family, condominium or subdivision). Readers may download the applicable checklist in electronic format and complete it electronically, or print it out and complete it by hand. As an alternative, they may create a freestanding document that lists the TDM measures being proposed and provides additional detail on them, including an implementation plan as required by the City's *TIA Guidelines*.

Each measure in the checklist is numbered for easy reference. Each measure is also flagged as:

- **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.

Glossary

This glossary defines and describes the following measures that are identified in the **TDM Measures Checklist**:

TDM program management

- Program coordinator
- Travel surveys

Parking

- Priced parking

Walking & cycling

- Information on walking/cycling routes & destinations
- Bicycle skills training
- Valet bike parking

Transit

- Transit information
- Transit fare incentives
- Enhanced public transit service
- Private transit service

Ridesharing

- Ridematching service
- Carpool parking price incentives
- Vanpool service

Carsharing & bikesharing

- Bikeshare stations & memberships
- Carshare vehicles & memberships

TDM marketing & communications

- Multimodal travel information
- Personalized trip planning
- Promotions

Other incentives & amenities

- Emergency ride home
- Alternative work arrangements
- Local business travel options
- Commuter incentives
- On-site amenities

For further information on selecting and implementing TDM measures (particularly as they apply to non-residential developments, with a focus on workplaces), readers may find it helpful to consult Transport Canada's *Workplace Travel Plans: Guidance for Canadian Employers*, which can be downloaded in English and French from the ACT Canada website at

www.actcanada.com/resources/act-resources.

► ***TDM program management***

While some TDM measures can be implemented with a minimum of effort through routine channels (e.g. parking or human resources), more complex measures or a larger development site may warrant assigning responsibility for TDM program coordination to a designated person either inside or outside the implementing organization. Similarly, some TDM measures are more effective if they are targeted or customized for specific audiences, and would benefit from the collection of related information.

Program coordinator. This person is charged with day-to-day TDM program development and implementation. Only in very large employers with thousands of workers is this likely to be a full-time, dedicated position. Usually, it is added to an existing role in parking, real estate, human resources or environmental management. In practice, this role may be called TDM coordinator, commute trip reduction coordinator or employee transportation coordinator. The City of Ottawa can identify external resources (e.g. non-profit organizations or consultants) that could provide these services.

Travel surveys. Travel surveys are most commonly conducted at workplaces, but can be helpful in other settings. They identify how and why people travel the way they do, and what barriers and opportunities exist for different behaviours. They usually capture the following information:

- *Personal data* including home address or postal code, destination, job type or function, employment status (full-time, part-time and/or teleworker), gender, age and hours of work
- *Commute information* including distance or time for the trip between home and work, usual methods of commuting, and reasons for choosing them
- *Barriers and opportunities* including why other commuting methods are unattractive, willingness to consider other options, and what improvements to other options could make them more attractive

► ***Parking***

Priced parking. Charging for parking is typically among the most effective ways of getting drivers to consider other travel options. While drivers may not support parking fees, they can be more accepting if the revenues are used to improve other travel options (e.g. new showers and change rooms, improved bicycle parking or subsidized transit passes). At workplaces or daytime destinations, parking discounts (e.g. early bird specials, daily passes that cost significantly less than the equivalent hourly charge, monthly passes that cost significantly less than the equivalent daily charge) encourage long-term parking and discourage the use of other travel options. For residential uses, unbundling parking costs from dwelling purchase, lease or rental costs provides an incentive for residents to own fewer cars, and can reduce car use and the costs of parking provision.

► ***Walking & cycling***

Active transportation options like cycling and walking are particularly attractive for short trips (typically up to 5 km and 2 km, respectively). Other supportive factors include an active, health-conscious audience, and development proximity to high-quality walking and cycling networks. Common challenges to active transportation include rain, darkness, snowy or icy conditions, personal safety concerns, the potential for bicycle theft, and a lack of shower and change facilities for those making longer trips.

Information on walking/cycling routes & destinations. Ottawa, Gatineau and the National Capital Commission all publish maps to help people identify the most convenient and comfortable walking or cycling routes.

Bicycle skills training. Potential cyclists can be intimidated by the need to ride on roads shared with motor vehicles. This barrier can be reduced or eliminated by offering cycling skills training to interested cyclists (e.g. CAN-BIKE certification courses).

Valet bike parking. For large events, temporary “valet parking” areas can be easily set up to maximize convenience and security for cyclists. Experienced local non-profit groups can help.

► ***Transit***

Transit information. Difficulty in finding or understanding basic information on transit fares, routes and schedules can prevent people from trying transit. Employers can help by providing online links to OC Transpo and STO websites. Transit users also appreciate visible maps and schedules of transit routes that serve the site; even better, a screen that shows real-time transit arrival information is particularly useful at sites with many transit users and an adjacent transit stop or station.

