TRANSPORTATION IMPACT STUDY

(DRAFTPLAN OF SUBDIVISION)

Submitted To:

CITY OF CLARENCE-ROCKLAND
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And

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ATREL Ref. No. 180801

Transportation Impact Study

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1.0 INTRODUCTION

1.1 Background

The following Traffic Impact Study has been prepared by Atrel Engineering Ltd for the City of Clarence-Rockland in response to the Draft Plan conditions provided to Brigil and Spacebuilders. A location map illustrating the Traffic Study Area is presented in Apprendix "A" of this report (refer to SK1 "Location Map"). The recommendations are based on the results obtained from CastleGlenn Consultants, provided in Appendix "B", the legal plan prepared by Arpentage Dutrisac Surveying Inc. (ADSI) and the schematic design prepared by Atrel Engineering Ltd (AEL).

1.2 Study Objectives

As mentioned, this study is presented as a City request as part of the draft conditions for multiple development in the Rockland area. The requirements are detailed below:

The Owner shall submit a Transportation Impact Study certified by a qualified Professional Engineer with expertise in undertaking such studies which measures and analyzes traffic impacts, transit impacts and implications for traffic at the existing and proposed following intersections:

a. County Road 21 (St-Jean Street) and Laurier Street; **(Point A)**
b. County Road 21 (St-Jean Street) and Patricia Street; **(Point B)**
c. County Road 21 (St-Jean Street) and Docteur Corbeil Boulevard; **(Point C)**
d. Docteur Corbeil Boulevard and Caron Street **(Point D)**
e. David Street and Caron Street **(Point E)**
f. Street No.1 and Caron Street **(Point F)**
g. County Road 21 (St-Jean Street) and Street No. 1 of the proposed Stage 5 Subdivision; **(Point G)**
h. County Road 21 (St-Jean Street) and Poupart Road and Street No. 2 of the proposed Brigil/Poupart Subdivision; **(Point H)**
i. Poupart Road and Brigil/Poupart Subdivision West entrance **(Point I)**
j. Poupart Side Road with Poupart Side Road at the 90 degree turn **(Point J)**
k. Poupart Side Road and Richelieu Street **(Point K)**
l. Laurier Street bend **(Point L)**
m. Richelieu Street and the entrance to Walmart and commercial uses to the north **(Point M)**
n. Poupart Side Road and Carmen Bergeron **(Point N)**
o. County Road 17 and Carmen Bergeron Street **(Point O)**

The consultant shall provide traffic counts at all above mentioned locations. Furthermore, the consultant shall provide the prescribed rights-of-ways for Poupart Road and St-Jean Street as part of this study as well as provide turning lanes and through lanes information.

Further, the Transportation Impact Study will consider the road link capacity and configuration for all roadways from Laurier Street to County Road 17 as per the intersections listed above and shall consider the development potential located east of the Spacebuilders Stage 5 Subdivision. The Transportation Impact Study shall consider a roundabout at the intersection of St-Jean Street and

Street No. 1 of the proposed Stage 5 Subdivision as well as at the intersection of County Road 21 and Dr. Corbeil Boulevard. The study shall be reviewed and approved by the Director of Infrastructure and Planning of the City of Clarence-Rockland.

Additionally, the study will identify the following:

a. the schematic design of the critical intersections **(Points C, D, G, H, I and K)** along Poupart Road and St-Jean Street
b. the legal boundary extent from points **L to B** along Poupart Road and St-Jean Street
c. recommendations for hill rehabilitation and necessary land acquisition along the St-Jean Street slope (from points **H to G**)
d. whether the roads should be divided or not
e. whether a sidewalk, bikepath or multi-use path is required
f. the lane width, length, storage, turning, acceleration and deceleration lanes
g. the proposed posted speed limit and any traffic calming features
h. if the intersections are warranted
i. the maximum hill slope of St-Jean Street. A preliminary grading and profile will be provided from points **H to G**.
j. the traffic schemes from existing to build out conditions including a 5 to 10 year and a 10 to 20 year horizon.

1.3 Key Findings

As per the Traffic Impact Study, prepared by CastleGlenn Consultants, presented in Appendix "B" and the legal plan prepared by ADSI, the following observations/recommendations are made:

1.3.1 General

Road cross-sections were developed based on the forecast traffic volume, the posted speed limit, the traffic calming features and the non-auto mode requirements. Five (5) typical cross-sections (Appendix "C") were developed to identify the various right-of-way width, roadway lanes and non-auto mode.

A reference plan has been prepared to identify the various locations of the cross-sections, the land acquisition plans, the roundabout schematic plans, the road schematic plans, the St-Jean hill preliminary plans and the hydro station sketches.

Based on the forecasted traffic volumes and analysis, Castleglenn Consultants have elected to use roundabouts between Richelieu Street and Patricia Street to control the traffic. Roundabout schematics of the various intersection are shown as drawings 180801-RA1 to 180801-RA5 in Appendix "E".

Using the existing legal plan, the proposed road cross-section and the roundabout schematic, the land acquisition preliminary plans were prepared to identify various areas where the existing right-of-way width is insufficient to accommodate the proposed road infrastructures. Drawings 180801-LA1 to 180801-LA6 (Appendix "F") show the preliminary extent of the require land acquisition. Prior to acquiring the land, a detailed road, roundabout and utility design will be

required and then, an Ontario Land Surveyor (OLS) will need to clearly identify the proposed right-of-way.

Based on the proposed cross-sections, the widening of the Poupart Road and St-Jean Street will require some land acquisition. Dutrisac Surveying Inc. has been retained by AEL to obtain the existing legal surveying plans of the Poupart Road and St-Jean Street.

Drawings 180801-RD1 to 180801-RD6 in Appendix "G" show the proposed road schematic plans for Poupart Road and St-Jean Street from Laurier to Patricia Street which correspond to the cross-sections.

One of the main constraints in re-building St-Jean Street is the longitudinal slope of the existing road from the St-Jean/Poupart intersection to the proposed roundabout at Street No.1 (Morris Village entrance). After careful analysis of the surrounding areas, preliminary drawings were prepared to harmonize the hill to the surrounding residential and commercial entrances. Drawings 180801-HILL, 180801-DS1 and 180801-DS2 show the preliminary design of the hill and its proposed modifications.

Furthermore, the property requirement (road widening and roundabout construction) in proximity to the hydro station will have to be discussed with hydro at an early stage.

Additionally, drawings 180801-HS1 and 180801-HS2 show that some utility poles are currently located within the proposed road area and subsequently will need to be relocated as per the typical cross-sections mentioned above. Coordination with the utility companies will be required in order to complete this work.

1.3.2 Richelieu Street, Carmen Bergeron Street and Future East to West Poupart Road Bypass (Study Points O, N, M, K and J)

As detailed in Castleglenn's report, the majority of the future developments south of Rockland will travel along St-Jean Street and Poupart Road in the east and west direction to travel to and from the City of Ottawa. Castleglenn has analyzed Richelieu Street and Carmen Bergeron Street and found that at the 5 to 10 year timeframe, the segments' capacities are maximized and the system requires a travel alternative.

The alternative is provided in the form of the City of Clarence-Rockland's special study to extend the current Poupart Road to the west from the 90 degree bend in order to connect to County Road 17 further west (refer to Castleglenn's report for details).

This alternative, however, does not fix the issue of County Road 17 itself which is currently near maximum capacity. Another traffic study has been prepared and recommended to upgrade County Road 17 in the medium term (± year 2032).

1.3.3 Poupart Road (from Laurier Street to 90 degree bend) (Study point L, K and J)

- The road is currently a two lane undivided asphalt road from Richelieu Street to Sta. 1+310.
- The road is currently a two lane rural undivided gravel road with surface treatment from Sta. 1+310 to the 90 degree bend.
- The existing right-of-way width is approximately 23m from Laurier Street to Sta. 1+425.

- The existing right-of-way width ranges from approximately 12m to 23m from Sta. 1+425 to the 90 degree bend.
- Please refer to cross-section 180801-CS1 in Appendix "C" for this segment's proposed roadway and servicing details.
- The proposed right-of-way width is proposed to be 23m.
- As shown on the cross-section, the built out roadway will be a two lane (4.25m per lane) undivided asphalt road with concrete barrier curbs.
- A multi-use pathway and sidewalk are proposed in the boulevard.
- As shown on drawing 180801-RD1, there are existing utility poles along the road which will need to be relocated to the new location as shown on the cross-section.

1.3.4 Poupart Road (from 90 degree bend to St-Jean Street) (Study Points J, I and H)

- The road is currently a two lane rural undivided gravel road with surface treatment.
- The existing right-of-way width ranges from approximately 10m to 23m.
- Please refer to cross-section 18010-CS2 in Appendix "C" for this segment's proposed roadway and servicing details.
- The proposed right-of-way width is proposed to be 30m.
- As shown on the cross-section, the built out roadway will be a four lane (3.75m per lane) divided asphalt road (5.0m island) with concrete barrier curbs.
- A multi-use pathway and sidewalk are proposed in the boulevard.
- As shown on drawings 180801-RD2 and 180801-RD3, there are existing utility poles along the road which will need to be relocated to the new location as shown on the cross-section.

1.3.5 St-Jean Street (from Poupart Road to Morris Site Entrance - Street No. 1) (Study Points H and G)

- The road is currently a two lane rural undivided asphalt road.
- The existing right-of-way width ranges from approximately 24m to 38m.
- The current maximum slope along the road is approximately 14.6%.
- Please refer cross-section 180801-CS3 in Appendix "C" for this segment's proposed roadway and servicing details.
- The proposed right-of-way width will be widened to a minimum of 30m depending on the side slopes.
- As shown on the cross-section, the built out roadway will be a four lane (3.75m per lane) undivided asphalt road with concrete barrier curbs.
- The maximum proposed slope will be 8%.
- A multi-use pathway and sidewalk are proposed in the boulevard.
- As shown on drawings 180801-RD3 and 180801-RD4, there are existing utility poles along the road which will need to be relocated to the new location as shown the cross-section.

1.3.6 Morris Village Street No. 1 (Study Points C and D)

- Please refer to cross-section 180801-CS4 in Appendix "C" for this segment's proposed roadway and servicing details.
- The proposed right-of-way width will be 26m.
- As shown on the cross-section, the built out roadway will be a two lane (5.5m per lane) undivided asphalt road with concrete mountable curbs.
- A multi-use pathway and sidewalk are proposed in the boulevard

1.3.7 St-Jean Street (from Morris Site Entrance – Street No. 1 to Patricia Street) (Study Points G and C)

- The road is currently a two lane rural undivided asphalt road.
- The existing right-of-way width ranges from approximately 10m to 15m.
- Please refer to cross-section 180801-CS5 in Appendix "C" for this segment's proposed roadway and servicing details.
- The proposed right-of-way width will be a minimum of 26m depending on the side slopes.
- As shown on the cross-section, the built out roadway will be a two lane (4.25m per lane) undivided asphalt road with concrete barrier curbs.
- A multi-use pathway and sidewalk are proposed in the boulevard.
- As shown on drawings 180801-RD4 to 180801-RD6, there are utility poles along the road which will need to be relocated to the new locations as shown on the cross-sections.

1.3.8 Caron Street (Study Points D, E and F)

- The road is currently a two lane rural undivided asphalt road from Baseline Road to David Street.
- The road then becomes a three lane undivided with a shared turning lane from David Street to Laurier Street.
- Castleglenn has evaluated Caron Street for all development timeframes and has detailed their results within their report. A four (4) lane road with traffic lights are ultimately proposed for better traffic flow.

1.4 St-Jean Street Hill Rehabilitation (From Study Points H to G)

The existing St-Jean Street's road gradient was found to be approximately 15%. As per the Ontario Ministry of Transportation, the maximum slope for an undivided four lane collector is found to be 8.0%. In order to achieve such a requirement, the St-Jean Street hill was redesigned and realigned in order to match the existing properties.

There are currently four (4) lots which need to be accounted for in the hill design; three residential lots at the top of the hill (1253, 1259 and 1273 St-Jean Street) as well as the existing commercial lot owned by Centennial Construction Rockland Ltd (1211 St- Jean Street).

The St-Jean hill was designed in order to accommodate those lots. Based on the preliminary design, the existing residential properties' entrances will be matched and reinstated while the commercial entrances will be slightly modified to accommodate the hill's design slope of 8% which results in increasing the St-Jean Street elevations several metres near the bottom of the hill (Refer to drawing 180801-HILL for profile alignment and 180801-DS1 and 180801-DS2 for recommended driveway realignment).

In order to properly accommodate the commercial land entrances, it is proposed to realign the St-Jean Street centreline to the north. The right-of-way from Sta. 3+400 to Sta. 3+900 will be between 30m and 45m wide.

The existing culvert at the bottom of the St-Jean hill, which conveys runoff from the existing Lafontaine Creek, does not currently convey the creek's 100 year runoff. Instead the major storm event's runoff crosses St-Jean Street overland. As St-Jean Street will be raised several metres, the culvert will probably be replaced and sized to convey the creek's 100 year storm runoff. Various work permits from the conservation authority/Ministry of Natural

Resources/Ministry of Environment will be required in order to work within the floodplain limits.

1.5 Laurier/Poupart Intersection (Study Point L)

The existing intersection is currently curving toward the west to abruptly turn towards the east when driving to the north.

ADSI looked at the legal property to observe that there are no private properties to acquire in order to rebuild this road with a normal curve.

Essentially this road can be re-aligned whenever the City wishes to do so. Drawing 180801-LA1 shows the extent of the property lines.

Since the multi-use pathway (MUP) will be provided to the Poupart/Laurier intersection, it would be recommended to continue the MUP to Laporte Street if the right-of-way allows such installation. The legal boundary would need to be verified, especially at the Lafontaine Creek crossing to ensure it can be achieved.

1.6 Hydro Station/Utilities

The construction of a wider and urbanized road will trigger the movement of infrastructures. The above and underground utilities along the Poupart and St-Jean roads will have to be identified and a relocation plan will be worked out with all utility companies.

Drawings 180801-HS1 and 180801-HS2 show the existing hydro station at the corner of Poupart and St-Jean and its various pole lines. In order to acquire the appropriate land, discussions should take place with Hydro One and other utility companies at an early stage to ensure that land can be acquired in this area, otherwise a plan ‘B’ will be required.

2.0 SUMMARY AND RECOMMENDATION

Castleglenn has analyzed Rockland's transportation system for three timeframes; 5 to 10 year, 10 to 20 year and built out. Recommendations have been made for key intersections and roadway specifications for all three timeframes along the study area as mentioned in the City's draft conditions to the developers.

In addition, road and intersection configurations are shown on the attached drawings along with land acquisition drawings and St-Jean Street hill grading specifications. As mentioned, the St-Jean hill's proposed grading will require widening of the right-of-way as well as work within the Lafontaine Creek area. These works will require a geotechnical report, an environmental impact study as well as a hydraulic analysis of the creek itself in order to assess the impact of the proposed road profile on the new culvert.

In order to assess the required land acquisition, a detailed road and roundabout design should be undertaken including the input of the utility companies.

All of which is respectfully submitted:

Prepared by:

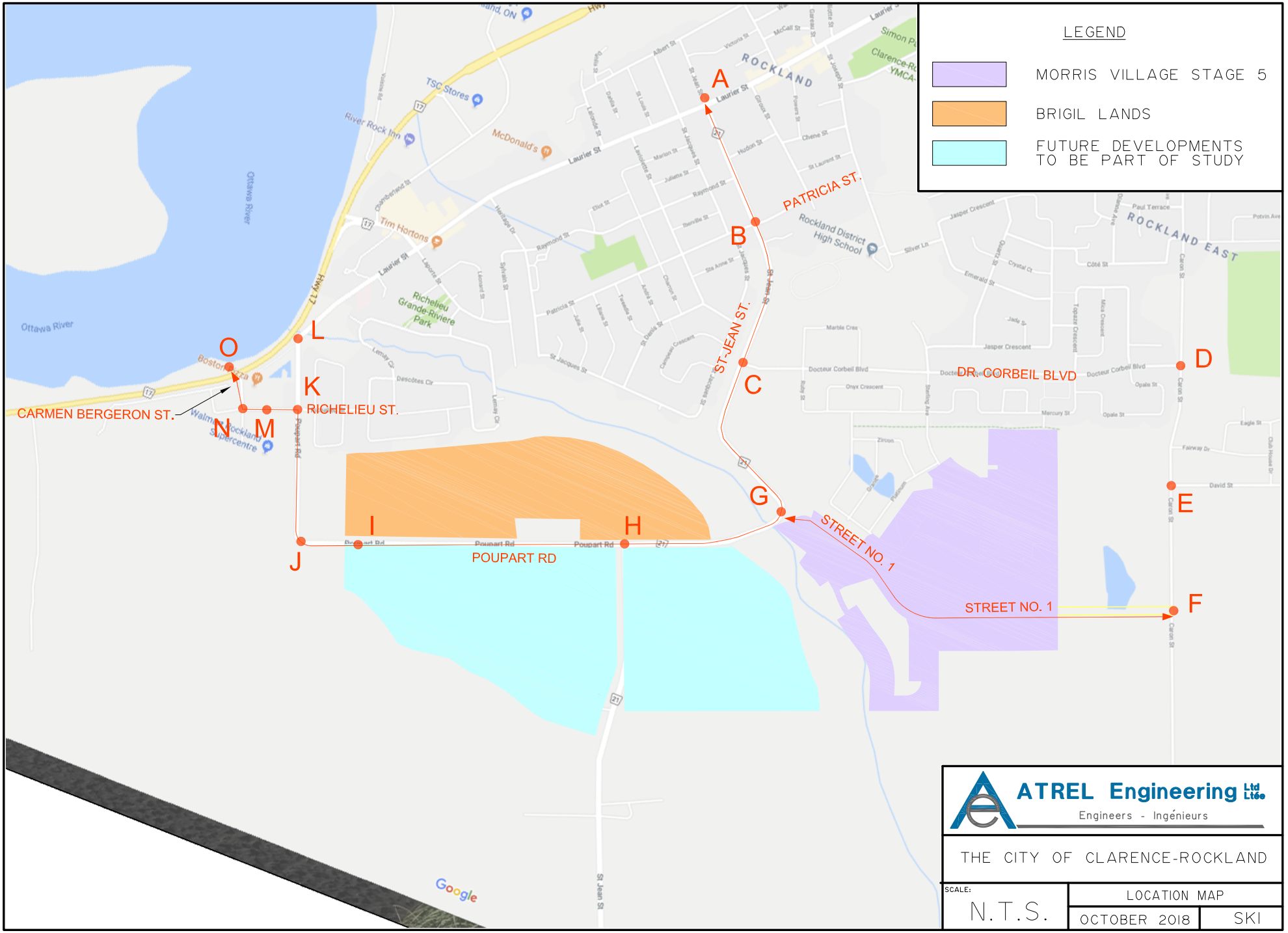
ATREL ENGINEERING LTD

Jonathan Gendron, P.Eng.
Project Designer

Jean Décoeur, P.Eng.
Project Engineer

APPENDIX "A"

SK1 – Location Map



ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

THE CITY OF CLARENCE-ROCKLAND

SCALE:	LOCATION MAP	
N.T.S.	OCTOBER 2018	SKI

APPENDIX "B"

Traffic Impact Study prepared by CastleGlenn Consultants

TRANSPORTATION IMPACT STUDY

Draft Plan of Subdivision

Presented to: Atrel Engineering

Mr. Jean Décoeur
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Prepared by: Castleglenn Consultants Inc.

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Table of Contents

1 INTRODUCTION

Castleglenn Consultants Inc. was retained in August, 2018 to undertake a Transportation Impact Study (TIS) that would:

- provide an overview of the existing conditions within the study area;
- address the traffic and transportation issues associated with the plan of subdivision located in the south-west end of the City of Clarence-Rockland; and
- provide input to the design component within the study area, inclusive of intersection type and configuration, auxiliary lane requirements, cross-section configuration (divided vs undivided), posted speed, traffic calming measures, non-auto mode requirements, right-of-way requirements and the St-Jean Street hill slope.

The plan of subdivision would involve the construction of over 9,000 units over approximately 430 hectares of land. The residential units are anticipated to consist of approximately 4,000 single family detached homes, 2,700 townhomes and 2,400 apartment units. A 1.03 hectares commercial development is also proposed.

2 EXISTING CONDITIONS

The study area is defined by Carmen-Bergeron Street to the west, County Road (CR) 17 and Laurier St to the north, Caron Street to the east and Poupart Road to the south. A site visit was undertaken on September 18th, 2018 to verify current roadway geometrics (roadway lane configuration, land uses, etc.) and undertake observations of the existing conditions within the vicinity of the proposed site.

The majority of the study area is undeveloped rural and treed areas, with some existing country residential dwellings located along Poupart Road. Within the north-east section of the study area, residential development has been built around Dr. Corbeil Boulevard. West of the proposed development plans is an existing commercial area with big box stores.

2.1 EXISTING ROADWAYS

The roadways within the study area are described as follows:

- ***Carmen Bergeron Street:*** This north-south corridor represents the first main access into the City from the west. The corridor connects CR 17 with a commercial development, by way of a 4-lane undivided cross-section. On-street parking is not permitted and one sidewalk is located on the east side. The speed limit is 50 km/hr.
- ***Caron Street:*** This north-south corridor was recently (within the last 10 years) reconstructed and intersects with CR 17. The corridor has a 3-lane cross-section, with a single lane in each direction and a middle lane with back-to-back left turns (between

CR 17 and David Street). On-street parking is not permitted and one sidewalk is located on the west side and a multi-use pathway on the east side. The posted speed limit is 50 km/hr.

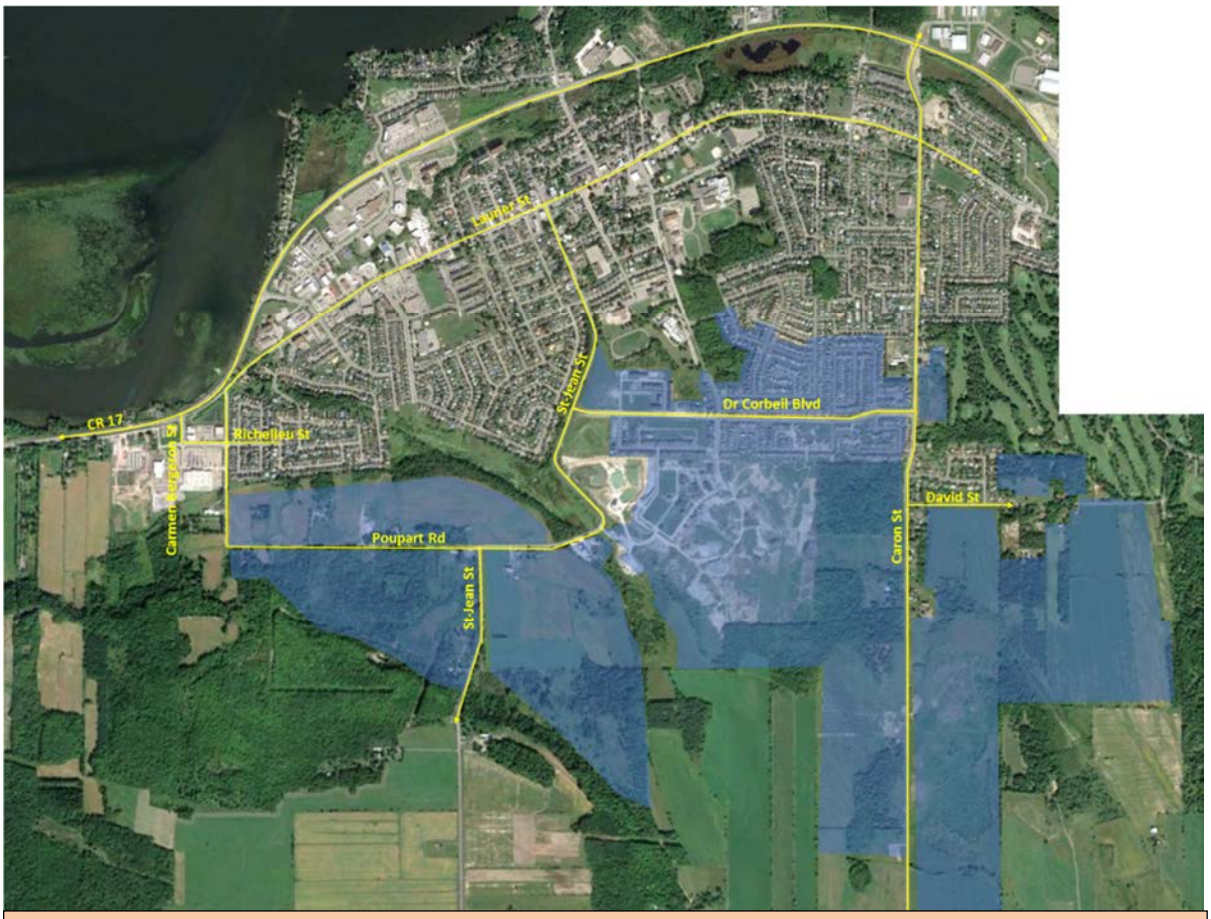


***Exhibit 2-1: Study Area** (Development area shown in blue)*

- ***County Road 17** (CR 17):* This east-west corridor connects the City of Clarence-Rockland to Ottawa on the west and Hawkesbury on the east. Within the City, the corridor cross-section is 2-lanes (one-lane in each direction) along the majority of its length. On-street parking is not permitted and no sidewalks are provided. The posted speed limit is 70 km/hr.
- ***David Street:*** This east-west corridor is a local, rural, 2-lane roadway. There are no sidewalks. The speed limit is 50 km/hr.
- ***Dr. Corbeil Boulevard:*** This east-west corridor connects St-Jean Street to Caron Street and was constructed within the last 10-years as a local 2-lane roadway. The roadway has on-street parking permitted on the north side and sidewalks on either the south side or along both sides along its length. The corridor accommodates bike lanes and has a speed limit of 50 km/hr.
- ***Laurier Street:*** This east-west corridor represents the City's "main street". The roadway has a 2-lane cross-section along the majority of its length and on-street

parking is permitted along many segments of the roadway. Sidewalks are provided on the north side or on both sides throughout its length. The posted speed limit is 50 km/hr.

- ***Patricia Street:*** This east-west corridor is a local, 2-lane roadway. Parking is permitted on both sides and a sidewalk is provided on the south side. The speed limit is 50 km/hr.
- ***Poupart Road:*** This east-west corridor connects the commercial development to the west, to the residential area around St-Jean Street. The corridor has a 2-lane cross-section and a paved surface treatment chip seal. There are no sidewalks along the majority of the length, with the exception of a sidewalk along the west side of the north-south section of roadway (between Laurier and the Walmart access). The speed limit is 50 km/hr.
- ***Richelieu Street:*** This east-west corridor has a 3-lane cross-section within the study area (between Carmen Bergeron St and Poupart Rd), where the center lane provides back-to-back left-turn auxiliary lanes. The section is intersected by Smart Centres commercial area and Walmart accesses. On-street parking is not permitted. Sidewalks are provided along both sides of the roadway. The speed limit is 50 km/hr.
- ***St-Jean Street:*** This north-south corridor connects Laurier Street to Poupart Rd (and continues further south as County Road 21). The corridor has a 2-lane cross-section. The roadway has designated on-street parking permitted on the west side (from Laurier Street to Raymond St) and a sidewalk located along the east side (from Laurier Street to Dr. Corbeil Blvd). The speed limit is 50 km/hr.

2.2 EXISTING PEDESTRIAN FACILITIES

Sidewalks currently exist along:

- St-Jean St, from Laurier Street to Dr. Corbeil Boulevard;
- Poupart Road in the vicinity of Richelieu Street and the commercial plaza;
- Dr. Corbeil Boulevard; and
- Caron Street, from CR 17 to David Street on the west side of the road.

Multi-use pathway (MUP) currently exist in the east-west direction south of Dr. Corbeil Boulevard from Caron Street to St-Jean Street.

2.3 EXISTING CYCLING FACILITIES

In general, there are no dedicated cycling lanes within the study area, with the exception that on-street cycling lanes are provided along Dr. Corbeil Boulevard. Very few cyclists were observed during the traffic count periods.

2.4 EXISTING TRANSIT PROVISIONS

Clarence-Rockland Transit (CR Transit) operates a commuter route in the morning and afternoon peak hours, providing service to Ottawa in the morning and return in the afternoon. Service is not provided on statutory holidays. There are two main routes:

- ***#530A – Morris Village:*** This route, going westbound in the morning, travels from CR 17, along Laurier Street, down Caron Street, along Dr. Corbeil Boulevard, down St-Jean Street and back onto Laurier Street and connects with CR 17. Ten (10) stops are provided along the route. The reverse route takes place in the afternoon; and
- ***#530 – Laurier***: This route, going westbound in the morning, travels from CR 17, goes along the entire length of Laurier Street, and connects back to CR 17. Eight (8) stops are provided along the route. The reverse route takes place in the afternoon.

A total of 8 westbound trips are provided in the morning and 7 eastbound in the afternoon (a single westbound trip also takes place in the early afternoon as the first bus travels to Ottawa).

2.5 EXISTING TRAFFIC VOLUMES

Traffic counts were undertaken at the existing study area intersections during the week of September 10th, 2018, which accounted for school traffic. The traffic counts were undertaken during the morning (6:30am-to-9:00am) and afternoon (3:00pm-to-6:00pm) peak hours.

A review of Exhibit 2.1 indicates that the demand in the morning is greater in the westbound direction (vehicles traveling towards Ottawa) and the reverse trend is observed in the afternoon (where commuters return home).

3 TRAFFIC ANALYSIS

This TIS evaluated three (3) design horizon years: short-term (5-to-10 years), medium-term (10-to-20 years) and ultimate build-out. The forecast traffic volumes are based on existing (2018) traffic data and future developments within the study area. The following sections provide details on the forecast traffic volumes and analysis.

3.1 FUTURE DEVELOPMENT

Exhibit 3.1 illustrates the future developments that were accounted for in the forecasted traffic volumes. The future developments were segmented into three phases that included short-term, medium-term and ultimate build-out.

- In the short-term, over 2,000 units are anticipated to be constructed;
- In the medium-term, an additional 3,100 are anticipated to come on board; and
- At full build-out, an additional 3,900 units are anticipated, resulting in over 9,100 total units.

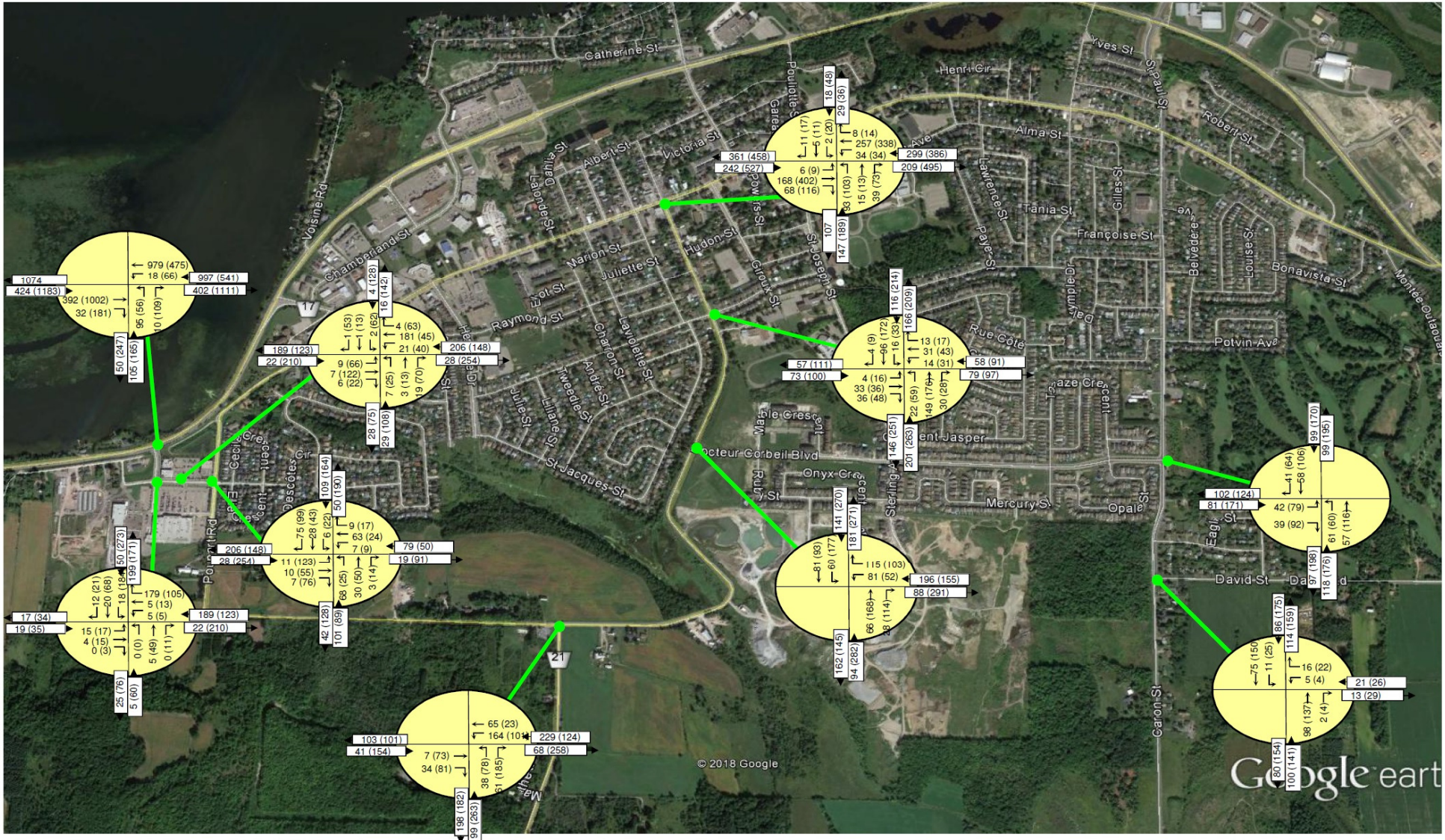


Exhibit 2.1: Existing (2018) Traffic Volumes — *Format: Morning peak hour (afternoon peak hour)*

3.2 TRIP GENERATION

The trip generation associated with the study area developments were estimated using the ITE Trip Generation Manual. The morning and afternoon peak hour rates were used to estimate the site traffic volumes. It has become a common and accepted practice to determine the volume of "person" trips to be generated by a given development. The purpose of this is to quantify the expected demands for the primary modes of transportation. In order to convert ITE rates to person trips, the rates obtained from the ITE Trip Generation Manual were adjusted by a factor of 1.3 passengers-per-vehicle to account for an inherent transit modal share and auto occupancy.

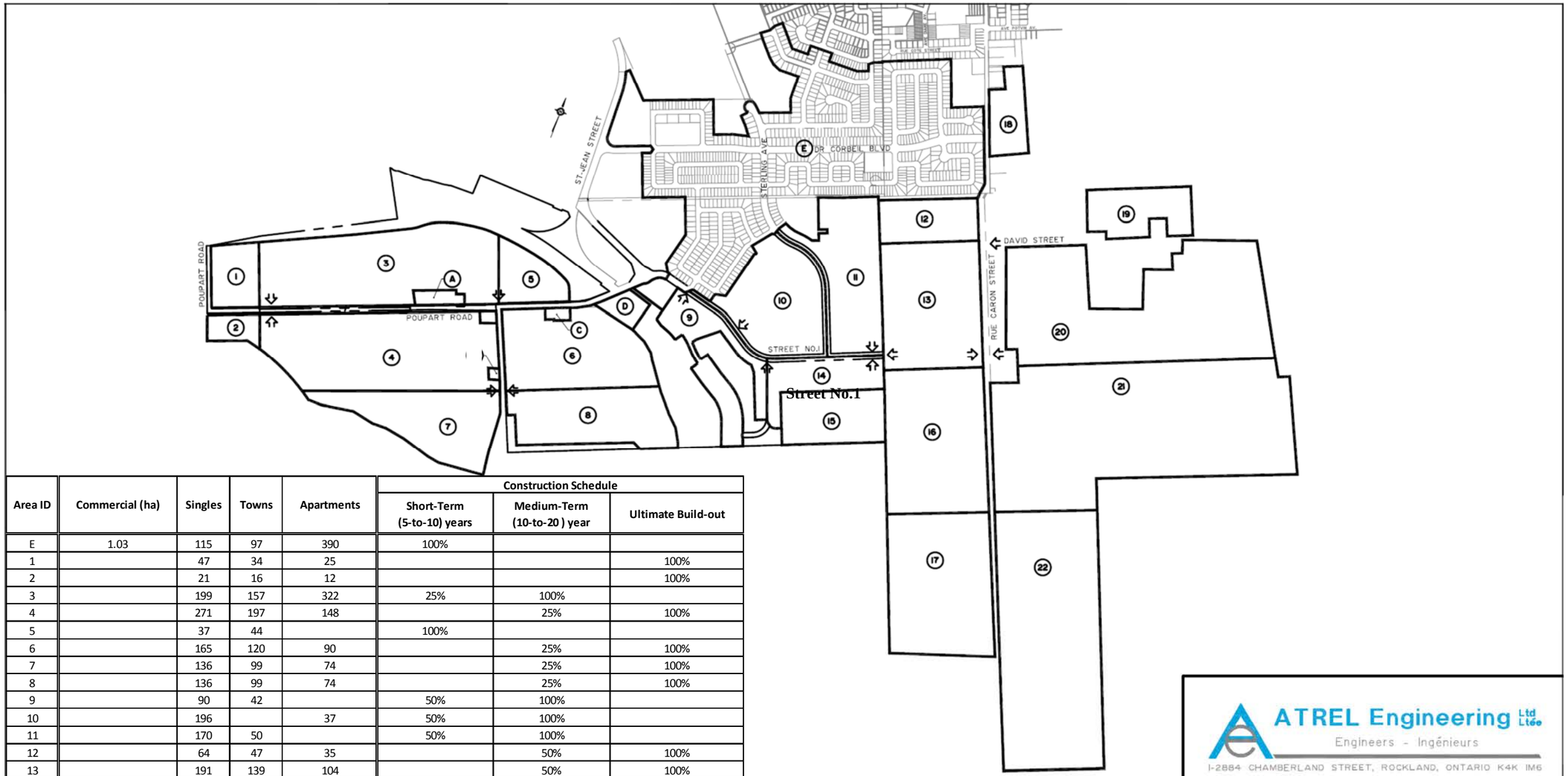
Table 3.1: ITE Trip Rates

ITE Trip Rates					**Modified Person Trips Rate**	**x 1.3**			
Rate per unit	Pk Period	Rate	Split		Rate per unit	Pk Period	Rate	Split	
			IN	OUT				IN	OUT
Single Family Homes - 210	AM	0.75	25%	75%	Single Family Homes - 210	AM	0.98	25%	75%
	PM	1.01	63%	37%		PM	1.31	63%	37%
Rate per unit	Pk Period	Rate	Split		Rate per unit	Pk Period	Rate	Split	
			IN	OUT				IN	OUT
Townhomes - 230	AM	0.44	17%	83%	Townhomes - 230	AM	0.57	17%	83%
	PM	0.52	67%	33%		PM	0.68	67%	33%
Rate per unit	Pk Period	Rate	Split		Rate per unit	Pk Period	Rate	Split	
			IN	OUT				IN	OUT
Apartment - 220	AM	0.51	20%	80%	Apartment - 220	AM	0.66	20%	80%
	PM	0.62	65%	35%		PM	0.81	65%	35%

The person trips were then assigned to the primary modal shares (i.e. auto, passenger, transit and non-auto). Based on limited existing transit service and active mode facilities in the immediate study area, it was assumed that the auto driver modal share will be 85% and the remaining 15% will encompass passenger, transit, and non-auto modes.

Table 3.1: Build-Out Total Development – Person Trips by Modal Share

Travel Mode	***Mode Share***	***AM***			***PM***		
		In	***Out***	***Total***	***In***	***Out***	***Total***
Auto Driver	85%	1,481	4,473	5,954	4,936	3,019	7,955
Passenger	5%	78	257	335	242	187	428
Transit (Non-Auto)	10%		509	509	581		581
Total Person Trips	100%	1,559	5,239	6,798	5,759	3,206	8,965
Total Development Auto Trips		**1,481**	**4,473**	**5,954**	**4,936**	**3,019**	**7,955**



Area ID	Commercial (ha)	Singles	Towns	Apartments	Construction Schedule		
					Short-Term (5-to-10) years	Medium-Term (10-to-20) year	Ultimate Build-out
E	1.03	115	97	390	100%		
1		47	34	25			100%
2		21	16	12			100%
3		199	157	322	25%	100%	
4		271	197	148		25%	100%
5		37	44		100%		
6		165	120	90		25%	100%
7		136	99	74		25%	100%
8		136	99	74		25%	100%
9		90	42		50%	100%	
10		196		37	50%	100%	
11		170	50		50%	100%	
12		64	47	35		50%	100%
13		191	139	104		50%	100%
14		90			50%	100%	
15		83	60	45		50%	100%
16		221	161	121		50%	100%
17		224	163	122		50%	100%
18			110			100%	
19		70	51	38	50%	100%	
20		424	309	232	25%	50%	100%
21		603	439	329	25%	50%	100%
22		426	310	232	25%	50%	100%
Total	**1.03**	**3,979**	**2,744**	**2,430**	**2,096**	**3,154**	**3,904**

* Note that areas A, B, C and D are existing/developed parcels. The table above presents proposed new developments only.

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CITY OF CLARENCE-ROCKLAND

TRANSPORTATION IMPACT STUDY

PROJECT No. 180801

DATE AUGUST 2018

PLAN
FUTURE DEVELOPMENT AREA AND STATISTICS

DRAWING No. 180801-FDASI

Exhibit 3.1: Future Development Area and Statistics

The total site traffic volumes generated by the proposed development have been estimated to be approximately 6,000 vehicle trips during the morning peak hour and 8,000 vehicle trips during the afternoon peak hour.

A small commercial development is also proposed within the study area located at the south-west corner of St-Jean Street / Street No.1 (area between "D" and "9" on Exhibit 3.1). The commercial development site trips are anticipated to be internal and pass-by trips from the community. Therefore, the traffic impacts of the commercial development are not anticipated to be significant.

3.3 TRIP DISTRIBUTION AND ASSIGNMENT

The traffic distribution assumptions were derived from the "***Place of work and commuting to work***" information obtained from Statistics Canada in the 2016 Census. The statistics indicate that the majority (~65%) of working residents commute to a different census subdivision. However, given the nature of the development (residential) and the lack of employment development in Rockland, the following traffic distribution assumptions were applied:

- 65% destined to/from west of the City of Rockland;
- 15% destined to/from south of the City of Rockland;
- 13% destined to/from east of the City of Rockland; and
- 7% remain within the City of Rockland.

3.4 FORECAST TRAFFIC VOLUMES

The forecast short-term, medium-term and ultimate traffic volumes were produced for the study area. Appendix "B" illustrates the site and forecast traffic volumes for the study area intersections.

3.5 INTERSECTION CAPACITY ANALYSIS

Intersection capacity analysis was undertaken for the existing and forecast traffic volumes for the study area intersections. Synchro 10™ was used to analyze stop control and traffic-controlled intersections. Roundabouts were analyzed using Sidra intersection analysis. For analysis purposes, it was assumed that a volume-to-capacity (v/c) ratio of greater than 0.92 was considered unsatisfactory.

3.5.1 Existing Traffic Analysis

Table 3.1 depicts a summary of the intersection capacity analysis results for the study area intersections (See Appendix A for detailed traffic analysis sheets). Existing signal timing was used for the intersection of CR 17 and Carmen Bergeron Street.

Table 3.1: Existing (2018) Intersection Capacity Analysis Results

Intersection	*Control Type*	*Morning Peak Hour*		*Afternoon Peak Hour*	
		Overall LOS	*Critical Movement (LOS, V/C)*	*Overall LOS*	*Critical Movement (LOS, V/C)*
CR 17 / Carmen Bergeron[1]	Traffic Signal	C	WB-TH (C, **0.92**)	**E**	**EB-TH (F, 1.22)**
CR 17 / Carmen Bergeron[2]	Traffic Signal	C	WB-TH (C, 0.62)	C	EB-TH (D, **0.96)**
Carmen Bergeron / Richelieu	All-Way Stop Control	A	WB-T/RT (A, 0.22)	A	WB-T/RT (A, 0.16)
Richelieu / Commercial Access	2-Way Stop Control	B	NB (A, 0.04)	B	SB (B, 0.26)
Poupart / Richelieu	All-Way Stop Control	A	NB (A, 0.14)	A	SB (A, 0.22)
Poupart / St-Jean	All-Way Stop Control	A	WB (A, 0.30)	A	NB (A, 0.34)
St-Jean / Dr. Corbeil	Minor-leg Stop Control	B	WB (B, 0.26)	B	WB (B, 0.27)
St-Jean / Patricia	All-Way Stop Control	A	NB (A, 0.04)	A	NB (B, 0.38)
St-Jean / Laurier	Traffic Signal	B	WB (B, 0.37)	B	EB-TH (B, 0.65)
Caron / Dr. Corbeil	Minor-leg Stop Control	B	EB (B, 0.11)	B	EB (B, 0.26)
Caron / David	All-Way Stop Control	A	NB (A, 0.13)	A	NB (A, 0.18)

1- Existing signal timing from County of Prescott-Russell
2- Optimized signal timing

The results indicate that all the intersections operate at satisfactory level of service except the intersection of CR 17 / Carmen Bergeron Street. The intersection operates at an overall level of service (LOS) "E" during the afternoon peak hour of travel demand. The critical movement was determined to be the eastbound (EB) movement with LOS "F" and v/c ratio of 1.22. With optimized signal timing (i.e. providing more time to the dominant movement), the EB-TH movement can be improved to LOS "D" with v/c ratio of 0.96 during the afternoon peak hour of travel demand.

3.5.2 Forecast Short-term (5-to-10 years) Traffic Analysis

By the short-term horizon year, it was assumed that:

- Roundabouts would be constructed at St-Jean Street / Dr. Corbeil Boulevard and St-Jean Street / Street No.1 Access into Morris Village development;
- Stop-Control configuration along Poupart west of the St-Jean Street slope hill;

- Stop-Control configuration along Caron Street; and
- 2-lane cross-sections along St-Jean Street, Poupart Road and Caron Street.

Table 3.2 below provides a summary of the short-term analysis results (See Appendix "D" for detailed analysis sheets).

Table 3.2: Short-Term Traffic Analysis

Intersection	*Control Type*	*Morning Peak Hour*		*Afternoon Peak Hour*	
		Overall LOS	*Critical Movement (LOS, V/C)*	*Overall LOS*	*Critical Movement (LOS, V/C)*
CR 17 / Carmen Bergeron	Traffic Signal	**F**	**WB-TH (F, 1.20) NB-LT (F, 1.00)**	**F**	**EB-TH (F, 1.38)**
Carmen Bergeron / Richelieu	All-Way Stop Control	B	WB-T/R (A, 0.48)	B	SB-T/L (B, 0.49)
Richelieu / Commercial Access	2-Way Stop Control	B	NB (A, 0.05)	C	SB (C, 0.44)
Poupart / Richelieu	All-Way Stop Control	B	NB (A, 0.46)	B	EB-T/R (B, 0.57)
Poupart / St-Jean	All-Way Stop Control	B	WB (A, 0.57)	B	NB (B, 0.54)
St-Jean / Dr. Corbeil	Roundabout	A	EB (A, 0.39)	A	SB (A, 0.48)
St-Jean / Patricia	All-Way Stop Control	B	NB (A, 0.52)	B	SB (B, 0.61)
St-Jean / Laurier	Traffic Signal	B	WB-TH (B, 0.39) NB-LT (C, 0.56)	B	EB-TH (B, 0.68)
Caron / Dr. Corbeil	Minor-leg Stop Control	C	EB (B, 0.33)	E	EB (E, 0.74)
Caron / David	All-Way Stop Control	B	NB (A, 0.55)	C	SB (C, 0.70)
St-Jean/Street No. 1 Access	Roundabout	A	SB (A, 0.28)	A	NB (A, 0.43)
Street No.1 / Sterling	Minor-leg Stop Control	A	SB (A, 0.005)	A	SB (A, 0.02)
Caron / Street No.1	All-Way Stop Control	B	NB (B, 0.52)	C	SB (D, 0.79)
Poupart / Site Access	Minor-leg Stop Control	B	SB (B, 0.06)	B	SB (B, 0.04)

All of the study area intersections operate at satisfactory level of service during the peak hours of travel demand, except for CR 17 / Carmen Bergeron Street. The intersection warrants more capacity in the east-west direction (over 1,500 vph in the peak direction). The CR 17 is at capacity today and warrants to be widened given the level of development that is anticipated to occur.

3.5.3 Forecast Medium-term (10-to-20 years) Traffic Analysis

By the medium-term horizon year, it was assumed that:

- Single roundabouts would be constructed along Poupart Road;

- Poupart Road would require to be extended further west to connect with CR 17[1]; and
- Traffic signals would be required along Caron Street;
- 2-lane cross-sections along St-Jean Street, Poupart Road and Caron Street[2]; and 4-lanes along CR 17.

Table 3.3 below provides a summary of the medium-term analysis results.

Table 3.3: Medium-Term Traffic Analysis

Intersection	*Control Type*	*Morning Peak Hour*		*Afternoon Peak Hour*	
		Overall LOS	*Critical Movement (LOS, V/C)*	*Overall LOS*	*Critical Movement (LOS, V/C)*
CR 17 / Carmen Bergeron	Traffic Signal	B	WB-TH (C, 0.91)	C	EB-TH (D, **1.00**)
Carmen Bergeron / Richelieu	All-Way Stop Control	A	WB-T/R (A, 0.27)	A	SB-L/T (A, 0.18)
Richelieu / Commercial Access	2-Way Stop Control	B	SB (B, 0.03)	C	SB (C, 0.40)
Poupart / Richelieu	All-Way Stop Control	A	NB (A, 0.30)	B	EB-LT (B, 0.34)
Poupart / St-Jean	Roundabout	C	WB (C, **0.94**)	E	**EB (F, 1.14)** **NB (F, 1.14)**
St-Jean / Dr. Corbeil	Roundabout	A	WB (A, 0.44)	A	SB (A, 0.61)
St-Jean / Patricia	All-Way Stop Control	B	NB (C, 0.66)	C	SB (D, 0.80)
St-Jean / Laurier	Traffic Signal	B	NB-LT (C, 0.69)	B	WB (C, 0.76)
Caron / Dr. Corbeil	Traffic Signal	B	EB (C, 0.58) NB (B, 0.68)	C	EB (E, 0.85) SB (C, **0.95**)
Caron / David	Traffic Signal	A	WB (B, 0.44) NB (A, 0.69)	A	SB (A, 0.80)
St-Jean/Street No. 1 Access	Roundabout	A	NB (A, 0.29)	A	SB (A, 0.86)
Street No.1 / Sterling	Minor-leg Stop Control	B	WB (B, 0.13)	C	SB (C, 0.23)
Caron / Street No.1	Traffic Signal	B	SB (E, 0.59)	B	SB (C, 0.78)
Poupart Rd Extension	Roundabout	A	WB (A, 0.91)	C	**EB (F, 1.03)**
Poupart / Site Access	Roundabout	A	WB (A, 0.83)	C	**EB (F, 1.04)**

All of the study area intersections operate at satisfactory level of service during the peak hours of travel demand, except for:

- ***CR 17 / Carmen Bergeron Street***: The intersection still experiences slight congestion in the peak direction despite assuming a 4-lane CR 17. The EB movement results in a v/c ratio greater than 0.90 during the afternoon peak hour of travel demand.
- ***Poupart Road west of St-Jean Street***: The proposed single roundabouts from St-Jean Street to Poupart Road extension to CR 17 are anticipated to reach capacity (EB direction results in v/c ratio greater than 1.00) during the afternoon peak hour. The corridor should be monitored as development progresses to confirm if/when a 4-lane facility is required during the medium-term horizon year.
  Since the forecast assumes that a 2-lane Poupart and single roundabouts fail within

[1] Official Plan City of Clarence-Rockland - Schedule "B" – Road Network and Community Linkages
[2] Caron Street has an existing third lane along its length.

the medium-term horizon, consideration should be given to construct this corridor as a 4-lane cross-section with double roundabouts from the onset. Staging Poupart Road and the roundabouts from single-to-double within a short time period (potentially under 10-years) would result in throw-away infrastructure and is not recommended.

3.5.4 Forecast Ultimate Build-Out Traffic Analysis

By the full build-out year, it was assumed that:

- Poupart Road west of the Morris Village roundabout (as St-Jean/Poupart transition from north-south to east-west) would require a 4-lane cross-section to accommodate development growth; and
- Caron Street would require a 4-lane cross-section to accommodate development along Caron Street.

Table 3.4 below provides a summary of the build-out analysis.

Table 3.4: Build-Out Traffic Analysis

Intersection	*Control Type*	*Morning Peak Hour*		*Afternoon Peak Hour*	
		Overall LOS	*Critical Movement (LOS, V/C)*	*Overall LOS*	*Critical Movement (LOS, V/C)*
CR 17 / Carmen Bergeron	Traffic Signal	D	WB-TH (C, **1.04**)	**F**	**EB-TH (F, 1.25)**
Carmen Bergeron / Richelieu	All-Way Stop Control	A	WB-T/R (A, 0.29)	A	SB-L/T (A, 0.19)
Richelieu / Commercial Access	2-Way Stop Control	B	SB (B, 0.04)	D	SB (C, 0.54)
Poupart / Richelieu	All-Way Stop Control	A	NB (A, 0.41)	B	EB-LT (B, 0.54)
Poupart / St-Jean	Roundabout	B	WB (C, 0.82) SB (E, **0.98**)	C	EB (C, .96) **NB-RT (F, 1.01)**
St-Jean / Dr. Corbeil	Roundabout	A	WB (B, 0.51)	A	SB (A, 0.75)
St-Jean / Patricia	All-Way Stop Control	C	NB (D, 0.84)	E	**SB (F, 1.03)**
St-Jean / Laurier	Traffic Signal	B	NB-LT (C, 0.79)	C	WB (C, 0.86)
Caron / Dr. Corbeil	Traffic Signal	B	EB (C, 0.59) NB (B, 0.68)	C	EB (D, 0.80) SB (C, **0.91**)
Caron / David	Traffic Signal	A	WB (C, 0.47) NB (B, 0.68)	A	SB (A, 0.80)
St-Jean/Street No. 1 Access	Roundabout	B	EB-LT (B, 0.76)	A	SB (A, 0.77)
Street No.1 / Sterling	Minor-leg Stop Control	C	SB (C, 0.35)	C	**SB (F, 0.91)**
Caron / Street No.1	Traffic Signal	C	WB (E, 0.75)	C	SB (C, 0.83)
Poupart Rd Extension	Roundabout	A	WB (A, 0.77)	B	EB (C, **0.94)**
Poupart / Site Access	Roundabout	B	WB (A, 0.77) SB (C, 0.83)	A	EB (A, 0.88) NB (C, 0.77)

All of the study area intersections operate at satisfactory level of service during the peak hours of travel demand, except for:

- ***CR 17 / Carmen Bergeron Street***: The intersection would continue to experience congestion in the peak direction despite assuming a 4-lane CR 17. The EB movement results in a v/c ratio greater than 0.90 during the afternoon peak hour of travel demand.

- ***St-Jean Street / Patricia Street***: The intersection would experience failure level of service in the southbound direction during the afternoon peak hour. The intersection should be monitored as development progresses within the area to determine if traffic signals are warranted at this intersection.
- ***Poupart Road west of St-Jean Street***: The proposed roundabouts from St-Jean Street to Poupart Road extension to CR 17 are anticipated to improve in terms of level of service with the additional capacity along Poupart Road. Albeit a few roundabouts would still experience slightly high v/c ratio at the build-out stage during the afternoon peak hour of travel demand.

4 INFRASTRUCTURE REQUIREMENTS

This section provides the infrastructure requirements for the study area for each phase of the development. The section is segmented into two part: study area corridors and intersections.

4.1 STUDY AREA CORRIDORS

Exhibit 4.1 illustrates the infrastructure envisioned to be required for each phase of the development. The exhibit provides link volumes at each location along the study area corridors. In summary:

- ***Poupart Road*** (west of Street No.1/St-Jean roundabout) is envisioned to be a 4-lane facility. The corridor reaches capacity by the medium-term horizon year. Should development progress as envisioned in this study, widening should be considered by or beyond the medium-term horizon year.
- ***St-Jean Street*** north of the Street No.1 roundabout is envisioned to remain a 2-lane corridor.
- ***Caron Street*** is envisioned to remain a 2-lane facility and would (at the time of the full build-out) require to be widened to 4-lanes to accommodate the growth on either side of the corridor. It is appreciated that some sections of Caron Street might not have sufficient right-of-way (ROW) to be able to be widened. This should be evaluated in details to determine if sufficient ROW exists to widen ultimately to 4-lanes.

4.2 STUDY AREA INTERSECTIONS

As development progresses within the study area, roundabouts are envisioned along Poupart Road and traffic signals along Caron Street for the study area intersections.

Traffic signals were selected along Caron Street as a preferred intersection control given the dominant direction alternates between the northbound (during the morning) and southbound (during the afternoon) direction. Traffic signals would provide the ability to control and provide more green time to the dominant movement during the peak direction.

Table 4.1 provides a summary of the intersection type and configuration for each phase of the development.

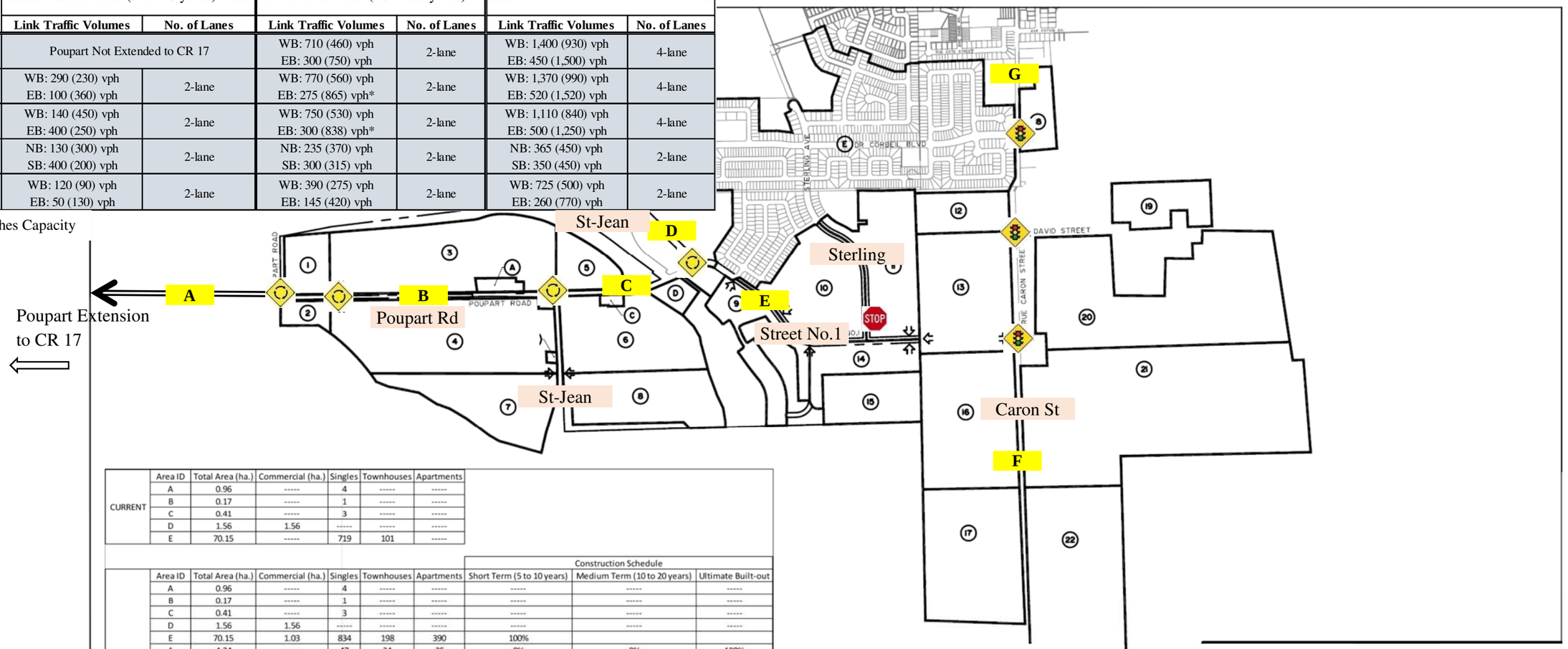
Table 4.1: Proposed Improvements

Intersections	***Short-Term Improvements***	***Medium-Term Improvements***	***Ultimate Build-Out Improvements***
Caron / Dr. Corbeil	All-Way Stop Control	Traffic Signals[1] • NB-LT = 40 m	Traffic Signals NB-LT = 40 m Storage
Caron / David St	2-Way Stop Control	Traffic Signals[1] • NB-LT = 30 m	Traffic Signals SB-LT = 30 m Storage
Caron / Street No.1	All-Way Stop Control	Traffic Signals[1] • NB-LT = 120 m • SB-LT = 120m • SB-RT = 120m • EB-LT = 35 • EB-RT = 125m • WB-LT = 30m • WB-RT = 120m	Traffic Signals • NB-LT = 120 m • SB-LT = 120m • SB-RT = 120m • EB-LT = 35 • EB-RT = 125m • WB-LT = 30m • WB-RT = 120m
St-Jean / Dr. Corbeil	Single lane roundabout	Single lane roundabout	Single lane roundabout
St-Jean / Street No.1	Single lane roundabout with auxiliary lanes	Single lane roundabout with auxiliary lanes[2]	Single lane roundabout with auxiliary lanes
St-Jean / Poupart	All-Way Stop Control	Single (or Double[3]) lane roundabout	2-lane roundabout with auxiliary lanes[2]
Poupart / Site Access	2-Way Stop Control	Single (or Double[3]) lane roundabout[3]	2-lane roundabout
Poupart / Poupart Rd Extension	N/A	Single (or Double[3]) lane roundabout[3]	2-lane roundabout

1- The storage lengths were calculated assuming a cycle length of 120 sec, vehicle length of 7m and a safety factor of 1.5.
2- See Appendix "C" for conceptual level lay-out along with auxiliary lane.
3- The roundabouts can be constructed as 4-lanes during the medium term. The intersections should be monitored closely at this time to confirm a 4-lane Poupart facility is required. Consideration should be given to construct double roundabouts and a 4-lane Poupart Rd from the outset.

Links	Short-term (5-to-10 years)		Medium-term (10-to-20 years)		Ultimate Build-out	
	Link Traffic Volumes	No. of Lanes	Link Traffic Volumes	No. of Lanes	Link Traffic Volumes	No. of Lanes
A	Poupart Not Extended to CR 17		WB: 710 (460) vph EB: 300 (750) vph	2-lane	WB: 1,400 (930) vph EB: 450 (1,500) vph	4-lane
B	WB: 290 (230) vph EB: 100 (360) vph	2-lane	WB: 770 (560) vph EB: 275 (865) vph*	2-lane	WB: 1,370 (990) vph EB: 520 (1,520) vph	4-lane
C	WB: 140 (450) vph EB: 400 (250) vph	2-lane	WB: 750 (530) vph EB: 300 (838) vph*	2-lane	WB: 1,110 (840) vph EB: 500 (1,250) vph	4-lane
D	NB: 130 (300) vph SB: 400 (200) vph	2-lane	NB: 235 (370) vph SB: 300 (315) vph	2-lane	NB: 365 (450) vph SB: 350 (450) vph	2-lane
E	WB: 120 (90) vph EB: 50 (130) vph	2-lane	WB: 390 (275) vph EB: 145 (420) vph	2-lane	WB: 725 (500) vph EB: 260 (770) vph	2-lane

*Reaches Capacity



	Area ID	Total Area (ha.)	Commercial (ha.)	Singles	Townhouses	Apartments
CURRENT	A	0.96	-----	4	-----	-----
	B	0.17	-----	1	-----	-----
	C	0.41	-----	3	-----	-----
	D	1.56	1.56	-----	-----	-----
	E	70.15	-----	719	101	-----

							Construction Schedule		
	Area ID	Total Area (ha.)	Commercial (ha.)	Singles	Townhouses	Apartments	Short Term (5 to 10 years)	Medium Term (10 to 20 years)	Ultimate Built-out
FUTURE	A	0.96	-----	4	-----	-----	-----	-----	-----
	B	0.17	-----	1	-----	-----	-----	-----	-----
	C	0.41	-----	3	-----	-----	-----	-----	-----
	D	1.56	1.56	-----	-----	-----	-----	-----	-----
	E	70.15	1.03	834	198	390	100%		
	1	4.24	-----	47	34	25	0%	0%	100%
	2	1.94	-----	21	16	12	0%	0%	100
	3	25.26	-----	199	157	322	25%	100%	
	4	24.63	-----	271	197	148	0%	25%	100
	5	5.44	-----	37	44	-----	100%		
	6	14.96	-----	165	120	90	0%	25%	100
	7	12.33	-----	136	99	74	0%	25%	100
	8	12.34	-----	136	99	74	0%	25%	100
	9	7.97	-----	90	42	-----	50%	100%	
	10	13.92	-----	196	-----	37	50%	100%	
	11	13.61	-----	170	50	-----	50%	100%	
	12	5.85	-----	64	47	35	0%	50%	100
	13	17.40	-----	191	139	104	0%	50%	100%
	14	6.22	-----	90	-----	-----	50%	100%	
	15	7.53	-----	83	60	45	0%	50%	100%
	16	20.10	-----	221	161	121	0%	50%	100%
	17	20.38	-----	224	163	122	0%	50%	100%
	18	3.56	-----	-----	110	-----	100%		
	19	6.40	-----	70	51	38	50%	100%	
	20	38.59	-----	424	309	232	25%	50%	100%
	21	54.84	-----	603	439	329	25%	50%	100%
	22	38.72	-----	426	310	232	25%	50%	100%

Links	Short-term (5-to-10 years)		Medium-term (10-to-20 years)		Ultimate Build-out	
	Link Traffic Volumes	No. of Lanes	Link Traffic Volumes	No. of Lanes	Link Traffic Volumes	No. of Lanes
F	NB: 340 (360) vph SB: 225 (430) vph	2-lane	NB: 800 (700) vph SB: 415 (930) vph	2-lane	NB: 1,480 (1,190) vph SB: 670 (1,660) vph	4-lane
G	NB: 435 (420) vph SB: 210 (530) vph	2-lane	NB: 940 (750) vph SB: 375 (1,060) vph	2-lane	NB: 1,640 (1,210) vph SB: 600 (1,800) vph	4-lane

TRANSPORTATION IMPACT STUDY

PROJECT No. 18080I

DATE AUGUST 2018

PLAN FUTURE DEVELOPMENT AREA AND STATISTICS

DRAWING No. 18080I-FDASI

Exhibit 4.1: Infrastructure Requirements

5 DESIGN INPUT

This section provides input to the design component of the traffic study such as cross-section requirements, posted speeds, traffic calming measures, etc.

5.1 CROSS-SECTION CONFIGURATION (DIVIDED VS UNDIVIDED)

Poupart Road, from the proposed St-Jean Street (CR 21) roundabout to the proposed extension to CR 17 is anticipated to be a 4-lane facility. Whether the cross-section configuration be divided or undivided depends on many factors, which include access management, speed, traffic volumes, but the main factor is safety.

Raised medians are used to restrict turning movements and access points, and consequently decrease collision rates. Table 4.5.3 within the "***Geometric Design Guide for Canadian Roads***" (Transportation Association of Canada, June 2017) indicates that divided roads reduce the potential of collisions (i.e. head-on and side sweep collisions) by up to ~60% (based upon traffic volumes). As such, a divided cross-section along Poupart Road is recommended from the proposed St-Jean Street roundabout (west of the hill) to the proposed extension to CR 17.

It should be noted that although east of the St-Jean Street roundabout to the Street No. 1 roundabout is recommended to be a divided cross-section, a divided configuration cannot be accommodated due to the hill slope requirements along this segment of St-Jean Street (see Section 5.7 of this report).

5.2 POSTED SPEED

A posted speed limit of 50 km/hr is recommended along all roads within the study area (with the exception of CR 17 which has an existing posted speed of 70 km/hr).

Due to mainly residential land uses surrounding the corridors and the use of roundabouts along Poupart Road and St-Jean Street, it is recommended that a posted speed of 50 km/hr be maintained along this corridor. (A higher posted speed would result in vehicles speeding up/slowing down between each roundabout, which is considered undesirable and defeats the purpose of using roundabouts as traffic calming tools, see Section 5.3.)

5.3 TRAFFIC CALMING

Traffic calming measures are often implemented as a reactionary tool where high speed traffic, cut-through traffic or other local issues are identified in established areas.

As a precautionary traffic calming tool, roundabouts have been proposed along many intersections within the study area. Roundabouts naturally slow vehicular traffic and encourage drivers to be more aware by increasing cognitive load approaching intersections. Roundabouts are posted at 30 km/hr and, by their design, all vehicles approaching intersections slow down (as opposed to traffic signals where vehicles are often seen speeding up to ensure they cross on the green).

Other traffic calming features that can be considered at the design stage, specifically for local roads, include narrow lanes, horizontal deflections and accommodating on-street parking.

5.4 NON-AUTO MODE REQUIREMENTS

Along St-Jean Street, Poupart Road and Street No. 1, the design is to include a multi-use pathway and/or sidewalk to provide for a safe area for pedestrians and cyclists. The multi-use pathway (MUP) is proposed to be 2.5m wide and would accommodate cyclists and other forms of active transportation (skateboards, rollerblades, etc.); the pathway will connect to the existing path along the hydro corridor within the residential development. The sidewalk is proposed to be 2m wide. Both the multi-use pathway and sidewalk are recommended to be hard-surfaces (pavement for MUP and concrete for sidewalks) and cleared of snow in winter months.

5.5 RIGHT-OF-WAY REQUIREMENTS

Right-of-way widths were identified as 26m for two-lane roadways (with the exception of Poupart Road in the vicinity of the Walmart access which is currently 23m) and 30m for four-lane cross-sections (See proposed cross-sections presented by Atrel). Additional property would be needed at intersections to accommodate auxiliary lanes (particularly where roundabouts are provided, see Section 4.2).

- **Caron Street**: This corridor was recently constructed to a 3-lane cross-section. It is recommended that in the ultimate stage, this roadway be widened to 4-lanes. Traffic signals are proposed along the intersections at Dr Corbeil Boulevard, David Street and Street No. 1, however it would be prudent to protect right-of-way to accommodate roundabouts along this corridor, should they be preferred in the future.
- **Poupart Road**: A 4-lane divided cross-section is proposed within the 30 m right-of-way with 15m pavement width (3.75m per lane) and 5m median. Additional right-of-way is required at the roundabout locations. Poupart Road at Walmart narrows to ROW of 23m with pavement width of 8.5m.
- **St-Jean Street**: A 4-lane undivided cross-section is proposed within the 30 m right-of-way to Street No.1 (3.75m lane width). A 2-lane cross-section is envisioned north of Street No.1 roundabout with ROW of 26m and pavement width of 8.5m.

- **Street No.1**: This road is envisioned to accommodate 2 travel lanes with ROW of 26m. The pavement width is proposed to be 11m to accommodate on-street parking.

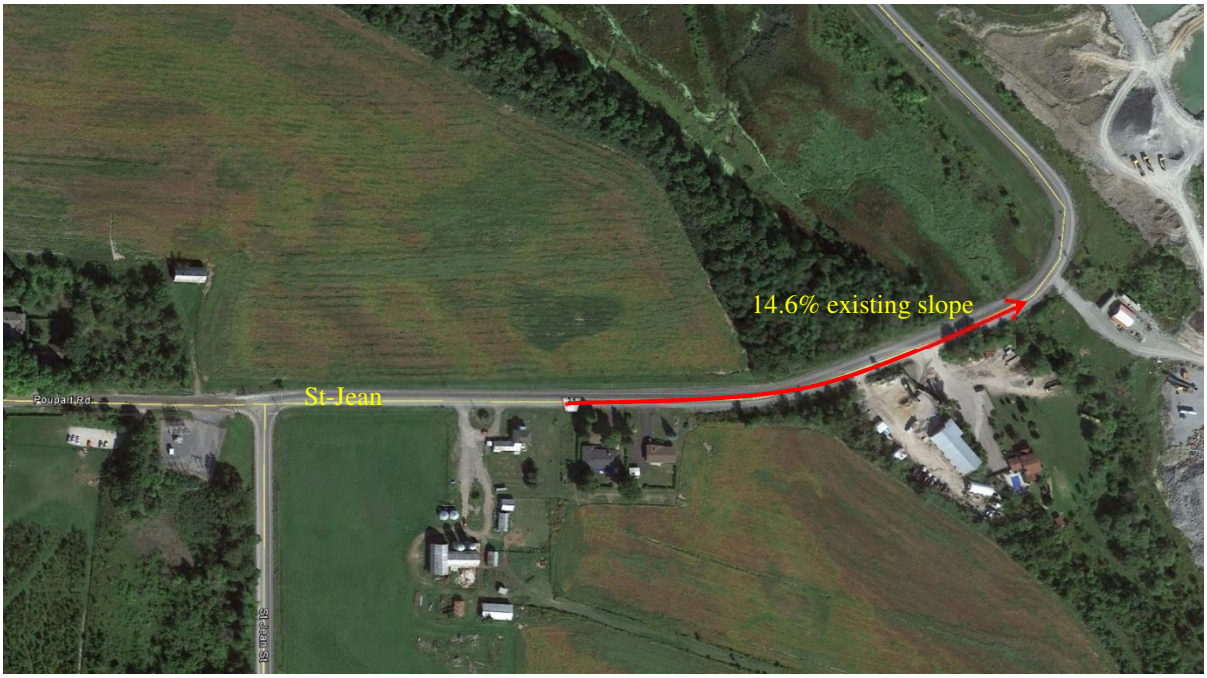
5.6 ROUNDABOUT CONFIGURATIONS

The following provides details regarding roundabout configuration and sizing:

- For all roundabouts, the roundabout circle diameter depends on the design vehicle that would traverse the roundabout. Typically for a single lane roundabout that would accommodate a WB-15 truck has an inscribed circle that ranges from 32-to-46m[3]. In the case of the St-Jean Street and Dr. Corbeil roundabout, a 32-to-36m inscribed circle for a single lane would suffice. This translates to a 6m circular lane width and 20m inner circle that includes a 3-to-4m apron for trucks.
- A 2-lane roundabout, that would typically accommodate a WB-15 or WB-20 truck, has an inscribed circle that ranges from 46-to-67m. A 46-to-50m inscribed circle for a 2-lane roundabout within this study area should suffice. This translates to 9.5-to-10m circular lane width and a 30m inner circle that includes a 3-to-4m apron for trucks. Please note that the dimensions of the roundabout should be tested to accommodate the design vehicle that is envisioned to use the roundabout.

5.7 ST-JEAN STREET HILL SLOPE

St-Jean Street hill is located after the bend along St-Jean Street shown in the exhibit below with an existing slope of 14.6%. St-Jean Street is generally posted at 50km/hr. speed with an advisory speed of 30 km/hr in the vicinity of the hill because of the back-to-back curves on either side along St-Jean Street.



[3] National Cooperative Highway Research Program (NCHRP) Report 672, Exhibit 6-9

It was assumed that the St-Jean Street hill will be classified (as development progresses) as an Urban Collector Undivided (UCU) roadway. Based on this classification and referencing Table 3.3.1 of the "***Geometric Design Guide for Canadian Roads***" (Transportation Association of Canada, June 2017), the maximum acceptable gradient for UCU (50km/hr) is 8% for rolling topography. This would flatten the slope by almost half of the existing slope.

5.8 POUPART RD & LAURIER ST CURVE

Poupart Rd and Laurier St are currently connected by back-to-back curves, where the main curve appears to have a radius of approximately 18m (which does not meet current design standards[4]). Two-way traffic volumes along this segment of roadway are currently 159 vehicles-per-hour in the morning and 354 vph in the afternoon. Traffic volume growth from the proposed developments are anticipated to be low (growth along this section of Poupart Rd/Laurier St is going to be more representative of background growth within the City itself), by the ultimate stage, forecast traffic volumes along this segment are anticipated to be 225 vph in the morning and 435 vph in the afternoon.

The existing curve should be reviewed and considerations should be given to increase the radius in this location if/when safety concerns arise.

6 ALTERNATE FUTURE ROUTES

The following section explores, at a high-level, potential alternative road options for the City of Clarence-Rockland.

6.1 EAST-WEST CORRIDOR

Given the growth that is anticipated to occur within the City of Clarence-Rockland in the next 20 years (and beyond), it is recommended that other road options be explored to provide an alternative entry/exit point to the City. The majority of traffic today use CR 17 to head to/from the City of Ottawa, which funnels all the traffic in and out of the City. Despite widening the CR 17 corridor, it reaches capacity in the next 20-to-30 years as development progresses. A potential alternative option is evaluating a second east-west corridor south of the study area (i.e. connecting Baseline Road to Innes Road – Exhibit 6.1). This would provide additional capacity and alleviate traffic along CR 17, Poupart Road and divert traffic south of the study area. A detailed network-wide assessment is recommended to be undertaken to determine the level of impact on traffic diversion.

[4] "***Geometric Design Guide for Canadian Roads***", (Transportation Association of Canada, June 2017). Table 3.2.8 states that, at a minimum, a 30m radius curve should be provided for a roadway with a design speed of 30km/hr.

Exhibit 6.1: Alternative East-West Corridor

6.2 NORTH-SOUTH CORRIDOR

It is anticipated that Caron Street would ultimately require to be 4-lanes to accommodate growth on either side of the corridor. The challenge with 4-lanning Caron Street is the potential ROW constraint along some segments of the road, especially north of David Street. Another option is to evaluate an alternative north-south corridor connecting the City of Clarence-Rockland to Baseline Road. Consideration should be given to having this roadway be somewhere between St-Jean St (CR 21) and Caron Street, or between Caron Street and Landry Street. This could alleviate the pressure from Caron Street and eliminate the need to 4-lane the corridor. Again, this option should be evaluated in more details as part of a network-wide study to quantify the benefits, a north-south corridor on its own, without an extended east-west connection (i.e. Baseline to Innes, as described above), would not likely provide much benefit.

7 FINDINGS AND RECOMMENDATIONS

The traffic study yields the following findings:

1. The total site traffic volumes generated by the proposed development has been estimated be approximately 6,000 vehicle trips during the morning peak hour and 8,000 vehicle trips during the afternoon peak hour.
2. By the short-term horizon year, it was assumed that:
    a. Roundabouts are recommneded to be constructed at St-Jean Street / Dr. Corbeil Boulevard and St-Jean Street / Street No.1 access into the Morris Village development (as development is anticpated to progress from the east to west);
    b. Stop-Control configuration along Poupart west of the St-Jean Street slope hill;
    c. Stop-Control configuration along Caron Street; and
    d. A 2-lane St-Jean Street, Poupart Road and Caron Street.
3. By the medium-term horizon year, it was assumed that:
    a. Single roundabouts and a 2-lane Poupart Road would be constructed. It should be acknowledged that a 2-lane Poupart Road does reach capacity by this horizon year if development progresses at the rate assumed within this report. The intersections should be monitored to confirm if a 4-lane Poupart facility and double roundabouts are preferred. Consideration should be given to construct double roundabouts and a 4-lane Poupart Rd from the outset to avoid staging costs and throw-away infrastructure;
    b. Poupart Road would require to be extended further west to connect with CR 17;
    c. Traffic signals would be required along Caron Street; and
    d. 2-lane cross-sections along St-Jean Street and Caron Street and 4-lanes along CR 17.
4. By the full build-out year, it was assumed that:
    a. Poupart Road west of the Morris Village roundabout would require a 4-lane cross-section to accommodate development growth; and
    b. Caron Street would require a 4-lane cross-section to accommodate development along Caron Street. A detailed evaluation is recommended to ensure Caron Street has sufficient ROW to accommodate a 4-lane roadway.
5. A divided cross-section along Poupart Road is recommended from the proposed St-Jean Street roundabout (west of the hill) to the proposed extension to CR 17.
6. A posted speed limit of 50 km/hr is recommended along St-Jean Street, Poupart Road and Street No.1.
7. The maximum acceptable proposed gradient for St-Jean Street hill [UCU (50km/hr.)] is recommended to be 8% for rolling topography. This would flatten the slope by almost half of the existing slope.

8. The Poupart Road and Laurier Street curve should be monitered; considerations should be given to increase the radius in this location if/when safety concerns arise.
9. Roundabouts have been proposed along many intersections within the study area. Roundabouts naturally slow vehicular traffic and encourage drivers to be more aware. Roundabouts are posted at 30 km/hr and by their design act as a traffic calming measures. Other traffic calming features that can be considered at the design stage, specifically for local roads, include narrow lanes, horizontal deflections and accommodating on-street parking.
10. The design is to include a paved multi-use pathway and/or concrete sidewalk located within the boulevard to provide for a safe area for pedestrians and cyclists along St-Jean Street, Poupart Road and Street No. 1.

It is recommended that the City of Clarence-Rockland proceed to process the application of subdivision from a transportation perspective. Given the size of the development and long-term planning horizon years, the City of Clarence-Rockland is encouraged to undertake subsequent transportation impact studies as the development progresses to substantiate the medium and long-term assumptions (beyond five years) in this traffic study.

Yours Truly,

Arman Matti

Arman Matti, P. Eng.
Sr. Transportation Engineer
December 2018

Appendix A

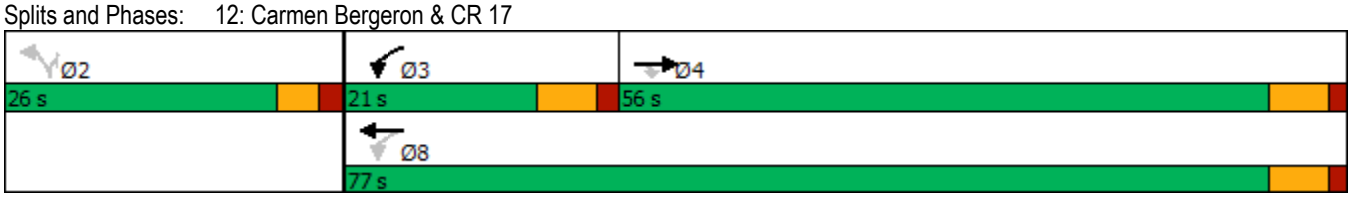
Existing Traffic Analysis

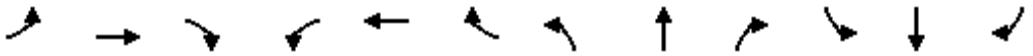
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	392	32	18	979	95	10
Future Volume (vph)	392	32	18	979	95	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		85.0	125.0		0.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			70.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1810	1524	1703	1881	1770	1346
Flt Permitted			0.394		0.950	
Satd. Flow (perm)	1810	1524	706	1881	1770	1346
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		35				11
Link Speed (k/h)	50			50	50	
Link Distance (m)	470.1			337.0	115.6	
Travel Time (s)	33.8			24.3	8.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	6%	6%	1%	2%	20%
Adj. Flow (vph)	426	35	20	1064	103	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	426	35	20	1064	103	11
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8		2	2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	27.2	27.2	11.2	27.2	23.2	23.2
Total Split (s)	56.0	56.0	21.0	77.0	26.0	26.0
Total Split (%)	54.4%	54.4%	20.4%	74.8%	25.2%	25.2%
Maximum Green (s)	49.8	49.8	14.8	70.8	20.8	20.8
Yellow Time (s)	4.6	4.6	4.6	4.6	3.3	3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	5.2	5.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0		14.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	48.4	48.4	52.6	52.6	21.4	21.4
Actuated g/C Ratio	0.56	0.56	0.61	0.61	0.25	0.25
v/c Ratio	0.42	0.04	0.04	0.92	0.23	0.03
Control Delay	12.6	3.6	5.6	27.8	32.1	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	3.6	5.6	27.8	32.1	17.1
LOS	B	A	A	C	C	B
Approach Delay	11.9			27.3	30.7	
Approach LOS	B			C	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 103			
Actuated Cycle Length: 85.7			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 23.3		Intersection LOS: C	
Intersection Capacity Utilization 66.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 12: Carmen Bergeron & CR 17



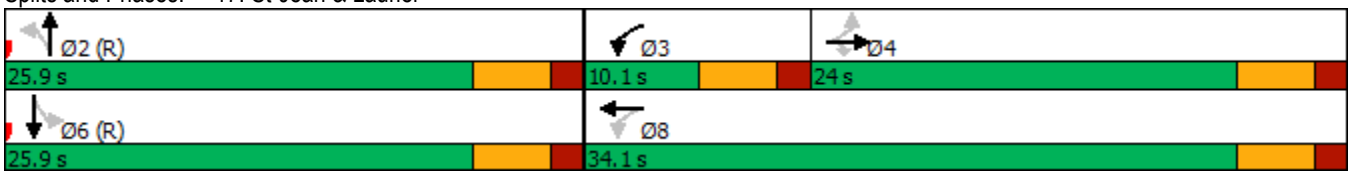


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	168	68	34	257	8	93	15	39	2	5	11
Future Volume (vph)	6	168	68	34	257	8	93	15	39	2	5	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		10.0	0.0		0.0	20.0		0.0	10.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			10.0			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.996			0.891			0.894	
Flt Protected		0.998			0.994		0.950			0.950		
Satd. Flow (prot)	0	1843	1568	0	1875	0	1719	1479	0	1805	1604	0
Flt Permitted		0.985			0.959		0.746			0.719		
Satd. Flow (perm)	0	1819	1568	0	1809	0	1350	1479	0	1366	1604	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		3			42			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		549.0			622.7			441.7			187.4	
Travel Time (s)		39.5			44.8			31.8			13.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	3%	3%	0%	0%	5%	13%	15%	0%	20%	0%
Adj. Flow (vph)	7	183	74	37	279	9	101	16	42	2	5	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	190	74	0	325	0	101	58	0	2	17	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Minimum Split (s)	23.1	23.1	23.1	10.1	23.1		23.1	23.1		23.1	23.1	
Total Split (s)	24.0	24.0	24.0	10.1	34.1		25.9	25.9		25.9	25.9	
Total Split (%)	40.0%	40.0%	40.0%	16.8%	56.8%		43.2%	43.2%		43.2%	43.2%	
Maximum Green (s)	19.0	19.0	19.0	5.1	29.1		20.9	20.9		20.9	20.9	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Walk Time (s)	7.0	7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)		19.0	19.0		29.1		20.9	20.9		20.9	20.9	
Actuated g/C Ratio		0.32	0.32		0.48		0.35	0.35		0.35	0.35	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.33	0.13		0.37		0.21	0.11		0.00	0.03	
Control Delay		17.7	1.6		11.1		15.4	7.1		13.0	8.8	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		17.7	1.6		11.1		15.4	7.1		13.0	8.8	
LOS		B	A		B		B	A		B	A	
Approach Delay		13.2			11.1			12.4			9.3	
Approach LOS		B			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.37			
Intersection Signal Delay: 12.0		Intersection LOS: B	
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 17: St-Jean & Laurier



Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	33	36	14	31	13	22	149	30	16	96	4
Future Vol, veh/h	4	33	36	14	31	13	22	149	30	16	96	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	6	0	14	6	0	5	3	10	0	1	25
Mvmt Flow	4	36	39	15	34	14	24	162	33	17	104	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	8.4	9	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	5%	24%	14%
Vol Thru, %	74%	45%	53%	83%
Vol Right, %	15%	49%	22%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	201	73	58	116
LT Vol	22	4	14	16
Through Vol	149	33	31	96
RT Vol	30	36	13	4
Lane Flow Rate	218	79	63	126
Geometry Grp	1	1	1	1
Degree of Util (X)	0.267	0.099	0.086	0.157
Departure Headway (Hd)	4.396	4.477	4.93	4.484
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	817	800	727	801
Service Time	2.419	2.506	2.96	2.51
HCM Lane V/C Ratio	0.267	0.099	0.087	0.157
HCM Control Delay	9	8	8.4	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.1	0.3	0.3	0.6

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	16	98	2	11	75
Future Vol, veh/h	5	16	98	2	11	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	40	13	9	0	18	13
Mvmt Flow	5	17	107	2	12	82
Number of Lanes	1	0	1	0	1	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	1	0
HCM Control Delay	7.8	7.9	8.1
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	24%	100%	0%
Vol Thru, %	98%	0%	0%	100%
Vol Right, %	2%	76%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	100	21	11	75
LT Vol	0	5	11	0
Through Vol	98	0	0	75
RT Vol	2	16	0	0
Lane Flow Rate	109	23	12	82
Geometry Grp	5	2	7	7
Degree of Util (X)	0.128	0.029	0.018	0.109
Departure Headway (Hd)	4.249	4.649	5.4	4.815
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	838	775	662	743
Service Time	2.303	2.649	3.136	2.55
HCM Lane V/C Ratio	0.13	0.03	0.018	0.11
HCM Control Delay	7.9	7.8	8.2	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.1	0.4

Intersection	
Int Delay, s/veh	6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	81	115	66	28	60	81
Future Vol, veh/h	81	115	66	28	60	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	4	2	7	2	2
Mvmt Flow	88	125	72	30	65	88

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	305	87	0	0	102	0
Stage 1	87	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Critical Hdwy	6.4	6.24	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	-	-	2.218	-
Pot Cap-1 Maneuver	691	966	-	-	1490	-
Stage 1	941	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	659	966	-	-	1490	-
Mov Cap-2 Maneuver	659	-	-	-	-	-
Stage 1	898	-	-	-	-	-
Stage 2	823	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	3.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	810	1490	-
HCM Lane V/C Ratio	-	-	0.263	0.044	-
HCM Control Delay (s)	-	-	11	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	7	34	164	65	38	61
Future Vol, veh/h	7	34	164	65	38	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	43	0	1	0	0	5
Mvmt Flow	8	37	178	71	41	66
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.9	9.2	7.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	38%	0%	72%
Vol Thru, %	0%	17%	28%
Vol Right, %	62%	83%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	99	41	229
LT Vol	38	0	164
Through Vol	0	7	65
RT Vol	61	34	0
Lane Flow Rate	108	45	249
Geometry Grp	1	1	1
Degree of Util (X)	0.128	0.057	0.296
Departure Headway (Hd)	4.282	4.639	4.285
Convergence, Y/N	Yes	Yes	Yes
Cap	843	775	829
Service Time	2.283	2.65	2.364
HCM Lane V/C Ratio	0.128	0.058	0.3
HCM Control Delay	7.9	7.9	9.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.4	0.2	1.2

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	10	7	7	63	9	68	30	3	6	28	75
Future Vol, veh/h	11	10	7	7	63	9	68	30	3	6	28	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	22	0	0	0	0	0	2	0	33	0	4	0
Mvmt Flow	12	11	8	8	68	10	74	33	3	7	30	82
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	8.1	8	8.2	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	67%	100%	0%	9%	6%
Vol Thru, %	30%	0%	59%	80%	26%
Vol Right, %	3%	0%	41%	11%	69%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	101	11	17	79	109
LT Vol	68	11	0	7	6
Through Vol	30	0	10	63	28
RT Vol	3	0	7	9	75
Lane Flow Rate	110	12	18	86	118
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.136	0.02	0.025	0.107	0.128
Departure Headway (Hd)	4.444	5.948	4.779	4.484	3.897
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	809	604	751	801	923
Service Time	2.457	3.666	2.497	2.501	1.91
HCM Lane V/C Ratio	0.136	0.02	0.024	0.107	0.128
HCM Control Delay	8.2	8.8	7.6	8	7.5
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.5	0.1	0.1	0.4	0.4

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	4	0	5	5	179	0	5	0	18	20	12
Future Vol, veh/h	15	4	0	5	5	179	0	5	0	18	20	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	6	0	13
Mvmt Flow	16	4	0	5	5	195	0	5	0	20	22	13
Number of Lanes	1	1	0	1	1	0	0	2	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8	7.8	6.9	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%	47%	0%
Vol Thru, %	100%	100%	0%	100%	0%	3%	53%	0%
Vol Right, %	0%	0%	0%	0%	0%	97%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	3	15	4	5	184	38	12
LT Vol	0	0	15	0	5	0	18	0
Through Vol	3	3	0	4	0	5	20	0
RT Vol	0	0	0	0	0	179	0	12
Lane Flow Rate	3	3	16	4	5	200	41	13
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.004	0.003	0.024	0.006	0.008	0.218	0.061	0.016
Departure Headway (Hd)	5.041	3.335	5.206	4.705	5.112	3.93	5.331	4.289
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	714	1079	680	751	695	904	676	839
Service Time	2.743	1.036	2.995	2.494	2.879	1.696	3.032	1.99
HCM Lane V/C Ratio	0.004	0.003	0.024	0.005	0.007	0.221	0.061	0.015
HCM Control Delay	7.8	6	8.1	7.5	7.9	7.8	8.4	7.1
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0	0	0.8	0.2	0

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	39	61	57	58	41
Future Vol, veh/h	42	39	61	57	58	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	400	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	13	13	9	0	10
Mvmt Flow	46	42	66	62	63	45