Transit fare incentives. Free or subsidized transit fares are an attractive incentive for non-transit riders to try transit. Many non-users are unsure of how to pay a fare, and providing tickets or a preloaded PRESTO card (or, for special events, pre-arranging with OC Transpo that transit fares are included with event tickets) overcome that barrier.

Enhanced public transit service. OC Transpo may adjust transit routes, stop locations, service hours or frequencies for an agreed fee under contract, or at no cost where warranted by the potential ridership increase. Information provided by a survey of people who travel to a given development can support these decisions.

Private transit service. At remote suburban or rural workplaces, a poor transit connection to the nearest rapid transit station can be an obstacle for potential transit users, and an employer in this situation could initiate a private shuttle service to make transit use more feasible or attractive. Other circumstances where a shuttle makes sense include large special events, or a residential development for people with limited independent mobility who still require regular access to shops and services.

► **Ridesharing**

Ridesharing's potential is greatest in situations where transit ridership is low, where parking costs are high, and/or where large numbers of car commuters (e.g. employees or full-time students) live reasonably far from the workplace.

Ridematching service. Potential carpoolers in Ottawa are served by www.OttawaRideMatch.com, an online service to help people find carpool partners. Employers can arrange for a dedicated portal where their employees can search for potential carpool partners only among their colleagues, if they desire. Some very large employers may establish internal ridematching services, to maximize employee uptake and corporate control. Ridematching service providers typically include a waiver to relieve employers of liability when their employees start carpooling through a ridematching service. Ridesharing with co-workers also tends to eliminate security concerns.

Carpool parking price incentives. Discounted parking fees for carpools can be an extra incentive to rideshare.

Vanpool service. Vanpools operate in the Toronto and Vancouver metropolitan areas, where vans that carry up to about ten occupants are driven by one of the vanpool members. Vanpools tend to operate on a cost-recovery basis, and are most practical for long-distance commutes where transit is not an option. Current legislation in Ontario does not permit third-party (i.e. private or non-profit) vanpool services, but does permit employers to operate internal vanpools.

► **Carsharing & bikesharing**

Bikeshare station & memberships. VeloGO Bike Share and Right Bike both operate bikesharing services in Ottawa. Developments that would benefit from having a bikeshare station installed at or near their development may negotiate directly with either service provider.

Carshare vehicles & memberships. VRTUCAR and Zipcar both operate carsharing services in Ottawa, for use by the general public or by businesses as an alternative to corporate fleets. Carsharing services offer 24-hour access, self-serve reservation systems, itemized monthly billings, and outsourcing of all financing, insurance, maintenance and administrative responsibilities.

► **TDM marketing & communications**

Multimodal travel information. Aside from mode-specific information discussed elsewhere in this document, multimodal information that identifies and explains the full range of travel options available to people can be very influential—especially when provided at times and locations where individuals are actively choosing among those options. Examples include: employees when their employer is relocating, or when they are joining a new employer; students when they are starting a program at a new institution; visitors or customers travelling to an unfamiliar destination, or when faced with new options (e.g. shuttle services or parking restrictions); and residents when they purchase or occupy a residence that is new to them.

Personalized trip planning. As an extension to the simple provision of information, this technique (also known as *individualized marketing*) is effective in helping people make more sustainable travel choices. The approach involves identifying who is most likely to change their travel choices (notably relocating employees, students or residents) giving them customized information, training and incentives to support them in making that change. It may be conducted with assistance from an external service provider with the necessary skills, and delivered in a variety of settings including workplaces and homes.

Promotions. Special events and incentives can raise awareness and encourage individuals to examine and try new travel options.

- *Special events* can help attract attention, build participation and celebrate successes. Events that have been held in Ottawa include Earth Day (in April) Bike to Work Month (in May), Environment Week (early June), International Car Free Day (September 22), and Canadian Ridesharing Week (October). At workplaces or educational institutions, similarly effective internal events could include workshops, lunch-and-learns, inter-departmental challenges, pancake breakfasts, and so on.
- *Incentives* can encourage trial of sustainable modes, and might include loyalty rewards for duration or consistency of activity (e.g. 1,000 km commuted by bicycle), participation prizes (e.g. for completing a survey or joining a special event), or personal recognition that highlights individual accomplishments.

► **Other incentives & amenities**

Emergency ride home. This measure assures non-driving commuters that they will be able to get home quickly and conveniently in case of family emergency (or in some workplaces, in case of unexpected overtime, severe weather conditions, or the early departure of a carpool driver) by offering a chit or reimbursement for taxi, carshare or rental car usage. Limits on annual usage or cost per employee may be set, although across North America the actual rates of usage are typically very low.

Alternative work arrangements. A number of alternatives to the standard 9-to-5, Monday-to-Friday workweek can support sustainable commuting (and work-life balance) at workplaces:

- *Flexible working hours* allow transit commuters to take advantage of the fastest and most convenient transit services, and allow potential carpoolers to include people who work slightly different schedules in their search for carpool partners. They also allow active commuters to travel at least one direction in daylight, either in the morning or the afternoon, during the winter.
- *Compressed workweeks* allow employees to work their required hours over fewer days (e.g. five days in four, or ten days in nine), eliminating the need to commute on certain days. For employees, this can promote work-life balance and gives flexibility for appointments. For employers, this can permit extended service hours as well as reduced parking demands if employees stagger their days off.
- *Telework* is a normal part of many workplaces. It helps reduce commuting activity, and can lead to significant cost savings through workspace sharing. Telework initiatives involve many stakeholders, and may face as much resistance as support within an organization. Consultation, education and training are helpful.

Local business travel options. A common obstacle for people who might prefer to not drive to work is that their employer requires them to bring a car to work so they can make business trips during the day. Giving employees convenient alternatives to private cars for local business travel during the workday makes walking, cycling, transit or carpooling in someone else's car more practical.

- *Walking and cycling*—Active transportation can be a convenient and enjoyable way to make short business trips. They can also reduce employer expenses, although they may require extra travel time. Providing a fleet of shared bikes, or reimbursing cyclists for the kilometres they ride, are inexpensive ways to validate their choice.
- *Public transit*—Transit can be convenient and inexpensive compared to driving. OC Transpo's PRESTO cards are transferable among employees and automatically reloadable, making them the perfect tool for enabling transit use during the day.
- *Ridesharing*—When multiple employees attend the same off-site meeting or event, they can be reminded to carpool whenever possible.
- *Taxis or ride-hailing*—Taxis and ride-hailing can eliminate parking costs, save time and eliminate collision liability concerns. Taxi chits eliminate cash transactions and minimize paperwork.
 - *Fleet vehicles or carsharing*—Fleet vehicles can be cost-effective for high travel volumes, while carsharing is a great option for less frequent trips.
 - *Interoffice shuttles*—Employers with multiple worksites in the region could use a shuttle service to move people as well as mail or supplies.
 - *Videoconferencing*—New technologies mean that staying in the office to hold meetings electronically is more viable, affordable and productive than ever.

Commuter incentives. Financial incentives can help create a level playing field and support commuting by sustainable modes. A “commuting allowance” given to all employees as a taxable benefit is one such incentive; employees who choose to drive could then be charged for parking, while other employees could use the allowance for transit fares or cycling equipment, or for spending or saving. (Note that in the United States this practice is known as “parking cash-out,” and is popular because commuting allowances are not taxable up to a certain limit). Alternatively, a monthly commuting allowance for non-driving employees would give drivers an incentive to choose a different commuting mode. Another practical incentive for active commuters or transit users is to offer them discounted “rainy day” parking passes for a small number of days each month.

On-site amenities. Developments that offer services to limit employees' need for a car during their commute (e.g. to drop off clothing at the dry cleaners) or during their workday (e.g. to buy lunch) can free employees to make the commuting decision that otherwise works best for them.

TDM Measures Checklist: *Non-Residential Developments (office, institutional, retail or industrial)*

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: <i>Non-residential developments</i>		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	<input type="checkbox"/>
1.2 Travel surveys		
BETTER	1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	<input type="checkbox"/>
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	<input type="checkbox"/>
2.2 Bicycle skills training		
<i>Commuter travel</i>		
BETTER ★	2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses	<input type="checkbox"/>
2.3 Valet bike parking		
<i>Visitor travel</i>		
BETTER	2.3.1 Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	<input type="checkbox"/>

TDM measures: <i>Non-residential developments</i>		Check if proposed & add descriptions
3. TRANSIT		
3.1 Transit information		
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances	<input type="checkbox"/>
BASIC	3.1.2 Provide online links to OC Transpo and STO information	<input type="checkbox"/>
BETTER	3.1.3 Provide real-time arrival information display at entrances	<input type="checkbox"/>
3.2 Transit fare incentives		
<i>Commuter travel</i>		
BETTER	3.2.1 Offer preloaded PRESTO cards to encourage commuters to use transit	<input type="checkbox"/>
BETTER ★	3.2.2 Subsidize or reimburse monthly transit pass purchases by employees	<input type="checkbox"/>
<i>Visitor travel</i>		
BETTER	3.2.3 Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	<input type="checkbox"/>
3.3 Enhanced public transit service		
<i>Commuter travel</i>		
BETTER	3.3.1 Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	<input type="checkbox"/>
<i>Visitor travel</i>		
BETTER	3.3.2 Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	<input type="checkbox"/>
3.4 Private transit service		
<i>Commuter travel</i>		
BETTER	3.4.1 Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	<input type="checkbox"/>
<i>Visitor travel</i>		
BETTER	3.4.2 Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	<input type="checkbox"/>