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	280	86	108	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	194	-	-	-	-	-
Critical Hdwy	6.42	6.33	4.23	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.417	2.317	-	-	-
Pot Cap-1 Maneuver	710	943	1417	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	839	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	677	943	1417	-	-	-
Mov Cap-2 Maneuver	677	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	839	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1417	-	783	-	-
HCM Lane V/C Ratio	0.047	-	0.112	-	-
HCM Control Delay (s)	7.7	-	10.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	7	6	21	181	4	7	3	19	2	1	1
Future Vol, veh/h	9	7	6	21	181	4	7	3	19	2	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	350	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	22	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	10	8	7	23	197	4	8	3	21	2	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	201	0	0	15	0	0	278	279	12	289	280	199
Stage 1	-	-	-	-	-	-	32	32	-	245	245	-
Stage 2	-	-	-	-	-	-	246	247	-	44	35	-
Critical Hdwy	4.32	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.398	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1260	-	-	1616	-	-	678	632	1074	667	632	847
Stage 1	-	-	-	-	-	-	990	872	-	763	707	-
Stage 2	-	-	-	-	-	-	762	706	-	975	870	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1260	-	-	1616	-	-	665	618	1074	640	618	847
Mov Cap-2 Maneuver	-	-	-	-	-	-	665	618	-	640	618	-
Stage 1	-	-	-	-	-	-	982	865	-	757	697	-
Stage 2	-	-	-	-	-	-	749	696	-	945	863	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.2	0.7	9.3	10.4
HCM LOS			A	B

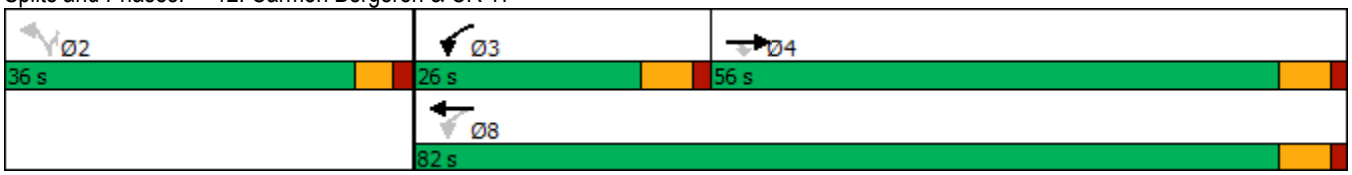
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	877	1260	-	-	1616	-	-	675
HCM Lane V/C Ratio	0.036	0.008	-	-	0.014	-	-	0.006
HCM Control Delay (s)	9.3	7.9	-	-	7.3	-	-	10.4
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1002	181	66	475	56	109
Future Volume (vph)	1002	181	66	475	56	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		85.0	125.0		0.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			70.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1845	1599	1752	1863	1805	1615
Flt Permitted			0.071		0.950	
Satd. Flow (perm)	1845	1599	131	1863	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		111				118
Link Speed (k/h)	50			50	50	
Link Distance (m)	470.1			337.0	115.6	
Travel Time (s)	33.8			24.3	8.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	3%	2%	0%	0%
Adj. Flow (vph)	1089	197	72	516	61	118
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1089	197	72	516	61	118
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8		2	2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	27.2	27.2	11.2	27.2	26.2	26.2
Total Split (s)	56.0	56.0	26.0	82.0	36.0	36.0
Total Split (%)	47.5%	47.5%	22.0%	69.5%	30.5%	30.5%
Maximum Green (s)	49.8	49.8	19.8	75.8	30.8	30.8
Yellow Time (s)	4.6	4.6	4.6	4.6	3.3	3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	5.2	5.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0		14.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	50.0	50.0	60.8	60.8	30.9	30.9
Actuated g/C Ratio	0.48	0.48	0.59	0.59	0.30	0.30
v/c Ratio	1.22	0.24	0.38	0.47	0.11	0.21
Control Delay	135.9	8.3	14.9	13.6	28.6	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	135.9	8.3	14.9	13.6	28.6	6.4
LOS	F	A	B	B	C	A
Approach Delay	116.4			13.7	13.9	
Approach LOS	F			B	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118			
Actuated Cycle Length: 103.1			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 78.0		Intersection LOS: E	
Intersection Capacity Utilization 69.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 12: Carmen Bergeron & CR 17

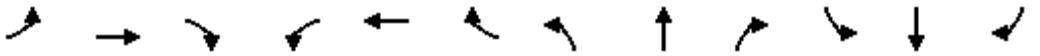


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1002	181	66	475	56	109
Future Volume (vph)	1002	181	66	475	56	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		85.0	125.0		0.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			70.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1845	1599	1752	1863	1805	1615
Flt Permitted			0.054		0.950	
Satd. Flow (perm)	1845	1599	100	1863	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		171				118
Link Speed (k/h)	50			50	50	
Link Distance (m)	470.1			337.0	115.6	
Travel Time (s)	33.8			24.3	8.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	3%	2%	0%	0%
Adj. Flow (vph)	1089	197	72	516	61	118
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1089	197	72	516	61	118
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8		2	2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	27.2	27.2	11.2	27.2	26.2	26.2
Total Split (s)	80.0	80.0	11.2	91.2	26.8	26.8
Total Split (%)	67.8%	67.8%	9.5%	77.3%	22.7%	22.7%
Maximum Green (s)	73.8	73.8	5.0	85.0	21.6	21.6
Yellow Time (s)	4.6	4.6	4.6	4.6	3.3	3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	5.2	5.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0		14.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	67.8	67.8	76.2	76.2	22.1	22.1
Actuated g/C Ratio	0.62	0.62	0.69	0.69	0.20	0.20
v/c Ratio	0.96	0.19	0.49	0.40	0.17	0.28
Control Delay	39.3	2.4	21.1	7.8	42.2	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	2.4	21.1	7.8	42.2	9.4
LOS	D	A	C	A	D	A
Approach Delay	33.7			9.4	20.6	
Approach LOS	C			A	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118			
Actuated Cycle Length: 110			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 25.6		Intersection LOS: C	
Intersection Capacity Utilization 69.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 12: Carmen Bergeron & CR 17

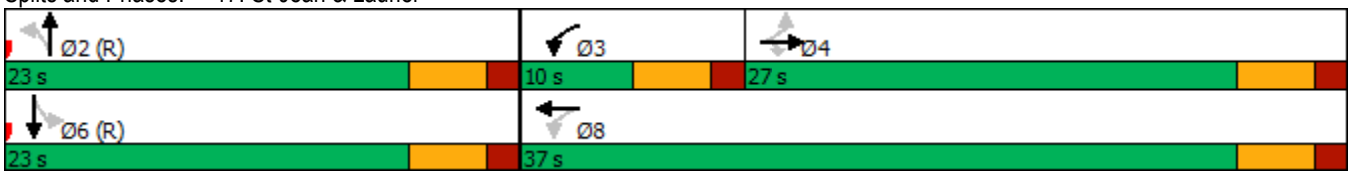


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	402	116	34	338	14	103	13	73	20	11	17
Future Volume (vph)	9	402	116	34	338	14	103	13	73	20	11	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		10.0	0.0		0.0	20.0		0.0	10.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			10.0			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.995			0.873			0.910	
Flt Protected		0.999			0.996		0.950			0.950		
Satd. Flow (prot)	0	1898	1568	0	1878	0	1752	1659	0	1805	1729	0
Flt Permitted		0.988			0.928		0.738			0.697		
Satd. Flow (perm)	0	1877	1568	0	1750	0	1361	1659	0	1324	1729	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		5			79			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		549.0			622.7			441.7			187.4	
Travel Time (s)		39.5			44.8			31.8			13.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	0%	7%	3%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	437	126	37	367	15	112	14	79	22	12	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	447	126	0	419	0	112	93	0	22	30	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Minimum Split (s)	23.0	23.0	23.0	10.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	27.0	27.0	27.0	10.0	37.0		23.0	23.0		23.0	23.0	
Total Split (%)	45.0%	45.0%	45.0%	16.7%	61.7%		38.3%	38.3%		38.3%	38.3%	
Maximum Green (s)	22.0	22.0	22.0	5.0	32.0		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Walk Time (s)	7.0	7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)		22.0	22.0		32.0		18.0	18.0		18.0	18.0	
Actuated g/C Ratio		0.37	0.37		0.53		0.30	0.30		0.30	0.30	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.65	0.19		0.44		0.27	0.17		0.06	0.06	
Control Delay		21.2	3.8		10.2		18.3	6.5		15.6	9.9	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		21.2	3.8		10.2		18.3	6.5		15.6	9.9	
LOS		C	A		B		B	A		B	A	
Approach Delay		17.3			10.2			13.0			12.3	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 67.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 17: St-Jean & Laurier



Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	36	48	31	43	17	59	176	28	33	172	9
Future Vol, veh/h	16	36	48	31	43	17	59	176	28	33	172	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	3	2	0	0	0	2	1	0	0	1	0
Mvmt Flow	17	39	52	34	47	18	64	191	30	36	187	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.1	9.2	10.6	10
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	22%	16%	34%	15%
Vol Thru, %	67%	36%	47%	80%
Vol Right, %	11%	48%	19%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	263	100	91	214
LT Vol	59	16	31	33
Through Vol	176	36	43	172
RT Vol	28	48	17	9
Lane Flow Rate	286	109	99	233
Geometry Grp	1	1	1	1
Degree of Util (X)	0.375	0.154	0.143	0.309
Departure Headway (Hd)	4.724	5.098	5.221	4.775
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	758	697	680	747
Service Time	2.786	3.182	3.307	2.841
HCM Lane V/C Ratio	0.377	0.156	0.146	0.312
HCM Control Delay	10.6	9.1	9.2	10
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.7	0.5	0.5	1.3

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	22	137	4	25	150
Future Vol, veh/h	4	22	137	4	25	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	1	0	8	1
Mvmt Flow	4	24	149	4	27	163
Number of Lanes	1	0	1	0	1	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	1	0
HCM Control Delay	7.3	8.2	8.5
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	15%	100%	0%
Vol Thru, %	97%	0%	0%	100%
Vol Right, %	3%	85%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	141	26	25	150
LT Vol	0	4	25	0
Through Vol	137	0	0	150
RT Vol	4	22	0	0
Lane Flow Rate	153	28	27	163
Geometry Grp	5	2	7	7
Degree of Util (X)	0.178	0.033	0.04	0.21
Departure Headway (Hd)	4.187	4.203	5.262	4.642
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	846	857	679	771
Service Time	2.267	2.203	3.003	2.383
HCM Lane V/C Ratio	0.181	0.033	0.04	0.211
HCM Control Delay	8.2	7.3	8.2	8.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.1	0.1	0.8

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	52	103	166	114	117	93
Future Vol, veh/h	52	103	166	114	117	93
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	1	0	1	1
Mvmt Flow	57	112	180	124	127	101

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	597	242	0	0	304	0
Stage 1	242	-	-	-	-	-
Stage 2	355	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	469	802	-	-	1263	-
Stage 1	803	-	-	-	-	-
Stage 2	714	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	419	802	-	-	1263	-
Mov Cap-2 Maneuver	419	-	-	-	-	-
Stage 1	717	-	-	-	-	-
Stage 2	714	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	4.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	614	1263	-
HCM Lane V/C Ratio	-	-	0.274	0.101	-
HCM Control Delay (s)	-	-	13.1	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.3	-

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	73	81	101	23	78	185
Future Vol, veh/h	73	81	101	23	78	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	2	2	4	3	2
Mvmt Flow	79	88	110	25	85	201
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.6	9.1	9.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	30%	0%	81%
Vol Thru, %	0%	47%	19%
Vol Right, %	70%	53%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	263	154	124
LT Vol	78	0	101
Through Vol	0	73	23
RT Vol	185	81	0
Lane Flow Rate	286	167	135
Geometry Grp	1	1	1
Degree of Util (X)	0.341	0.205	0.185
Departure Headway (Hd)	4.291	4.414	4.932
Convergence, Y/N	Yes	Yes	Yes
Cap	838	812	726
Service Time	2.322	2.452	2.972
HCM Lane V/C Ratio	0.341	0.206	0.186
HCM Control Delay	9.5	8.6	9.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.5	0.8	0.7

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	123	55	76	9	24	17	25	50	14	22	43	99
Future Vol, veh/h	123	55	76	9	24	17	25	50	14	22	43	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	11	0	0	0	0	0	0	2	0
Mvmt Flow	134	60	83	10	26	18	27	54	15	24	47	108
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	9.3	8.5	8.7	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	28%	100%	0%	18%	13%
Vol Thru, %	56%	0%	42%	48%	26%
Vol Right, %	16%	0%	58%	34%	60%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	89	123	131	50	164
LT Vol	25	123	0	9	22
Through Vol	50	0	55	24	43
RT Vol	14	0	76	17	99
Lane Flow Rate	97	134	142	54	178
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.131	0.211	0.189	0.075	0.222
Departure Headway (Hd)	4.877	5.69	4.778	4.999	4.488
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	733	630	748	713	799
Service Time	2.921	3.439	2.527	3.059	2.525
HCM Lane V/C Ratio	0.132	0.213	0.19	0.076	0.223
HCM Control Delay	8.7	10	8.6	8.5	8.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.4	0.8	0.7	0.2	0.8

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	15	3	5	13	105	0	49	11	18	68	21
Future Vol, veh/h	17	15	3	5	13	105	0	49	11	18	68	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	33	0	0	0	0	2	0	0	1	19
Mvmt Flow	18	16	3	5	14	114	0	53	12	20	74	23
Number of Lanes	1	1	0	1	1	0	0	2	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8.1	7.9	7.8	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%	21%	0%
Vol Thru, %	100%	60%	0%	83%	0%	11%	79%	0%
Vol Right, %	0%	40%	0%	17%	0%	89%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	33	27	17	18	5	118	86	21
LT Vol	0	0	17	0	5	0	18	0
Through Vol	33	16	0	15	0	13	68	0
RT Vol	0	11	0	3	0	105	0	21
Lane Flow Rate	36	30	18	20	5	128	93	23
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.05	0.039	0.029	0.027	0.008	0.155	0.132	0.027
Departure Headway (Hd)	5.042	4.725	5.562	4.943	5.488	4.362	5.065	4.275
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	712	760	645	726	654	825	709	839
Service Time	2.759	2.442	3.281	2.662	3.204	2.078	2.781	1.991
HCM Lane V/C Ratio	0.051	0.039	0.028	0.028	0.008	0.155	0.131	0.027
HCM Control Delay	8	7.6	8.4	7.8	8.2	7.9	8.6	7.1
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.1	0.1	0	0.5	0.5	0.1

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	79	92	60	116	106	64
Future Vol, veh/h	79	92	60	116	106	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	400	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	86	100	65	126	115	70

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	406	150	185	0	-	0
Stage 1	150	-	-	-	-	-
Stage 2	256	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	605	902	1402	-	-	-
Stage 1	883	-	-	-	-	-
Stage 2	791	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	577	902	1402	-	-	-
Mov Cap-2 Maneuver	577	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	791	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	2.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1402	-	716	-	-
HCM Lane V/C Ratio	0.047	-	0.26	-	-
HCM Control Delay (s)	7.7	-	11.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1	-	-

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	66	122	22	40	45	63	25	13	70	62	13	53
Future Vol, veh/h	66	122	22	40	45	63	25	13	70	62	13	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	350	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	72	133	24	43	49	68	27	14	76	67	14	58

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	117	0	0	157	0	0	494	492	145	503	470	83
Stage 1	-	-	-	-	-	-	289	289	-	169	169	-
Stage 2	-	-	-	-	-	-	205	203	-	334	301	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1484	-	-	1435	-	-	489	481	908	482	495	982
Stage 1	-	-	-	-	-	-	723	677	-	838	763	-
Stage 2	-	-	-	-	-	-	802	737	-	684	669	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1484	-	-	1435	-	-	423	443	908	406	456	982
Mov Cap-2 Maneuver	-	-	-	-	-	-	423	443	-	406	456	-
Stage 1	-	-	-	-	-	-	688	644	-	797	740	-
Stage 2	-	-	-	-	-	-	718	715	-	583	636	-

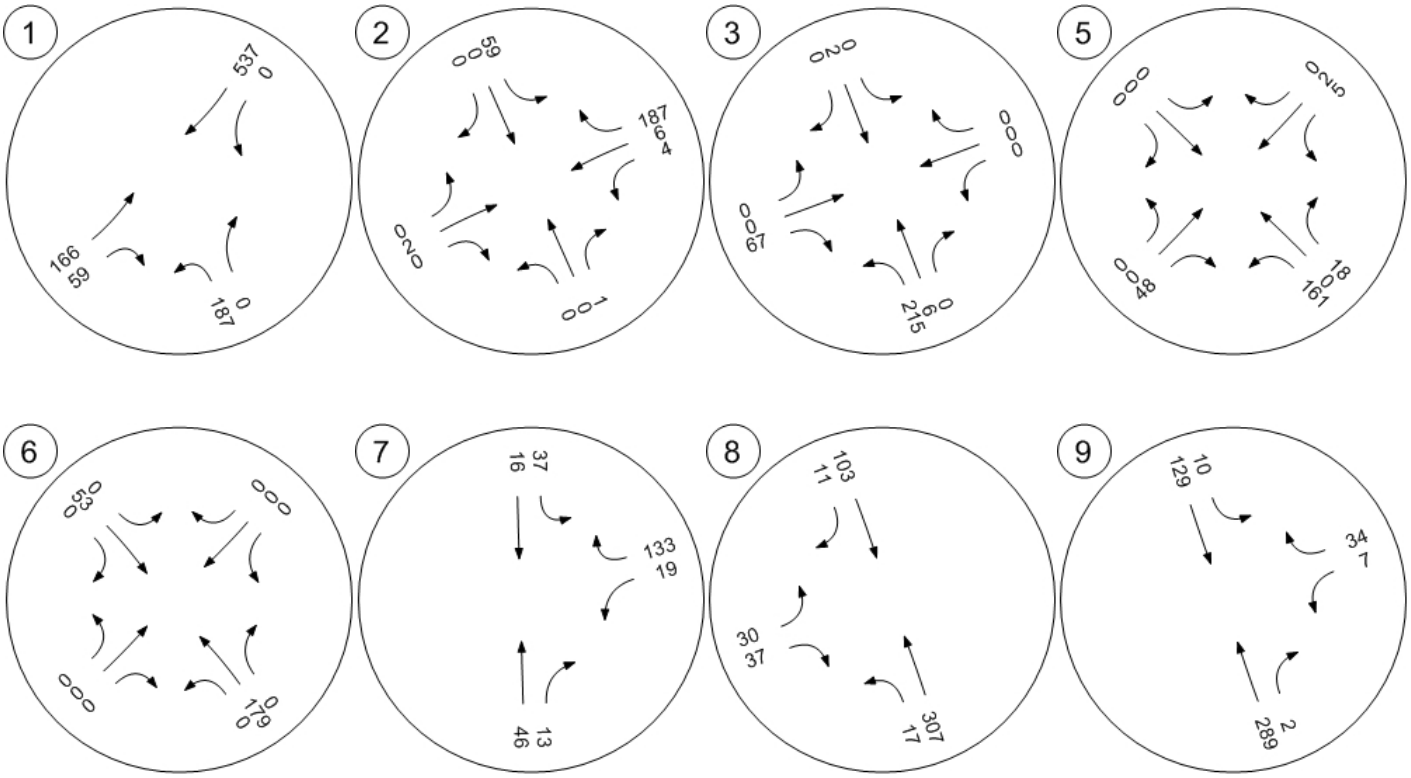
Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	2.1	11.7	13.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	652	1484	-	-	1435	-	-	544
HCM Lane V/C Ratio	0.18	0.048	-	-	0.03	-	-	0.256
HCM Control Delay (s)	11.7	7.5	-	-	7.6	-	-	13.9
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.7	0.2	-	-	0.1	-	-	1