TDM measures: <i>Non-residential developments</i>		Check if proposed & add descriptions
4. RIDESHARING		
4.1 Ridematching service		
<i>Commuter travel</i>		
BASIC ★	4.1.1 Provide a dedicated ridematching portal at OttawaRideMatch.com	<input type="checkbox"/>
4.2 Carpool parking price incentives		
<i>Commuter travel</i>		
BETTER	4.2.1 Provide discounts on parking costs for registered carpools	<input checked="" type="checkbox"/> And provide a car charging station.
4.3 Vanpool service		
<i>Commuter travel</i>		
BETTER	4.3.1 Provide a vanpooling service for long-distance commuters	<input type="checkbox"/>
5. CARSHARING & BIKESHARING		
5.1 Bikeshare stations & memberships		
BETTER	5.1.1 Contract with provider to install on-site bikeshare station for use by commuters and visitors	<input type="checkbox"/>
<i>Commuter travel</i>		
BETTER	5.1.2 Provide employees with bikeshare memberships for local business travel	<input type="checkbox"/>
5.2 Carshare vehicles & memberships		
<i>Commuter travel</i>		
BETTER	5.2.1 Contract with provider to install on-site carshare vehicles and promote their use by tenants	<input type="checkbox"/>
BETTER	5.2.2 Provide employees with carshare memberships for local business travel	<input type="checkbox"/>
6. PARKING		
6.1 Priced parking		
<i>Commuter travel</i>		
BASIC ★	6.1.1 Charge for long-term parking (daily, weekly, monthly)	<input type="checkbox"/>
BASIC	6.1.2 Unbundle parking cost from lease rates at multi-tenant sites	<input type="checkbox"/>
<i>Visitor travel</i>		
BETTER	6.1.3 Charge for short-term parking (hourly)	<input type="checkbox"/>

TDM measures: <i>Non-residential developments</i>			Check if proposed & add descriptions
7. TDM MARKETING & COMMUNICATIONS			
7.1 Multimodal travel information			
<i>Commuter travel</i>			
BASIC	★	7.1.1 Provide a multimodal travel option information package to new/relocating employees and students	<input type="checkbox"/>
<i>Visitor travel</i>			
BETTER	★	7.1.2 Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	<input type="checkbox"/>
7.2 Personalized trip planning			
<i>Commuter travel</i>			
BETTER	★	7.2.1 Offer personalized trip planning to new/relocating employees	<input type="checkbox"/>
7.3 Promotions			
<i>Commuter travel</i>			
BETTER		7.3.1 Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	<input type="checkbox"/>
8. OTHER INCENTIVES & AMENITIES			
8.1 Emergency ride home			
<i>Commuter travel</i>			
BETTER	★	8.1.1 Provide emergency ride home service to non-driving commuters	<input type="checkbox"/>
8.2 Alternative work arrangements			
<i>Commuter travel</i>			
BASIC	★	8.2.1 Encourage flexible work hours	<input type="checkbox"/>
BETTER		8.2.2 Encourage compressed workweeks	<input type="checkbox"/>
BETTER	★	8.2.3 Encourage telework	<input type="checkbox"/>
8.3 Local business travel options			
<i>Commuter travel</i>			
BASIC	★	8.3.1 Provide local business travel options that minimize the need for employees to bring a personal car to work	<input type="checkbox"/>
8.4 Commuter incentives			
<i>Commuter travel</i>			
BETTER		8.4.1 Offer employees a taxable, mode-neutral commuting allowance	<input type="checkbox"/>
8.5 On-site amenities			
<i>Commuter travel</i>			
BETTER		8.5.1 Provide on-site amenities/services to minimize mid-day or mid-commute errands	<input type="checkbox"/>

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: <i>Residential developments</i>		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	<input type="checkbox"/>
1.2 Travel surveys		
BETTER	1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	<input type="checkbox"/>
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 (<i>multi-family, condominium</i>)	<input checked="" type="checkbox"/>
2.2 Bicycle skills training		
BETTER	2.2.1 Offer on-site cycling courses for residents, or subsidize off-site courses	<input type="checkbox"/>

TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
3. TRANSIT		
3.1 Transit information		
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances (<i>multi-family, condominium</i>)	<input checked="" type="checkbox"/>
BETTER	3.1.2 Provide real-time arrival information display at entrances (<i>multi-family, condominium</i>)	<input type="checkbox"/>
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	<input checked="" type="checkbox"/> On residence purchase/move-in within the first 6 months of Pre-sales/sales initiation.
BETTER	3.2.2 Offer at least one year of free monthly transit passes on residence purchase/move-in	<input type="checkbox"/>
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 (<i>subdivision</i>)	<input type="checkbox"/>
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)	<input type="checkbox"/>
4. CARSHARING & BIKESHARING		
4.1 Bikeshare stations & memberships		
BETTER	4.1.1 Contract with provider to install on-site bikeshare station (<i>multi-family</i>)	<input type="checkbox"/>
BETTER	4.1.2 Provide residents with bikeshare memberships, either free or subsidized (<i>multi-family</i>)	<input type="checkbox"/>
4.2 Carshare vehicles & memberships		
BETTER	4.2.1 Contract with provider to install on-site carshare vehicles and promote their use by residents	<input checked="" type="checkbox"/>
BETTER	4.2.2 Provide residents with carshare memberships, either free or subsidized	<input type="checkbox"/>
5. PARKING		
5.1 Priced parking		
BASIC ★	5.1.1 Unbundle parking cost from purchase price (<i>condominium</i>)	<input type="checkbox"/>
BASIC ★	5.1.2 Unbundle parking cost from monthly rent (<i>multi-family</i>)	<input type="checkbox"/>

TDM measures: <i>Residential developments</i>		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	<input type="checkbox"/>
6.2 Personalized trip planning		
BETTER ★	6.2.1 Offer personalized trip planning to new residents	<input type="checkbox"/>

Appendix K

Adjacent Signalized Intersections Multi-modal Analysis

Multi-Modal Level of Service - Intersections Form

Consultant
Scenario
Comments

Parsons

Existing conditions and improvements

Project
Date

Elmvale SC Phase 1

31-Aug-18

Unlocked Rows for Replicating

Unlocked Rows for Replicating

INTERSECTIONS		St. Laurent / Lancaster / Smyth (Existing)				Smyth/Russell/Othello (Existing)				St. Laurent / Lancaster / Smyth (Improvements)				Smyth/Russell/Othello (Improvements)				
Crossing Side		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	
Pedestrian	Lanes	7	7	6	7	0 - 2	0 - 2	6	5	7	7	6	4	0 - 2	0 - 2	6	5	
	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	No Median - 2.4 m	Median > 2.4 m	Median > 2.4 m	Median > 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m	Median > 2.4 m	
	Conflicting Left Turns	Protected/ Permissive	Protected/ Permissive	Protected/ Permissive	Protected/ Permissive	Permissive	Protected/ Permissive	Protected	Protected	No left turn / Prohib.	No left turn / Prohib.	No left turn / Prohib.	Protected/ Permissive	Permissive	Protected/ Permissive	No left turn / Prohib.	No left turn / Prohib.	
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Protected	Protected	Permissive or yield control	Permissive or yield control	No right turn	No right turn	No right turn	Permissive or yield control	Protected	Protected	No right turn	No right turn	
	Right Turns on Red (RTor) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	
	Right Turn Channel	Conv'tl without Receiving Lane	Conv'tl without Receiving Lane	Conventional with Receiving Lane	Conv'tl without Receiving Lane	No Channel	No Channel	No Channel	No Channel	No Right Turn	No Right Turn	No Right Turn	Conv'tl without Receiving Lane	No Channel	No Channel	No Right Turn	No Right Turn	
	Corner Radius	15-25m	15-25m	15-25m	15-25m	5-10m	10-15m	5-10m	5-10m	No Right Turn	No Right Turn	No Right Turn	10-15m	5-10m	10-15m	No Right Turn	5-10m	
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Raised crosswalk	Raised crosswalk	Raised crosswalk	Zebra stripe hi-vis markings	Std transverse markings	Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	
	PETSI Score	6	6	19	6	94	93	29	46	45	45	60	60	94	95	56	66	
	Ped. Exposure to Traffic LoS	F	F	F	F	A	A	F	D	D	D	C	C	A	A	D	C	
	Cycle Length	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	Effective Walk Time	21	32	42	42	47	34	25	27	21	32	42	42	47	36	36	36	
	Average Pedestrian Delay	41	32	25	25	22	31	38	36	41	32	25	25	22	29	29	29	
Pedestrian Delay LoS	E	D	C	C	C	D	D	D	E	D	C	C	C	C	C	C		
Level of Service	F	F	F	F	C	D	F	D	E	D	C	C	C	C	D	C		
	F				F				E				D					
Approach From		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	
Bicycle	Bicycle Lane Arrangement on Approach	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Pocket Bike Lane	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Pocket Bike Lane	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	
	Right Turn Lane Configuration		≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m	≤ 50 m	> 50 m	≤ 50 m			≤ 50 m Introduced right turn lane		Not Applicable	≤ 50 m Introduced right turn lane	Not Applicable	Not Applicable	
	Right Turning Speed		>25 km/h	>25 km/h	>25 km/h	≤ 25 km/h	≤ 25 km/h	>25 km/h	≤ 25 km/h			>25 to 30 km/h		Not Applicable	>25 to 30 km/h	Not Applicable	Not Applicable	
	Cyclist relative to RT motorists	Not Applicable	E	E	E	D	D	F	D	Not Applicable	Not Applicable	C	Not Applicable	Not Applicable	C	Not Applicable	Not Applicable	
	Separated or Mixed Traffic	Separated	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Separated	Separated	Separated	Separated	Separated	Separated	Separated	Separated	
	Left Turn Approach	2-stage, LT box	≥ 2 lanes crossed	One lane crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	2-stage, LT box	2-stage, LT box	1 lane crossed	2-stage, LT box	1 lane crossed	1 lane crossed	2-stage, LT box	2-stage, LT box	
	Operating Speed	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 40 to ≤ 50 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 40 to ≤ 50 km/h	> 50 to < 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	
	Left Turning Cyclist	A	F	E	F	B	C	F	F	A	A	C	A	C	C	A	A	
	Level of Service	A	F	E	F	D	D	F	F	A	A	C	A	C	C	A	A	
F				F				C				C						
Truck	Effective Corner Radius	> 15 m	> 15 m	> 15 m	> 15 m	10 - 15 m	10 - 15 m	10 - 15 m	10 - 15 m	> 15 m	> 15 m	> 15 m	> 15 m	10 - 15 m	10 - 15 m	10 - 15 m	10 - 15 m	
	Number of Receiving Lanes on Departure from Intersection	≥ 2	1	≥ 2	≥ 2	≥ 2	≥ 2	1	1	≥ 2	1	≥ 2	≥ 2	≥ 2	≥ 2	1	1	
	Level of Service	A	C	A	A	B	B	E	E	A	C	A	A	B	B	E	E	
		C				E				C				E				