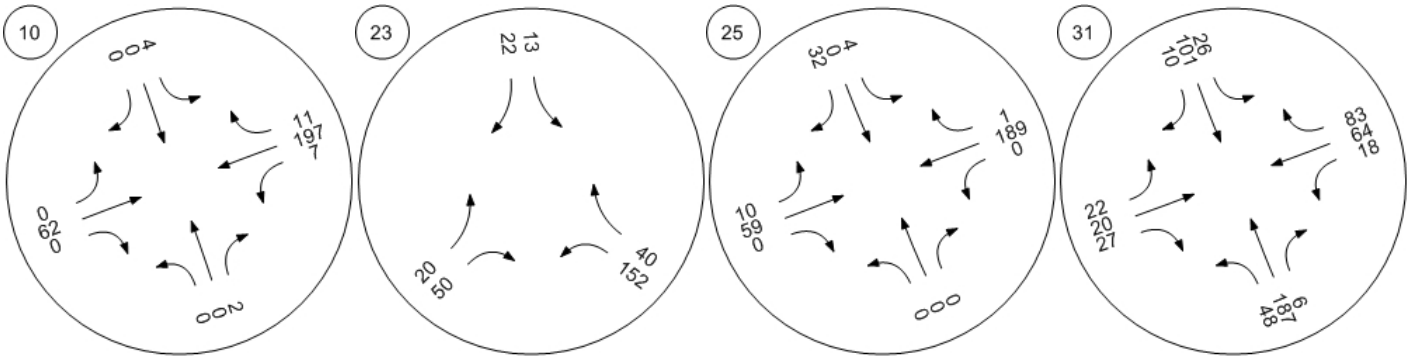
Appendix B

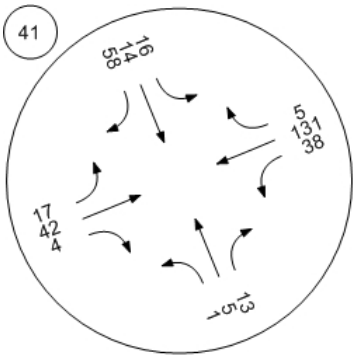
Site and Forecast Traffic Volumes

Traffic Volume - Net New Site Trips

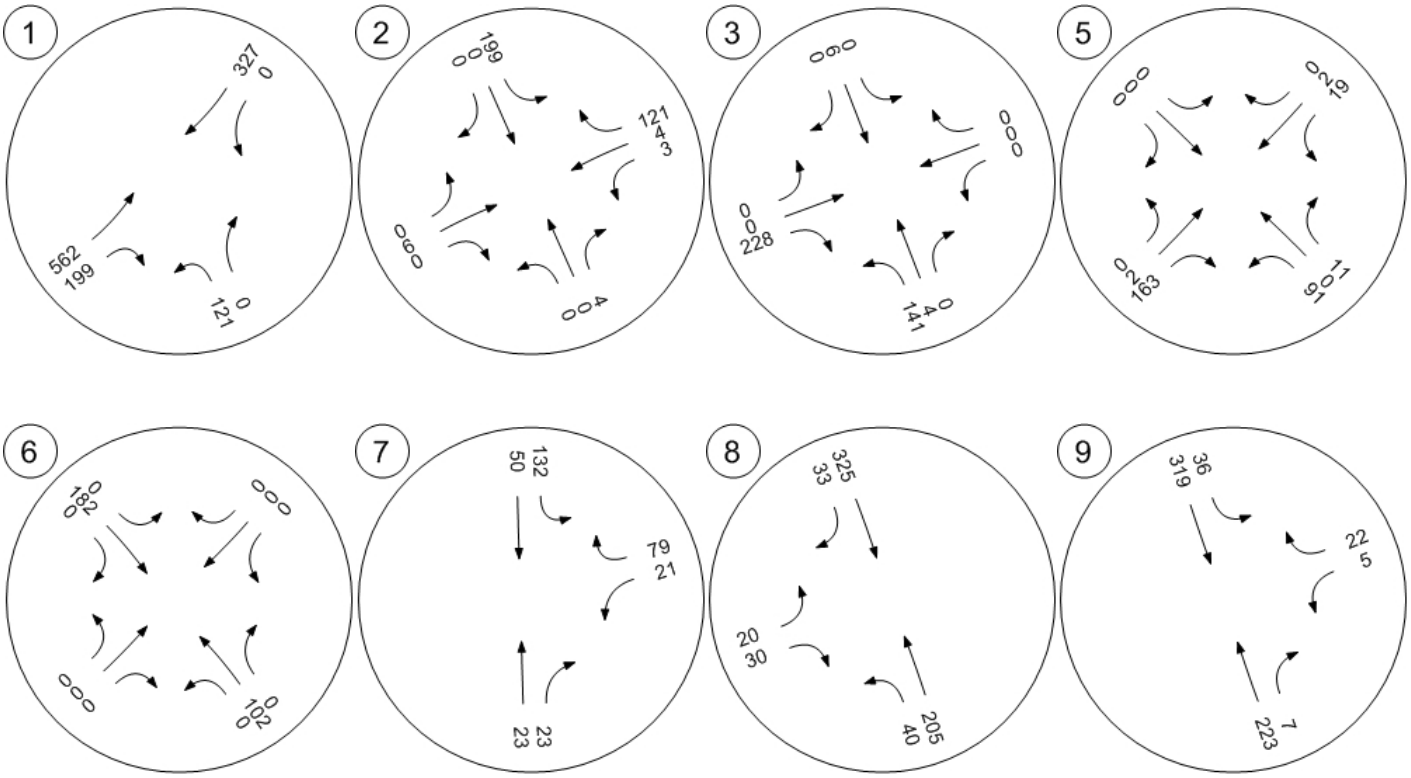


Traffic Volume - Net New Site Trips

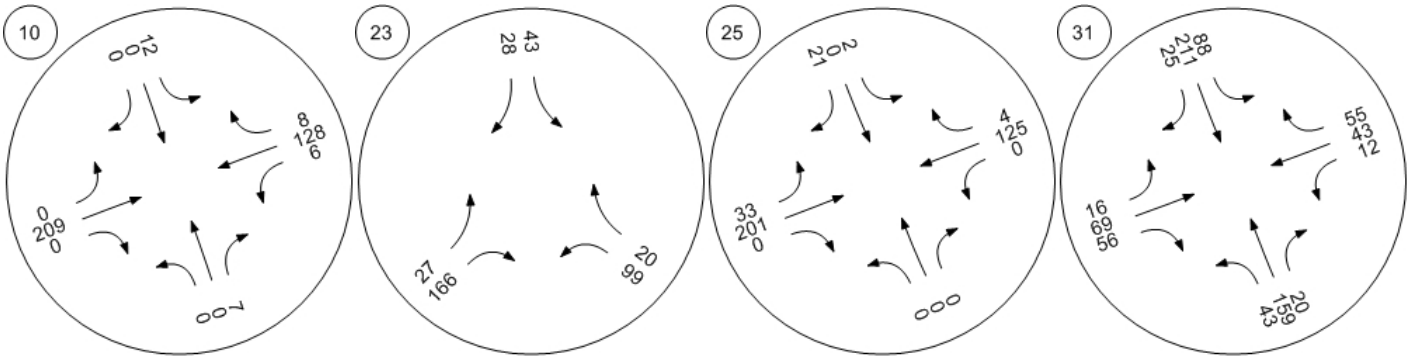




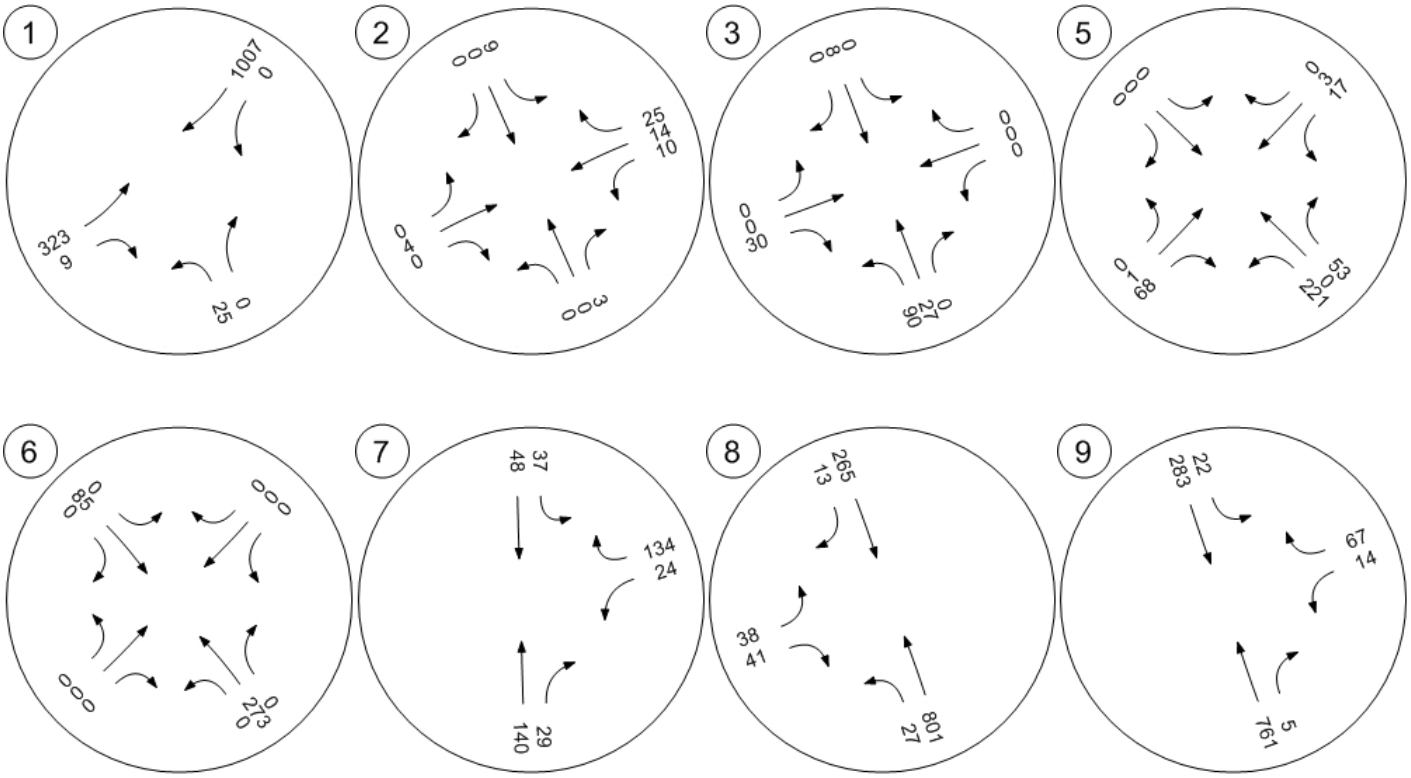
Traffic Volume - Net New Site Trips



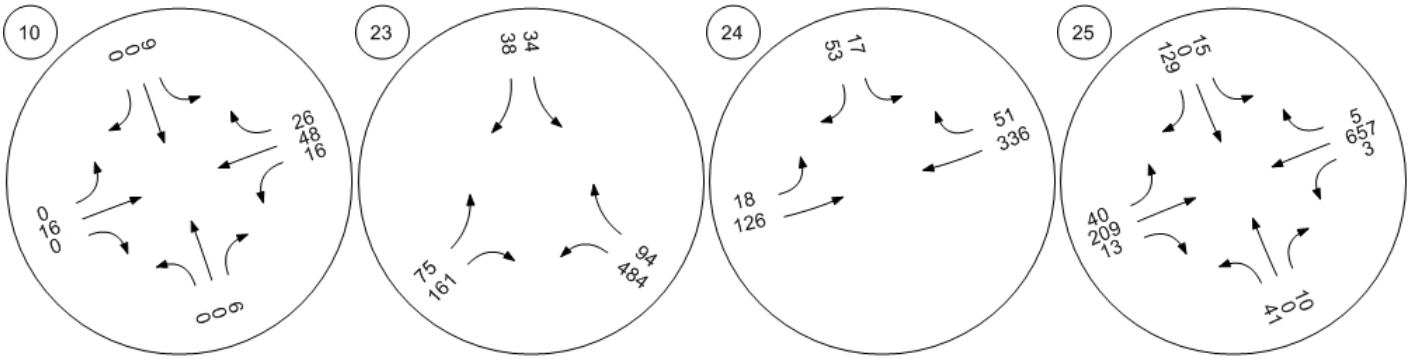
Traffic Volume - Net New Site Trips

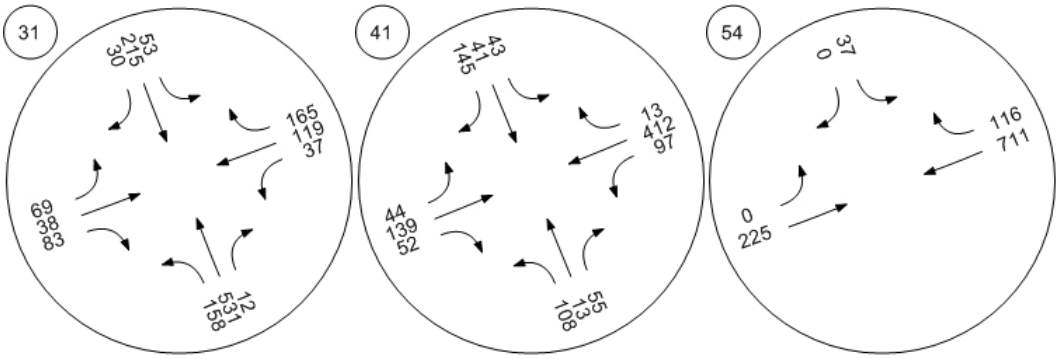


Traffic Volume - Net New Site Trips

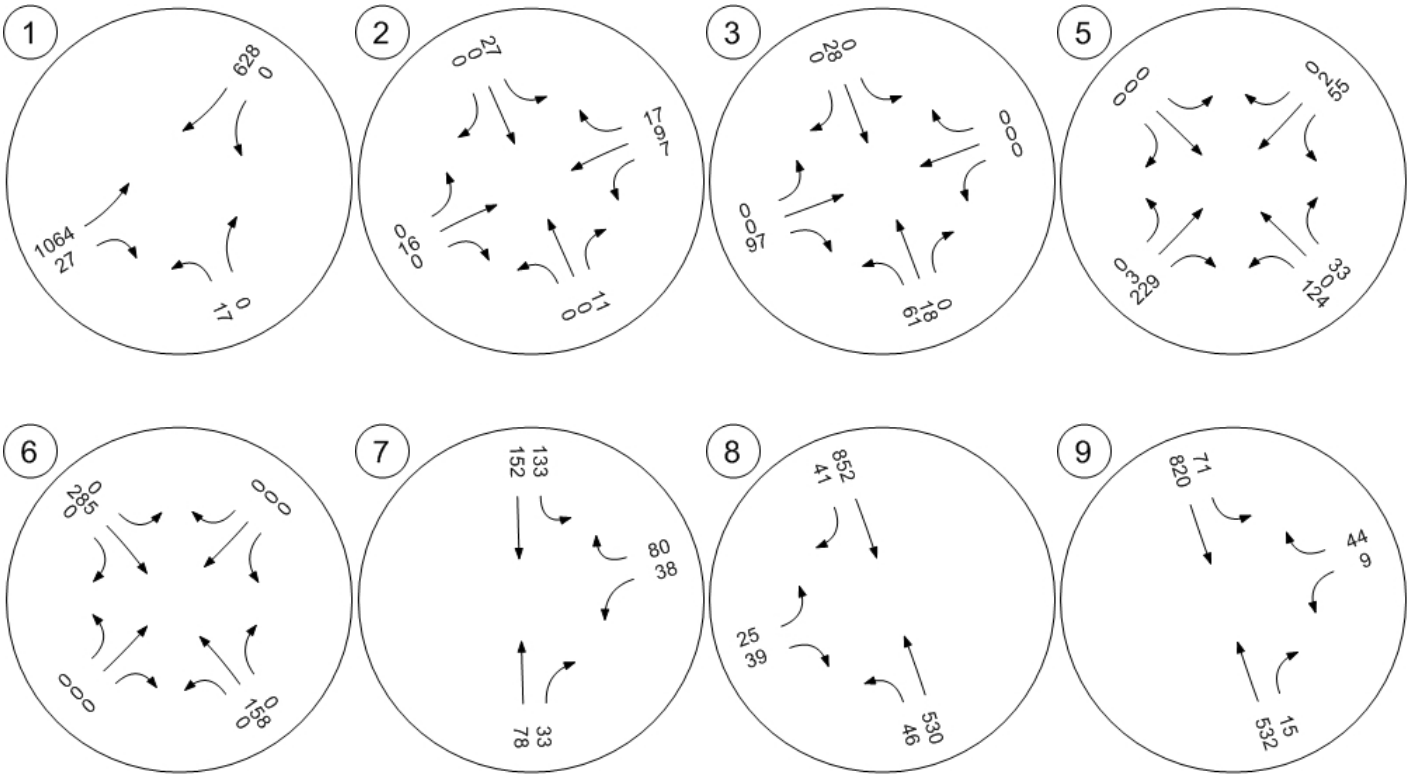


Traffic Volume - Net New Site Trips

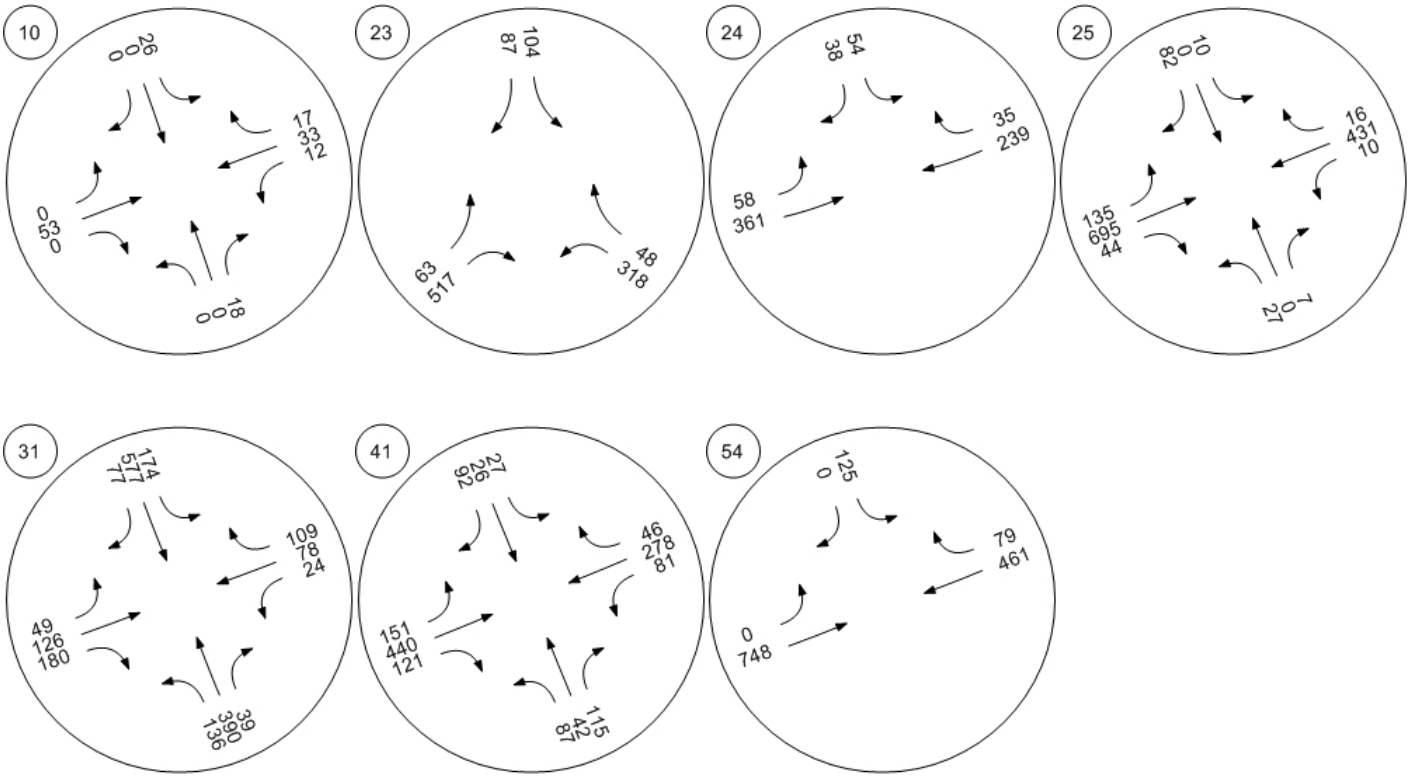




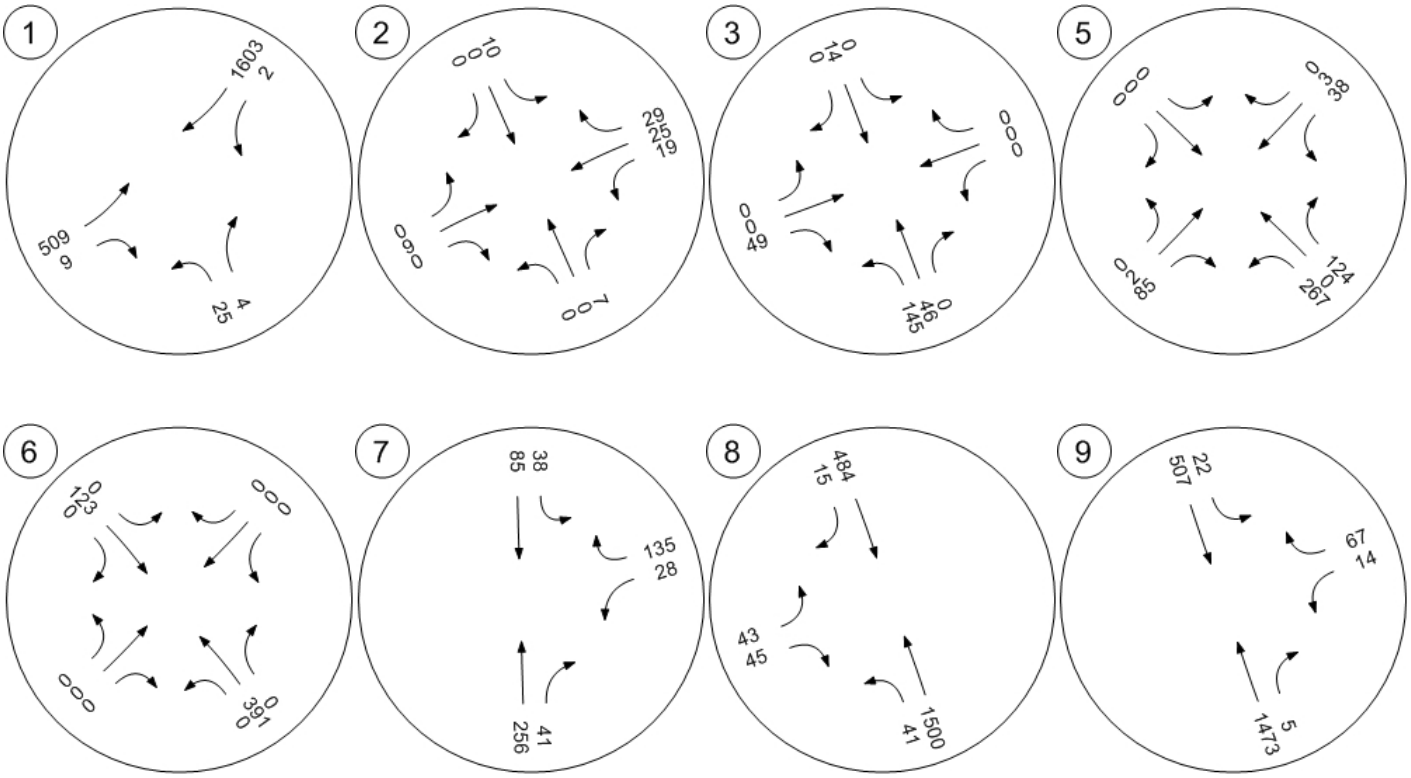
Traffic Volume - Net New Site Trips



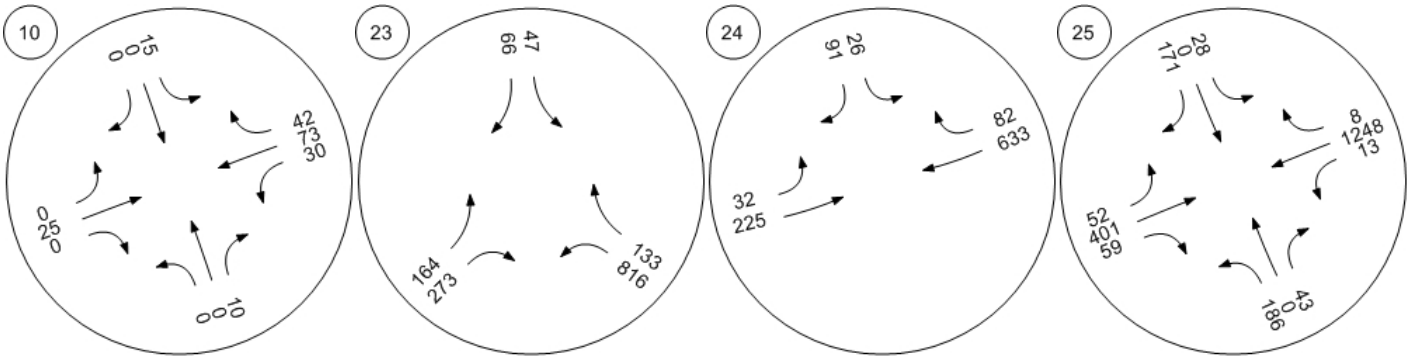
Traffic Volume - Net New Site Trips

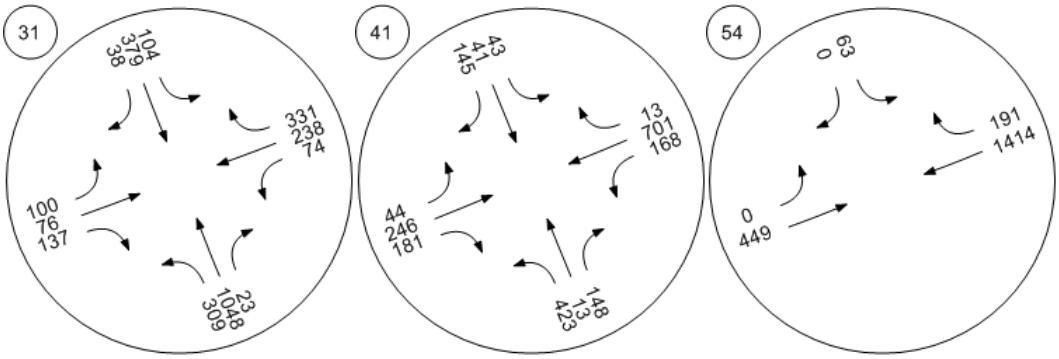


Traffic Volume - Net New Site Trips

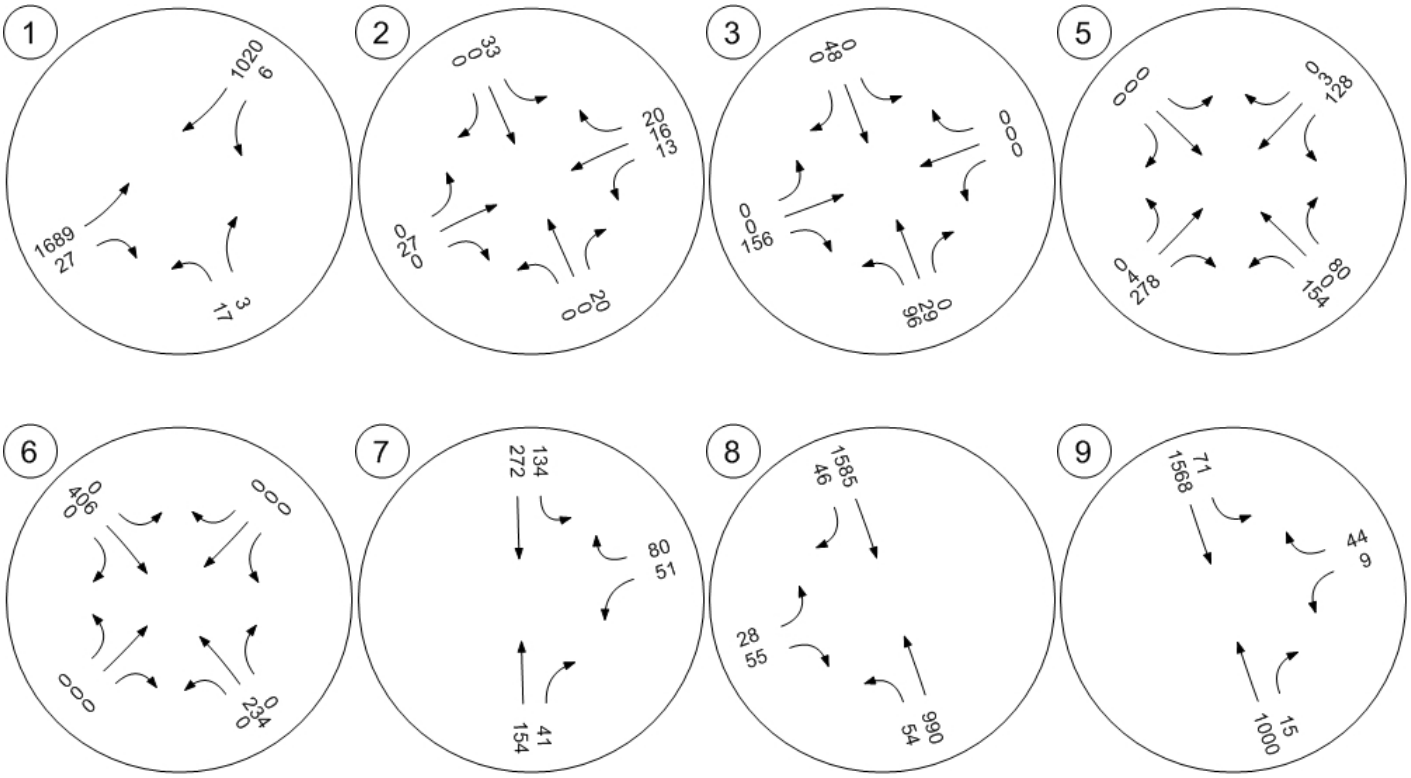


Traffic Volume - Net New Site Trips

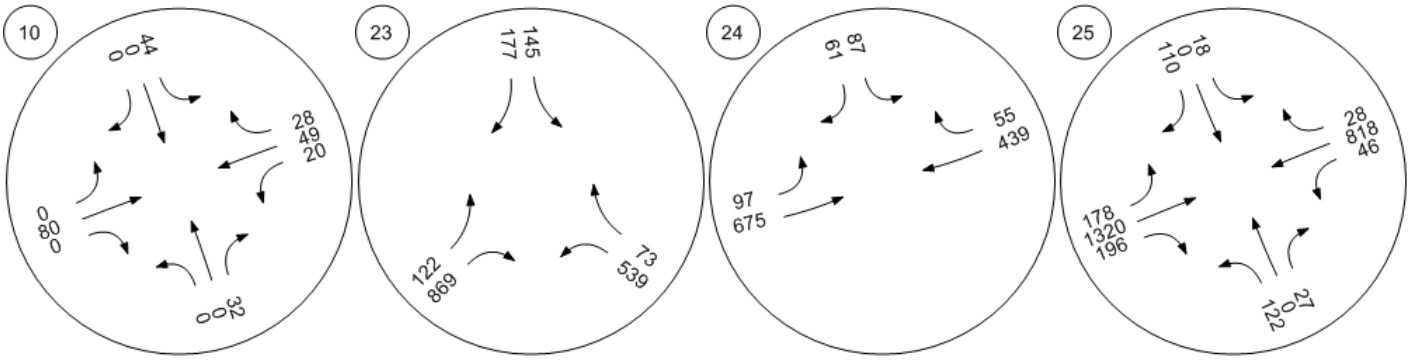


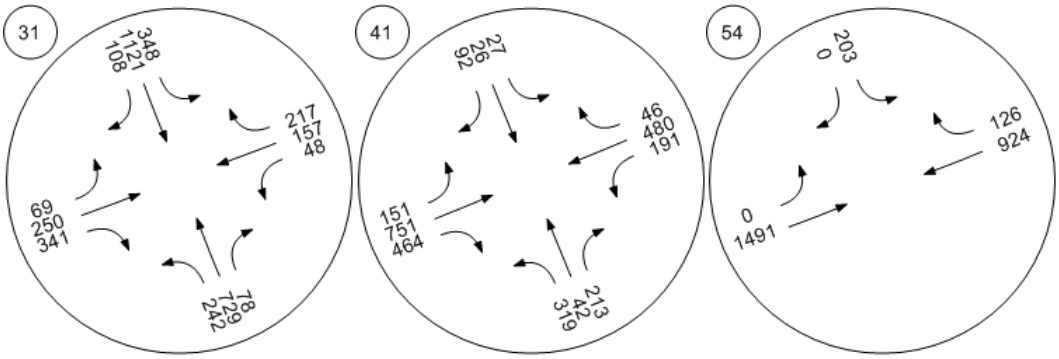


Traffic Volume - Net New Site Trips

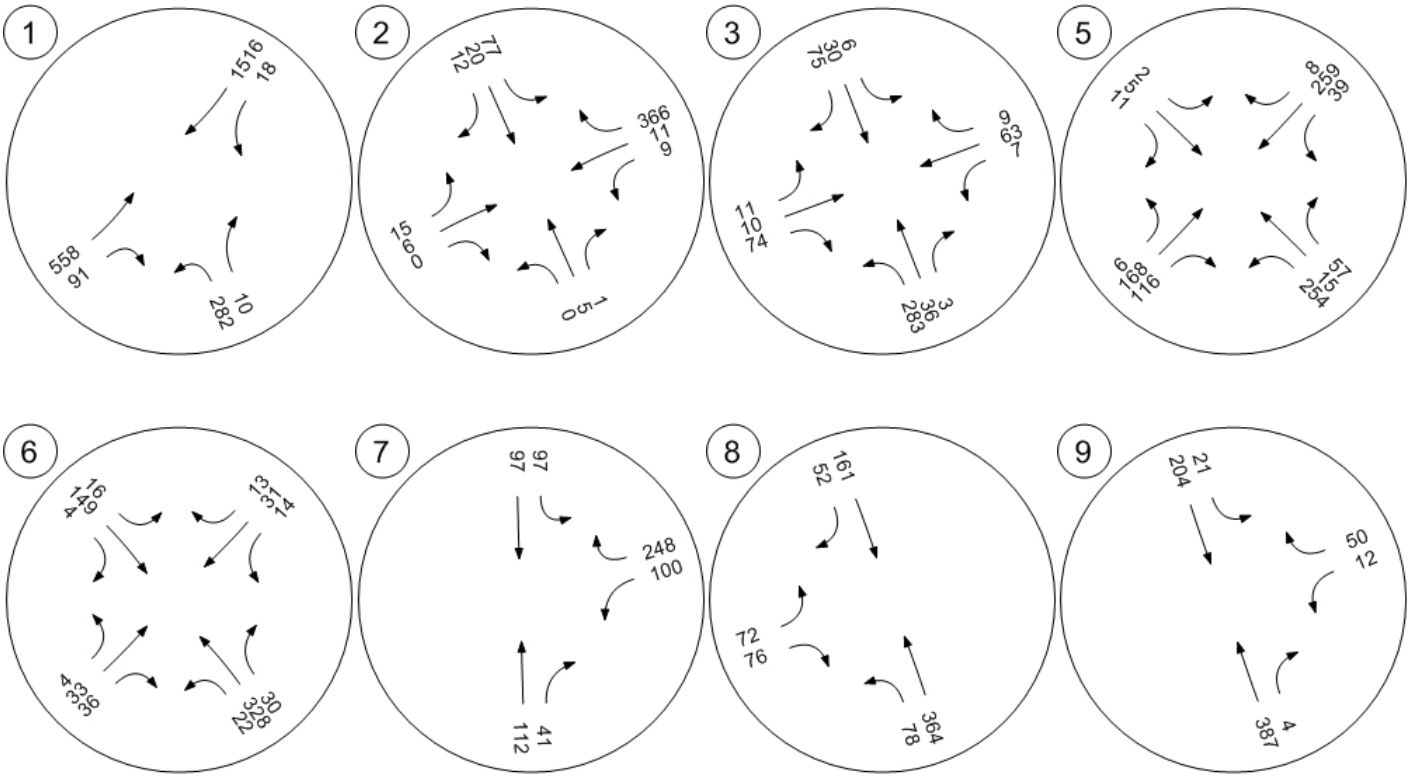


Traffic Volume - Net New Site Trips

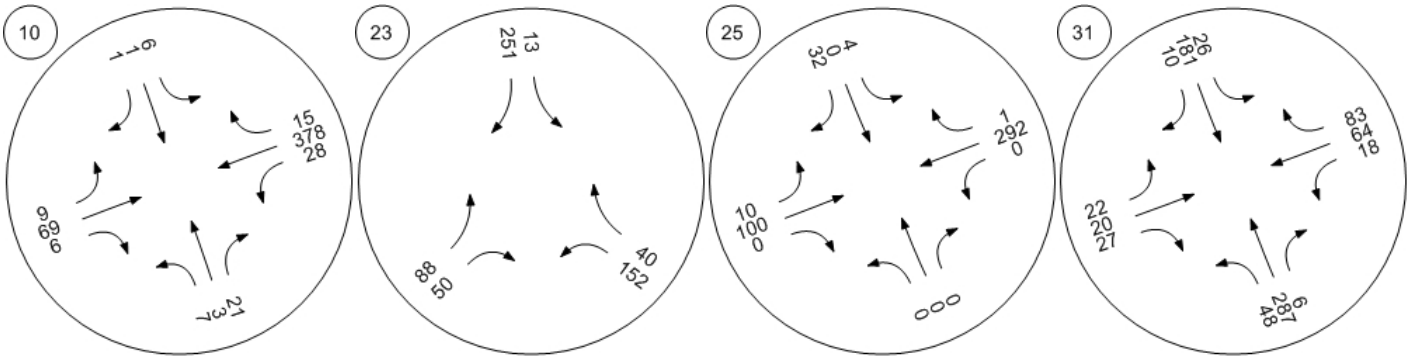


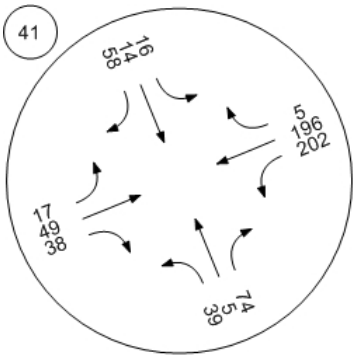


Traffic Volume - Future Total Volume

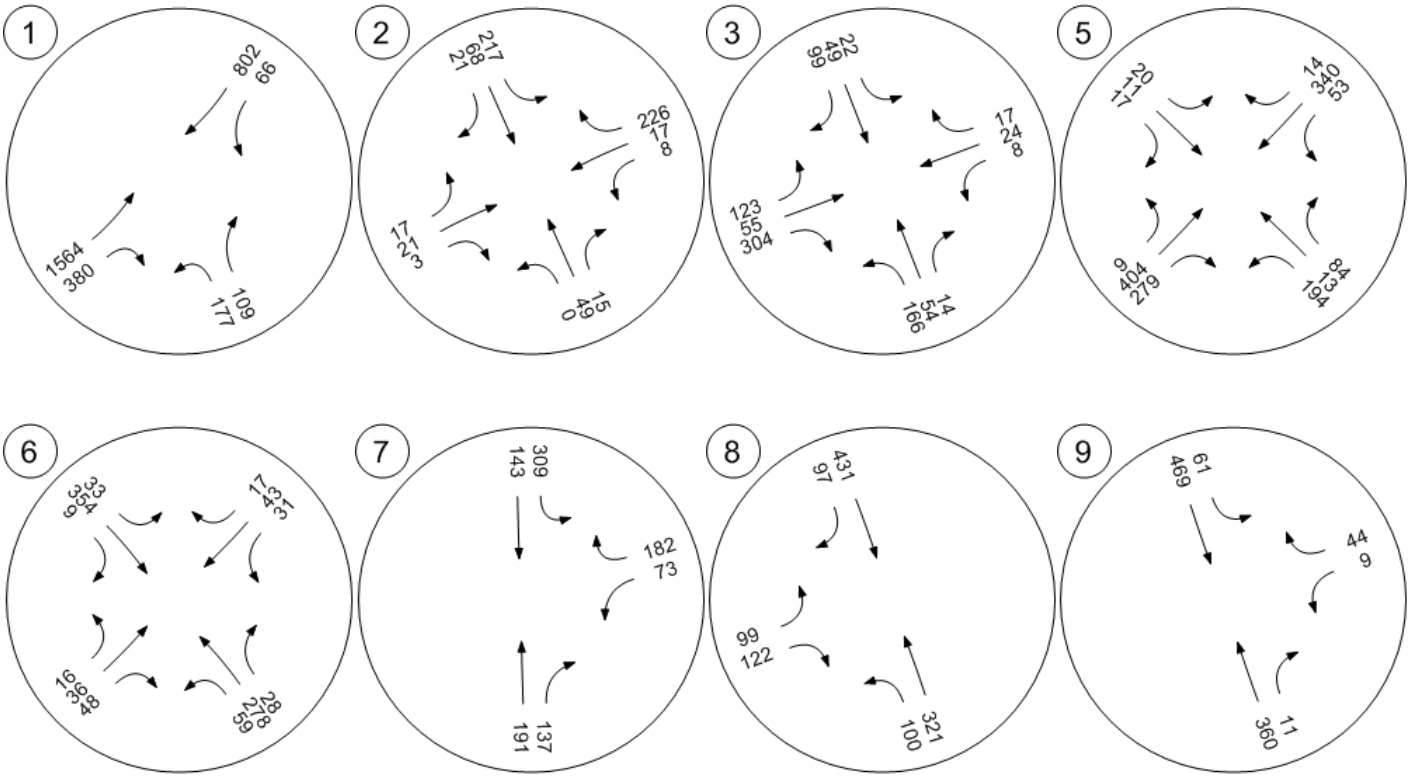


Traffic Volume - Future Total Volume

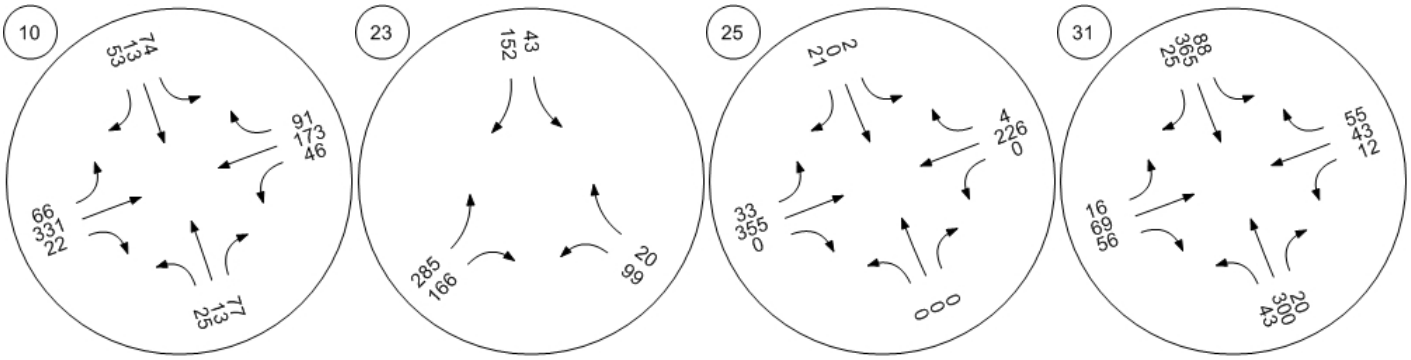


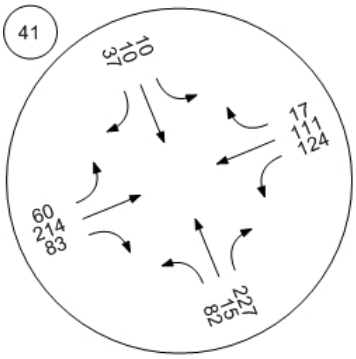


Traffic Volume - Future Total Volume

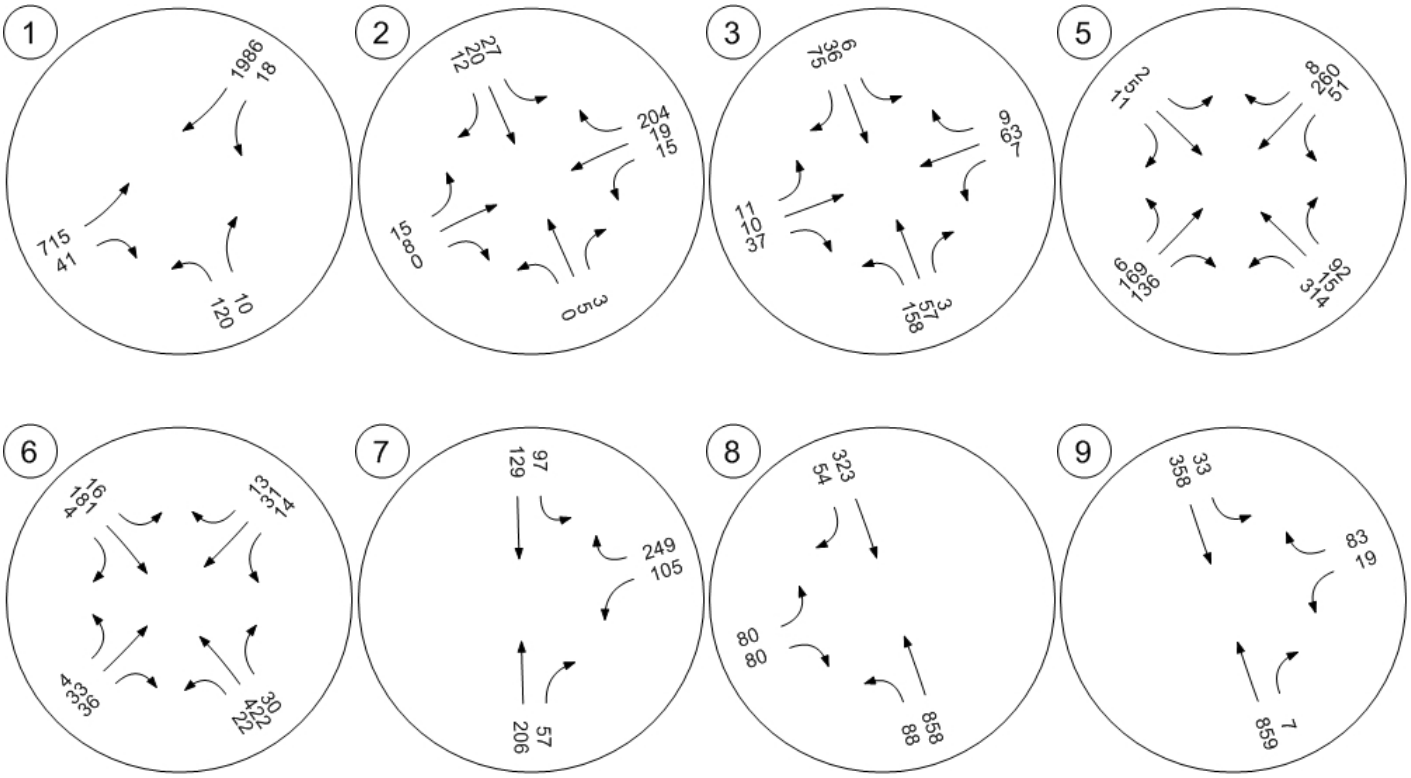


Traffic Volume - Future Total Volume

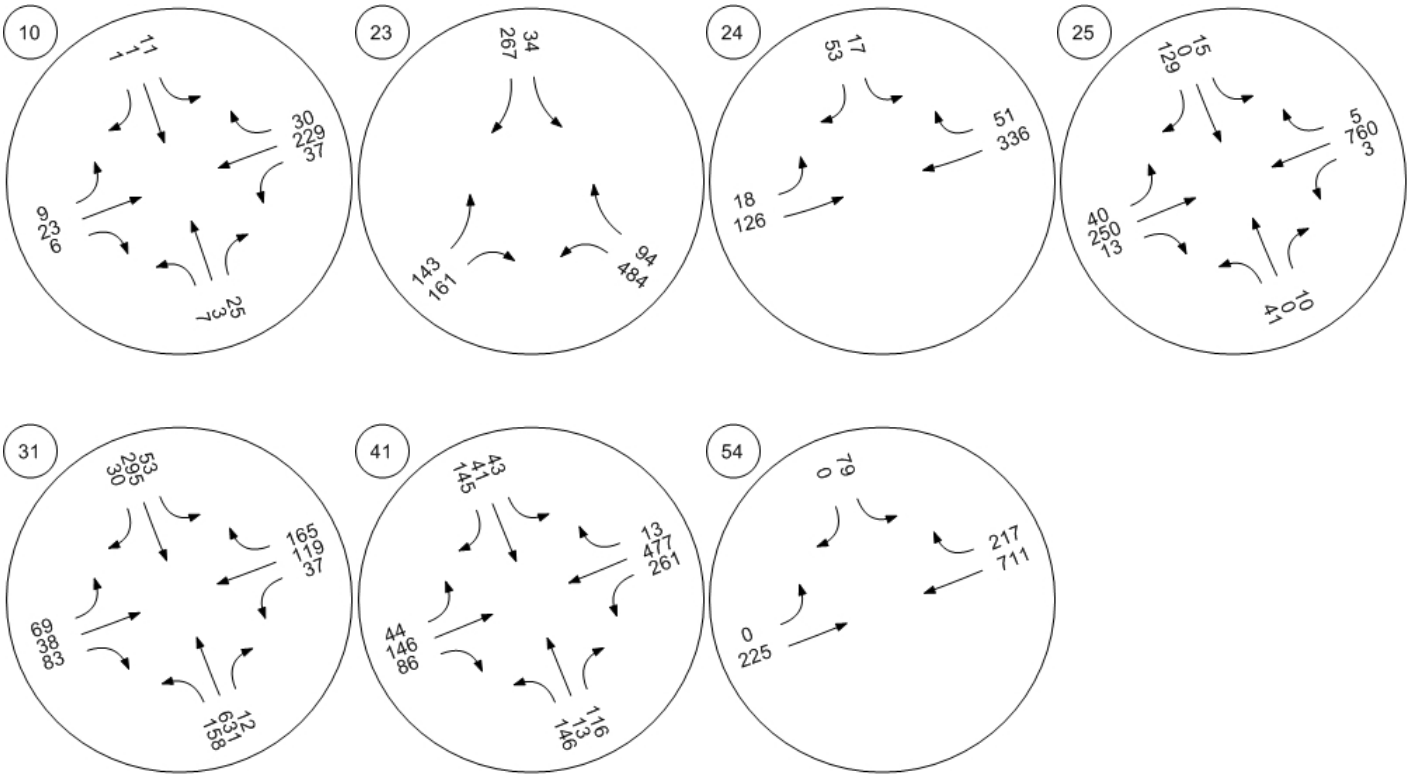




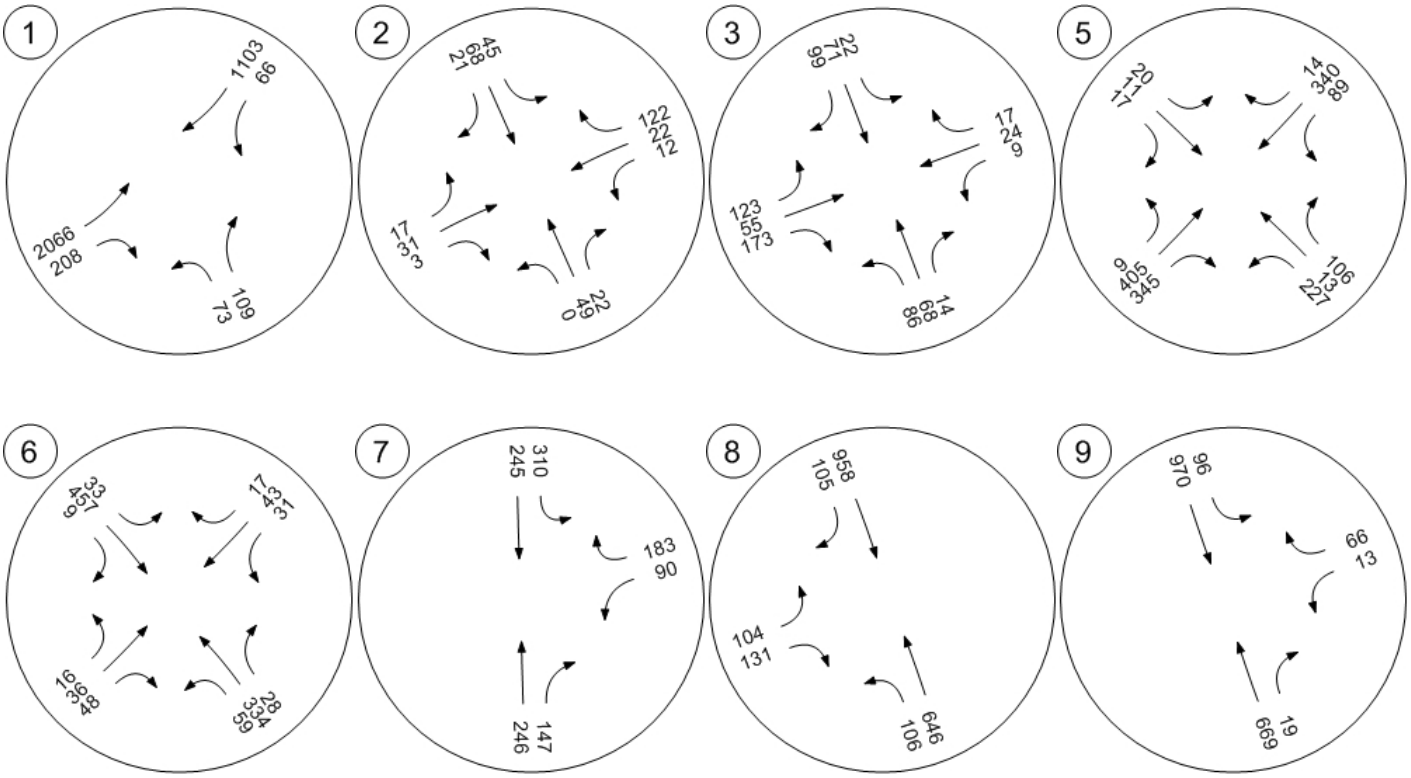
Traffic Volume - Future Total Volume



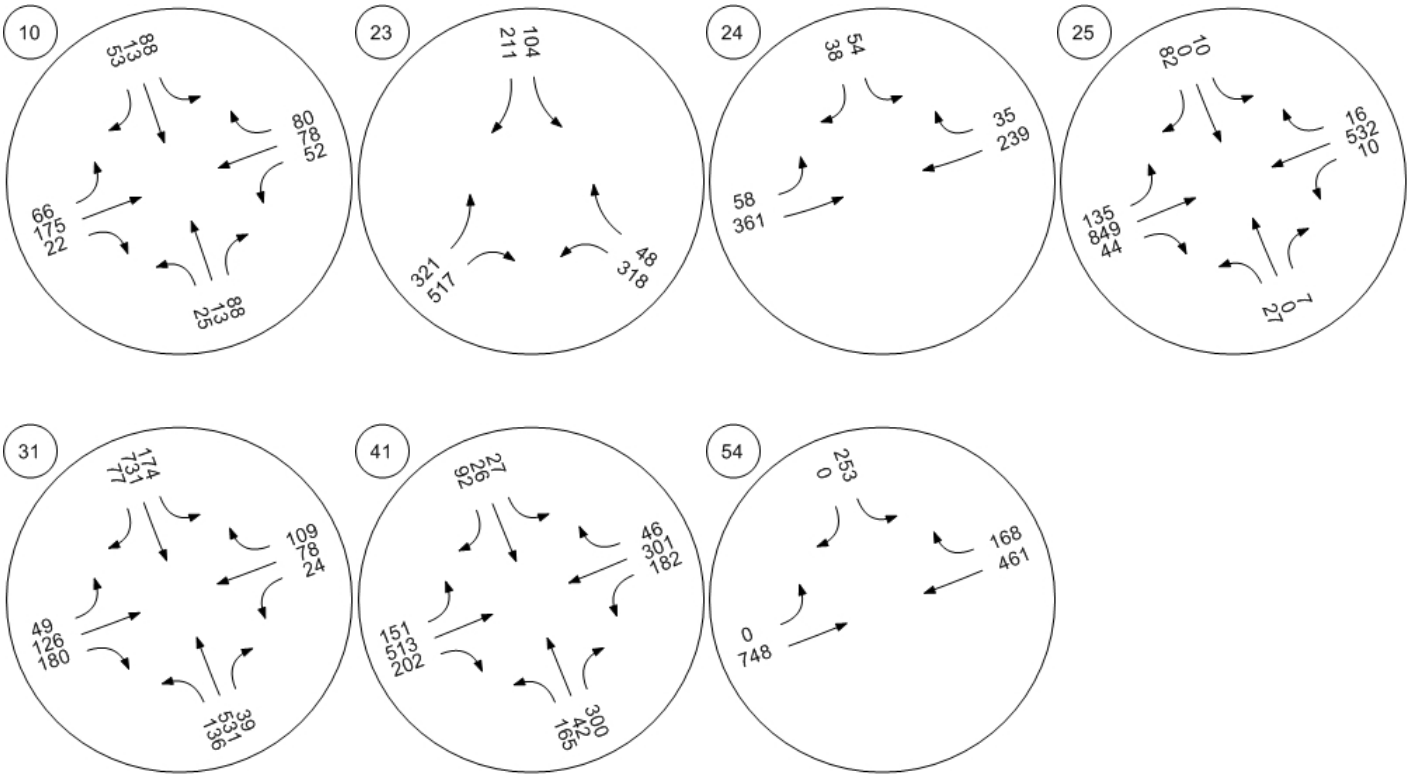
Traffic Volume - Future Total Volume



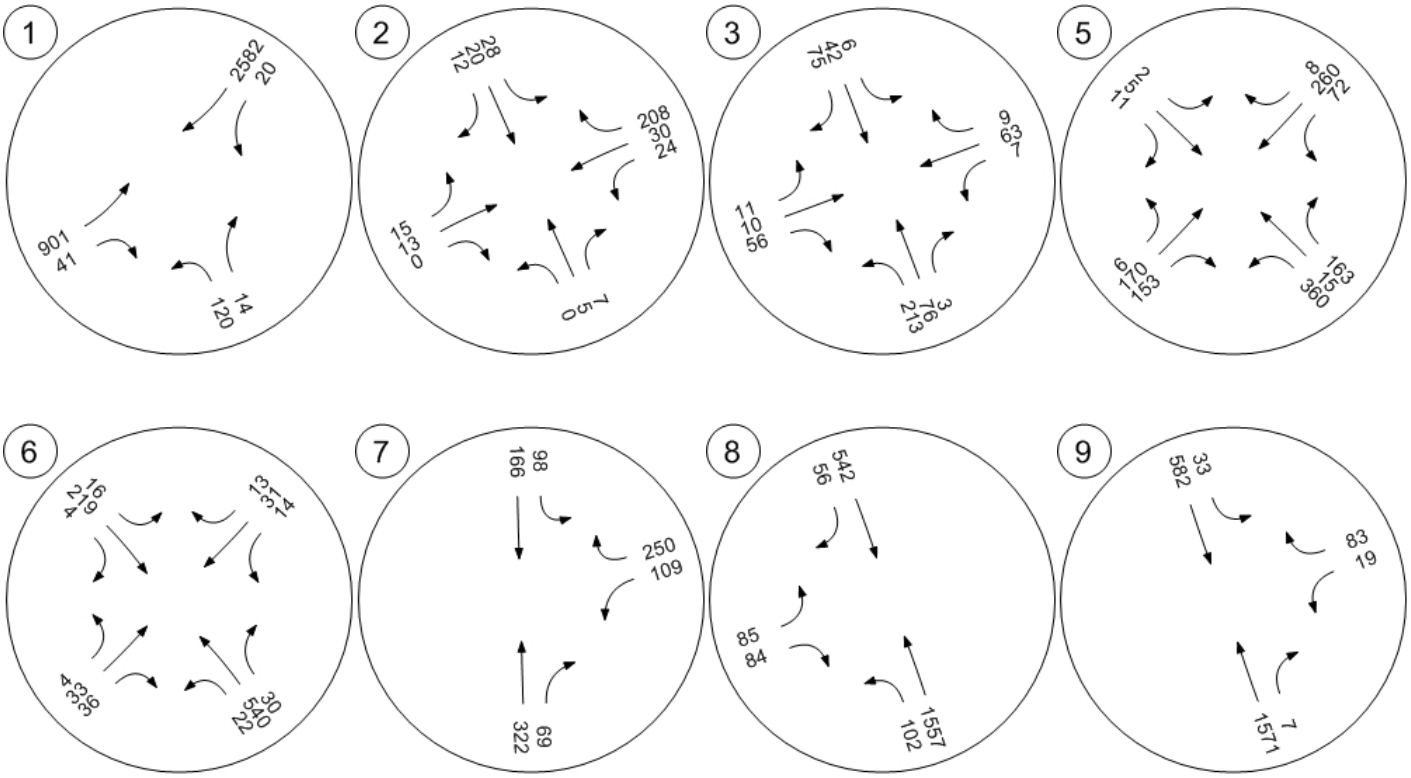
Traffic Volume - Future Total Volume



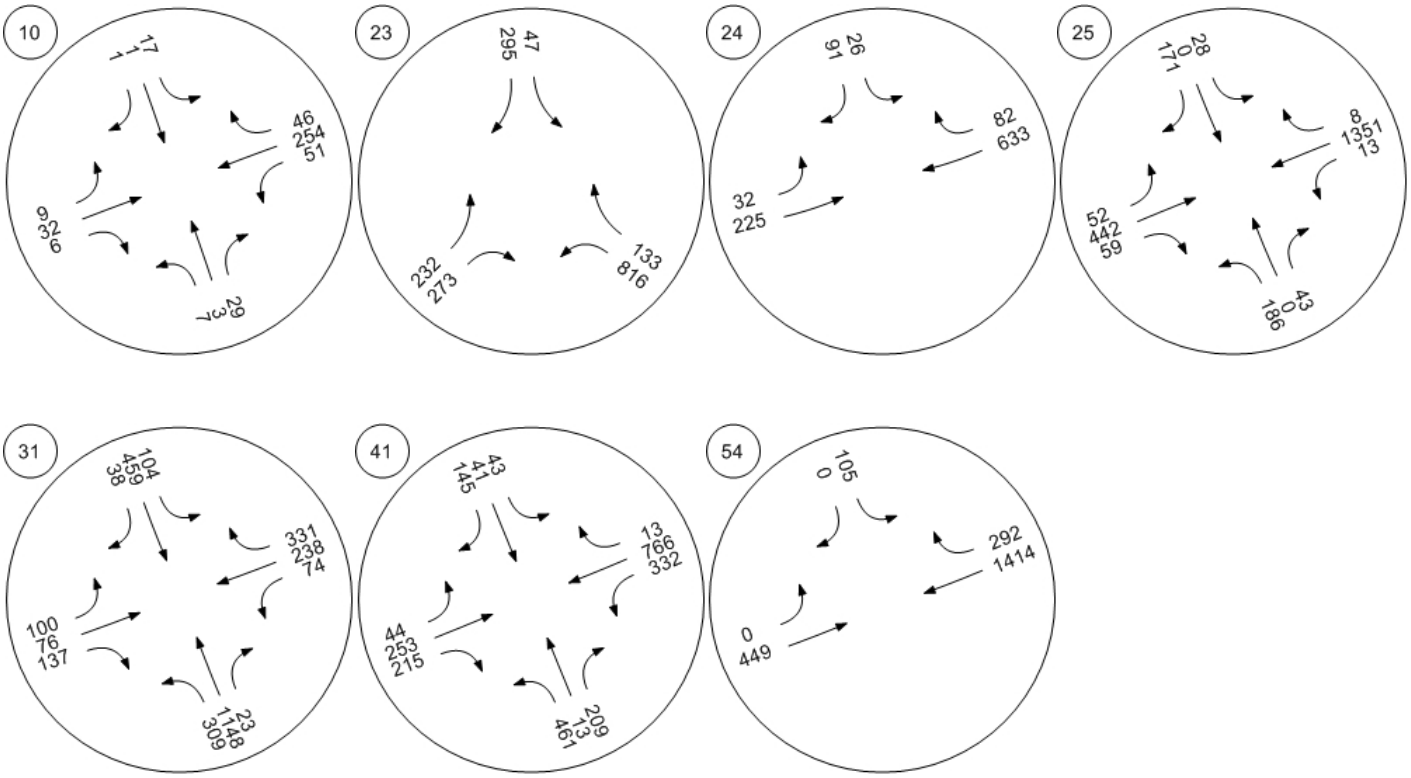
Traffic Volume - Future Total Volume



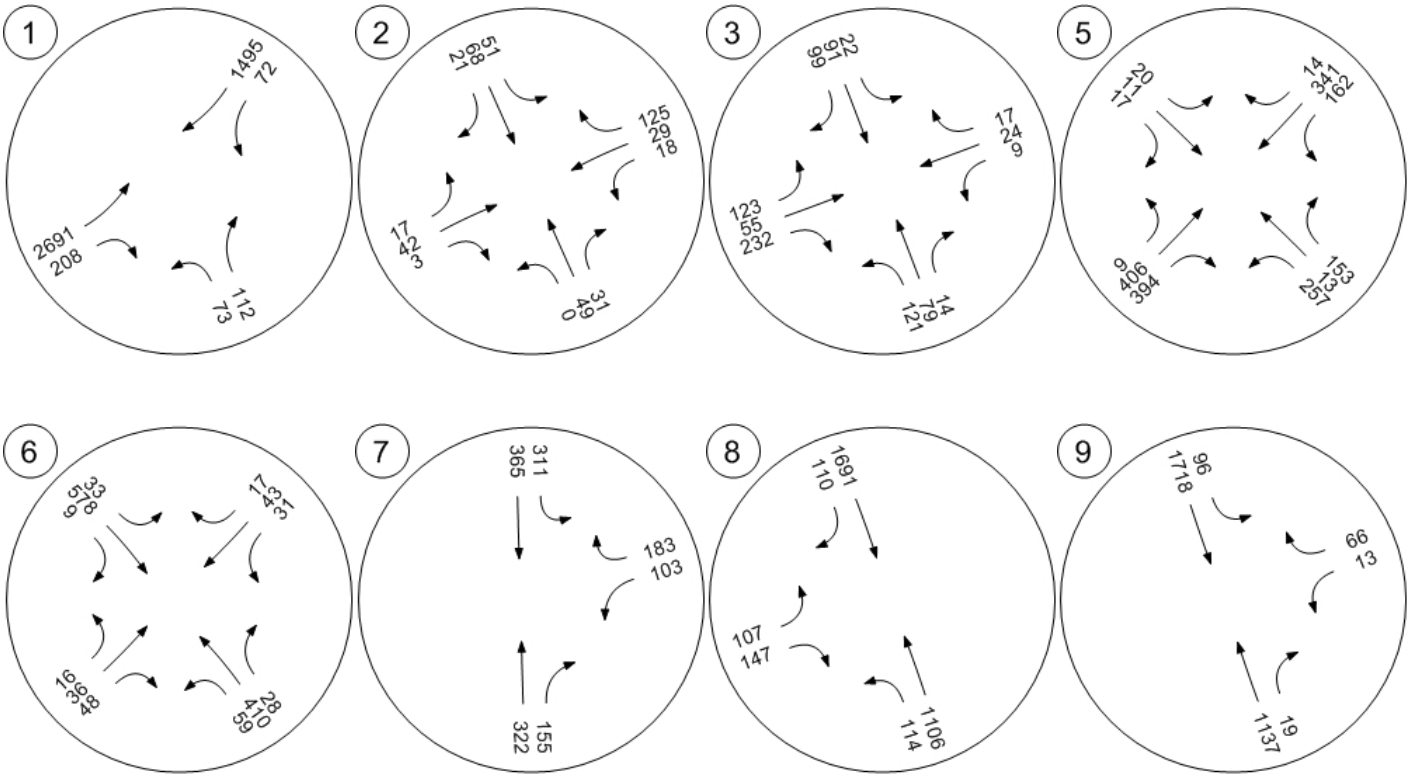
Traffic Volume - Future Total Volume



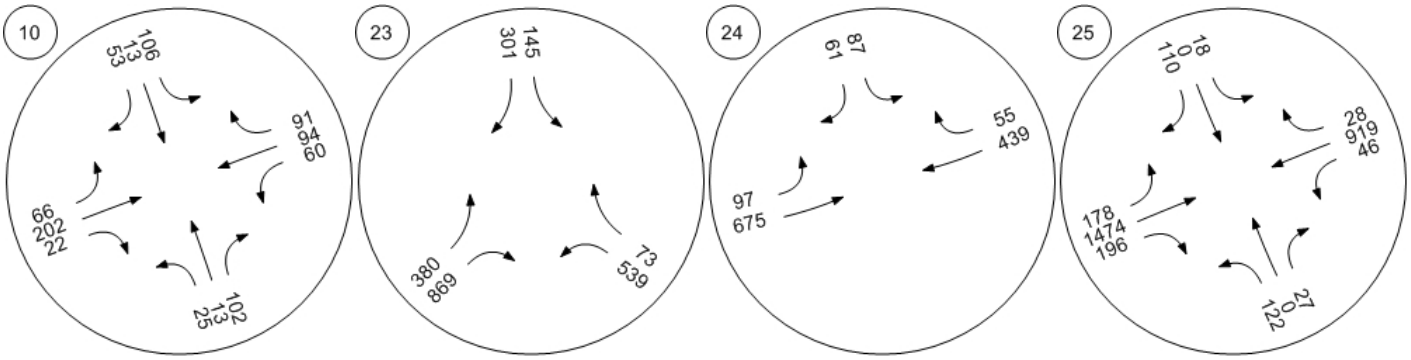
Traffic Volume - Future Total Volume

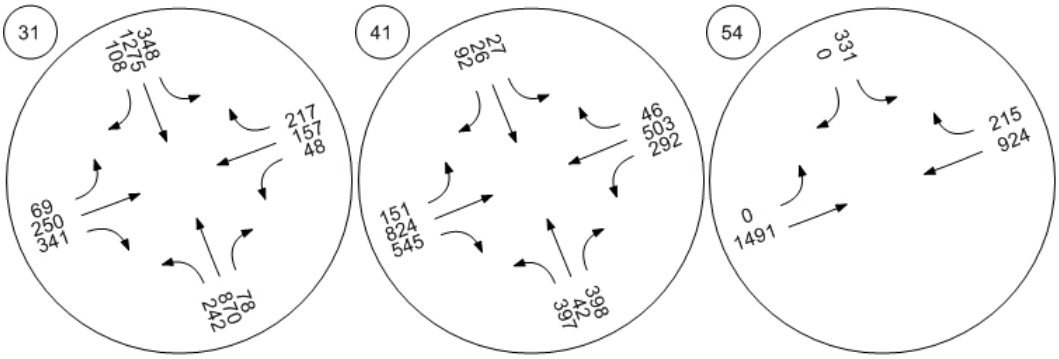


Traffic Volume - Future Total Volume



Traffic Volume - Future Total Volume





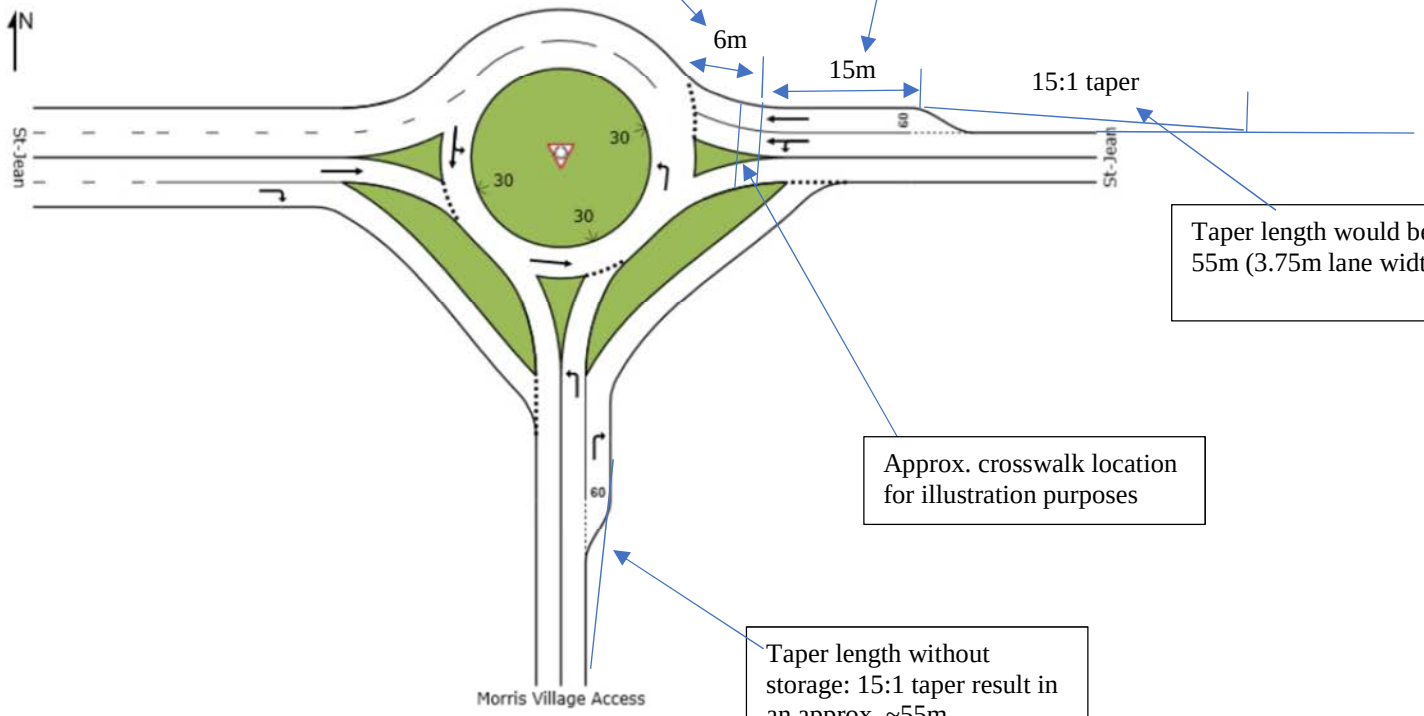
Appendix C

Roundabout Configuration
(St-Jean/Street No.1 & St-Jean/Poupart)

SITE LAYOUT

Site: St-Jean / Morris Village Access AM (Build-out)

New Site
Roundabout



Storage between roundabout lane and crosswalk

Storage for 2 car length or a WB 15 truck

6m

15m

15:1 taper

Taper length would be ~ 55m (3.75m lane width)

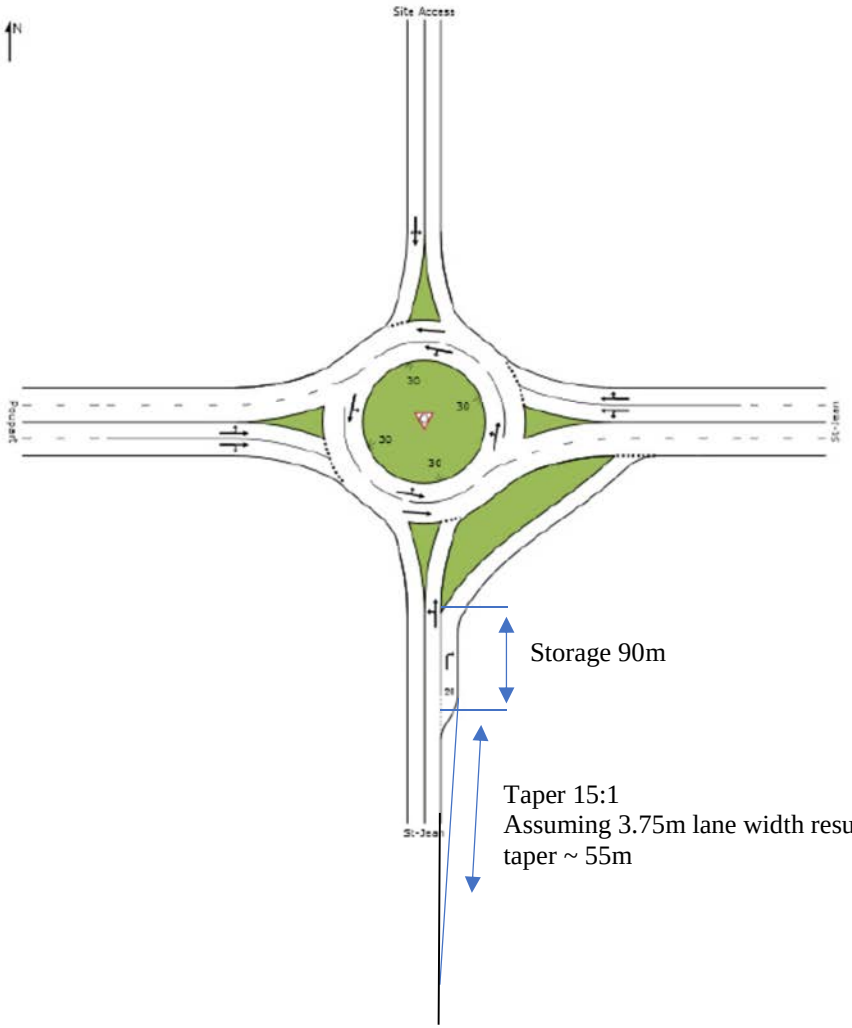
Approx. crosswalk location for illustration purposes

Taper length without storage: 15:1 taper result in an approx. ~55m

SITE LAYOUT

Site: St-Jean / Poupart AM (Build-out)

New Site
Roundabout



Appendix D

Forecast Traffic Analysis

Appendix D-1

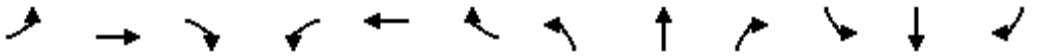
Forecast Short-Term Traffic Analysis

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	558	91	18	1516	282	10
Future Volume (vph)	558	91	18	1516	282	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		85.0	125.0		0.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			70.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1810	1524	1703	1881	1770	1346
Flt Permitted			0.335		0.950	
Satd. Flow (perm)	1810	1524	600	1881	1770	1346
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		99				11
Link Speed (k/h)	50			50	50	
Link Distance (m)	470.1			337.0	115.6	
Travel Time (s)	33.8			24.3	8.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	6%	6%	1%	2%	20%
Adj. Flow (vph)	607	99	20	1648	307	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	607	99	20	1648	307	11
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8		2	2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	27.2	27.2	11.2	27.2	23.2	23.2
Total Split (s)	82.8	82.8	11.2	94.0	26.0	26.0
Total Split (%)	69.0%	69.0%	9.3%	78.3%	21.7%	21.7%
Maximum Green (s)	76.6	76.6	5.0	87.8	20.8	20.8
Yellow Time (s)	4.6	4.6	4.6	4.6	3.3	3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	5.2	5.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0		14.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	83.3	83.3	87.8	87.8	20.8	20.8
Actuated g/C Ratio	0.69	0.69	0.73	0.73	0.17	0.17
v/c Ratio	0.48	0.09	0.04	1.20	1.00	0.05
Control Delay	10.9	1.8	4.6	115.8	102.1	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	1.8	4.6	115.8	102.1	20.8
LOS	B	A	A	F	F	C
Approach Delay	9.6			114.4	99.3	
Approach LOS	A			F	F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 85.2		Intersection LOS: F	
Intersection Capacity Utilization 104.9%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 12: Carmen Bergeron & CR 17

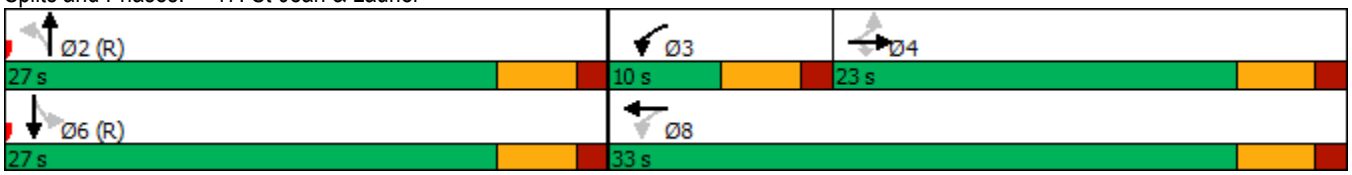


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	168	116	39	259	8	254	15	57	2	5	11
Future Volume (vph)	6	168	116	39	259	8	254	15	57	2	5	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		10.0	0.0		0.0	20.0		0.0	10.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			10.0			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.996			0.881			0.894	
Flt Protected		0.998			0.994		0.950			0.950		
Satd. Flow (prot)	0	1843	1568	0	1874	0	1719	1461	0	1805	1604	0
Flt Permitted		0.984			0.952		0.746			0.706		
Satd. Flow (perm)	0	1817	1568	0	1795	0	1350	1461	0	1341	1604	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		3			62			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		549.0			622.7			441.7			187.4	
Travel Time (s)		39.5			44.8			31.8			13.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	3%	3%	0%	0%	5%	13%	15%	0%	20%	0%
Adj. Flow (vph)	7	183	126	42	282	9	276	16	62	2	5	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	190	126	0	333	0	276	78	0	2	17	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Minimum Split (s)	23.0	23.0	23.0	10.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	23.0	23.0	23.0	10.0	33.0		27.0	27.0		27.0	27.0	
Total Split (%)	38.3%	38.3%	38.3%	16.7%	55.0%		45.0%	45.0%		45.0%	45.0%	
Maximum Green (s)	18.0	18.0	18.0	5.0	28.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Walk Time (s)	7.0	7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)		18.0	18.0		28.0		22.0	22.0		22.0	22.0	
Actuated g/C Ratio		0.30	0.30		0.47		0.37	0.37		0.37	0.37	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.35	0.23		0.39		0.56	0.14		0.00	0.03	
Control Delay		18.7	4.8		12.0		20.4	6.0		12.0	8.3	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		18.7	4.8		12.0		20.4	6.0		12.0	8.3	
LOS		B	A		B		C	A		B	A	
Approach Delay		13.1			12.0			17.2			8.7	
Approach LOS		B			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 58.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 17: St-Jean & Laurier



Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	33	36	14	31	13	22	328	30	16	149	4
Future Vol, veh/h	4	33	36	14	31	13	22	328	30	16	149	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	6	0	14	6	0	5	3	10	0	1	25
Mvmt Flow	4	36	39	15	34	14	24	357	33	17	162	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.8	9.2	12.4	9.3
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	5%	24%	9%
Vol Thru, %	86%	45%	53%	88%
Vol Right, %	8%	49%	22%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	380	73	58	169
LT Vol	22	4	14	16
Through Vol	328	33	31	149
RT Vol	30	36	13	4
Lane Flow Rate	413	79	63	184
Geometry Grp	1	1	1	1
Degree of Util (X)	0.52	0.112	0.097	0.242
Departure Headway (Hd)	4.532	5.069	5.528	4.738
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	793	701	643	753
Service Time	2.578	3.142	3.605	2.793
HCM Lane V/C Ratio	0.521	0.113	0.098	0.244
HCM Control Delay	12.4	8.8	9.2	9.3
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	3.1	0.4	0.3	0.9

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	50	387	4	21	204
Future Vol, veh/h	19	50	387	4	21	204
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	40	13	9	0	18	13
Mvmt Flow	21	54	421	4	23	222
Number of Lanes	1	0	1	0	1	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	1	0
HCM Control Delay	9.6	13.3	10.3
HCM LOS	A	B	B

Lane	NBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	28%	100%	0%
Vol Thru, %	99%	0%	0%	100%
Vol Right, %	1%	72%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	391	69	21	204
LT Vol	0	19	21	0
Through Vol	387	0	0	204
RT Vol	4	50	0	0
Lane Flow Rate	425	75	23	222
Geometry Grp	5	2	7	7
Degree of Util (X)	0.55	0.12	0.037	0.324
Departure Headway (Hd)	4.66	5.759	5.856	5.266
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	773	620	611	683
Service Time	2.691	3.816	3.594	3.005
HCM Lane V/C Ratio	0.55	0.121	0.038	0.325
HCM Control Delay	13.3	9.6	8.8	10.5
HCM Lane LOS	B	A	A	B
HCM 95th-tile Q	3.4	0.4	0.1	1.4

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	49	38	202	196	5	39	5	74	16	14	58
Future Vol, veh/h	17	49	38	202	196	5	39	5	74	16	14	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	43	0	1	0	2	0	2	5	2	2	2
Mvmt Flow	18	53	41	220	213	5	42	5	80	17	15	63
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.8	13.9	9.2	8.9
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	16%	50%	18%
Vol Thru, %	4%	47%	49%	16%
Vol Right, %	63%	37%	1%	66%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	118	104	403	88
LT Vol	39	17	202	16
Through Vol	5	49	196	14
RT Vol	74	38	5	58
Lane Flow Rate	128	113	438	96
Geometry Grp	1	1	1	1
Degree of Util (X)	0.179	0.152	0.572	0.134
Departure Headway (Hd)	5.027	4.828	4.697	5.062
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	707	735	762	700
Service Time	3.11	2.91	2.758	3.15
HCM Lane V/C Ratio	0.181	0.154	0.575	0.137
HCM Control Delay	9.2	8.8	13.9	8.9
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0.6	0.5	3.7	0.5

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	10	74	7	63	9	283	36	3	6	30	75
Future Vol, veh/h	11	10	74	7	63	9	283	36	3	6	30	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	22	0	0	0	0	0	2	0	33	0	4	0
Mvmt Flow	12	11	80	8	68	10	308	39	3	7	33	82
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	8.7	9	11.7	8.2
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	88%	100%	0%	9%	5%
Vol Thru, %	11%	0%	12%	80%	27%
Vol Right, %	1%	0%	88%	11%	68%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	322	11	84	79	111
LT Vol	283	11	0	7	6
Through Vol	36	0	10	63	30
RT Vol	3	0	74	9	75
Lane Flow Rate	350	12	91	86	121
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.459	0.022	0.129	0.124	0.148
Departure Headway (Hd)	4.72	6.594	5.086	5.206	4.408
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	759	541	700	684	808
Service Time	2.764	4.357	2.849	3.272	2.464
HCM Lane V/C Ratio	0.461	0.022	0.13	0.126	0.15
HCM Control Delay	11.7	9.5	8.6	9	8.2
HCM Lane LOS	B	A	A	A	A
HCM 95th-tile Q	2.4	0.1	0.4	0.4	0.5

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	6	0	9	11	366	0	5	1	77	20	12
Future Vol, veh/h	15	6	0	9	11	366	0	5	1	77	20	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	6	0	13
Mvmt Flow	16	7	0	10	12	398	0	5	1	84	22	13
Number of Lanes	1	1	0	1	1	0	0	2	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8.4	10.7	8.3	9.7
HCM LOS	A	B	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%	79%	0%
Vol Thru, %	100%	62%	0%	100%	0%	3%	21%	0%
Vol Right, %	0%	38%	0%	0%	0%	97%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	3	15	6	9	377	97	12
LT Vol	0	0	15	0	9	0	77	0
Through Vol	3	2	0	6	0	11	20	0
RT Vol	0	1	0	0	0	366	0	12
Lane Flow Rate	4	3	16	7	10	410	105	13
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.006	0.004	0.026	0.009	0.015	0.479	0.175	0.017
Departure Headway (Hd)	5.631	5.366	5.693	5.19	5.394	4.211	5.973	4.767
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	634	665	629	690	666	856	600	749
Service Time	3.377	3.112	3.424	2.92	3.11	1.927	3.712	2.505
HCM Lane V/C Ratio	0.006	0.005	0.025	0.01	0.015	0.479	0.175	0.017
HCM Control Delay	8.4	8.1	8.6	8	8.2	10.8	10	7.6
HCM Lane LOS	A	A	A	A	A	B	A	A
HCM 95th-tile Q	0	0	0.1	0	0	2.6	0.6	0.1

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	72	76	78	364	161	52
Future Vol, veh/h	72	76	78	364	161	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	400	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	13	13	9	0	10
Mvmt Flow	78	83	85	396	175	57

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	770	204	232	0	-	0
Stage 1	204	-	-	-	-	-
Stage 2	566	-	-	-	-	-
Critical Hdwy	6.42	6.33	4.23	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.417	2.317	-	-	-
Pot Cap-1 Maneuver	369	810	1274	-	-	-
Stage 1	830	-	-	-	-	-
Stage 2	568	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	344	810	1274	-	-	-
Mov Cap-2 Maneuver	344	-	-	-	-	-
Stage 1	774	-	-	-	-	-
Stage 2	568	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16	1.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1274	-	488	-	-
HCM Lane V/C Ratio	0.067	-	0.33	-	-
HCM Control Delay (s)	8	-	16	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1.4	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	69	6	28	378	15	7	3	21	6	1	1
Future Vol, veh/h	9	69	6	28	378	15	7	3	21	6	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	350	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	22	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	10	75	7	30	411	16	8	3	23	7	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	427	0	0	82	0	0	579	586	79	591	581	419
Stage 1	-	-	-	-	-	-	99	99	-	479	479	-
Stage 2	-	-	-	-	-	-	480	487	-	112	102	-
Critical Hdwy	4.32	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.398	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1033	-	-	1528	-	-	429	425	987	422	428	638
Stage 1	-	-	-	-	-	-	912	817	-	571	558	-
Stage 2	-	-	-	-	-	-	571	554	-	898	815	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1033	-	-	1528	-	-	418	412	987	400	415	638
Mov Cap-2 Maneuver	-	-	-	-	-	-	418	412	-	400	415	-
Stage 1	-	-	-	-	-	-	903	809	-	565	547	-
Stage 2	-	-	-	-	-	-	558	543	-	865	807	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.5	10.5	13.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	684	1033	-	-	1528	-	-	422
HCM Lane V/C Ratio	0.049	0.009	-	-	0.02	-	-	0.021
HCM Control Delay (s)	10.5	8.5	-	-	7.4	-	-	13.7
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0.1

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	100	0	0	292	1	0	0	0	4	0	32
Future Vol, veh/h	10	100	0	0	292	1	0	0	0	4	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	109	0	0	317	1	0	0	0	4	0	35

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	318	0	0	109	0	0	466	449	109	449	449	318
Stage 1	-	-	-	-	-	-	131	131	-	318	318	-
Stage 2	-	-	-	-	-	-	335	318	-	131	131	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1242	-	-	1481	-	-	507	505	945	520	505	723
Stage 1	-	-	-	-	-	-	873	788	-	693	654	-
Stage 2	-	-	-	-	-	-	679	654	-	873	788	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1242	-	-	1481	-	-	479	500	945	516	500	723
Mov Cap-2 Maneuver	-	-	-	-	-	-	479	500	-	516	500	-
Stage 1	-	-	-	-	-	-	865	781	-	687	654	-
Stage 2	-	-	-	-	-	-	646	654	-	865	781	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	0	10.5
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1242	-	-	1481	-	-	692
HCM Lane V/C Ratio	-	0.009	-	-	-	-	-	0.057
HCM Control Delay (s)	0	7.9	0	-	0	-	-	10.5
HCM Lane LOS	A	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.2

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	20	27	16	64	83	48	287	6	26	181	10
Future Vol, veh/h	22	20	27	16	64	83	48	287	6	26	181	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	22	29	17	70	90	52	312	7	28	197	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.4	10.3	13.3	10.8
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	32%	10%	12%
Vol Thru, %	84%	29%	39%	83%
Vol Right, %	2%	39%	51%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	341	69	163	217
LT Vol	48	22	16	26
Through Vol	287	20	64	181
RT Vol	6	27	83	10
Lane Flow Rate	371	75	177	236
Geometry Grp	1	1	1	1
Degree of Util (X)	0.517	0.117	0.262	0.338
Departure Headway (Hd)	5.021	5.631	5.322	5.152
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	723	635	675	698
Service Time	3.021	3.676	3.36	3.184
HCM Lane V/C Ratio	0.513	0.118	0.262	0.338
HCM Control Delay	13.3	9.4	10.3	10.8
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	3	0.4	1	1.5

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	45	117	10	4	0
Future Vol, veh/h	0	45	117	10	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	49	127	11	4	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	138	0	-	0	182	133
Stage 1	-	-	-	-	133	-
Stage 2	-	-	-	-	49	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1446	-	-	-	807	916
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	973	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1446	-	-	-	807	916
Mov Cap-2 Maneuver	-	-	-	-	807	-
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	973	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1446	-	-	-	807
HCM Lane V/C Ratio	-	-	-	-	0.005
HCM Control Delay (s)	0	-	-	-	9.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

LANE SUMMARY

Site: St-Jean / Morris Village Access AM (short-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Morris Village Access													
Lane 1[d]	165	3.0	1327	0.124	100	10.6	LOS B	0.6	4.9	Full	500	0.0	0.0
Lane 2	43	3.0	1327	0.033	100	4.0	LOS A	0.2	1.2	Short	60	0.0	NA
Approach	209	3.0		0.124		9.2	LOS A	0.6	4.9				
East: St-Jean													
Lane 1[d]	287	3.0	1021	0.281	100	5.0	LOS A	1.7	12.9	Full	500	0.0	0.0
Approach	287	3.0		0.281		5.0	LOS A	1.7	12.9				
West: St-Jean													
Lane 1[d]	150	3.0	1197	0.125	100	3.6	LOS A	0.7	5.4	Full	500	0.0	0.0
Approach	150	3.0		0.125		3.6	LOS A	0.7	5.4				
Intersection	646	3.0		0.281		6.0	LOS A	1.7	12.9				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Dr Corbeil AM (short-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	166	3.0	996	0.167	100	5.1	LOS A	0.9	7.1	Full	500	0.0	0.0
Approach	166	3.0		0.167		5.1	LOS A	0.9	7.1				
East: Dr. Corbeil													
Lane 1[d]	378	3.0	978	0.387	100	7.0	LOS A	2.6	20.3	Full	500	0.0	0.0
Approach	378	3.0		0.387		7.0	LOS A	2.6	20.3				
North: St-Jean													
Lane 1[d]	211	3.0	989	0.213	100	7.8	LOS A	1.2	9.6	Full	500	0.0	0.0
Approach	211	3.0		0.213		7.8	LOS A	1.2	9.6				
Intersection	755	3.0		0.387		6.8	LOS A	2.6	20.3				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

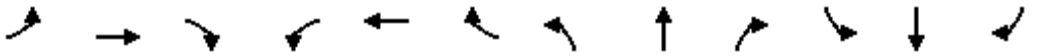
d Dominant lane on roundabout approach

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1564	380	66	802	177	109
Future Volume (vph)	1564	380	66	802	177	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		85.0	125.0		0.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			70.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1845	1599	1752	1863	1805	1615
Flt Permitted			0.047		0.950	
Satd. Flow (perm)	1845	1599	87	1863	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		247				96
Link Speed (k/h)	50			50	50	
Link Distance (m)	470.1			337.0	115.6	
Travel Time (s)	33.8			24.3	8.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	3%	2%	0%	0%
Adj. Flow (vph)	1700	413	72	872	192	118
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1700	413	72	872	192	118
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8		2	2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	27.2	27.2	11.2	27.2	23.2	23.2
Total Split (s)	85.0	85.0	11.2	96.2	23.8	23.8
Total Split (%)	70.8%	70.8%	9.3%	80.2%	19.8%	19.8%
Maximum Green (s)	78.8	78.8	5.0	90.0	18.6	18.6
Yellow Time (s)	4.6	4.6	4.6	4.6	3.3	3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	5.2	5.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0		14.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	78.9	78.9	87.7	87.7	18.6	18.6
Actuated g/C Ratio	0.67	0.67	0.74	0.74	0.16	0.16
v/c Ratio	1.38	0.36	0.53	0.63	0.67	0.35
Control Delay	196.2	4.3	26.4	9.6	60.2	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	196.2	4.3	26.4	9.6	60.2	16.2
LOS	F	A	C	A	E	B
Approach Delay	158.7			10.9	43.5	
Approach LOS	F			B	D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 117.8			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.38			
Intersection Signal Delay: 106.6		Intersection LOS: F	
Intersection Capacity Utilization 101.6%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 12: Carmen Bergeron & CR 17

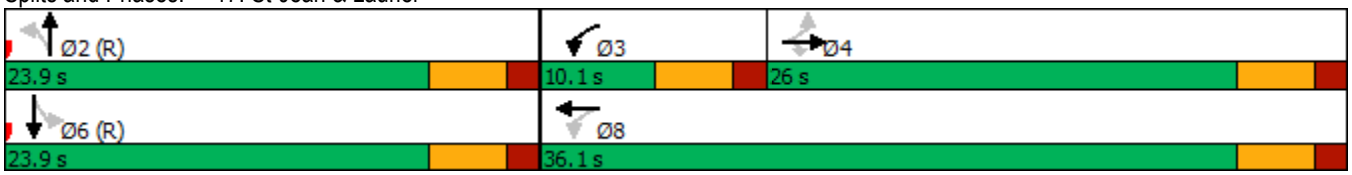


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	404	279	53	340	14	194	13	84	20	11	17
Future Volume (vph)	9	404	279	53	340	14	194	13	84	20	11	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		10.0	0.0		0.0	20.0		0.0	10.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			10.0			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.995			0.870			0.910	
Flt Protected		0.999			0.993		0.950			0.950		
Satd. Flow (prot)	0	1898	1568	0	1873	0	1752	1653	0	1805	1729	0
Flt Permitted		0.988			0.757		0.738			0.689		
Satd. Flow (perm)	0	1877	1568	0	1428	0	1361	1653	0	1309	1729	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			140		4			91			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		549.0			622.7			441.7			187.4	
Travel Time (s)		39.5			44.8			31.8			13.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	0%	7%	3%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	439	303	58	370	15	211	14	91	22	12	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	449	303	0	443	0	211	105	0	22	30	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Minimum Split (s)	23.0	23.0	23.0	10.1	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	26.0	26.0	26.0	10.1	36.1		23.9	23.9		23.9	23.9	
Total Split (%)	43.3%	43.3%	43.3%	16.8%	60.2%		39.8%	39.8%		39.8%	39.8%	
Maximum Green (s)	21.0	21.0	21.0	5.1	31.1		18.9	18.9		18.9	18.9	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Walk Time (s)	7.0	7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)		21.0	21.0		31.1		18.9	18.9		18.9	18.9	
Actuated g/C Ratio		0.35	0.35		0.52		0.32	0.32		0.32	0.32	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.68	0.47		0.57		0.49	0.18		0.05	0.05	
Control Delay		23.1	10.9		12.8		21.5	6.0		14.9	9.5	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		23.1	10.9		12.8		21.5	6.0		14.9	9.5	
LOS		C	B		B		C	A		B	A	
Approach Delay		18.2			12.8			16.3			11.8	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 73.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 17: St-Jean & Laurier



Intersection	
Intersection Delay, s/veh	14.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	36	48	31	43	17	59	278	28	33	354	9
Future Vol, veh/h	16	36	48	31	43	17	59	278	28	33	354	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	3	2	0	0	0	2	1	0	0	1	0
Mvmt Flow	17	39	52	34	47	18	64	302	30	36	385	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.5	10.5	14.9	15.9
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	16%	16%	34%	8%
Vol Thru, %	76%	36%	47%	89%
Vol Right, %	8%	48%	19%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	365	100	91	396
LT Vol	59	16	31	33
Through Vol	278	36	43	354
RT Vol	28	48	17	9
Lane Flow Rate	397	109	99	430
Geometry Grp	1	1	1	1
Degree of Util (X)	0.57	0.182	0.17	0.611
Departure Headway (Hd)	5.17	6.041	6.175	5.112
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	698	591	579	706
Service Time	3.21	4.103	4.236	3.151
HCM Lane V/C Ratio	0.569	0.184	0.171	0.609
HCM Control Delay	14.9	10.5	10.5	15.9
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	3.6	0.7	0.6	4.2

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	44	360	11	61	469
Future Vol, veh/h	9	44	360	11	61	469
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	1	0	8	1
Mvmt Flow	10	48	391	12	66	510
Number of Lanes	1	0	1	0	1	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	1	0
HCM Control Delay	9.2	13.2	17.6
HCM LOS	A	B	C

Lane	NBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	17%	100%	0%
Vol Thru, %	97%	0%	0%	100%
Vol Right, %	3%	83%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	371	53	61	469
LT Vol	0	9	61	0
Through Vol	360	0	0	469
RT Vol	11	44	0	0
Lane Flow Rate	403	58	66	510
Geometry Grp	5	2	7	7
Degree of Util (X)	0.534	0.089	0.103	0.704
Departure Headway (Hd)	4.767	5.552	5.597	4.975
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	754	641	639	724
Service Time	2.807	3.626	3.339	2.716
HCM Lane V/C Ratio	0.534	0.09	0.103	0.704
HCM Control Delay	13.2	9.2	9	18.7
HCM Lane LOS	B	A	A	C
HCM 95th-tile Q	3.2	0.3	0.3	5.8

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	214	83	124	111	17	82	15	227	10	10	37
Future Vol, veh/h	60	214	83	124	111	17	82	15	227	10	10	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	1	2	2	4	2	3	2	2	2	2	2
Mvmt Flow	65	233	90	135	121	18	89	16	247	11	11	40
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	16.4	13.6	15	10
HCM LOS	C	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	17%	49%	18%
Vol Thru, %	5%	60%	44%	18%
Vol Right, %	70%	23%	7%	65%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	324	357	252	57
LT Vol	82	60	124	10
Through Vol	15	214	111	10
RT Vol	227	83	17	37
Lane Flow Rate	352	388	274	62
Geometry Grp	1	1	1	1
Degree of Util (X)	0.54	0.593	0.444	0.108
Departure Headway (Hd)	5.517	5.503	5.837	6.253
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	648	652	614	577
Service Time	3.592	3.577	3.918	4.253
HCM Lane V/C Ratio	0.543	0.595	0.446	0.107
HCM Control Delay	15	16.4	13.6	10
HCM Lane LOS	B	C	B	A
HCM 95th-tile Q	3.2	3.9	2.3	0.4

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	123	55	304	8	24	17	166	54	14	22	49	99
Future Vol, veh/h	123	55	304	8	24	17	166	54	14	22	49	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	11	0	0	0	0	0	0	2	0
Mvmt Flow	134	60	330	9	26	18	180	59	15	24	53	108
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	13.7	9.7	12.7	10.6
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	71%	100%	0%	16%	13%
Vol Thru, %	23%	0%	15%	49%	29%
Vol Right, %	6%	0%	85%	35%	58%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	234	123	359	49	170
LT Vol	166	123	0	8	22
Through Vol	54	0	55	24	49
RT Vol	14	0	304	17	99
Lane Flow Rate	254	134	390	53	185
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.406	0.235	0.567	0.09	0.28
Departure Headway (Hd)	5.742	6.339	5.233	6.06	5.458
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	626	567	691	590	658
Service Time	3.783	4.075	2.968	4.116	3.503
HCM Lane V/C Ratio	0.406	0.236	0.564	0.09	0.281
HCM Control Delay	12.7	11	14.6	9.7	10.6
HCM Lane LOS	B	B	B	A	B
HCM 95th-tile Q	2	0.9	3.6	0.3	1.1

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	21	3	8	17	226	0	49	15	217	68	21
Future Vol, veh/h	17	21	3	8	17	226	0	49	15	217	68	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	33	0	0	0	0	2	0	0	1	19
Mvmt Flow	18	23	3	9	18	246	0	53	16	236	74	23
Number of Lanes	1	1	0	1	1	0	0	2	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	9.1	10.6	8.7	13.7
HCM LOS	A	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%	76%	0%
Vol Thru, %	100%	52%	0%	88%	0%	7%	24%	0%
Vol Right, %	0%	48%	0%	12%	0%	93%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	33	31	17	24	8	243	285	21
LT Vol	0	0	17	0	8	0	217	0
Through Vol	33	16	0	21	0	17	68	0
RT Vol	0	15	0	3	0	226	0	21
Lane Flow Rate	36	34	18	26	9	264	310	23
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.058	0.052	0.034	0.043	0.015	0.368	0.494	0.03
Departure Headway (Hd)	5.847	5.473	6.549	5.953	6.172	5.012	5.746	4.676
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	616	658	550	605	577	713	623	755
Service Time	3.551	3.177	4.252	3.657	3.946	2.785	3.539	2.468
HCM Lane V/C Ratio	0.058	0.052	0.033	0.043	0.016	0.37	0.498	0.03
HCM Control Delay	8.9	8.5	9.5	8.9	9	10.7	14.1	7.6
HCM Lane LOS	A	A	A	A	A	B	B	A
HCM 95th-tile Q	0.2	0.2	0.1	0.1	0	1.7	2.7	0.1

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	99	122	100	321	431	97
Future Vol, veh/h	99	122	100	321	431	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	400	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	108	133	109	349	468	105

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1088	521	573	0	-	0
Stage 1	521	-	-	-	-	-
Stage 2	567	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	241	559	1010	-	-	-
Stage 1	600	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	215	559	1010	-	-	-
Mov Cap-2 Maneuver	215	-	-	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	572	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	41.5	2.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1010	-	326	-	-
HCM Lane V/C Ratio	0.108	-	0.737	-	-
HCM Control Delay (s)	9	-	41.5	-	-
HCM Lane LOS	A	-	E	-	-
HCM 95th %tile Q(veh)	0.4	-	5.5	-	-

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	331	22	46	173	91	25	13	77	74	13	53
Future Vol, veh/h	16	331	22	46	173	91	25	13	77	74	13	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	350	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	17	360	24	50	188	99	27	14	84	80	14	58

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	287	0	0	384	0	0	780	793	372	793	756	238
Stage 1	-	-	-	-	-	-	406	406	-	338	338	-
Stage 2	-	-	-	-	-	-	374	387	-	455	418	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1287	-	-	1186	-	-	315	323	678	309	340	806
Stage 1	-	-	-	-	-	-	626	601	-	681	644	-
Stage 2	-	-	-	-	-	-	651	613	-	589	594	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1287	-	-	1186	-	-	271	306	678	250	322	806
Mov Cap-2 Maneuver	-	-	-	-	-	-	271	306	-	250	322	-
Stage 1	-	-	-	-	-	-	618	593	-	672	617	-
Stage 2	-	-	-	-	-	-	566	587	-	497	586	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1.2	15.6	23.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	463	1287	-	-	1186	-	-	348
HCM Lane V/C Ratio	0.27	0.014	-	-	0.042	-	-	0.437
HCM Control Delay (s)	15.6	7.8	-	-	8.2	-	-	23.1
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.1	0	-	-	0.1	-	-	2.1

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	33	355	0	0	226	4	0	0	0	2	0	21
Future Vol, veh/h	33	355	0	0	226	4	0	0	0	2	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	36	386	0	0	246	4	0	0	0	2	0	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	250	0	0	386	0	0	718	708	386	706	706	248
Stage 1	-	-	-	-	-	-	458	458	-	248	248	-
Stage 2	-	-	-	-	-	-	260	250	-	458	458	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1316	-	-	1172	-	-	344	360	662	351	361	791
Stage 1	-	-	-	-	-	-	583	567	-	756	701	-
Stage 2	-	-	-	-	-	-	745	700	-	583	567	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1316	-	-	1172	-	-	325	347	662	342	348	791
Mov Cap-2 Maneuver	-	-	-	-	-	-	325	347	-	342	348	-
Stage 1	-	-	-	-	-	-	563	547	-	730	701	-
Stage 2	-	-	-	-	-	-	724	700	-	563	547	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	0	10.3
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1316	-	-	1172	-	-	710
HCM Lane V/C Ratio	-	0.027	-	-	-	-	-	0.035
HCM Control Delay (s)	0	7.8	0	-	0	-	-	10.3
HCM Lane LOS	A	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.1

Intersection	
Intersection Delay, s/veh	20.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	69	56	12	43	55	43	300	20	88	365	25
Future Vol, veh/h	16	69	56	12	43	55	43	300	20	88	365	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	75	61	13	47	60	47	326	22	96	397	27
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.1	11.5	17.9	26.1
HCM LOS	B	B	C	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	11%	11%	18%
Vol Thru, %	83%	49%	39%	76%
Vol Right, %	6%	40%	50%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	363	141	110	478
LT Vol	43	16	12	88
Through Vol	300	69	43	365
RT Vol	20	56	55	25
Lane Flow Rate	395	153	120	520
Geometry Grp	1	1	1	1
Degree of Util (X)	0.628	0.279	0.219	0.788
Departure Headway (Hd)	5.733	6.543	6.591	5.57
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	635	550	545	655
Service Time	3.733	4.569	4.62	3.57
HCM Lane V/C Ratio	0.622	0.278	0.22	0.794
HCM Control Delay	17.9	12.1	11.5	26.1
HCM Lane LOS	C	B	B	D
HCM 95th-tile Q	4.4	1.1	0.8	7.7

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	125	85	7	12	0
Future Vol, veh/h	0	125	85	7	12	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	136	92	8	13	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	100	0	-	0	232	96
Stage 1	-	-	-	-	96	-
Stage 2	-	-	-	-	136	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1493	-	-	-	756	960
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	890	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1493	-	-	-	756	960
Mov Cap-2 Maneuver	-	-	-	-	756	-
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	890	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1493	-	-	-	756
HCM Lane V/C Ratio	-	-	-	-	0.017
HCM Control Delay (s)	0	-	-	-	9.8
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

LANE SUMMARY

Site: St-Jean / Morris Village Access PM (short-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Morris Village Access													
Lane 1[d]	108	3.0	1114	0.097	100	11.6	LOS B	0.5	4.0	Full	500	0.0	0.0
Lane 2	22	3.0	1114	0.020	100	4.9	LOS A	0.1	0.8	Short	60	0.0	NA
Approach	129	3.0		0.097		10.5	LOS B	0.5	4.0				
East: St-Jean													
Lane 1[d]	212	3.0	1074	0.197	100	5.6	LOS A	1.1	8.9	Full	500	0.0	0.0
Approach	212	3.0		0.197		5.6	LOS A	1.1	8.9				
West: St-Jean													
Lane 1[d]	490	3.0	1153	0.425	100	3.9	LOS A	3.2	25.0	Full	500	0.0	0.0
Approach	490	3.0		0.425		3.9	LOS A	3.2	25.0				
Intersection	832	3.0		0.425		5.4	LOS A	3.2	25.0				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Dr Corbeil PM (short-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	357	3.0	779	0.458	100	7.7	LOS A	3.0	23.8	Full	500	0.0	0.0
Approach	357	3.0		0.458		7.7	LOS A	3.0	23.8				
East: Dr. Corbeil													
Lane 1[d]	277	3.0	874	0.317	100	7.6	LOS A	2.0	15.8	Full	500	0.0	0.0
Approach	277	3.0		0.317		7.6	LOS A	2.0	15.8				
North: St-Jean													
Lane 1[d]	491	3.0	1022	0.481	100	8.8	LOS A	3.9	30.7	Full	500	0.0	0.0
Approach	491	3.0		0.481		8.8	LOS A	3.9	30.7				
Intersection	1125	3.0		0.481		8.2	LOS A	3.9	30.7				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Appendix D-1

Forecast Medium-Term Traffic Analysis

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	83	859	7	33	358
Future Volume (vph)	19	83	859	7	33	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	30.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.891		0.999			
Flt Protected	0.991				0.950	
Satd. Flow (prot)	1420	0	1743	0	1530	1681
Flt Permitted	0.991				0.232	
Satd. Flow (perm)	1420	0	1743	0	374	1681
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	90		1			
Link Speed (k/h)	50		50			50
Link Distance (m)	196.2		531.3			401.7
Travel Time (s)	14.1		38.3			28.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	40%	13%	9%	0%	18%	13%
Adj. Flow (vph)	21	90	934	8	36	389
Shared Lane Traffic (%)						
Lane Group Flow (vph)	111	0	942	0	36	389
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8				6	
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	23.0		23.0		23.0	23.0
Total Split (s)	23.0		97.0		97.0	97.0
Total Split (%)	19.2%		80.8%		80.8%	80.8%
Maximum Green (s)	18.0		92.0		92.0	92.0
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	1.5		1.5		1.5	1.5
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	5.0		5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Walk Time (s)	7.0		7.0		7.0	7.0
Flash Dont Walk (s)	11.0		11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0		0	0
Act Effct Green (s)	7.5		47.2		47.2	47.2
Actuated g/C Ratio	0.12		0.78		0.78	0.78
v/c Ratio	0.44		0.69		0.12	0.30
Control Delay	16.4		8.6		4.1	3.8
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	16.4		8.6		4.1	3.8
LOS	B		A		A	A
Approach Delay	16.4		8.6			3.8
Approach LOS	B		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 60.6			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 7.8		Intersection LOS: A	
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			

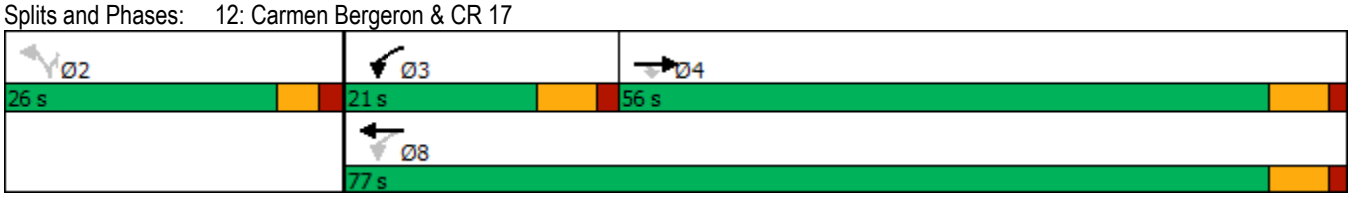
Splits and Phases: 5: Caron & David

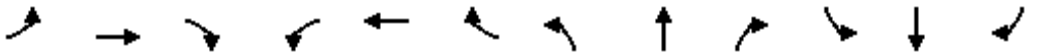
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	715	41	18	1986	120	10
Future Volume (vph)	715	41	18	1986	120	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		85.0	125.0		0.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			70.0		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3438	1524	1703	3574	1770	1346
Flt Permitted			0.292		0.950	
Satd. Flow (perm)	3438	1524	523	3574	1770	1346
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		45				11
Link Speed (k/h)	50			50	50	
Link Distance (m)	470.1			337.0	115.6	
Travel Time (s)	33.8			24.3	8.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	6%	6%	1%	2%	20%
Adj. Flow (vph)	777	45	20	2159	130	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	777	45	20	2159	130	11
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8		2	2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	27.2	27.2	11.2	27.2	23.2	23.2
Total Split (s)	56.0	56.0	21.0	77.0	26.0	26.0
Total Split (%)	54.4%	54.4%	20.4%	74.8%	25.2%	25.2%
Maximum Green (s)	49.8	49.8	14.8	70.8	20.8	20.8
Yellow Time (s)	4.6	4.6	4.6	4.6	3.3	3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	5.2	5.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0		14.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	59.2	59.2	63.9	63.9	21.0	21.0
Actuated g/C Ratio	0.61	0.61	0.66	0.66	0.22	0.22
v/c Ratio	0.37	0.05	0.05	0.91	0.34	0.04
Control Delay	10.5	3.2	5.4	20.7	37.0	17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	3.2	5.4	20.7	37.0	17.4
LOS	B	A	A	C	D	B
Approach Delay	10.1			20.6	35.5	
Approach LOS	B			C	D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 103			
Actuated Cycle Length: 96.4			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 71.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 12: Carmen Bergeron & CR 17



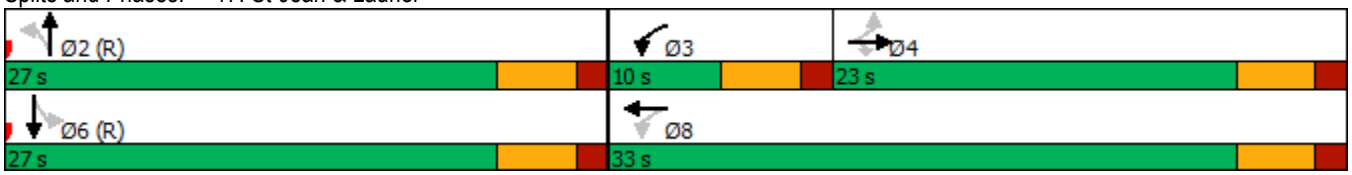


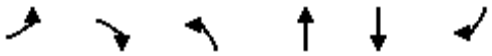
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	169	136	51	260	8	314	15	92	2	5	11
Future Volume (vph)	6	169	136	51	260	8	314	15	92	2	5	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		10.0	0.0		0.0	20.0		0.0	10.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			10.0			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.996			0.871			0.894	
Flt Protected		0.998			0.992		0.950			0.950		
Satd. Flow (prot)	0	1843	1568	0	1868	0	1719	1443	0	1805	1604	0
Flt Permitted		0.984			0.934		0.746			0.682		
Satd. Flow (perm)	0	1817	1568	0	1759	0	1350	1443	0	1296	1604	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			148		3			100			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		549.0			622.7			441.7			187.4	
Travel Time (s)		39.5			44.8			31.8			13.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	3%	3%	0%	0%	5%	13%	15%	0%	20%	0%
Adj. Flow (vph)	7	184	148	55	283	9	341	16	100	2	5	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	191	148	0	347	0	341	116	0	2	17	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Minimum Split (s)	23.0	23.0	23.0	10.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	23.0	23.0	23.0	10.0	33.0		27.0	27.0		27.0	27.0	
Total Split (%)	38.3%	38.3%	38.3%	16.7%	55.0%		45.0%	45.0%		45.0%	45.0%	
Maximum Green (s)	18.0	18.0	18.0	5.0	28.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Walk Time (s)	7.0	7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)		18.0	18.0		28.0		22.0	22.0		22.0	22.0	
Actuated g/C Ratio		0.30	0.30		0.47		0.37	0.37		0.37	0.37	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.35	0.26		0.42		0.69	0.20		0.00	0.03	
Control Delay		18.7	4.7		12.4		25.2	5.2		12.0	8.3	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		18.7	4.7		12.4		25.2	5.2		12.0	8.3	
LOS		B	A		B		C	A		B	A	
Approach Delay		12.6			12.4			20.1			8.7	
Approach LOS		B			B			C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 62.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 17: St-Jean & Laurier



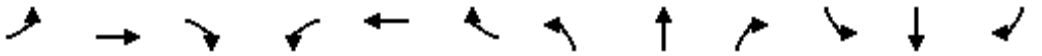


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	80	80	88	858	323	54
Future Volume (vph)	80	80	88	858	323	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	40.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.981	
Flt Protected	0.976		0.950			
Satd. Flow (prot)	1608	0	1597	1743	1837	0
Flt Permitted	0.976		0.506			
Satd. Flow (perm)	1608	0	851	1743	1837	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	36				21	
Link Speed (k/h)	50			50	50	
Link Distance (m)	1482.6			401.7	1080.0	
Travel Time (s)	106.7			28.9	77.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	13%	13%	9%	0%	10%
Adj. Flow (vph)	87	87	96	933	351	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	174	0	96	933	410	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1		1	2	2	
Detector Template	Left		Left	Thru	Thru	
Leading Detector (m)	2.0		2.0	10.0	10.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	
Detector 1 Size(m)	2.0		2.0	0.6	0.6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases			2			
Detector Phase	4		2	2	6	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.0		23.0	23.0	23.0	
Total Split (s)	24.0		96.0	96.0	96.0	
Total Split (%)	20.0%		80.0%	80.0%	80.0%	
Maximum Green (s)	19.0		91.0	91.0	91.0	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.5		1.5	1.5	1.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	None		Min	Min	Min	
Walk Time (s)	7.0		7.0	7.0	7.0	
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0		0	0	0	
Act Effct Green (s)	11.8		48.0	48.0	48.0	
Actuated g/C Ratio	0.17		0.68	0.68	0.68	
v/c Ratio	0.58		0.17	0.78	0.33	
Control Delay	31.8		5.1	13.8	5.3	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	31.8		5.1	13.8	5.3	
LOS	C		A	B	A	
Approach Delay	31.8			13.0	5.3	
Approach LOS	C			B	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 70.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 13.1		Intersection LOS: B	
Intersection Capacity Utilization 62.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 21: Caron & Dr. Corbeil