Appendix L

Correspondence

From: "Dubyk, Wally" <Wally.Dubyk@ottawa.ca>
Date: October 24, 2018 at 1:48:57 PM EDT
To: "Jack, Ronald" <Ronald.Jack@parsons.com>
Cc: "Moore, Sean" <Sean.Moore@ottawa.ca>
Subject: 1910 St Laurent Blvd - Elmvale Forecasting Resubmission response

1910 St Laurent Blvd –Elmvale Acres Shopping Centre (Phase 1)

**TIA Forecasting Report Resubmission, Dated October 02, 2018
Proposed Site Plan – Option 2, Dated September 05, 2018**

(Ref: D01-01-15-0019)

Traffic Engineering

PM synchro file still contains fatal error and will not run SIM traffic. Please contact Connor Bomhower at 613-580-2424 Ext 23088 to discuss further.

Transportation Engineering Services

Include a discussion/rational to explain the projected trip distribution. Confirm that retail trips during the PM are expected to be 40% from/to the South and 20% from/to the West.

Figures 6 and 9 continue to not contain any volumes for Wingate Drive.

The exemptions chart in the scoping section indicates that Section 4.7.2 should be excluded. However, the CTS completed in May 2017 indicated that OC Transpo requested that Transit Priority Measures be examined at the north end of the Transit loop at St. Laurent Boulevard and the intersection of St. Laurent and Russell Road.

Also of note, is that the 2017 CTS report indicated background growth of 1%. This Forecasting report is indicating that through review of previous traffic counts that the background growth has been negative and therefore a 0% growth rate will be applied. Following from that change there is no projection for total future volumes 5 years after completion of the development.

Wally Dubyk
Project Manager - Transportation Approvals
Development Review, Central & South Branches
613-580-2424 x13783

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Memorandum

To: Wally Dubyk
Copy: Ronald Jack
From: Andrés Pena

Date: 2 October 2018
Project: 476853

Re: Elmvale SC Phase 1 – TIA Forecasting Report- Response to City's Additional Comments

1. INTRODUCTION

Parsons has prepared a Transportation Impact Assessment Forecasting Report in support of the proposed Phase 1 development located at 1910 St. Laurent Boulevard and consisting of a residential apartment tower with 168 apartment units, approximately 1086 m² of ground level retail, a 144-spaces two-level garage, and 45 surface parking spaces, as per latest information.

As part of the review process, the City of Ottawa, through its Development Review, Central & South Branches delivered comments related to the Trip Generation and Traffic Analysis sections of the report. This memo addresses these comments and provide record to the City. The revised Forecasting Report is attached.

2. CITY OF OTTAWA COMMENTS

1910 St Laurent Blvd (Elmvale Shopping Centre)
TIA - Forecasting Report, Dated August 28, 2018

D02-02-15-0087

Traffic Engineering

Comment 1: The SYNCHRO as provided contains fatal errors and will not run sim traffic simulations.