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	38	83	37	119	165	158	631	12	53	295	30
Future Volume (vph)	69	38	83	37	119	165	158	631	12	53	295	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		125.0	30.0		120.0	120.0		0.0	120.0		40.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.997				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1857	0	1770	1863	1583
Flt Permitted	0.385			0.730			0.504			0.293		
Satd. Flow (perm)	717	1863	1583	1360	1863	1583	939	1857	0	546	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			90			179		1				109
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		289.2			367.4			197.4			531.3	
Travel Time (s)		20.8			26.5			14.2			38.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	41	90	40	129	179	172	686	13	58	321	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	41	90	40	129	179	172	699	0	58	321	33
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	23.0	23.0	23.0	10.0	23.0		10.0	23.0	23.0
Total Split (s)	11.0	36.0	36.0	25.0	25.0	25.0	12.0	74.0		10.0	72.0	72.0
Total Split (%)	9.2%	30.0%	30.0%	20.8%	20.8%	20.8%	10.0%	61.7%		8.3%	60.0%	60.0%
Maximum Green (s)	6.0	31.0	31.0	20.0	20.0	20.0	7.0	69.0		5.0	67.0	67.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	Max
Walk Time (s)		7.0	7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0		0			0	0
Act Effct Green (s)	21.5	21.5	21.5	13.0	13.0	13.0	77.0	71.6		72.4	67.3	67.3
Actuated g/C Ratio	0.19	0.19	0.19	0.12	0.12	0.12	0.69	0.65		0.65	0.61	0.61
v/c Ratio	0.38	0.11	0.24	0.25	0.59	0.52	0.24	0.58		0.14	0.28	0.03
Control Delay	42.2	36.1	9.0	49.1	58.6	12.4	6.9	15.9		7.0	12.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	42.2	36.1	9.0	49.1	58.6	12.4	6.9	15.9		7.0	12.3	0.1
LOS	D	D	A	D	E	B	A	B		A	B	A
Approach Delay		26.5			33.8			14.1			10.6	
Approach LOS		C			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 110.9			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 18.4		Intersection LOS: B	
Intersection Capacity Utilization 61.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 33: Caron & Street No.1

Intersection	
Intersection Delay, s/veh	13.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	33	36	14	31	13	22	422	30	16	181	4
Future Vol, veh/h	4	33	36	14	31	13	22	422	30	16	181	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	6	0	14	6	0	5	3	10	0	1	25
Mvmt Flow	4	36	39	15	34	14	24	459	33	17	197	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	9.7	16.2	10
HCM LOS	A	A	C	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	5%	24%	8%
Vol Thru, %	89%	45%	53%	90%
Vol Right, %	6%	49%	22%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	474	73	58	201
LT Vol	22	4	14	16
Through Vol	422	33	31	181
RT Vol	30	36	13	4
Lane Flow Rate	515	79	63	218
Geometry Grp	1	1	1	1
Degree of Util (X)	0.659	0.121	0.104	0.296
Departure Headway (Hd)	4.603	5.495	5.963	4.875
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	778	656	605	730
Service Time	2.668	3.497	3.965	2.958
HCM Lane V/C Ratio	0.662	0.12	0.104	0.299
HCM Control Delay	16.2	9.3	9.7	10
HCM Lane LOS	C	A	A	A
HCM 95th-tile Q	5	0.4	0.3	1.2

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	10	37	7	63	9	158	57	3	6	36	75
Future Vol, veh/h	11	10	37	7	63	9	158	57	3	6	36	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	22	0	0	0	0	0	2	0	33	0	4	0
Mvmt Flow	12	11	40	8	68	10	172	62	3	7	39	82
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	8.2	8.5	9.6	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	72%	100%	0%	9%	5%
Vol Thru, %	26%	0%	21%	80%	31%
Vol Right, %	1%	0%	79%	11%	64%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	218	11	47	79	117
LT Vol	158	11	0	7	6
Through Vol	57	0	10	63	36
RT Vol	3	0	37	9	75
Lane Flow Rate	237	12	51	86	127
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.301	0.021	0.069	0.116	0.147
Departure Headway (Hd)	4.572	6.297	4.86	4.861	4.165
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	787	568	736	737	860
Service Time	2.598	4.035	2.598	2.897	2.194
HCM Lane V/C Ratio	0.301	0.021	0.069	0.117	0.148
HCM Control Delay	9.6	9.2	8	8.5	7.9
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	1.3	0.1	0.2	0.4	0.5

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	8	0	15	19	204	0	5	0	27	20	12
Future Vol, veh/h	15	8	0	15	19	204	0	5	0	27	20	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	6	0	13
Mvmt Flow	16	9	0	16	21	222	0	5	0	29	22	13
Number of Lanes	1	1	0	1	1	0	0	2	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8	8.3	7.1	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%	57%	0%
Vol Thru, %	100%	100%	0%	100%	0%	9%	43%	0%
Vol Right, %	0%	0%	0%	0%	0%	91%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	3	15	8	15	223	47	12
LT Vol	0	0	15	0	15	0	27	0
Through Vol	3	3	0	8	0	19	20	0
RT Vol	0	0	0	0	0	204	0	12
Lane Flow Rate	3	3	16	9	16	242	51	13
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.004	0.003	0.024	0.012	0.023	0.269	0.078	0.016
Departure Headway (Hd)	5.187	3.479	5.366	4.864	5.13	3.988	5.513	4.419
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	694	1034	670	739	690	887	653	814
Service Time	2.891	1.183	3.072	2.571	2.915	1.773	3.214	2.121
HCM Lane V/C Ratio	0.004	0.003	0.024	0.012	0.023	0.273	0.078	0.016
HCM Control Delay	7.9	6.2	8.2	7.6	8	8.3	8.7	7.2
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0	0.1	1.1	0.3	0

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	23	6	37	229	30	7	3	25	11	1	1
Future Vol, veh/h	9	23	6	37	229	30	7	3	25	11	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	350	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	22	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	10	25	7	40	249	33	8	3	27	12	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	282	0	0	32	0	0	396	411	29	410	398	266
Stage 1	-	-	-	-	-	-	49	49	-	346	346	-
Stage 2	-	-	-	-	-	-	347	362	-	64	52	-
Critical Hdwy	4.32	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.398	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1174	-	-	1593	-	-	568	534	1052	556	543	778
Stage 1	-	-	-	-	-	-	969	858	-	674	639	-
Stage 2	-	-	-	-	-	-	673	629	-	952	856	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1174	-	-	1593	-	-	552	516	1052	525	525	778
Mov Cap-2 Maneuver	-	-	-	-	-	-	552	516	-	525	525	-
Stage 1	-	-	-	-	-	-	960	850	-	668	623	-
Stage 2	-	-	-	-	-	-	654	613	-	916	848	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.9	9.6	11.9
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	828	1174	-	-	1593	-	-	538
HCM Lane V/C Ratio	0.046	0.008	-	-	0.025	-	-	0.026
HCM Control Delay (s)	9.6	8.1	-	-	7.3	-	-	11.9
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0.1

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	126	336	51	17	53
Future Vol, veh/h	18	126	336	51	17	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	137	365	55	18	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	420	0	-	0	570	393
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	177	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1139	-	-	-	483	656
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	854	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	1139	-	-	-	474	656
Mov Cap-2 Maneuver	-	-	-	-	474	-
Stage 1	-	-	-	-	669	-
Stage 2	-	-	-	-	854	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1139	-	-	-	600
HCM Lane V/C Ratio	0.017	-	-	-	0.127
HCM Control Delay (s)	8.2	0	-	-	11.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

LANE SUMMARY

Site: Poupart / Site Access AM (Medium-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	66	3.0	796	0.083	100	10.2	LOS B	0.4	3.2	Full	500	0.0	0.0
Approach	66	3.0		0.083		10.2	LOS B	0.4	3.2				
East: St-Jean													
Lane 1[d]	835	3.0	1005	0.831	100	7.1	LOS A	13.0	101.0	Full	500	0.0	0.0
Approach	835	3.0		0.831		7.1	LOS A	13.0	101.0				
North: Site Access													
Lane 1[d]	167	3.0	367	0.457	100	16.9	LOS B	3.3	26.0	Full	500	0.0	0.0
Approach	167	3.0		0.457		16.9	LOS B	3.3	26.0				
West: Poupart													
Lane 1[d]	329	3.0	1084	0.304	100	5.3	LOS A	2.2	17.3	Full	500	0.0	0.0
Approach	329	3.0		0.304		5.3	LOS A	2.2	17.3				
Intersection	1398	3.0		0.831		8.0	LOS A	13.0	101.0				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: Poupart Extension AM (Medium-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Poupart													
Lane 1[d]	1009	3.0	1102	0.915	100	5.7	LOS A	33.5	260.9	Full	500	0.0	0.0
Approach	1009	3.0		0.915		5.7	LOS A	33.5	260.9				
North: Poupart													
Lane 1[d]	108	3.0	422	0.255	100	15.7	LOS B	1.6	12.4	Full	500	0.0	0.0
Approach	108	3.0		0.255		15.7	LOS B	1.6	12.4				
West: Poupart Extension													
Lane 1[d]	266	3.0	1004	0.265	100	5.5	LOS A	1.8	13.8	Full	500	0.0	0.0
Approach	266	3.0		0.265		5.5	LOS A	1.8	13.8				
Intersection	1383	3.0		0.915		6.4	LOS A	33.5	260.9				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Dr Corbeil AM (Medium-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	286	3.0	995	0.287	100	5.2	LOS A	1.8	13.8	Full	500	0.0	0.0
Approach	286	3.0		0.287		5.2	LOS A	1.8	13.8				
East: Dr. Corbeil													
Lane 1[d]	385	3.0	875	0.440	100	8.1	LOS A	3.0	23.2	Full	500	0.0	0.0
Approach	385	3.0		0.440		8.1	LOS A	3.0	23.2				
North: St-Jean													
Lane 1[d]	246	3.0	978	0.251	100	7.5	LOS A	1.5	12.0	Full	500	0.0	0.0
Approach	246	3.0		0.251		7.5	LOS A	1.5	12.0				
Intersection	916	3.0		0.440		7.1	LOS A	3.0	23.2				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Morris Village Access AM (Medium-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Morris Village Access													
Lane 1[d]	526	3.0	1259	0.418	100	11.2	LOS B	2.9	22.7	Full	500	0.0	0.0
Lane 2	102	3.0	1259	0.081	100	4.3	LOS A	0.4	3.2	Short	60	0.0	NA
Approach	628	3.0		0.418		10.1	LOS B	2.9	22.7				
East: St-Jean													
Lane 1[d]	327	3.0	716	0.457	100	9.4	LOS A	3.2	25.3	Full	500	0.0	0.0
Approach	327	3.0		0.457		9.4	LOS A	3.2	25.3				
West: St-Jean													
Lane 1[d]	330	3.0	1159	0.285	100	3.8	LOS A	2.0	15.7	Full	500	0.0	0.0
Approach	330	3.0		0.285		3.8	LOS A	2.0	15.7				
Intersection	1286	3.0		0.457		8.3	LOS A	3.2	25.3				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Poupart AM (Medium-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	299	3.0	837	0.357	100	9.4	LOS A	2.3	17.9	Full	500	0.0	0.0
Approach	299	3.0		0.357		9.4	LOS A	2.3	17.9				
East: St-Jean													
Lane 1[d]	816	3.0	874	0.935	100	23.3	LOS C	24.6	191.9	Full	500	0.0	0.0
Approach	816	3.0		0.935		23.3	LOS C	24.6	191.9				
North: Site Access													
Lane 1[d]	249	3.0	314	0.794	100	38.6	LOS D	8.6	67.3	Full	500	0.0	0.0
Approach	249	3.0		0.794		38.6	LOS D	8.6	67.3				
West: Poupart													
Lane 1[d]	300	3.0	722	0.415	100	8.7	LOS A	2.8	21.6	Full	500	0.0	0.0
Approach	300	3.0		0.415		8.7	LOS A	2.8	21.6				
Intersection	1664	3.0		0.935		20.4	LOS C	24.6	191.9				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	13	66	669	19	96	970
Future Volume (vph)	13	66	669	19	96	970
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	30.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.887		0.996			
Flt Protected	0.992				0.950	
Satd. Flow (prot)	1672	0	1874	0	1671	1881
Flt Permitted	0.992				0.335	
Satd. Flow (perm)	1672	0	1874	0	589	1881
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	72		4			
Link Speed (k/h)	50		50			50
Link Distance (m)	196.2		558.9			401.7
Travel Time (s)	14.1		40.2			28.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	8%	1%
Adj. Flow (vph)	14	72	727	21	104	1054
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	0	748	0	104	1054
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8				6	
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	23.0		23.0		23.0	23.0
Total Split (s)	23.0		97.0		97.0	97.0
Total Split (%)	19.2%		80.8%		80.8%	80.8%
Maximum Green (s)	18.0		92.0		92.0	92.0
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	1.5		1.5		1.5	1.5
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	5.0		5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Walk Time (s)	7.0		7.0		7.0	7.0
Flash Dont Walk (s)	11.0		11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0		0	0
Act Effct Green (s)	7.3		49.4		49.4	49.4
Actuated g/C Ratio	0.12		0.80		0.80	0.80
v/c Ratio	0.33		0.50		0.22	0.70
Control Delay	15.4		4.7		4.1	7.9
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	15.4		4.7		4.1	7.9
LOS	B		A		A	A
Approach Delay	15.4		4.7			7.6
Approach LOS	B		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 62			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 6.8		Intersection LOS: A	
Intersection Capacity Utilization 64.2%		ICU Level of Service C	
Analysis Period (min) 15			

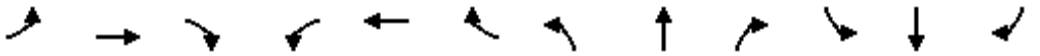
Splits and Phases: 5: Caron & David

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2066	208	66	1103	73	109
Future Volume (vph)	2066	208	66	1103	73	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		85.0	125.0		0.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			70.0		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3505	1599	1752	3539	1805	1615
Flt Permitted			0.053		0.950	
Satd. Flow (perm)	3505	1599	98	3539	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		194				81
Link Speed (k/h)	50			50	50	
Link Distance (m)	470.1			337.0	115.6	
Travel Time (s)	33.8			24.3	8.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	3%	2%	0%	0%
Adj. Flow (vph)	2246	226	72	1199	79	118
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2246	226	72	1199	79	118
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8		2	2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	27.2	27.2	11.2	27.2	23.2	23.2
Total Split (s)	75.0	75.0	11.2	86.2	23.8	23.8
Total Split (%)	68.2%	68.2%	10.2%	78.4%	21.6%	21.6%
Maximum Green (s)	68.8	68.8	5.0	80.0	18.6	18.6
Yellow Time (s)	4.6	4.6	4.6	4.6	3.3	3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	5.2	5.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0		14.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	69.0	69.0	77.7	77.7	18.6	18.6
Actuated g/C Ratio	0.64	0.64	0.72	0.72	0.17	0.17
v/c Ratio	1.00	0.21	0.49	0.47	0.25	0.34
Control Delay	40.3	2.3	20.4	7.0	42.1	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	2.3	20.4	7.0	42.1	18.3
LOS	D	A	C	A	D	B
Approach Delay	36.8			7.8	27.9	
Approach LOS	D			A	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 107.8			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 27.0		Intersection LOS: C	
Intersection Capacity Utilization 73.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 12: Carmen Bergeron & CR 17

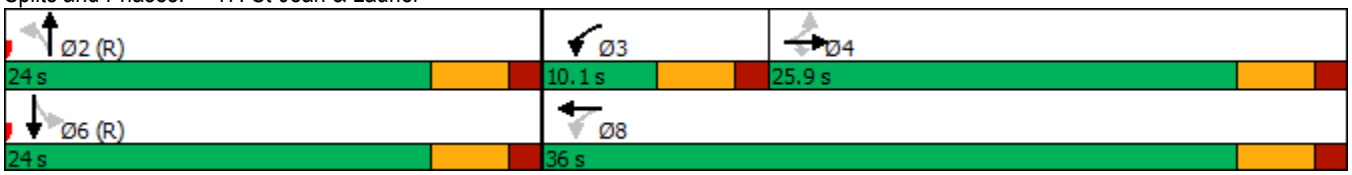


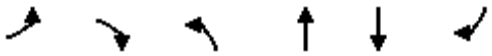
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	405	345	89	340	14	227	13	106	20	11	17
Future Volume (vph)	9	405	345	89	340	14	227	13	106	20	11	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		10.0	0.0		0.0	20.0		0.0	10.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			10.0			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.996			0.866			0.910	
Flt Protected		0.999			0.990		0.950			0.950		
Satd. Flow (prot)	0	1898	1568	0	1869	0	1752	1645	0	1805	1729	0
Flt Permitted		0.987			0.582		0.738			0.674		
Satd. Flow (perm)	0	1875	1568	0	1099	0	1361	1645	0	1281	1729	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			173		4			115			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		549.0			622.7			441.7			187.4	
Travel Time (s)		39.5			44.8			31.8			13.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	0%	7%	3%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	440	375	97	370	15	247	14	115	22	12	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	450	375	0	482	0	247	129	0	22	30	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Minimum Split (s)	23.0	23.0	23.0	10.1	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	25.9	25.9	25.9	10.1	36.0		24.0	24.0		24.0	24.0	
Total Split (%)	43.2%	43.2%	43.2%	16.8%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	20.9	20.9	20.9	5.1	31.0		19.0	19.0		19.0	19.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Walk Time (s)	7.0	7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)		20.9	20.9		31.0		19.0	19.0		19.0	19.0	
Actuated g/C Ratio		0.35	0.35		0.52		0.32	0.32		0.32	0.32	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.69	0.57		0.76		0.57	0.22		0.05	0.05	
Control Delay		23.4	12.3		20.5		23.5	5.5		14.8	9.5	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		23.4	12.3		20.5		23.5	5.5		14.8	9.5	
LOS		C	B		C		C	A		B	A	
Approach Delay		18.4			20.5			17.3			11.7	
Approach LOS		B			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 77.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 17: St-Jean & Laurier



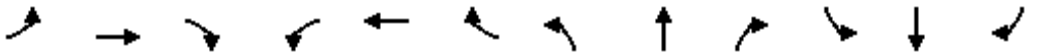


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	104	131	106	646	958	105
Future Volume (vph)	104	131	106	646	958	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	40.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.925				0.987	
Flt Protected	0.978		0.950			
Satd. Flow (prot)	1719	0	1805	1900	1875	0
Flt Permitted	0.978		0.053			
Satd. Flow (perm)	1719	0	101	1900	1875	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	44				10	
Link Speed (k/h)	50			50	50	
Link Distance (m)	1482.6			401.7	1080.0	
Travel Time (s)	106.7			28.9	77.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	113	142	115	702	1041	114
Shared Lane Traffic (%)						
Lane Group Flow (vph)	255	0	115	702	1155	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1		1	2	2	
Detector Template	Left		Left	Thru	Thru	
Leading Detector (m)	2.0		2.0	10.0	10.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	
Detector 1 Size(m)	2.0		2.0	0.6	0.6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Perm		pm+pt	NA	NA	
Protected Phases			5	2	6	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases	4		2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.0		10.0	23.0	23.0	
Total Split (s)	23.0		11.2	97.0	85.8	
Total Split (%)	19.2%		9.3%	80.8%	71.5%	
Maximum Green (s)	18.0		6.2	92.0	80.8	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.5		1.5	1.5	1.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	5.0	5.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	None		None	Min	Min	
Walk Time (s)	7.0			7.0	7.0	
Flash Dont Walk (s)	11.0			11.0	11.0	
Pedestrian Calls (#/hr)	0			0	0	
Act Effct Green (s)	16.7		82.1	82.1	70.6	
Actuated g/C Ratio	0.15		0.75	0.75	0.65	
v/c Ratio	0.85		0.66	0.49	0.95	
Control Delay	64.4		35.7	6.6	34.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	64.4		35.7	6.6	34.1	
LOS	E		D	A	C	
Approach Delay	64.4			10.7	34.1	
Approach LOS	E			B	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 109.1			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 29.0		Intersection LOS: C	
Intersection Capacity Utilization 89.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 21: Caron & Dr. Corbeil



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	126	180	24	78	109	136	531	39	174	731	77
Future Volume (vph)	49	126	180	24	78	109	136	531	39	174	731	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		125.0	30.0		120.0	120.0		0.0	120.0		40.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.990				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1844	0	1770	1863	1583
Flt Permitted	0.460			0.669			0.161			0.253		
Satd. Flow (perm)	857	1863	1583	1246	1863	1583	300	1844	0	471	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			196			145		5				145
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.3			276.0			177.7			558.9	
Travel Time (s)		12.9			19.9			12.8			40.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	137	196	26	85	118	148	577	42	189	795	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	137	196	26	85	118	148	619	0	189	795	84
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	23.0	23.0	23.0	10.0	23.0		10.0	23.0	23.0
Total Split (s)	10.0	33.0	33.0	23.0	23.0	23.0	10.0	45.0		12.0	47.0	47.0
Total Split (%)	11.1%	36.7%	36.7%	25.6%	25.6%	25.6%	11.1%	50.0%		13.3%	52.2%	52.2%
Maximum Green (s)	5.0	28.0	28.0	18.0	18.0	18.0	5.0	40.0		7.0	42.0	42.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	Max
Walk Time (s)		7.0	7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0		0			0	0
Act Effct Green (s)	15.1	15.1	15.1	9.5	9.5	9.5	45.5	40.4		49.1	42.3	42.3
Actuated g/C Ratio	0.19	0.19	0.19	0.12	0.12	0.12	0.59	0.52		0.63	0.55	0.55
v/c Ratio	0.23	0.38	0.42	0.17	0.37	0.37	0.55	0.64		0.46	0.78	0.09
Control Delay	27.1	29.3	7.0	34.8	37.5	7.4	14.9	18.6		9.6	22.8	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	27.1	29.3	7.0	34.8	37.5	7.4	14.9	18.6		9.6	22.8	0.6
LOS	C	C	A	C	D	A	B	B		A	C	A
Approach Delay		17.7			21.7			17.9			18.7	
Approach LOS		B			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 77.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 18.6		Intersection LOS: B	
Intersection Capacity Utilization 73.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 33: Caron & Street No.1

Intersection	
Intersection Delay, s/veh	20.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	36	48	31	43	17	59	334	28	33	457	9
Future Vol, veh/h	16	36	48	31	43	17	59	334	28	33	457	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	3	2	0	0	0	2	1	0	0	1	0
Mvmt Flow	17	39	52	34	47	18	64	363	30	36	497	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.3	11.3	19.6	25.7
HCM LOS	B	B	C	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	16%	34%	7%
Vol Thru, %	79%	36%	47%	92%
Vol Right, %	7%	48%	19%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	421	100	91	499
LT Vol	59	16	31	33
Through Vol	334	36	43	457
RT Vol	28	48	17	9
Lane Flow Rate	458	109	99	542
Geometry Grp	1	1	1	1
Degree of Util (X)	0.687	0.198	0.184	0.795
Departure Headway (Hd)	5.403	6.543	6.681	5.275
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	664	543	532	683
Service Time	3.468	4.638	4.779	3.337
HCM Lane V/C Ratio	0.69	0.201	0.186	0.794
HCM Control Delay	19.6	11.3	11.3	25.7
HCM Lane LOS	C	B	B	D
HCM 95th-tile Q	5.4	0.7	0.7	8

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	123	55	173	9	24	17	86	68	14	22	71	99
Future Vol, veh/h	123	55	173	9	24	17	86	68	14	22	71	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	11	0	0	0	0	0	0	2	0
Mvmt Flow	134	60	188	10	26	18	93	74	15	24	77	108
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	10.5	9.1	10.3	10
HCM LOS	B	A	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	51%	100%	0%	18%	11%
Vol Thru, %	40%	0%	24%	48%	37%
Vol Right, %	8%	0%	76%	34%	52%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	168	123	228	50	192
LT Vol	86	123	0	9	22
Through Vol	68	0	55	24	71
RT Vol	14	0	173	17	99
Lane Flow Rate	183	134	248	54	209
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.267	0.224	0.343	0.085	0.284
Departure Headway (Hd)	5.264	6.023	4.982	5.614	4.905
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	674	590	714	642	724
Service Time	3.362	3.82	2.778	3.614	3
HCM Lane V/C Ratio	0.272	0.227	0.347	0.084	0.289
HCM Control Delay	10.3	10.6	10.4	9.1	10
HCM Lane LOS	B	B	B	A	A
HCM 95th-tile Q	1.1	0.9	1.5	0.3	1.2

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	31	3	12	22	122	0	49	22	45	68	21
Future Vol, veh/h	17	31	3	12	22	122	0	49	22	45	68	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	33	0	0	0	0	2	0	0	1	19
Mvmt Flow	18	34	3	13	24	133	0	53	24	49	74	23
Number of Lanes	1	1	0	1	1	0	0	2	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8.3	8.4	8	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%	40%	0%
Vol Thru, %	100%	43%	0%	91%	0%	15%	60%	0%
Vol Right, %	0%	57%	0%	9%	0%	85%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	33	38	17	34	12	144	113	21
LT Vol	0	0	17	0	12	0	45	0
Through Vol	33	16	0	31	0	22	68	0
RT Vol	0	22	0	3	0	122	0	21
Lane Flow Rate	36	42	18	37	13	157	123	23
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.051	0.055	0.029	0.053	0.02	0.197	0.181	0.028
Departure Headway (Hd)	5.218	4.78	5.724	5.159	5.626	4.528	5.309	4.423
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	686	749	626	694	637	794	676	809
Service Time	2.95	2.512	3.452	2.887	3.349	2.251	3.039	2.153
HCM Lane V/C Ratio	0.052	0.056	0.029	0.053	0.02	0.198	0.182	0.028
HCM Control Delay	8.2	7.8	8.6	8.2	8.5	8.4	9.2	7.3
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.1	0.2	0.1	0.7	0.7	0.1

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	66	175	22	52	78	80	25	13	83	88	13	53
Future Vol, veh/h	66	175	22	52	78	80	25	13	83	88	13	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	350	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	72	190	24	57	85	87	27	14	90	96	14	58

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	172	0	0	214	0	0	625	632	202	641	601	129
Stage 1	-	-	-	-	-	-	346	346	-	243	243	-
Stage 2	-	-	-	-	-	-	279	286	-	398	358	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1417	-	-	1368	-	-	400	400	844	390	417	926
Stage 1	-	-	-	-	-	-	674	639	-	765	708	-
Stage 2	-	-	-	-	-	-	732	679	-	632	631	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1417	-	-	1368	-	-	339	364	844	315	379	926
Mov Cap-2 Maneuver	-	-	-	-	-	-	339	364	-	315	379	-
Stage 1	-	-	-	-	-	-	640	606	-	726	678	-
Stage 2	-	-	-	-	-	-	644	650	-	523	599	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	1.9	13	19.4
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	582	1417	-	-	1368	-	-	415
HCM Lane V/C Ratio	0.226	0.051	-	-	0.041	-	-	0.403
HCM Control Delay (s)	13	7.7	-	-	7.7	-	-	19.4
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.9	0.2	-	-	0.1	-	-	1.9

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	58	361	239	35	54	38
Future Vol, veh/h	58	361	239	35	54	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	392	260	38	59	41

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	298	0	-	0	797	279
Stage 1	-	-	-	-	279	-
Stage 2	-	-	-	-	518	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1263	-	-	-	356	760
Stage 1	-	-	-	-	768	-
Stage 2	-	-	-	-	598	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1263	-	-	-	333	760
Mov Cap-2 Maneuver	-	-	-	-	333	-
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	598	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	15.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1263	-	-	-	434
HCM Lane V/C Ratio	0.05	-	-	-	0.23
HCM Control Delay (s)	8	0	-	-	15.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.9

LANE SUMMARY

Site: Poupart / Site Access PM (Medium-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	48	3.0	246	0.195	100	20.4	LOS C	1.3	9.8	Full	500	0.0	0.0
Approach	48	3.0		0.195		20.4	LOS C	1.3	9.8				
East: St-Jean													
Lane 1[d]	607	3.0	896	0.677	100	7.8	LOS A	7.4	57.8	Full	500	0.0	0.0
Approach	607	3.0		0.677		7.8	LOS A	7.4	57.8				
North: Site Access													
Lane 1[d]	120	3.0	544	0.220	100	10.4	LOS B	1.3	10.1	Full	500	0.0	0.0
Approach	120	3.0		0.220		10.4	LOS B	1.3	10.1				
West: Poupart													
Lane 1[d]	1117	3.0	1072	1.043	100	34.1	LOS F	96.1	748.6	Full	500	0.0	18.6
Approach	1117	3.0		1.043		34.1	LOS C	96.1	748.6				
Intersection	1891	3.0		1.043		23.8	LOS C	96.1	748.6				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: Poupart Extension PM (Medium-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Poupart													
Lane 1[d]	684	3.0	1097	0.623	100	4.6	LOS A	8.0	62.6	Full	500	0.0	0.0
Approach	684	3.0		0.623		4.6	LOS A	8.0	62.6				
North: Poupart													
Lane 1[d]	297	3.0	670	0.443	100	14.6	LOS B	2.9	22.9	Full	500	0.0	0.0
Approach	297	3.0		0.443		14.6	LOS B	2.9	22.9				
West: Poupart Extension													
Lane 1[d]	835	3.0	808	1.033	100	45.5	LOS F	39.3	306.1	Full	500	0.0	0.0
Approach	835	3.0		1.033		45.5	LOS D	39.3	306.1				
Intersection	1815	3.0		1.033		25.1	LOS C	39.3	306.1				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Dr Corbeil PM (Medium-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	427	3.0	769	0.556	100	9.0	LOS A	4.6	36.0	Full	500	0.0	0.0
Approach	427	3.0		0.556		9.0	LOS A	4.6	36.0				
East: Dr. Corbeil													
Lane 1[d]	297	3.0	814	0.364	100	8.4	LOS A	2.4	18.7	Full	500	0.0	0.0
Approach	297	3.0		0.364		8.4	LOS A	2.4	18.7				
North: St-Jean													
Lane 1[d]	603	3.0	996	0.605	100	8.7	LOS A	6.0	46.4	Full	500	0.0	0.0
Approach	603	3.0		0.605		8.7	LOS A	6.0	46.4				
Intersection	1327	3.0		0.605		8.7	LOS A	6.0	46.4				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Morris Village Access PM (Medium-term)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Morris Village Access													
Lane 1[d]	346	3.0	1011	0.342	100	12.2	LOS B	2.5	19.4	Full	500	0.0	0.0
Lane 2	52	3.0	1011	0.052	100	5.1	LOS A	0.3	2.4	Short	60	0.0	NA
Approach	398	3.0		0.342		11.3	LOS B	2.5	19.4				
East: St-Jean													
Lane 1[d]	342	3.0	833	0.411	100	8.5	LOS A	2.8	21.8	Full	500	0.0	0.0
Approach	342	3.0		0.411		8.5	LOS A	2.8	21.8				
West: St-Jean													
Lane 1[d]	911	3.0	1060	0.859	100	7.3	LOS A	16.3	127.4	Full	500	0.0	0.0
Approach	911	3.0		0.859		7.3	LOS A	16.3	127.4				
Intersection	1651	3.0		0.859		8.5	LOS A	16.3	127.4				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Poupart PM (Medium-term)

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	551	3.0	484	1.138	100	98.3	LOS F	39.0	303.5	Full	500	0.0	0.0
Approach	551	3.0		1.138		98.3	LOS F	39.0	303.5				
East: St-Jean													
Lane 1[d]	575	3.0	763	0.754	100	15.2	LOS B	9.7	75.7	Full	500	0.0	0.0
Approach	575	3.0		0.754		15.2	LOS B	9.7	75.7				
North: Site Access													
Lane 1[d]	158	3.0	505	0.312	100	11.6	LOS B	1.9	15.1	Full	500	0.0	0.0
Approach	158	3.0		0.312		11.6	LOS B	1.9	15.1				
West: Poupart													
Lane 1[d]	941	3.0	828	1.137	100	83.5	LOS F	63.3	492.9	Full	500	0.0	4.6
Approach	941	3.0		1.137		83.5	LOS F	63.3	492.9				
Intersection	2225	3.0		1.138		64.4	LOS E	63.3	492.9				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Appendix D-3

Forecast Build-Out Traffic Analysis

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	83	1571	7	33	582
Future Volume (vph)	19	83	1571	7	33	582
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	30.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.891		0.999			
Flt Protected	0.991				0.950	
Satd. Flow (prot)	1420	0	3310	0	1530	3195
Flt Permitted	0.991				0.104	
Satd. Flow (perm)	1420	0	3310	0	167	3195
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	51		1			
Link Speed (k/h)	50		50			50
Link Distance (m)	196.2		531.3			401.7
Travel Time (s)	14.1		38.3			28.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	40%	13%	9%	0%	18%	13%
Adj. Flow (vph)	21	90	1708	8	36	633
Shared Lane Traffic (%)						
Lane Group Flow (vph)	111	0	1716	0	36	633
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8				6	
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	23.0		23.0		23.0	23.0
Total Split (s)	25.0		95.0		95.0	95.0
Total Split (%)	20.8%		79.2%		79.2%	79.2%
Maximum Green (s)	20.0		90.0		90.0	90.0
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	1.5		1.5		1.5	1.5
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	5.0		5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Walk Time (s)	7.0		7.0		7.0	7.0
Flash Dont Walk (s)	11.0		11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0		0	0
Act Effct Green (s)	9.0		51.1		51.1	51.1
Actuated g/C Ratio	0.14		0.78		0.78	0.78
v/c Ratio	0.47		0.67		0.28	0.26
Control Delay	25.0		7.0		10.5	3.6
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	25.0		7.0		10.5	3.6
LOS	C		A		B	A
Approach Delay	25.0		7.0			3.9
Approach LOS	C		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 65.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 7.0		Intersection LOS: A	
Intersection Capacity Utilization 58.2%		ICU Level of Service B	
Analysis Period (min) 15			

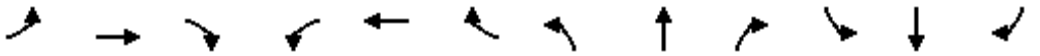
Splits and Phases: 5: Caron & David

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	901	41	20	2582	120	14
Future Volume (vph)	901	41	20	2582	120	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		85.0	125.0		0.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			70.0		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3438	1524	1703	3574	1770	1346
Flt Permitted			0.242		0.950	
Satd. Flow (perm)	3438	1524	434	3574	1770	1346
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		45				15
Link Speed (k/h)	50			50	50	
Link Distance (m)	470.1			337.0	115.6	
Travel Time (s)	33.8			24.3	8.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	6%	6%	1%	2%	20%
Adj. Flow (vph)	979	45	22	2807	130	15
Shared Lane Traffic (%)						
Lane Group Flow (vph)	979	45	22	2807	130	15
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8		2	2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	27.2	27.2	11.2	27.2	23.2	23.2
Total Split (s)	85.5	85.5	11.2	96.7	23.3	23.3
Total Split (%)	71.3%	71.3%	9.3%	80.6%	19.4%	19.4%
Maximum Green (s)	79.3	79.3	5.0	90.5	18.1	18.1
Yellow Time (s)	4.6	4.6	4.6	4.6	3.3	3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	5.2	5.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0		14.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	83.8	83.8	90.5	90.5	18.1	18.1
Actuated g/C Ratio	0.70	0.70	0.75	0.75	0.15	0.15
v/c Ratio	0.41	0.04	0.06	1.04	0.49	0.07
Control Delay	8.8	2.1	4.0	45.5	53.7	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	2.1	4.0	45.5	53.7	19.9
LOS	A	A	A	D	D	B
Approach Delay	8.5			45.2	50.2	
Approach LOS	A			D	D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Natural Cycle: 140			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.04			
Intersection Signal Delay: 36.0		Intersection LOS: D	
Intersection Capacity Utilization 87.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 12: Carmen Bergeron & CR 17

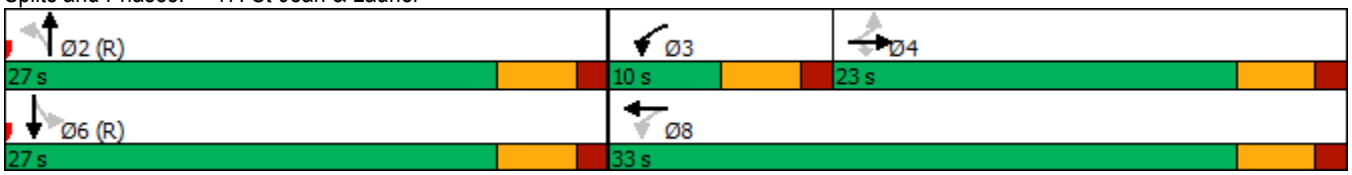


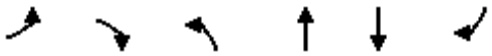
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	170	153	72	260	8	360	15	163	2	5	11
Future Volume (vph)	6	170	153	72	260	8	360	15	163	2	5	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		10.0	0.0		0.0	20.0		0.0	10.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			10.0			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.997			0.862			0.894	
Flt Protected		0.998			0.990		0.950			0.950		
Satd. Flow (prot)	0	1843	1568	0	1864	0	1719	1426	0	1805	1604	0
Flt Permitted		0.983			0.902		0.746			0.636		
Satd. Flow (perm)	0	1815	1568	0	1698	0	1350	1426	0	1208	1604	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			166		3			177			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		549.0			622.7			441.7			187.4	
Travel Time (s)		39.5			44.8			31.8			13.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	3%	3%	0%	0%	5%	13%	15%	0%	20%	0%
Adj. Flow (vph)	7	185	166	78	283	9	391	16	177	2	5	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	192	166	0	370	0	391	193	0	2	17	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Minimum Split (s)	23.0	23.0	23.0	10.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	23.0	23.0	23.0	10.0	33.0		27.0	27.0		27.0	27.0	
Total Split (%)	38.3%	38.3%	38.3%	16.7%	55.0%		45.0%	45.0%		45.0%	45.0%	
Maximum Green (s)	18.0	18.0	18.0	5.0	28.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Walk Time (s)	7.0	7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)		18.0	18.0		28.0		22.0	22.0		22.0	22.0	
Actuated g/C Ratio		0.30	0.30		0.47		0.37	0.37		0.37	0.37	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.35	0.28		0.46		0.79	0.30		0.00	0.03	
Control Delay		18.7	4.7		12.9		31.5	4.6		12.0	8.3	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		18.7	4.7		12.9		31.5	4.6		12.0	8.3	
LOS		B	A		B		C	A		B	A	
Approach Delay		12.2			12.9			22.6			8.7	
Approach LOS		B			B			C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 16.9		Intersection LOS: B	
Intersection Capacity Utilization 66.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 17: St-Jean & Laurier



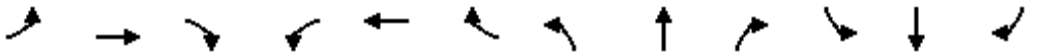


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	85	84	102	1557	542	56
Future Volume (vph)	85	84	102	1557	542	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	40.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt	0.933				0.986	
Flt Protected	0.975		0.950			
Satd. Flow (prot)	1608	0	1597	3312	3526	0
Flt Permitted	0.975		0.402			
Satd. Flow (perm)	1608	0	676	3312	3526	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	37				24	
Link Speed (k/h)	50			50	50	
Link Distance (m)	1482.6			401.7	1080.0	
Travel Time (s)	106.7			28.9	77.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	13%	13%	9%	0%	10%
Adj. Flow (vph)	92	91	111	1692	589	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	183	0	111	1692	650	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1		1	2	2	
Detector Template	Left		Left	Thru	Thru	
Leading Detector (m)	2.0		2.0	10.0	10.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	
Detector 1 Size(m)	2.0		2.0	0.6	0.6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases			2			
Detector Phase	4		2	2	6	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.0		23.0	23.0	23.0	
Total Split (s)	28.0		92.0	92.0	92.0	
Total Split (%)	23.3%		76.7%	76.7%	76.7%	
Maximum Green (s)	23.0		87.0	87.0	87.0	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.5		1.5	1.5	1.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	None		Min	Min	Min	
Walk Time (s)	7.0		7.0	7.0	7.0	
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0		0	0	0	
Act Effct Green (s)	12.7		49.7	49.7	49.7	
Actuated g/C Ratio	0.17		0.68	0.68	0.68	
v/c Ratio	0.59		0.24	0.75	0.27	
Control Delay	31.9		6.5	10.4	4.8	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	31.9		6.5	10.4	4.8	
LOS	C		A	B	A	
Approach Delay	31.9			10.2	4.8	
Approach LOS	C			B	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 72.8			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 10.3		Intersection LOS: B	
Intersection Capacity Utilization 61.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 21: Caron & Dr. Corbeil



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	76	137	74	238	331	309	1148	23	104	459	38
Future Volume (vph)	100	76	137	74	238	331	309	1148	23	104	459	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		125.0	30.0		120.0	120.0		0.0	120.0		40.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850			0.850		0.997				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3529	0	1770	3539	1583
Flt Permitted	0.246			0.703			0.376			0.128		
Satd. Flow (perm)	458	1863	1583	1310	1863	1583	700	3529	0	238	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			215		2				155
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		289.2			367.4			197.4			531.3	
Travel Time (s)		20.8			26.5			14.2			38.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	83	149	80	259	360	336	1248	25	113	499	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	83	149	80	259	360	336	1273	0	113	499	41
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	23.0	23.0	23.0	10.0	23.0		10.0	23.0	23.0
Total Split (s)	11.0	44.0	44.0	33.0	33.0	33.0	27.0	61.0		15.0	49.0	49.0
Total Split (%)	9.2%	36.7%	36.7%	27.5%	27.5%	27.5%	22.5%	50.8%		12.5%	40.8%	40.8%
Maximum Green (s)	6.0	39.0	39.0	28.0	28.0	28.0	22.0	56.0		10.0	44.0	44.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	Max
Walk Time (s)		7.0	7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0		0			0	0
Act Effct Green (s)	31.8	31.8	31.8	20.8	20.8	20.8	69.2	56.2		57.1	48.8	48.8
Actuated g/C Ratio	0.29	0.29	0.29	0.19	0.19	0.19	0.62	0.50		0.51	0.44	0.44
v/c Ratio	0.54	0.16	0.27	0.33	0.75	0.77	0.57	0.71		0.48	0.32	0.05
Control Delay	41.0	30.2	6.0	42.7	56.5	28.2	14.7	25.1		19.9	22.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	41.0	30.2	6.0	42.7	56.5	28.2	14.7	25.1		19.9	22.8	0.1
LOS	D	C	A	D	E	C	B	C		B	C	A
Approach Delay		23.0			40.4			23.0			20.9	
Approach LOS		C			D			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 111.3			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 26.2		Intersection LOS: C	
Intersection Capacity Utilization 73.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 33: Caron & Street No.1

Intersection	
Intersection Delay, s/veh	20.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	33	36	14	31	13	22	540	30	16	219	4
Future Vol, veh/h	4	33	36	14	31	13	22	540	30	16	219	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	6	0	14	6	0	5	3	10	0	1	25
Mvmt Flow	4	36	39	15	34	14	24	587	33	17	238	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.8	10.2	27.3	11.2
HCM LOS	A	B	D	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	5%	24%	7%
Vol Thru, %	91%	45%	53%	92%
Vol Right, %	5%	49%	22%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	592	73	58	239
LT Vol	22	4	14	16
Through Vol	540	33	31	219
RT Vol	30	36	13	4
Lane Flow Rate	643	79	63	260
Geometry Grp	1	1	1	1
Degree of Util (X)	0.838	0.131	0.112	0.372
Departure Headway (Hd)	4.687	5.937	6.413	5.156
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	759	606	561	701
Service Time	2.783	3.951	4.429	3.168
HCM Lane V/C Ratio	0.847	0.13	0.112	0.371
HCM Control Delay	27.3	9.8	10.2	11.2
HCM Lane LOS	D	A	B	B
HCM 95th-tile Q	9.5	0.4	0.4	1.7

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	10	56	7	63	9	213	76	3	6	42	75
Future Vol, veh/h	11	10	56	7	63	9	213	76	3	6	42	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	22	0	0	0	0	0	2	0	33	0	4	0
Mvmt Flow	12	11	61	8	68	10	232	83	3	7	46	82
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	8.5	8.9	10.9	8.2
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	73%	100%	0%	9%	5%
Vol Thru, %	26%	0%	15%	80%	34%
Vol Right, %	1%	0%	85%	11%	61%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	292	11	66	79	123
LT Vol	213	11	0	7	6
Through Vol	76	0	10	63	42
RT Vol	3	0	56	9	75
Lane Flow Rate	317	12	72	86	134
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.41	0.022	0.1	0.122	0.161
Departure Headway (Hd)	4.65	6.526	5.042	5.112	4.346
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	771	547	707	698	822
Service Time	2.687	4.281	2.797	3.167	2.392
HCM Lane V/C Ratio	0.411	0.022	0.102	0.123	0.163
HCM Control Delay	10.9	9.4	8.4	8.9	8.2
HCM Lane LOS	B	A	A	A	A
HCM 95th-tile Q	2	0.1	0.3	0.4	0.6

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	13	0	24	30	208	0	5	7	28	20	12
Future Vol, veh/h	15	13	0	24	30	208	0	5	7	28	20	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	6	0	13
Mvmt Flow	16	14	0	26	33	226	0	5	8	30	22	13
Number of Lanes	1	1	0	1	1	0	0	2	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8	8.5	7.6	8.5
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%	58%	0%
Vol Thru, %	100%	19%	0%	100%	0%	13%	42%	0%
Vol Right, %	0%	81%	0%	0%	0%	87%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	9	15	13	24	238	48	12
LT Vol	0	0	15	0	24	0	28	0
Through Vol	3	2	0	13	0	30	20	0
RT Vol	0	7	0	0	0	208	0	12
Lane Flow Rate	4	9	16	14	26	259	52	13
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.005	0.012	0.025	0.019	0.037	0.29	0.081	0.016
Departure Headway (Hd)	5.267	4.699	5.419	4.917	5.148	4.035	5.601	4.502
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	683	766	664	732	687	874	643	799
Service Time	2.971	2.402	3.123	2.621	2.945	1.831	3.302	2.204
HCM Lane V/C Ratio	0.006	0.012	0.024	0.019	0.038	0.296	0.081	0.016
HCM Control Delay	8	7.5	8.3	7.7	8.1	8.5	8.8	7.3
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0.1	0.1	1.2	0.3	0

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	32	6	51	254	46	7	3	29	17	1	1
Future Vol, veh/h	9	32	6	51	254	46	7	3	29	17	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	350	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	22	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	10	35	7	55	276	50	8	3	32	18	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	326	0	0	42	0	0	471	495	39	487	473	301
Stage 1	-	-	-	-	-	-	59	59	-	411	411	-
Stage 2	-	-	-	-	-	-	412	436	-	76	62	-
Critical Hdwy	4.32	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.398	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1129	-	-	1580	-	-	506	479	1038	494	493	743
Stage 1	-	-	-	-	-	-	958	850	-	622	598	-
Stage 2	-	-	-	-	-	-	621	583	-	938	847	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1129	-	-	1580	-	-	488	458	1038	460	471	743
Mov Cap-2 Maneuver	-	-	-	-	-	-	488	458	-	460	471	-
Stage 1	-	-	-	-	-	-	949	842	-	616	577	-
Stage 2	-	-	-	-	-	-	597	563	-	898	839	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	1.1	9.8	13
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	799	1129	-	-	1580	-	-	470
HCM Lane V/C Ratio	0.053	0.009	-	-	0.035	-	-	0.044
HCM Control Delay (s)	9.8	8.2	-	-	7.4	-	-	13
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0.1

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	225	633	82	26	91
Future Vol, veh/h	32	225	633	82	26	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	245	688	89	28	99

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	777	0	-	0	1048	733
Stage 1	-	-	-	-	733	-
Stage 2	-	-	-	-	315	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	839	-	-	-	252	421
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	740	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	839	-	-	-	240	421
Mov Cap-2 Maneuver	-	-	-	-	240	-
Stage 1	-	-	-	-	452	-
Stage 2	-	-	-	-	740	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	20.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	839	-	-	-	361
HCM Lane V/C Ratio	0.041	-	-	-	0.352
HCM Control Delay (s)	9.5	0	-	-	20.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.6

LANE SUMMARY

Site: Poupart / Site Access AM (Build-out)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	260	3.0	678	0.383	100	12.4	LOS B	1.8	13.6	Full	500	0.0	0.0
Approach	260	3.0		0.383		12.4	LOS B	1.8	13.6				
East: St-Jean													
Lane 1	746	3.0	970	0.769	100	9.6	LOS A	9.5	74.2	Full	500	0.0	0.0
Lane 2[d]	746	3.0	970	0.769	100	9.5	LOS A	9.5	74.2	Full	500	0.0	0.0
Approach	1491	3.0		0.769		9.5	LOS A	9.5	74.2				
North: Site Access													
Lane 1[d]	227	3.0	275	0.825	100	30.8	LOS C	5.7	44.4	Full	500	0.0	0.0
Approach	227	3.0		0.825		30.8	LOS C	5.7	44.4				
West: Poupart													
Lane 1	301	3.0	1158	0.259	100	5.6	LOS A	1.5	11.5	Full	500	0.0	0.0
Lane 2[d]	301	3.0	1158	0.259	100	4.5	LOS A	1.5	11.5	Full	500	0.0	0.0
Approach	601	3.0		0.259		5.1	LOS A	1.5	11.5				
Intersection	2579	3.0		0.825		10.6	LOS B	9.5	74.2				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: Poupart Extension AM (Build-out)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Poupart													
Lane 1	927	3.0	1203	0.770	100	4.6	LOS A	10.8	84.5	Full	500	0.0	0.0
Lane 2[d]	927	3.0	1203	0.770	100	4.6	LOS A	10.8	84.5	Full	500	0.0	0.0
Approach	1854	3.0		0.770		4.6	LOS A	10.8	84.5				
North: Poupart													
Lane 1[d]	136	3.0	379	0.358	100	18.7	LOS B	1.6	12.6	Full	500	0.0	0.0
Approach	136	3.0		0.358		18.7	LOS B	1.6	12.6				
West: Poupart Extension													
Lane 1	255	3.0	1091	0.234	100	5.3	LOS A	1.3	10.0	Full	500	0.0	0.0
Lane 2[d]	255	3.0	1091	0.234	100	4.8	LOS A	1.3	10.0	Full	500	0.0	0.0
Approach	510	3.0		0.234		5.1	LOS A	1.3	10.0				
Intersection	2500	3.0		0.770		5.5	LOS A	10.8	84.5				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Dr Corbeil AM (Ultimate)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	425	3.0	992	0.428	100	5.5	LOS A	3.1	24.3	Full	500	0.0	0.0
Approach	425	3.0		0.428		5.5	LOS A	3.1	24.3				
East: Dr. Corbeil													
Lane 1[d]	390	3.0	767	0.509	100	10.1	LOS B	3.8	29.6	Full	500	0.0	0.0
Approach	390	3.0		0.509		10.1	LOS B	3.8	29.6				
North: St-Jean													
Lane 1[d]	287	3.0	968	0.296	100	7.3	LOS A	2.0	15.2	Full	500	0.0	0.0
Approach	287	3.0		0.296		7.3	LOS A	2.0	15.2				
Intersection	1102	3.0		0.509		7.6	LOS A	3.8	29.6				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Morris Village Access AM (Build-out)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Morris Village Access													
Lane 1[d]	887	3.0	1167	0.760	100	14.7	LOS B	10.2	79.7	Full	500	0.0	0.0
Lane 2	145	3.0	1167	0.124	100	4.8	LOS A	0.7	5.1	Short	60	0.0	NA
Approach	1032	3.0		0.760		13.3	LOS B	10.2	79.7				
East: St-Jean													
Lane 1	167	3.0	444	0.377	100	13.8	LOS B	2.7	21.4	Full	500	0.0	0.0
Lane 2[d]	204	3.0	542	0.377	100	10.1	LOS B	2.9	23.0	Short	60	0.0	NA
Approach	372	3.0		0.377		11.8	LOS B	2.9	23.0				
West: St-Jean													
Lane 1[d]	252	3.0	1357	0.186	100	3.6	LOS A	1.3	9.8	Full	500	0.0	0.0
Lane 2	297	3.0	1357	0.219	100	3.9	LOS A	1.5	12.0	Full	500	0.0	0.0
Approach	549	3.0		0.219		3.8	LOS A	1.5	12.0				
Intersection	1952	3.0		0.760		10.3	LOS B	10.2	79.7				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Poupart AM (Build-out)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	515	3.0	904	0.570	100	13.0	LOS B	4.2	32.4	Full	500	0.0	0.0
Lane 2	227	3.0	937	0.243	100	5.5	LOS A	1.2	9.2	Short	60	0.0	NA
Approach	742	3.0		0.570		10.7	LOS B	4.2	32.4				
East: St-Jean													
Lane 1	604	3.0	738	0.818	100	20.0	LOS C	11.1	86.3	Full	500	0.0	0.0
Lane 2[d]	604	3.0	738	0.818	100	16.6	LOS B	11.1	86.3	Full	500	0.0	0.0
Approach	1208	3.0		0.818		18.3	LOS B	11.1	86.3				
North: Site Access													
Lane 1[d]	249	3.0	253	0.983	100	62.1	LOS E	10.8	83.8	Full	500	0.0	0.0
Approach	249	3.0		0.983		62.1	LOS E	10.8	83.8				
West: Poupart													
Lane 1	278	3.0	801	0.347	100	7.9	LOS A	2.1	16.2	Full	500	0.0	0.0
Lane 2[d]	278	3.0	801	0.347	100	6.9	LOS A	2.1	16.2	Full	500	0.0	0.0
Approach	557	3.0		0.347		7.4	LOS A	2.1	16.2				
Intersection	2755	3.0		0.983		18.0	LOS B	11.1	86.3				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	13	66	1137	19	96	1718
Future Volume (vph)	13	66	1137	19	96	1718
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	30.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.887		0.997			
Flt Protected	0.992				0.950	
Satd. Flow (prot)	1672	0	3564	0	1671	3574
Flt Permitted	0.992				0.204	
Satd. Flow (perm)	1672	0	3564	0	359	3574
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	72		4			
Link Speed (k/h)	50		50			50
Link Distance (m)	196.2		558.9			401.7
Travel Time (s)	14.1		40.2			28.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	8%	1%
Adj. Flow (vph)	14	72	1236	21	104	1867
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	0	1257	0	104	1867
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Perm		NA		Perm	NA
Protected Phases			2			6

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8				6	
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	23.0		23.0		23.0	23.0
Total Split (s)	24.0		96.0		96.0	96.0
Total Split (%)	20.0%		80.0%		80.0%	80.0%
Maximum Green (s)	19.0		91.0		91.0	91.0
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	1.5		1.5		1.5	1.5
Lost Time Adjust (s)	0.0		0.0		0.0	0.0
Total Lost Time (s)	5.0		5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Walk Time (s)	7.0		7.0		7.0	7.0
Flash Dont Walk (s)	11.0		11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0		0	0
Act Effct Green (s)	7.1		50.8		50.8	50.8
Actuated g/C Ratio	0.11		0.80		0.80	0.80
v/c Ratio	0.34		0.44		0.36	0.65
Control Delay	15.4		3.5		7.4	5.4
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	15.4		3.5		7.4	5.4
LOS	B		A		A	A
Approach Delay	15.4		3.5			5.5
Approach LOS	B		A			A

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 63.4			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 5.0		Intersection LOS: A	
Intersection Capacity Utilization 60.6%		ICU Level of Service B	
Analysis Period (min) 15			

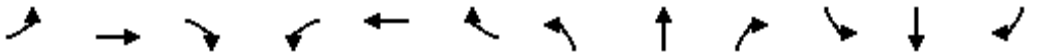
Splits and Phases: 5: Caron & David

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2691	208	72	1495	73	112
Future Volume (vph)	2691	208	72	1495	73	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		85.0	125.0		0.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			70.0		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3505	1599	1752	3539	1805	1615
Flt Permitted			0.047		0.950	
Satd. Flow (perm)	3505	1599	87	3539	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		149				67
Link Speed (k/h)	50			50	50	
Link Distance (m)	470.1			337.0	115.6	
Travel Time (s)	33.8			24.3	8.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	3%	2%	0%	0%
Adj. Flow (vph)	2925	226	78	1625	79	122
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2925	226	78	1625	79	122
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8		2	2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	27.2	27.2	11.2	27.2	23.2	23.2
Total Split (s)	85.0	85.0	11.2	96.2	23.8	23.8
Total Split (%)	70.8%	70.8%	9.3%	80.2%	19.8%	19.8%
Maximum Green (s)	78.8	78.8	5.0	90.0	18.6	18.6
Yellow Time (s)	4.6	4.6	4.6	4.6	3.3	3.3
All-Red Time (s)	1.6	1.6	1.6	1.6	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	5.2	5.2
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0		14.0	9.0	9.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	78.9	78.9	87.7	87.7	18.6	18.6
Actuated g/C Ratio	0.67	0.67	0.74	0.74	0.16	0.16
v/c Ratio	1.25	0.20	0.58	0.62	0.28	0.39
Control Delay	136.2	3.3	30.4	8.3	47.6	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	136.2	3.3	30.4	8.3	47.6	26.1
LOS	F	A	C	A	D	C
Approach Delay	126.7			9.3	34.6	
Approach LOS	F			A	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 117.8			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 83.5		Intersection LOS: F	
Intersection Capacity Utilization 90.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 12: Carmen Bergeron & CR 17

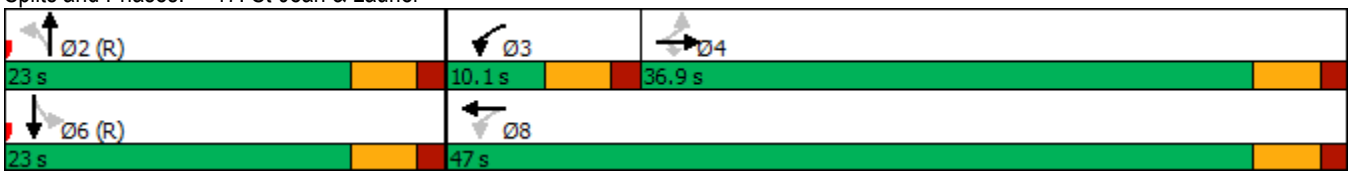


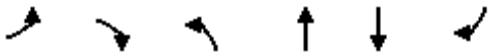
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	406	394	162	341	14	257	13	153	20	11	17
Future Volume (vph)	9	406	394	162	341	14	257	13	153	20	11	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		10.0	0.0		0.0	20.0		0.0	10.0		0.0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			10.0			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.996			0.862			0.910	
Flt Protected		0.999			0.985		0.950			0.950		
Satd. Flow (prot)	0	1898	1568	0	1861	0	1752	1638	0	1805	1729	0
Flt Permitted		0.987			0.518		0.738			0.616		
Satd. Flow (perm)	0	1875	1568	0	978	0	1361	1638	0	1170	1729	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			202		4			166			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		549.0			622.7			441.7			187.4	
Travel Time (s)		39.5			44.8			31.8			13.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	3%	0%	0%	7%	3%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	441	428	176	371	15	279	14	166	22	12	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	451	428	0	562	0	279	180	0	22	30	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Minimum Split (s)	23.0	23.0	23.0	10.1	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	36.9	36.9	36.9	10.1	47.0		23.0	23.0		23.0	23.0	
Total Split (%)	52.7%	52.7%	52.7%	14.4%	67.1%		32.9%	32.9%		32.9%	32.9%	
Maximum Green (s)	31.9	31.9	31.9	5.1	42.0		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Walk Time (s)	7.0	7.0	7.0		7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0		0	0		0	0	
Act Effct Green (s)		31.9	31.9		42.0		18.0	18.0		18.0	18.0	
Actuated g/C Ratio		0.46	0.46		0.60		0.26	0.26		0.26	0.26	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.53	0.52		0.86		0.80	0.33		0.07	0.07	
Control Delay		16.5	9.4		26.5		44.0	6.6		20.6	12.8	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		16.5	9.4		26.5		44.0	6.6		20.6	12.8	
LOS		B	A		C		D	A		C	B	
Approach Delay		13.0			26.5			29.3			16.1	
Approach LOS		B			C			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Pretimed			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 20.8		Intersection LOS: C	
Intersection Capacity Utilization 83.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 17: St-Jean & Laurier



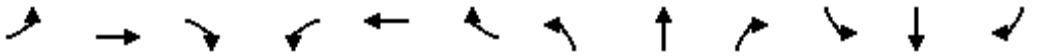


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	107	147	114	1106	1691	110
Future Volume (vph)	107	147	114	1106	1691	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	40.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt	0.922				0.991	
Flt Protected	0.979		0.950			
Satd. Flow (prot)	1715	0	1805	3610	3578	0
Flt Permitted	0.979		0.058			
Satd. Flow (perm)	1715	0	110	3610	3578	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	51				10	
Link Speed (k/h)	50			50	50	
Link Distance (m)	1482.6			401.7	1080.0	
Travel Time (s)	106.7			28.9	77.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	116	160	124	1202	1838	120
Shared Lane Traffic (%)						
Lane Group Flow (vph)	276	0	124	1202	1958	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1		1	2	2	
Detector Template	Left		Left	Thru	Thru	
Leading Detector (m)	2.0		2.0	10.0	10.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	
Detector 1 Size(m)	2.0		2.0	0.6	0.6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Perm		pm+pt	NA	NA	
Protected Phases			5	2	6	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases	4		2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.0		10.0	23.0	23.0	
Total Split (s)	28.0		13.0	92.0	79.0	
Total Split (%)	23.3%		10.8%	76.7%	65.8%	
Maximum Green (s)	23.0		8.0	87.0	74.0	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.5		1.5	1.5	1.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.0	5.0	5.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	None		None	Min	Min	
Walk Time (s)	7.0			7.0	7.0	
Flash Dont Walk (s)	11.0			11.0	11.0	
Pedestrian Calls (#/hr)	0			0	0	
Act Effct Green (s)	18.8		77.2	77.2	64.0	
Actuated g/C Ratio	0.18		0.73	0.73	0.60	
v/c Ratio	0.80		0.59	0.46	0.91	
Control Delay	53.8		29.5	6.8	26.0	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	53.8		29.5	6.8	26.0	
LOS	D		C	A	C	
Approach Delay	53.8			8.9	26.0	
Approach LOS	D			A	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 106.3			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 21.8		Intersection LOS: C	
Intersection Capacity Utilization 84.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 21: Caron & Dr. Corbeil



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	250	341	48	157	217	242	870	78	349	1275	108
Future Volume (vph)	69	250	341	48	157	217	242	870	78	349	1275	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		125.0	30.0		120.0	120.0		0.0	120.0		40.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850			0.850		0.988				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3497	0	1770	3539	1583
Flt Permitted	0.365			0.592			0.105			0.119		
Satd. Flow (perm)	680	1863	1583	1103	1863	1583	196	3497	0	222	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			284			236		10				131
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.3			276.0			177.7			558.9	
Travel Time (s)		12.9			19.9			12.8			40.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	272	371	52	171	236	263	946	85	379	1386	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	272	371	52	171	236	263	1031	0	379	1386	117
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	23.0	23.0	23.0	23.0	23.0	10.0	23.0		10.0	23.0	23.0
Total Split (s)	10.0	33.0	33.0	23.0	23.0	23.0	18.0	41.0		26.0	49.0	49.0
Total Split (%)	10.0%	33.0%	33.0%	23.0%	23.0%	23.0%	18.0%	41.0%		26.0%	49.0%	49.0%
Maximum Green (s)	5.0	28.0	28.0	18.0	18.0	18.0	13.0	36.0		21.0	44.0	44.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	Max
Walk Time (s)		7.0	7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)		0	0	0	0	0		0			0	0
Act Effct Green (s)	22.0	22.0	22.0	14.3	14.3	14.3	50.3	38.0		61.1	44.3	44.3
Actuated g/C Ratio	0.23	0.23	0.23	0.15	0.15	0.15	0.54	0.41		0.65	0.47	0.47
v/c Ratio	0.34	0.62	0.63	0.31	0.60	0.54	0.84	0.72		0.84	0.83	0.14
Control Delay	32.5	38.6	13.3	41.7	47.5	9.8	49.2	28.5		38.0	28.1	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	32.5	38.6	13.3	41.7	47.5	9.8	49.2	28.5		38.0	28.1	2.9
LOS	C	D	B	D	D	A	D	C		D	C	A
Approach Delay		24.9			27.5			32.7			28.5	
Approach LOS		C			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 93.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 29.1		Intersection LOS: C	
Intersection Capacity Utilization 82.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 33: Caron & Street No.1

Intersection	
Intersection Delay, s/veh	46.2
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	36	48	31	43	17	59	410	28	33	578	9
Future Vol, veh/h	16	36	48	31	43	17	59	410	28	33	578	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	3	2	0	0	0	2	1	0	0	1	0
Mvmt Flow	17	39	52	34	47	18	64	446	30	36	628	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.4	12.4	33.7	66.7
HCM LOS	B	B	D	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	16%	34%	5%
Vol Thru, %	82%	36%	47%	93%
Vol Right, %	6%	48%	19%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	497	100	91	620
LT Vol	59	16	31	33
Through Vol	410	36	43	578
RT Vol	28	48	17	9
Lane Flow Rate	540	109	99	674
Geometry Grp	1	1	1	1
Degree of Util (X)	0.856	0.217	0.201	1.03
Departure Headway (Hd)	5.703	7.331	7.485	5.504
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	627	492	483	654
Service Time	3.802	5.331	5.485	3.596
HCM Lane V/C Ratio	0.861	0.222	0.205	1.031
HCM Control Delay	33.7	12.4	12.4	66.7
HCM Lane LOS	D	B	B	F
HCM 95th-tile Q	9.6	0.8	0.7	17

Intersection	
Intersection Delay, s/veh	11.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	123	55	232	9	24	17	121	79	14	22	71	99
Future Vol, veh/h	123	55	232	9	24	17	121	79	14	22	71	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	11	0	0	0	0	0	0	2	0
Mvmt Flow	134	60	252	10	26	18	132	86	15	24	77	108
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	11.8	9.6	11.7	10.6
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	57%	100%	0%	18%	11%
Vol Thru, %	37%	0%	19%	48%	37%
Vol Right, %	7%	0%	81%	34%	52%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	214	123	287	50	192
LT Vol	121	123	0	9	22
Through Vol	79	0	55	24	71
RT Vol	14	0	232	17	99
Lane Flow Rate	233	134	312	54	209
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.36	0.234	0.453	0.089	0.305
Departure Headway (Hd)	5.567	6.304	5.225	5.923	5.265
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	647	571	689	604	682
Service Time	3.6	4.033	2.954	3.969	3.3
HCM Lane V/C Ratio	0.36	0.235	0.453	0.089	0.306
HCM Control Delay	11.7	11	12.2	9.6	10.6
HCM Lane LOS	B	B	B	A	B
HCM 95th-tile Q	1.6	0.9	2.4	0.3	1.3

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	42	3	18	29	125	0	49	31	51	68	21
Future Vol, veh/h	17	42	3	18	29	125	0	49	31	51	68	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	33	0	0	0	0	2	0	0	1	19
Mvmt Flow	18	46	3	20	32	136	0	53	34	55	74	23
Number of Lanes	1	1	0	1	1	0	0	2	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	8.5	8.6	8.1	9.2
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%	43%	0%
Vol Thru, %	100%	35%	0%	93%	0%	19%	57%	0%
Vol Right, %	0%	65%	0%	7%	0%	81%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	33	47	17	45	18	154	119	21
LT Vol	0	0	17	0	18	0	51	0
Through Vol	33	16	0	42	0	29	68	0
RT Vol	0	31	0	3	0	125	0	21
Lane Flow Rate	36	51	18	49	20	167	129	23
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.052	0.069	0.03	0.071	0.031	0.214	0.194	0.029
Departure Headway (Hd)	5.309	4.813	5.792	5.242	5.685	4.612	5.413	4.512
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	673	742	618	682	630	778	662	792
Service Time	3.051	2.555	3.531	2.981	3.417	2.344	3.152	2.25
HCM Lane V/C Ratio	0.053	0.069	0.029	0.072	0.032	0.215	0.195	0.029
HCM Control Delay	8.3	7.9	8.7	8.4	8.6	8.6	9.5	7.4
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.1	0.2	0.1	0.8	0.7	0.1

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	66	202	22	60	94	91	25	13	102	106	13	53
Future Vol, veh/h	66	202	22	60	94	91	25	13	102	106	13	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	300	-	-	350	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	72	220	24	65	102	99	27	14	111	115	14	58

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	201	0	0	244	0	0	694	707	232	721	670	152
Stage 1	-	-	-	-	-	-	376	376	-	282	282	-
Stage 2	-	-	-	-	-	-	318	331	-	439	388	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1383	-	-	1334	-	-	360	363	812	345	381	900
Stage 1	-	-	-	-	-	-	649	620	-	729	681	-
Stage 2	-	-	-	-	-	-	698	649	-	601	612	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1383	-	-	1334	-	-	302	327	812	267	344	900
Mov Cap-2 Maneuver	-	-	-	-	-	-	302	327	-	267	344	-
Stage 1	-	-	-	-	-	-	615	588	-	691	648	-
Stage 2	-	-	-	-	-	-	608	617	-	480	580	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.8	1.9	13.7	26.7
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	564	1383	-	-	1334	-	-	348
HCM Lane V/C Ratio	0.27	0.052	-	-	0.049	-	-	0.537
HCM Control Delay (s)	13.7	7.7	-	-	7.8	-	-	26.7
HCM Lane LOS	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1.1	0.2	-	-	0.2	-	-	3

Intersection	
Int Delay, s/veh	11.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	97	675	439	55	87	61
Future Vol, veh/h	97	675	439	55	87	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	734	477	60	95	66

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	537	0	-	0	1451	507
Stage 1	-	-	-	-	507	-
Stage 2	-	-	-	-	944	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1031	-	-	-	144	566
Stage 1	-	-	-	-	605	-
Stage 2	-	-	-	-	378	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1031	-	-	-	119	566
Mov Cap-2 Maneuver	-	-	-	-	119	-
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	378	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	99.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1031	-	-	-	176
HCM Lane V/C Ratio	0.102	-	-	-	0.914
HCM Control Delay (s)	8.9	0	-	-	99.9
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.3	-	-	-	6.9

LANE SUMMARY

Site: Poupart / Site Access PM (Build-out)

New Site
Roundabout

Lane Use and Performance	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	173	3.0	225	0.767	100	33.9	LOS C	4.7	36.4	Full	500	0.0	0.0
Approach	173	3.0		0.767		33.9	LOS C	4.7	36.4				
East: St-Jean													
Lane 1	540	3.0	917	0.589	100	8.2	LOS A	4.7	36.7	Full	500	0.0	0.0
Lane 2[d]	540	3.0	917	0.589	100	7.6	LOS A	4.7	36.7	Full	500	0.0	0.0
Approach	1079	3.0		0.589		7.9	LOS A	4.7	36.7				
North: Site Access													
Lane 1[d]	150	3.0	416	0.360	100	11.5	LOS B	1.7	12.9	Full	500	0.0	0.0
Approach	150	3.0		0.360		11.5	LOS B	1.7	12.9				
West: Poupart													
Lane 1	1004	3.0	1138	0.882	100	7.2	LOS A	16.2	126.6	Full	500	0.0	0.0
Lane 2[d]	1004	3.0	1138	0.882	100	6.1	LOS A	16.2	126.6	Full	500	0.0	0.0
Approach	2009	3.0		0.882		6.6	LOS A	16.2	126.6				
Intersection	3411	3.0		0.882		8.6	LOS A	16.2	126.6				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: Poupart Extension PM (Build-out)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
East: Poupart													
Lane 1	619	3.0	1197	0.517	100	4.4	LOS A	4.7	36.7	Full	500	0.0	0.0
Lane 2[d]	619	3.0	1197	0.517	100	4.4	LOS A	4.7	36.7	Full	500	0.0	0.0
Approach	1238	3.0		0.517		4.4	LOS A	4.7	36.7				
North: Poupart													
Lane 1[d]	382	3.0	533	0.715	100	21.2	LOS C	5.0	39.3	Full	500	0.0	0.0
Approach	382	3.0		0.715		21.2	LOS C	5.0	39.3				
West: Poupart Extension													
Lane 1	821	3.0	871	0.943	100	21.5	LOS C	21.6	168.7	Full	500	0.0	0.0
Lane 2[d]	821	3.0	871	0.943	100	21.3	LOS C	21.6	168.7	Full	500	0.0	0.0
Approach	1642	3.0		0.943		21.4	LOS C	21.6	168.7				
Intersection	3262	3.0		0.943		14.9	LOS B	21.6	168.7				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Dr Corbeil PM (Ultimate)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	518	3.0	753	0.689	100	11.4	LOS B	7.7	59.8	Full	500	0.0	0.0
Approach	518	3.0		0.689		11.4	LOS B	7.7	59.8				
East: Dr. Corbeil													
Lane 1[d]	311	3.0	735	0.423	100	9.5	LOS A	2.9	22.6	Full	500	0.0	0.0
Approach	311	3.0		0.423		9.5	LOS A	2.9	22.6				
North: St-Jean													
Lane 1[d]	735	3.0	976	0.753	100	8.9	LOS A	9.7	75.5	Full	500	0.0	0.0
Approach	735	3.0		0.753		8.9	LOS A	9.7	75.5				
Intersection	1564	3.0		0.753		9.9	LOS A	9.7	75.5				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Morris Village Access PM (Build-out)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Morris Village Access													
Lane 1[d]	586	3.0	1009	0.581	100	14.2	LOS B	5.3	41.4	Full	500	0.0	0.0
Lane 2	79	3.0	1009	0.079	100	5.5	LOS A	0.4	3.4	Short	60	0.0	NA
Approach	665	3.0		0.581		13.1	LOS B	5.3	41.4				
East: St-Jean													
Lane 1	225	3.0	703	0.320	100	12.3	LOS B	2.2	16.8	Full	500	0.0	0.0
Lane 2[d]	260	3.0	814	0.320	100	6.9	LOS A	2.3	17.8	Short	60	0.0	NA
Approach	485	3.0		0.320		9.4	LOS A	2.3	17.8				
West: St-Jean													
Lane 1[d]	413	3.0	1225	0.337	100	4.3	LOS A	2.4	19.0	Full	500	0.0	0.0
Lane 2	945	3.0	1225	0.771	100	5.8	LOS A	10.6	82.6	Full	500	0.0	0.0
Approach	1358	3.0		0.771		5.4	LOS A	10.6	82.6				
Intersection	2508	3.0		0.771		8.2	LOS A	10.6	82.6				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: St-Jean / Poupart PM (Build-out)

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: St-Jean													
Lane 1[d]	477	3.0	471	1.012	100	53.1	LOS F	18.5	144.0	Full	500	0.0	0.0
Lane 2	433	3.0	559	0.774	100	15.1	LOS B	7.0	54.4	Short	60	0.0	NA
Approach	910	3.0		1.012		35.0	LOS D	18.5	144.0				
East: St-Jean													
Lane 1	455	3.0	659	0.691	100	17.6	LOS B	6.9	54.1	Full	500	0.0	0.0
Lane 2[d]	459	3.0	664	0.691	100	13.5	LOS B	7.0	54.3	Full	500	0.0	0.0
Approach	914	3.0		0.691		15.5	LOS B	7.0	54.3				
North: Site Access													
Lane 1[d]	158	3.0	358	0.440	100	14.7	LOS B	2.3	17.6	Full	500	0.0	0.0
Approach	158	3.0		0.440		14.7	LOS B	2.3	17.6				
West: Poupart													
Lane 1	826	3.0	862	0.958	100	25.2	LOS C	23.5	183.3	Full	500	0.0	0.0
Lane 2[d]	826	3.0	862	0.958	100	24.1	LOS C	23.5	183.3	Full	500	0.0	0.0
Approach	1652	3.0		0.958		24.7	LOS C	23.5	183.3				
Intersection	3634	3.0		1.012		24.5	LOS C	23.5	183.3				

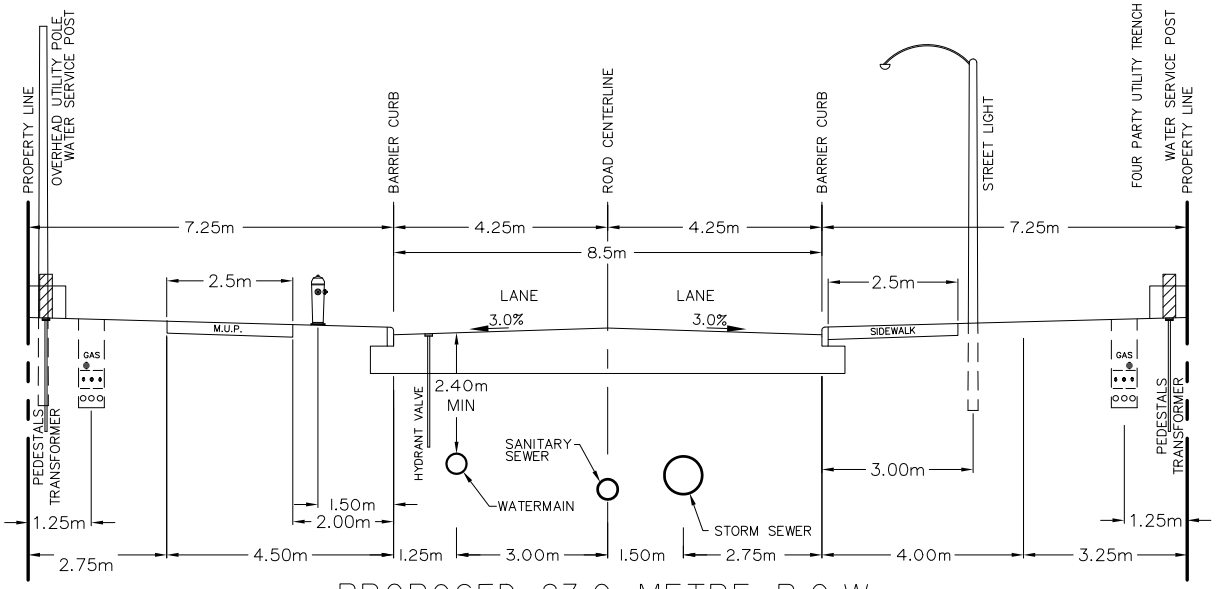
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

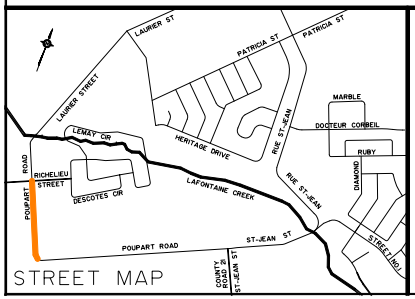
APPENDIX "C"

Typical Cross-Sections

180801-CS1 – Proposed undivided 23.0m R.O.W. (Poupart)
180801-CS2 - Proposed 30.0m divided R.O.W. (Poupart)
180801-CS3 - Proposed 30.0m undivided R.O.W. (St-Jean)
180801-CS4 - Proposed 26.0m undivided R.O.W. (Morris Village)
180801-CS5 - Proposed 26.0m undivided R.O.W. (St-Jean)



PROPOSED 23.0 METRE R.O.W.
POUPART AT WALMART



ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE:
1 : 150
1.5m 0 1.5 3.0 4.5m

CITY OF CLARENCE-ROCKLAND

MORRIS/ROCKLAND
ROAD CROSS-SECTIONS

PLAN

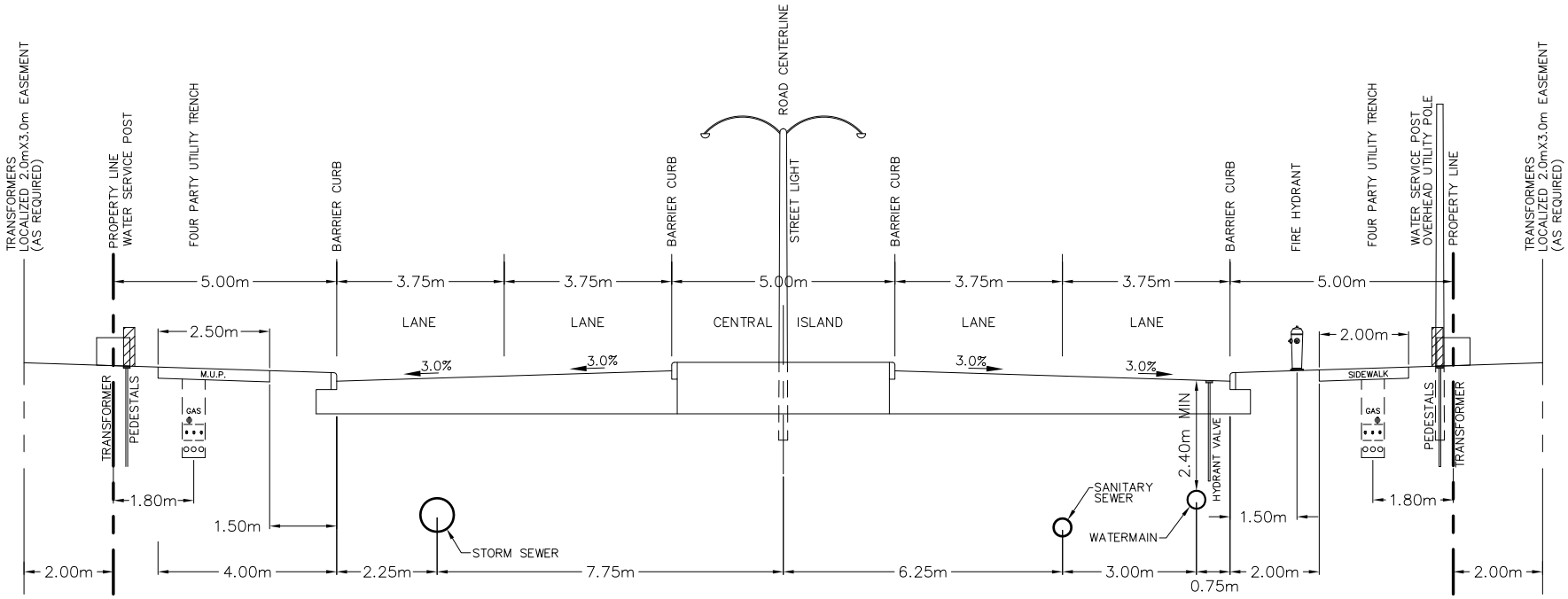
PROPOSED 23.0m R.O.W.
POUPART AT WALMART

CLIENT No.
111

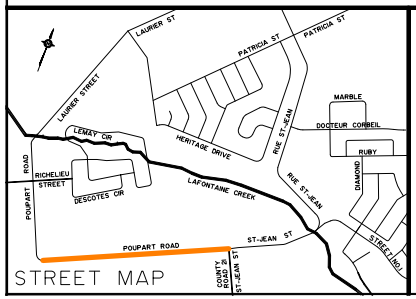
PROJECT No.
180801

DATE
OCTOBER, 2018

DRAWING No.
180801-CS1



PROPOSED 30.0 METRE R.O.W.
DIVIDED



ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE:
1 : 150
1.5m 0 1.5 3.0 4.5m

CITY OF CLARENCE-ROCKLAND

MORRIS/ROCKLAND
ROAD CROSS-SECTIONS

PLAN

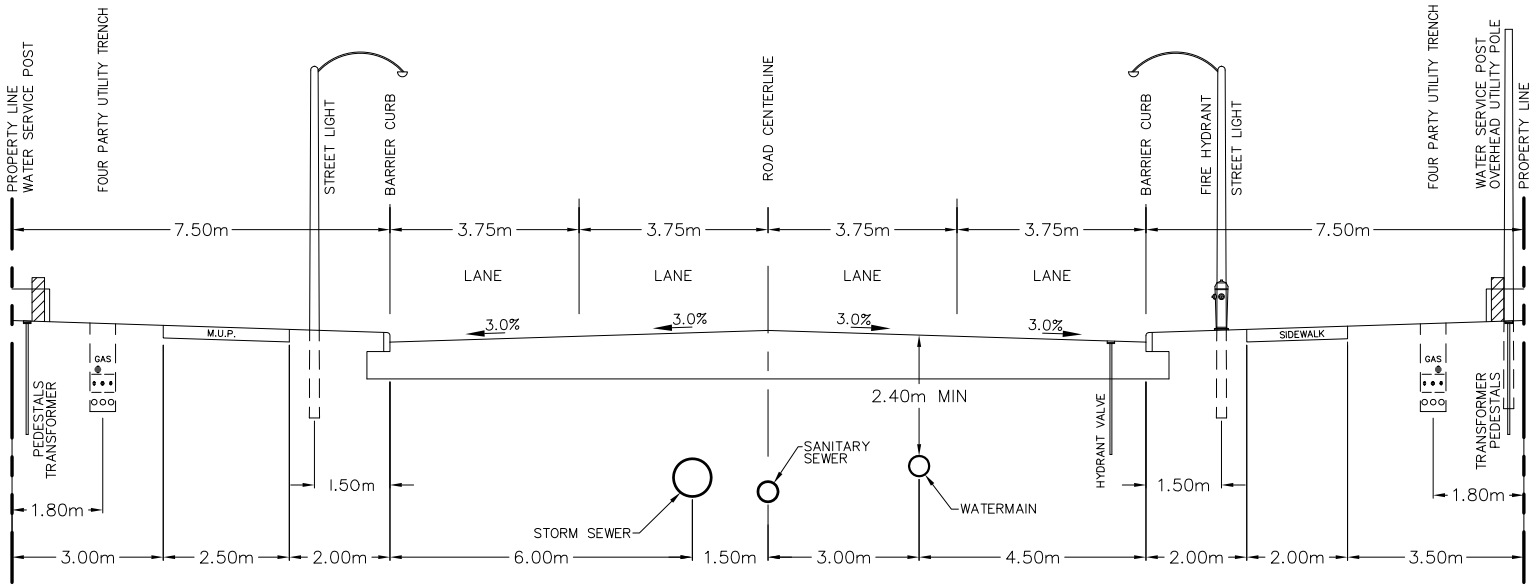
PROPOSED 30.0m R.O.W.
DIVIDED STREET

CLIENT No.
111

PROJECT No.
180801

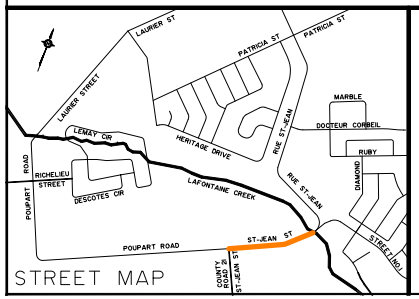
DATE
OCTOBER, 2018

DRAWING No.
180801-CS2



PROPOSED 30.0 METRE R.O.W. - UNDIVIDED

ST-JEAN - HILL



ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE:
1 : 150
1.5m 0 1.5 3.0 4.5m

CITY OF CLARENCE-ROCKLAND

MORRIS/ROCKLAND
ROAD CROSS-SECTIONS

PLAN

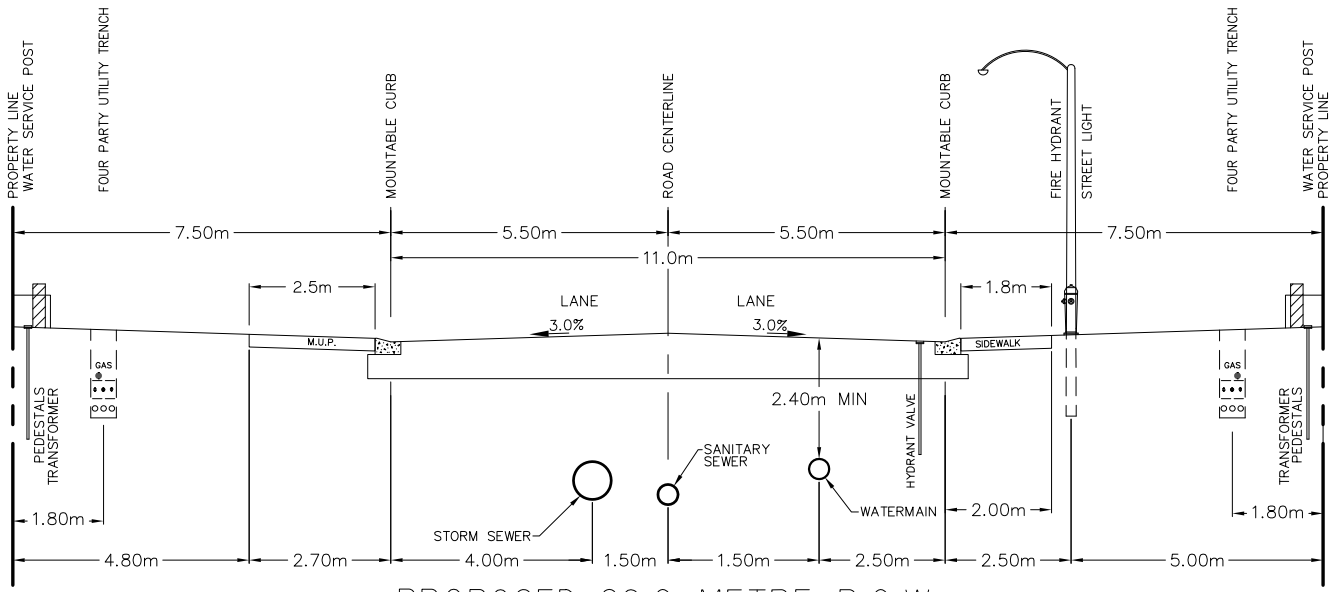
PROPOSED 30.0m R.O.W.
ST-JEAN HILL

CLIENT No.
111

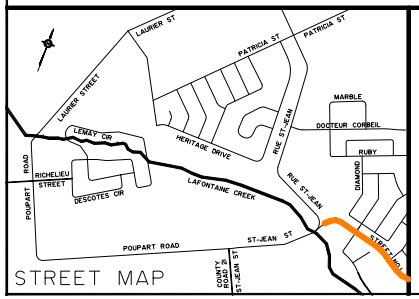
PROJECT No.
180801

DATE
OCTOBER, 2018

DRAWING No.
180801-CS3



PROPOSED 26.0 METRE R.O.W.
STREET No.1 (MORRIS VILLAGE)



STREET MAP

ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE:
1 : 150
1.5m 0 1.5 3.0 4.5m

CITY OF CLARENCE-ROCKLAND

MORRIS/ROCKLAND
ROAD CROSS-SECTIONS

PLAN

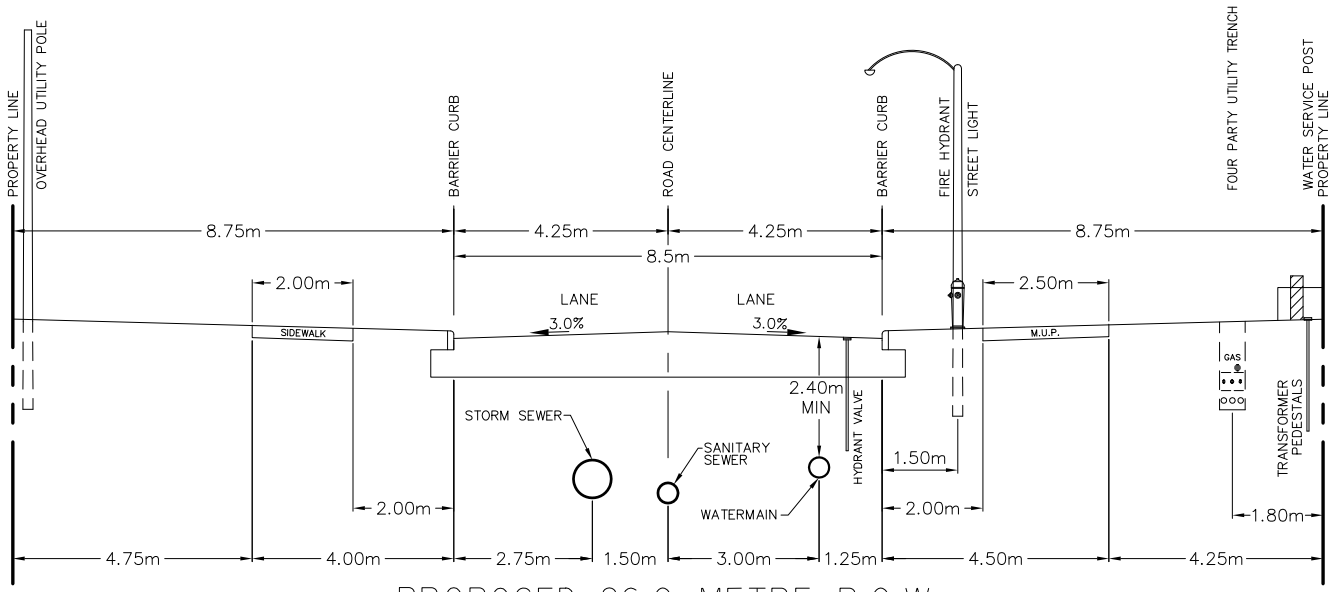
PROPOSED 26.0m R.O.W.
STREET No.1 (MORRIS VILLAGE)

CLIENT No.
111

PROJECT No.
180801

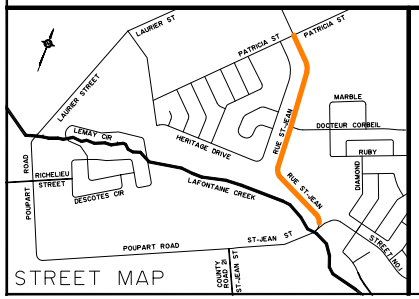
DATE
OCTOBER, 2018

DRAWING No.
180801-CS4



PROPOSED 26.0 METRE R.O.W.