Response 1: The SYNCHRO file has been corrected and is also attached to the foregoing Memo.

Comment 2: Any revision to trip distribution and generation will require revisions to the synchro for review.

Response 2: Noted.

Comment 3: Northbound queuing at Smyth Road and Othello Avenue may impact SBL and SBT movements at Hamlet Road and Site access. Depending on the severity, this may extend to Smyth Road causing disruptions at the traffic signal. Elimination of existing access on Smyth Road east of Othello Avenue may exacerbate the queuing issue on Othello Avenue.

Response 3: Field observations of existing conditions have identified NB queues occasionally extending back beyond the Site/Othello driveway (>70 m). When this condition has been observed, gaps are provided by users to allow for access/egress to/from Elmvale Mall and Hamlet Street. At no time have we observed southbound queues extending back and impacting the Smyth/Othello intersection, nor have we heard of this occurring. Very low use of the existing right-in access on Smyth Road was also observed and its removal is not considered problematic to traffic operations on Othello.

As part of the proposed Phase 1 development, the addition of one NBR lane to Othello Ave between Smyth Road and Othello/Site driveway will significantly reduce any NB queues on Othello approaching Smyth/Othello intersection. Table 1

summarizes queue projections at Smyth/Othello at 2021, as per SYNCHRO 10.1 model results, and with the additional NB lane.

Table 1: Queue Summary at Smyth/Othello for 2021 Total Projected Conditions

Weekday Peak Hour	50 th NBT Queue (m)	95 th NBT Queue (m)	SBL veh/minute	D – 95 th Queue (m)
AM	45	65	1	-2
PM	39.7	59.3	3	3.7

Note: "D" is the distance between Othello/Site driveway center to Smyth Road south side (approximately 63 m).

As observed in Table 1, the addition of the NBR lane to Othello Avenue at Smyth/Othello intersection will result in only 5% of NBT queues on Othello backing to Othello/Site driveway. For this condition, projected SBL traffic volumes at Othello/Site driveway are unlikely to queue back to Smyth Road (storage length of approximately 63 m), as they do not currently do so with only one NB lane. As such, the proposed addition of a NBR lane on Othello at the Smyth/Othello intersection is a significant improvement over existing conditions.

Transportation Engineering Services

Comment 4: Distribution percentage for retail according to ITE Manual is 44% in and 56% out.

Response 4: Distribution percentages have been corrected according to ITE Manual 10th edition. As such, for land use code 820 – Shopping Center, distribution percentages are 48% entering, 52% exiting. These changes have been inserted to the revised Forecasting Report.

Comment 5: For the residential apartments, please use Table 6.3 for trip rates and 3.13 for mode shares when calculating person trips. The person trips for AM and PM is approximately double of the numbers identified in the report. Table 8 should be revised accordingly.

Response 5: Person trips for AM and PM revised and inserted to the revised Forecasting Report.

Comment 6: Please resubmit the revised Forecasting Report and Synchro files for review.

Response 6: Noted. Revised Forecasting Report and Synchro files attached to this memo for review by the City.

The City has provided the following additional comments:

1910 St Laurent Blvd (Elmvale Shopping Centre)
Re-Submitted Synchro Files, Dated September 14, 2018

Traffic Engineering

Comment 7: Synchro analysis has only been provided for projected 2021. No existing conditions, or post 2021 analysis.

Response 7: Noted. Existing conditions SYCNHRO files are attached to this memo. Based on the 0% background growth identified, post-2021 horizon analysis is the same as the 2021 full-build-out scenario. As such, no post-2021 horizon will be analyzed.

Comment 8: Comments regarding queuing at Hamlet Road/Site access intersection and Smyth Road/Othello Avenue intersection carry forward from the previous response;

"Northbound queuing at Smyth Road and Othello Avenue may impact SBL and SBT movements at Hamlet Road and Site access. Depending on the severity, this may extend to Smyth Road causing disruptions at the traffic signal. Elimination of existing access on Smyth Road east of Othello Avenue may exacerbate the queuing issue on Othello Avenue."

Response 8: See response 3. The proposed addition of a NBR lane on Othello at the Smyth/Othello intersection is a significant improvement over existing conditions and will eliminate or minimize any queuing concerns.

Comment 9: Given the proposed 144 residential parking stalls along with an additional 45 surface stalls with 168 residential units, will the transit modal share be achieved by providing this number of parking stalls?

Response 9: Vehicle ownership, in conjunction with available transportation options can determine modal choice. Where convenient, high-frequency transit services are provided, car owners can -and have been observed- to choose to commute by transit and use their vehicles for non-work-related activities. In this sense, it is expected that modal choices in the analyzed time periods will be largely determined by the quality of available transit services. Considering the site is located less than 300 m walking from a high-frequency, sheltered transit service within an envisioned mixed-use center, a high transit ridership is anticipated for the analyzed time periods. Additional transportation demand management measures will be explored in the Strategy Report.

Prepared By:



Andrés Pena, M.Sc.
Engineering Intern

Reviewed By:



Ronald Jack, P.Eng.
Senior Transportation Engineer

Attached:

- Revised Elmvale Shopping Centre Phase 1 TIA Forecasting Report, and
- SYNCHRO files package – Existing Conditions.

From: [Pena-cabra, Andres](#)
To: ["Dubyk, Wally"](#)
Cc: ["Baggs, Rosanna"](#); [Jack, Ronald](#); [Baker, Mark](#)
Subject: RE: Elmvale Shopping Centre Forecasting Report-
Date: Tuesday, October 02, 2018 1:29:00 PM
Attachments: [Comments Response Memo 2.pdf](#)

Hi Wally,

Please find attached the corresponding signed Response Memo #2 and ignore the one attached to the previous email.

Apologies for the signature omission before.

Thank you,

Andrés Pena
E.I.T
1223 Michael St, Suite 100, Gloucester, ON K1J7T2
andres.pena-cabra@parsons.com +1 613.738.4160

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From: Pena-cabra, Andres
Sent: Tuesday, October 02, 2018 12:50 PM
To: 'Dubyk, Wally' <Wally.Dubyk@ottawa.ca>
Cc: 'Baggs, Rosanna' <Rosanna.Baggs@ottawa.ca>; Jack, Ronald <Ronald.Jack@parsons.com>; Baker, Mark <Mark.Baker@parsons.com>
Subject: RE: Elmvale Shopping Centre Forecasting Report-

Hi Wally,

Please find attached the revised Elmvale Shopping Centre Phase 1 Forecasting Report and Response Memo #2, as per comments received in September 25, 2018.

Please note that comments received previously have also been included in Memo #2 for reference purposes.

Due to file size, I will send the corresponding Existing Conditions-SYNCHRO files in another email.

Thank you,

Andrés Pena
E.I.T
1223 Michael St, Suite 100, Gloucester, ON K1J7T2
andres.pena-cabra@parsons.com +1 613.738.4160

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From: Pena-cabra, Andres
Sent: Thursday, September 13, 2018 3:47 PM
To: 'Dubyk, Wally' <Wally.Dubyk@ottawa.ca>
Cc: Jack, Ronald <Ronald.Jack@parsons.com>; Baker, Mark <Mark.Baker@parsons.com>
Subject: RE: Elmvale Shopping Centre Forecasting Report

Hi Wally,

Please find attached the revised Elmvale Shopping Centre Phase 1 Forecasting Report and corresponding Synchro files.

Thank you,

Andrés Pena
E.I.T
1223 Michael St, Suite 100, Gloucester, ON K1J7T2
andres.pena-cabra@parsons.com +1 613.738.4160

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From: Pena-cabra, Andres
Sent: Tuesday, August 28, 2018 11:42 AM
To: 'Dubyk, Wally' <Wally.Dubyk@ottawa.ca>; Jack, Ronald <Ronald.Jack@parsons.com>
Subject: RE: Elmvale Shopping Centre Forecasting Report

Hi Wally,

Please find attached the requested Synchro files.

Thank you,

Andrés Pena
Engineer in Training
1223 Michael St, Suite 100, Gloucester, ON K1J7T2
andres.pena-cabra@parsons.com +1 613.738.4160

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From: Dubyk, Wally <Wally.Dubyk@ottawa.ca>
Sent: Tuesday, August 28, 2018 11:29 AM
To: Jack, Ronald <Ronald.Jack@parsons.com>
Cc: Pena-cabra, Andres <Andres.Pena-cabra@parsons.com>
Subject: RE: Elmvale Shopping Centre Forecasting Report

Andres,

Please provide us with the Synchro files in digital format.

Thank you,

Wally Dubyk
Project Manager - Transportation Approvals
Development Review, Central & South Branches
613-580-2424 x13783

From: Jack, Ronald <Ronald.Jack@parsons.com>
Sent: Tuesday, August 28, 2018 11:12 AM
To: Dubyk, Wally <Wally.Dubyk@ottawa.ca>
Cc: Pena-cabra, Andres <Andres.Pena-cabra@parsons.com>; Stuart Craig <scraig@riocan.com>;
pbisson@hobinarc.com
Subject: Elmvale Shopping Centre Forecasting Report

Hi Wally

Attached is the Forecasting Report for Phase 1 of the redevelopment of Elmvale Acres Shopping Centre for your review/comment. We will now proceed with the Analysis/TIA Strategy Report and integrate your comments on the Forecasting Report when received. If you need the SYNCHRO files, Andres can provide.

Regards

Ron

Ronald Jack, P.Eng.



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