ST-JEAN AT PARK AND POND



STREET MAP

ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE:
1 : 150
1.5m 0 1.5 3.0 4.5m

CITY OF CLARENCE-ROCKLAND

MORRIS/ROCKLAND
ROAD CROSS-SECTIONS

PLAN

PROPOSED 26.0m R.O.W.
ST-JEAN AT PARK AND POND

CLIENT No.
111

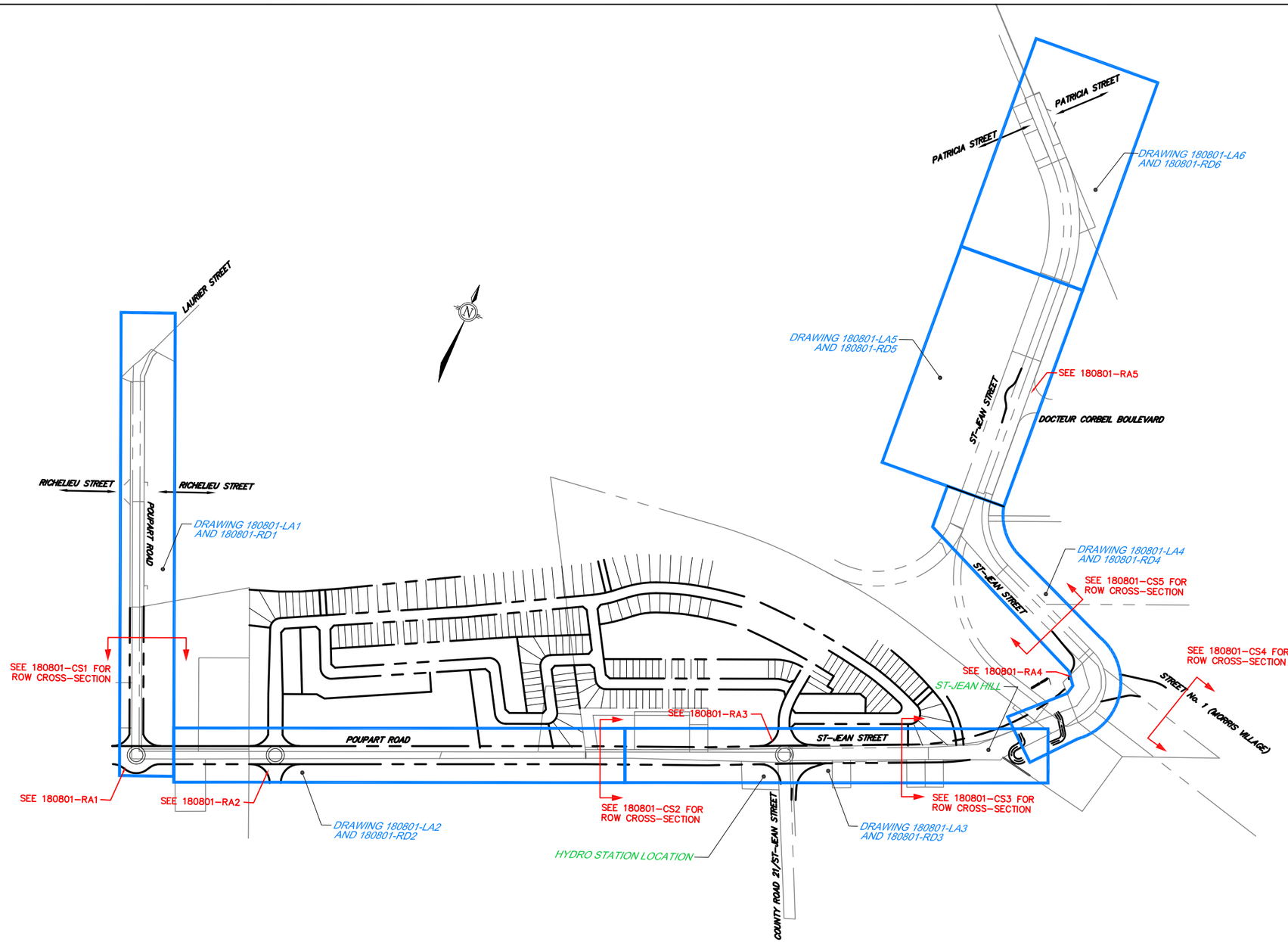
PROJECT No.
180801

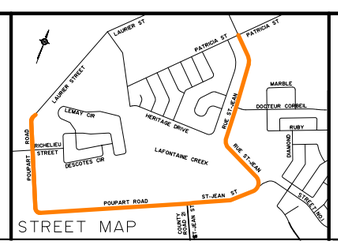
DATE
OCTOBER, 2018

DRAWING No.
180801-CS5

APPENDIX "D"

Reference Plan – 180801-RP1





ATREL Engineering Ltd.
Engineers - Ingénieurs

CITY OF CLARENCE-ROCKLAND

POUPART RD/ ST-JEAN ST

CLIENT No.: III

PROJECT No.: 180801

SCALE: N.T.S.

PLAN: REFERENCE PLAN

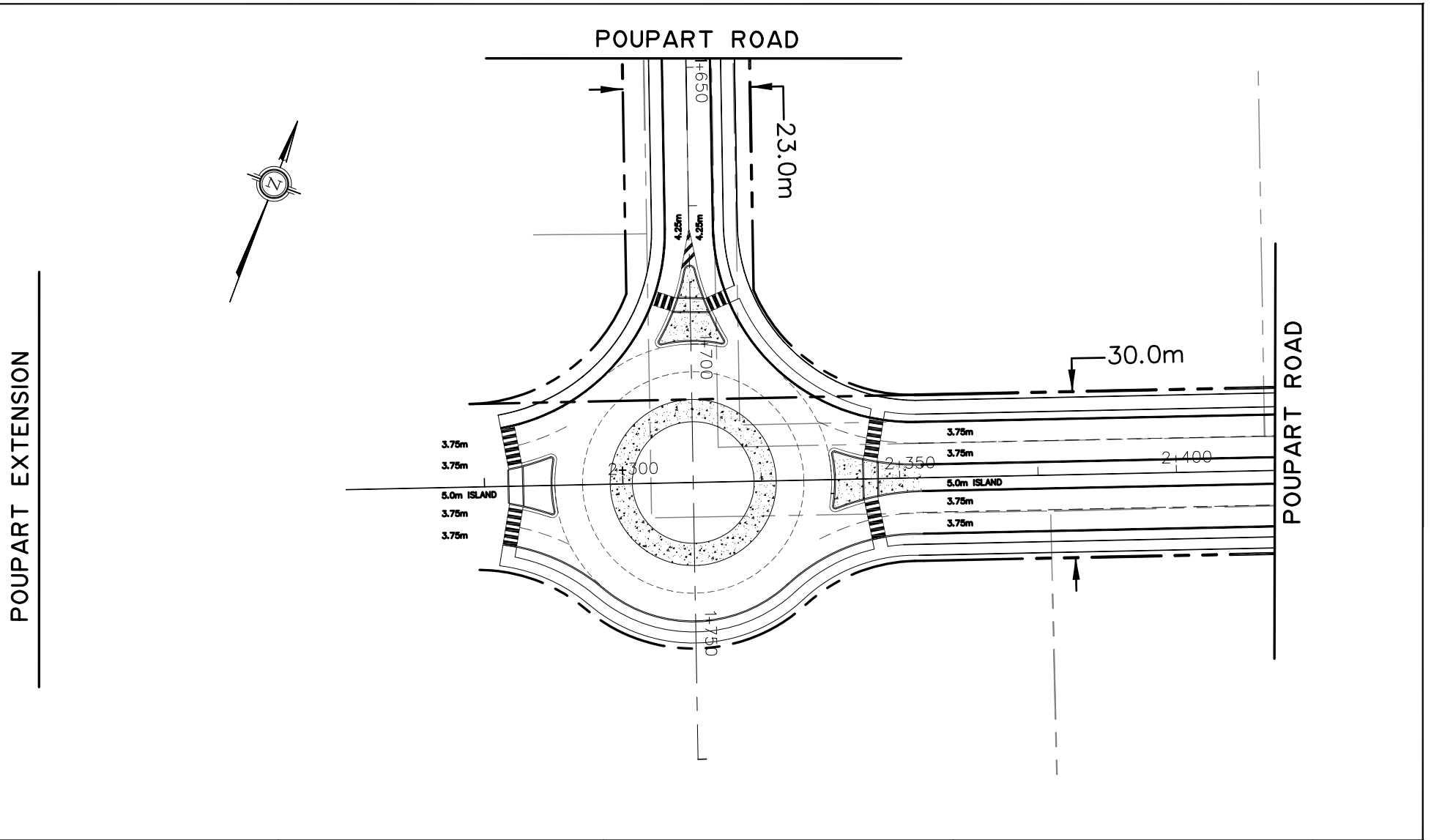
DATE: OCTOBER, 2018

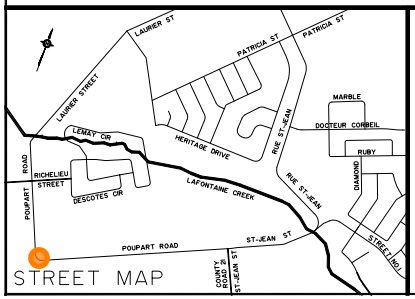
DRAWING No.: 180801-RPI

APPENDIX "E"

Roundabout Schematic Plans

180801-RA1 (Poupart)
180801-RA2 (Poupart/Brigil)
180801-RA3 (Poupart/Brigil/St-Jean)
180801-RA4 (St-Jean/Morris)
180801-RA5 (St-Jean/Dr. Corbeil)





ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE: 1 : 1000
10m 0 10 20 30m

CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN
ROUNDABOUT SCHEMATIC

PLAN

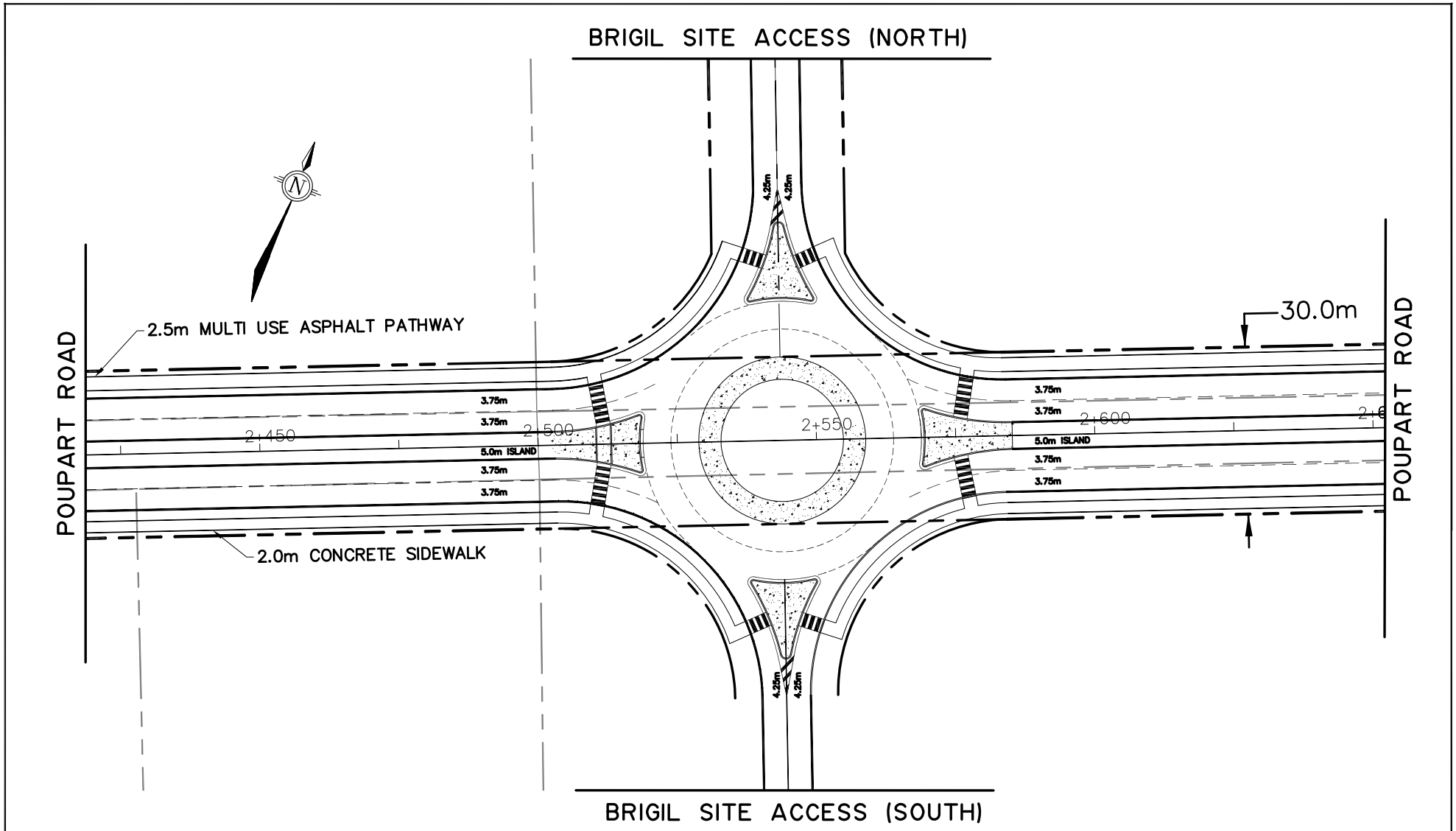
INTERSECTION AT POUPART ROAD EXTENSION

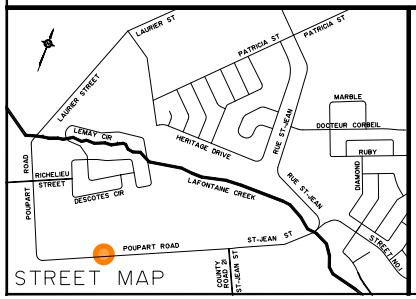
CLIENT No.
111

PROJECT No.
180801

DATE
OCTOBER, 2018

DRAWING No.
180801-RAI





ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE: 1 : 1000
10m 0 10 20 30m

CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN ROUNDABOUT SCHEMATIC

PLAN

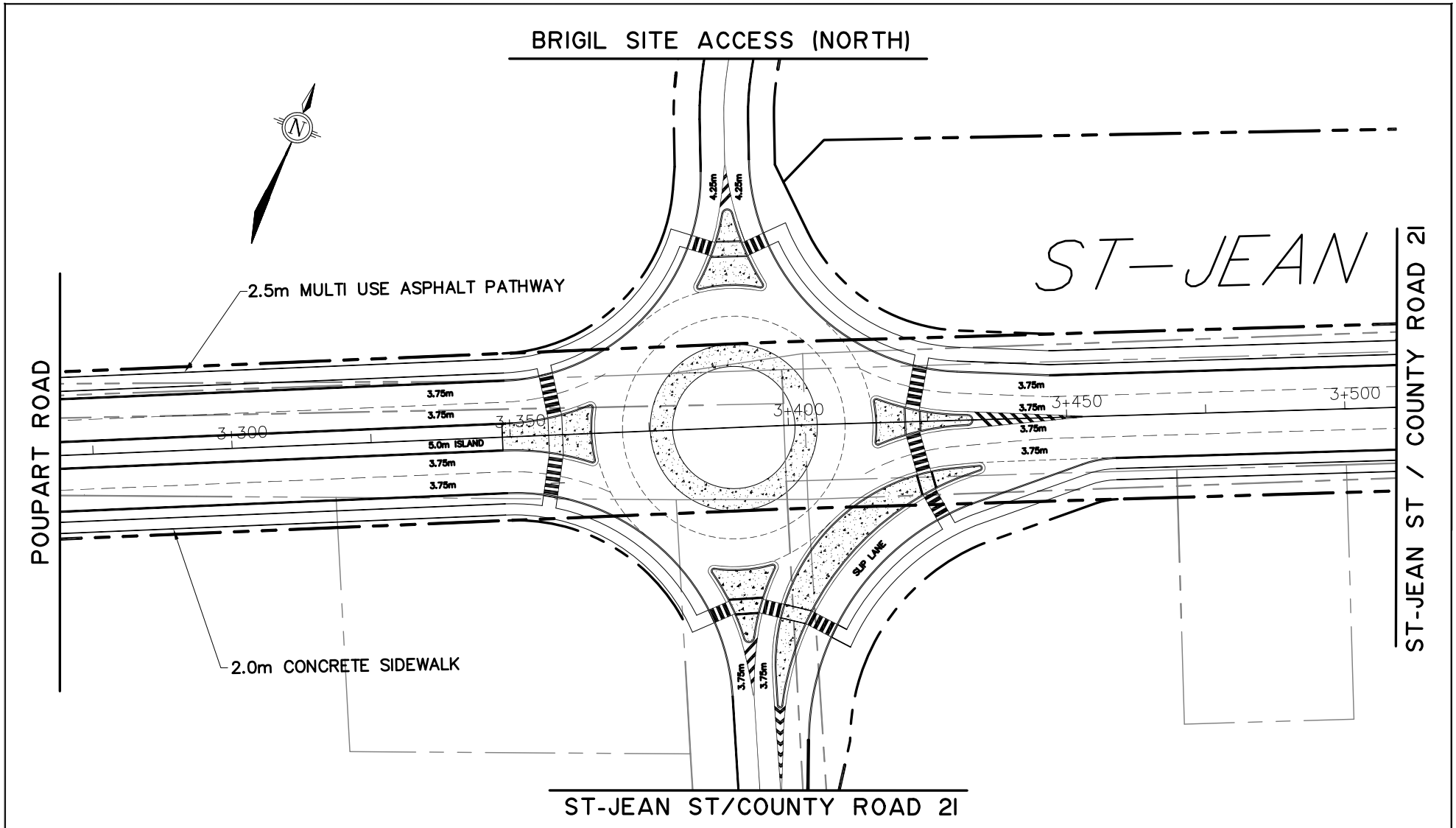
INTERSECTION AT POUPART ROAD AND BRIGIL SITE ACCESS

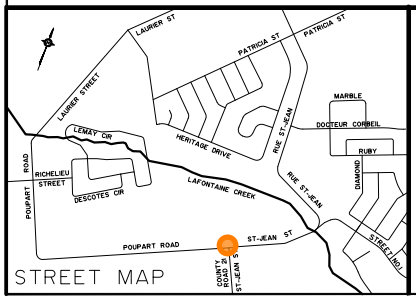
CLIENT No. III

PROJECT No. 180801

DATE OCTOBER, 2018

DRAWING No. 180801-RA2





STREET MAP

ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE: 1 : 1000
10m 0 10 20 30m

CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN ROUNDABOUT SCHEMATIC

PLAN

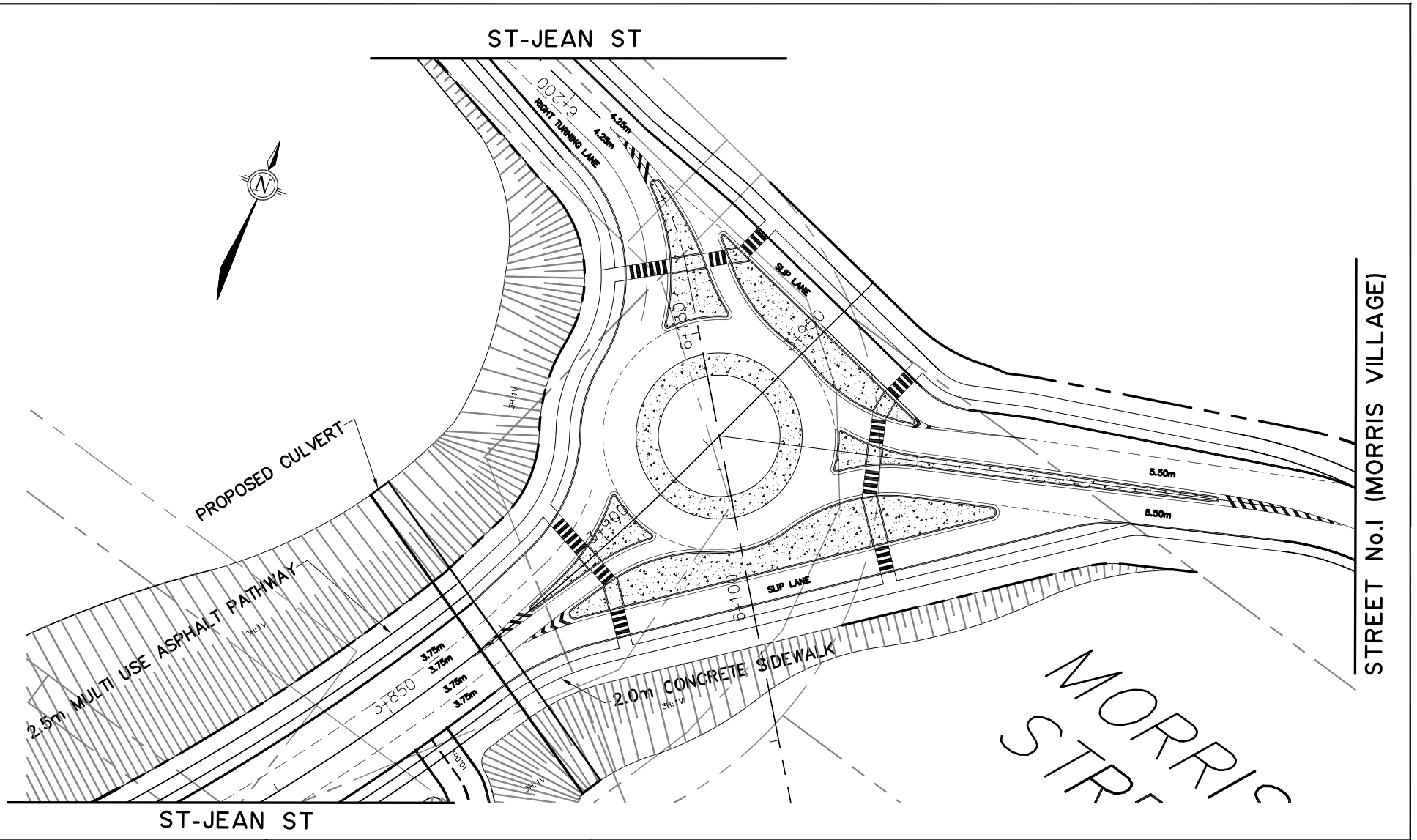
INTERSECTION AT POUPART ROAD AND ST-JEAN ST

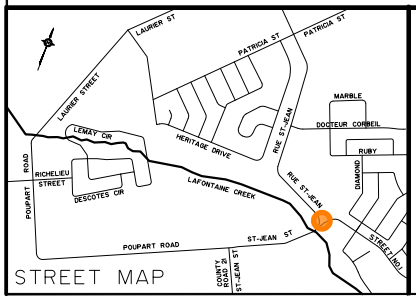
CLIENT No.
111

PROJECT No.
180801

DATE
OCTOBER, 2018

DRAWING No.
180801-RA3





ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE: 1 : 1000
10m 0 10 20 30m

CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN ROUNDABOUT SCHEMATIC

PLAN

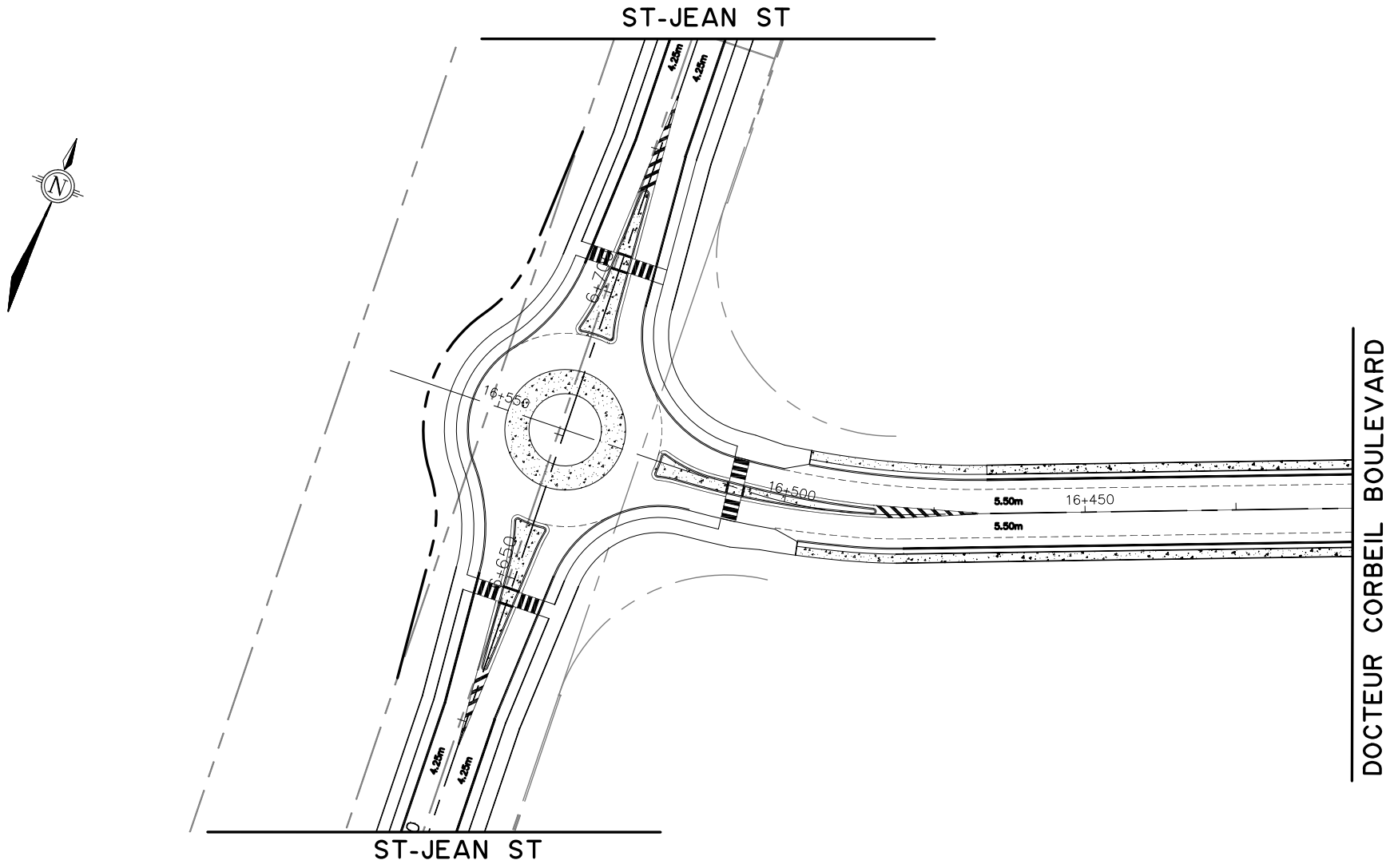
INTERSECTION AT ST-JEAN STREET AND STREET No. 1 (MORRIS VILLAGE)

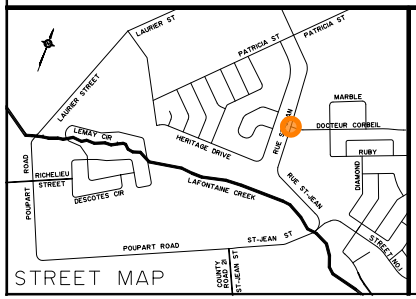
CLIENT No.: III

PROJECT No.: 180801

DATE: OCTOBER, 2018

DRAWING No.: 180801-RA4





ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE: 1 : 1000
10m 0 10 20 30m

CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN
ROUNDABOUT SCHEMATIC

PLAN

INTERSECTION AT ST-JEAN STREET
AND DR CORBEIL BOULEVARD

CLIENT No.
111

PROJECT No.
180801

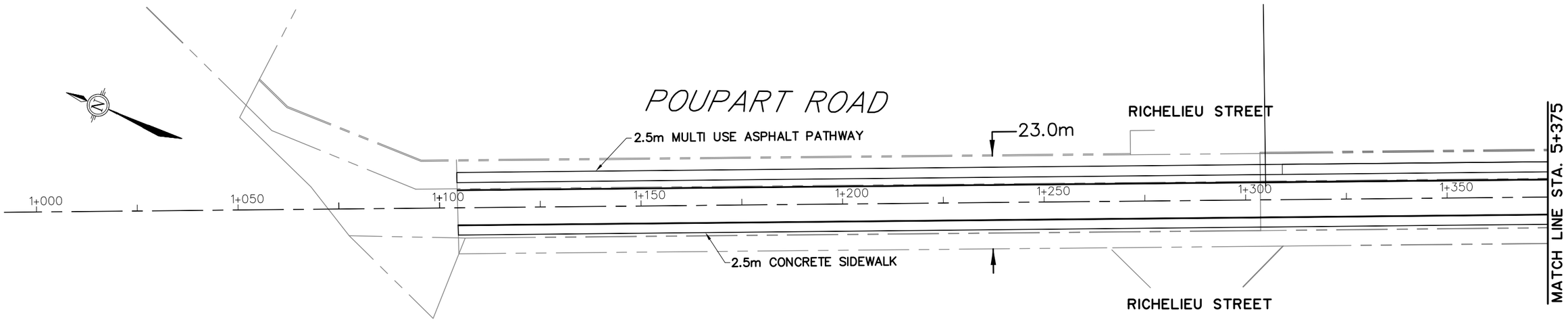
DATE
OCTOBER, 2018

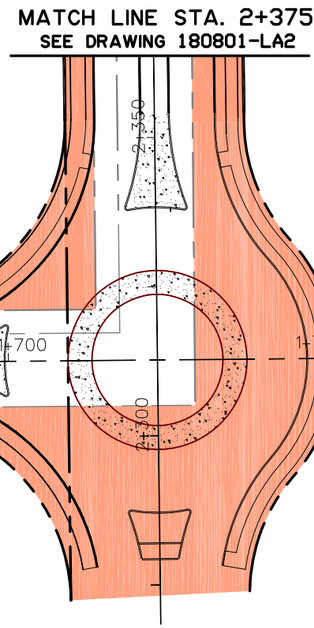
DRAWING No.
180801-RA5

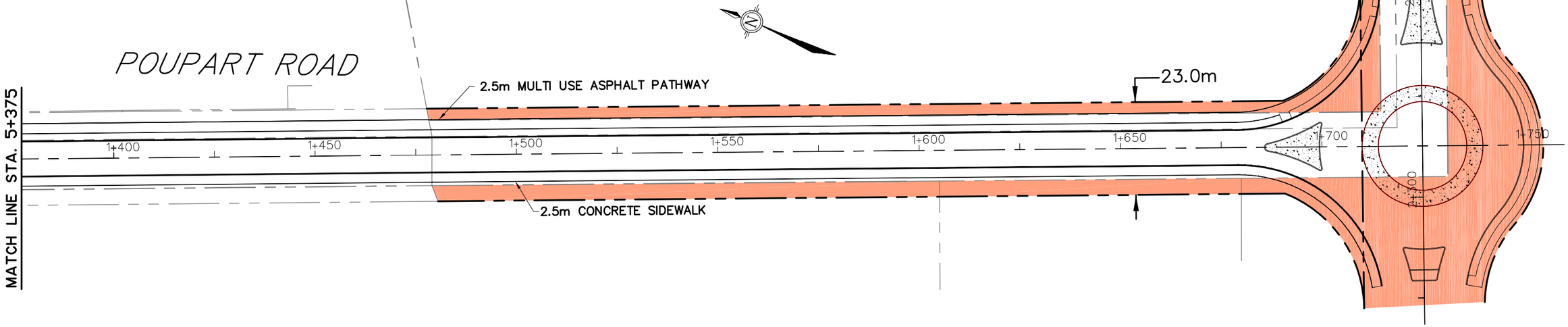
APPENDIX "F"

Land Acquisition Preliminary Plans

180801-LA1 (Poupart)
180801-LA2 (Poupart)
180801-LA3 (Poupart/St-Jean)
180801-LA4 (St-Jean)
180801-LA5 (St-Jean)
180801-LA6 (St-Jean)





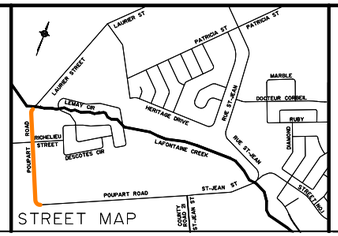


NOTES:

1- EXACT RIGHT OF WAY (R.O.W.) WIDTH "REQUIREMENT" TO BE SURVEYED BY OLS.

LEGEND:

LAND ACQUISITION REQUIREMENT



ATREL Engineering Ltd.
Engineers - Ingénieurs

SCALE:
1 : 1000
10m 0 10 20 30m

CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN
LAND ACQUISITION PLAN

PLAN

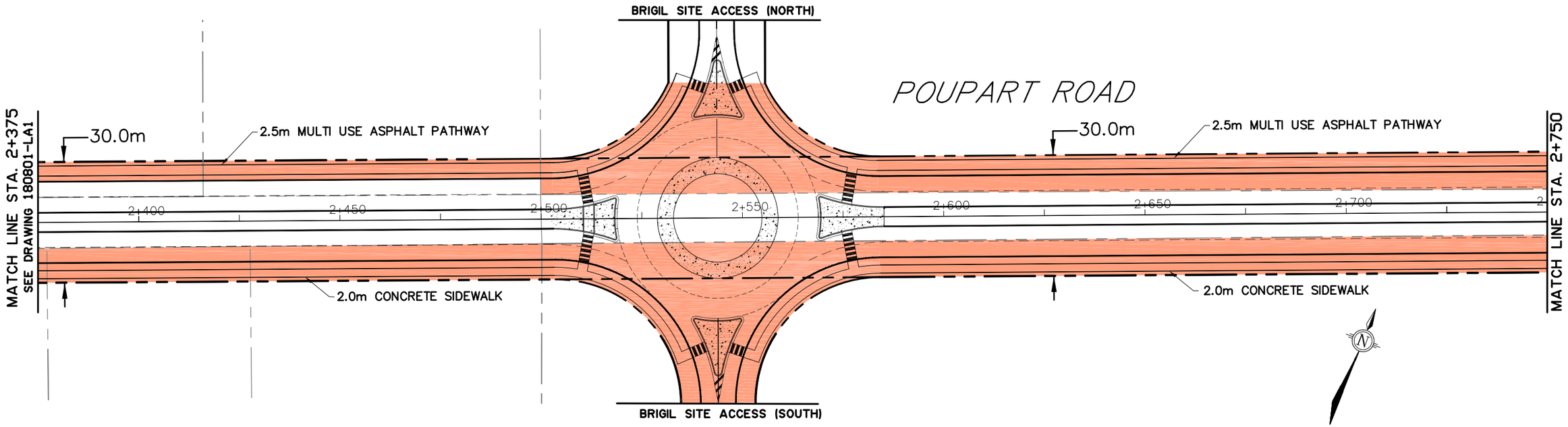
POUPART ROAD
STATION 1+000 TO STATION 2+375

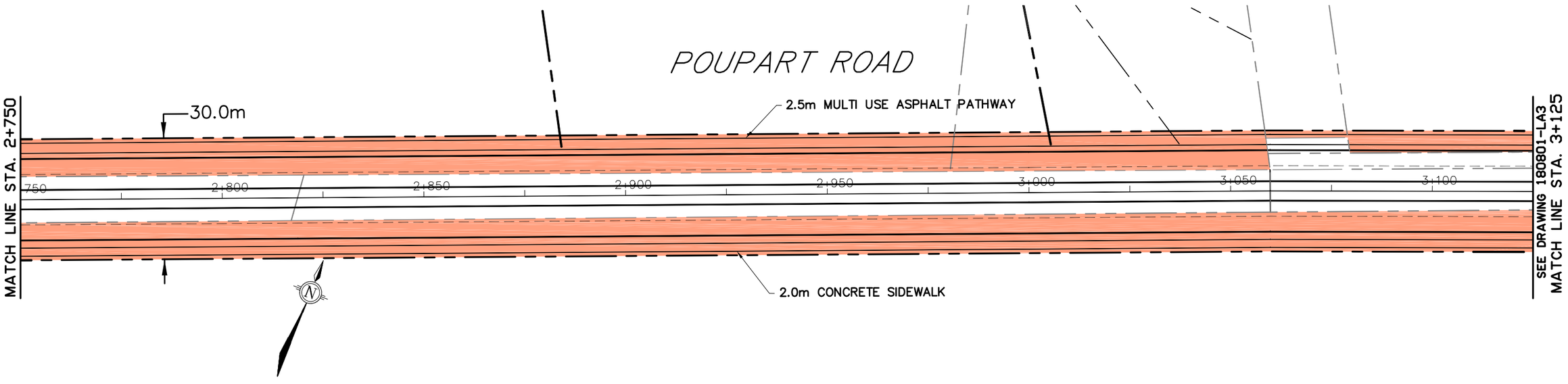
CLIENT No.
111

PROJECT No.
180801

DATE
OCTOBER, 2018

DRAWING No.
180801-LA1



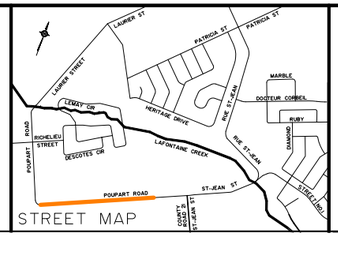


NOTES:

1– EXACT RIGHT OF WAY (R.O.W.) WIDTH "REQUIREMENT" TO BE SURVEYED BY OLS.

LEGEND:

LAND ACQUISITION REQUIREMENT



ATREL Engineering Ltd.
Engineers - Ingénieurs

SCALE:
1 : 1000
10m 0 10 20 30m

CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN
LAND ACQUISITION PLAN

PLAN

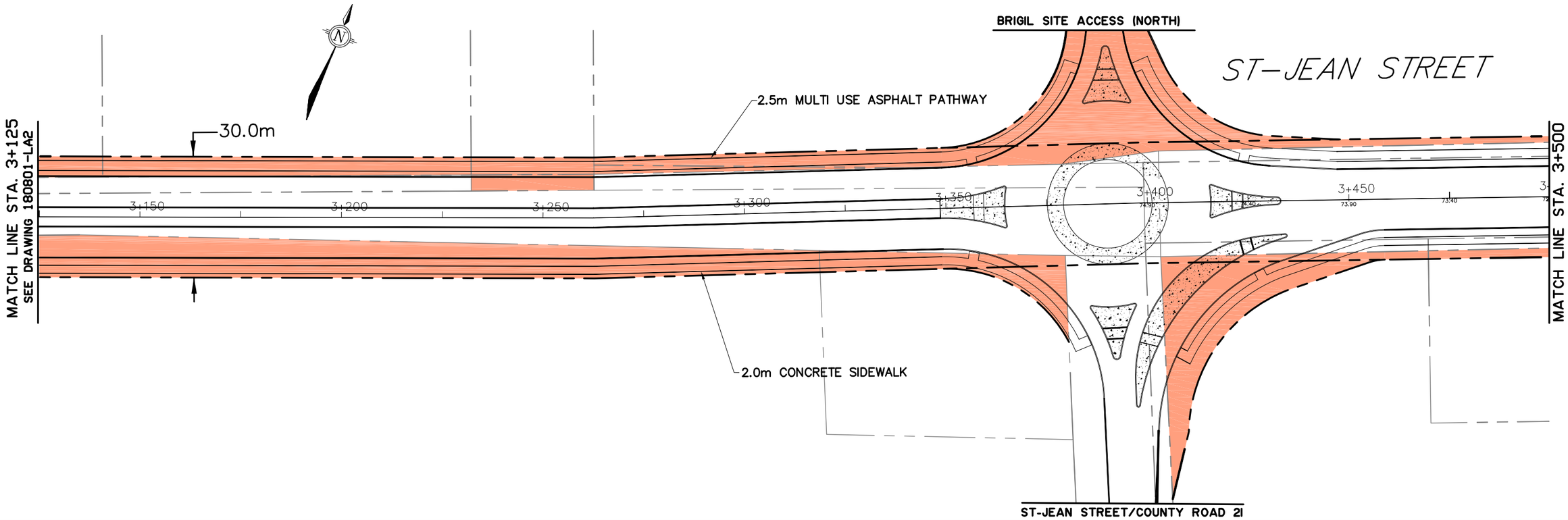
POUPART ROAD
STATION 2+375 TO STATION 3+125

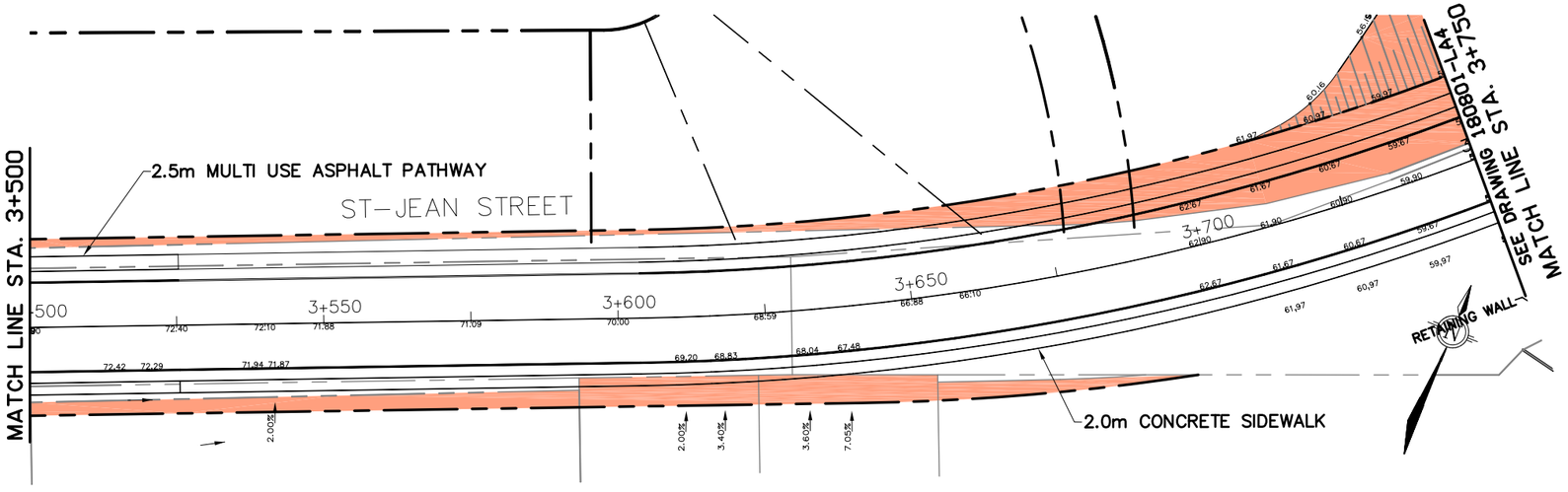
CLIENT No.
111

PROJECT No.
180801

DATE
OCTOBER, 2018

DRAWING No.
180801-LA2



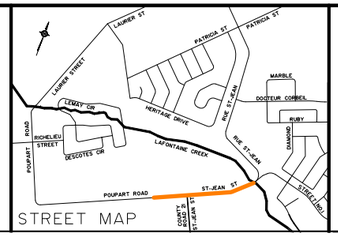


NOTES:

1- EXACT RIGHT OF WAY (R.O.W.) WIDTH "REQUIREMENT" TO BE SURVEYED BY OLS.

LEGEND:

LAND ACQUISITION REQUIREMENT



ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE:
1 : 1000
10m 0 10 20 30m

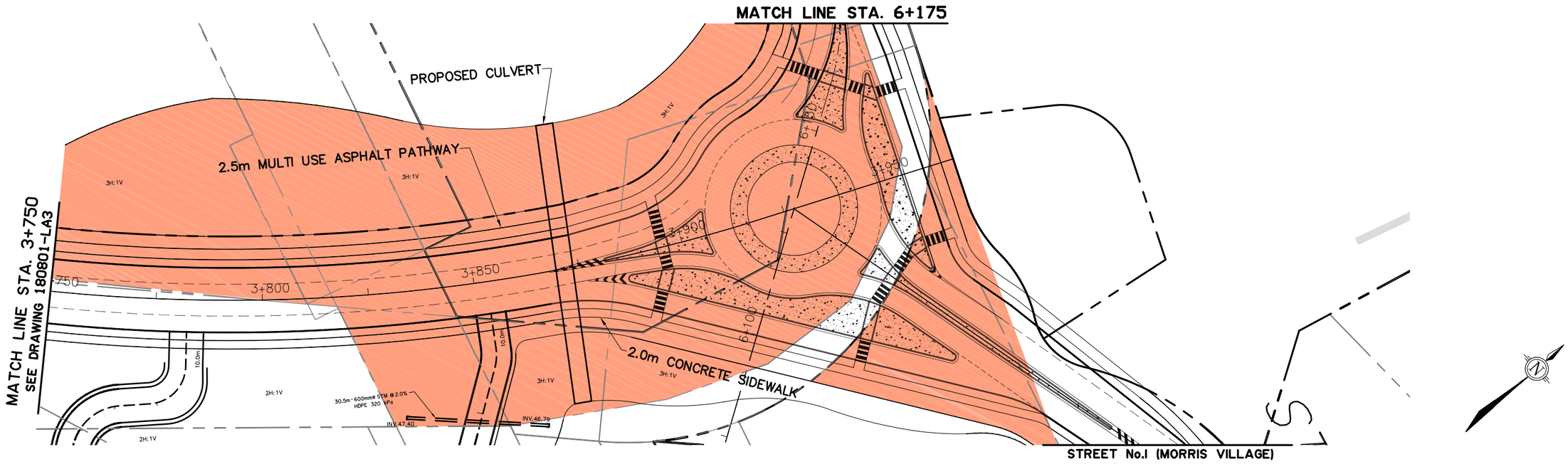
CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN LAND ACQUISITION PLAN

PLAN

POUPART/ST-JEAN
STATION 3+125 TO STATION 3+750

CLIENT No. 111
PROJECT No. 180801
DATE OCTOBER, 2018
DRAWING No. 180801-LA3

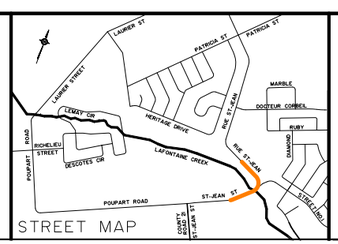


NOTES:

1- EXACT RIGHT OF WAY (R.O.W.) WIDTH "REQUIREMENT" TO BE SURVEYED BY OLS.

LEGEND:

LAND ACQUISITION REQUIREMENT



ATREL Engineering Ltd. Ltée
Engineers - Ingénieurs

SCALE:
1 : 1000
10m 0 10 20 30m

CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN
LAND ACQUISITION PLAN

PLAN

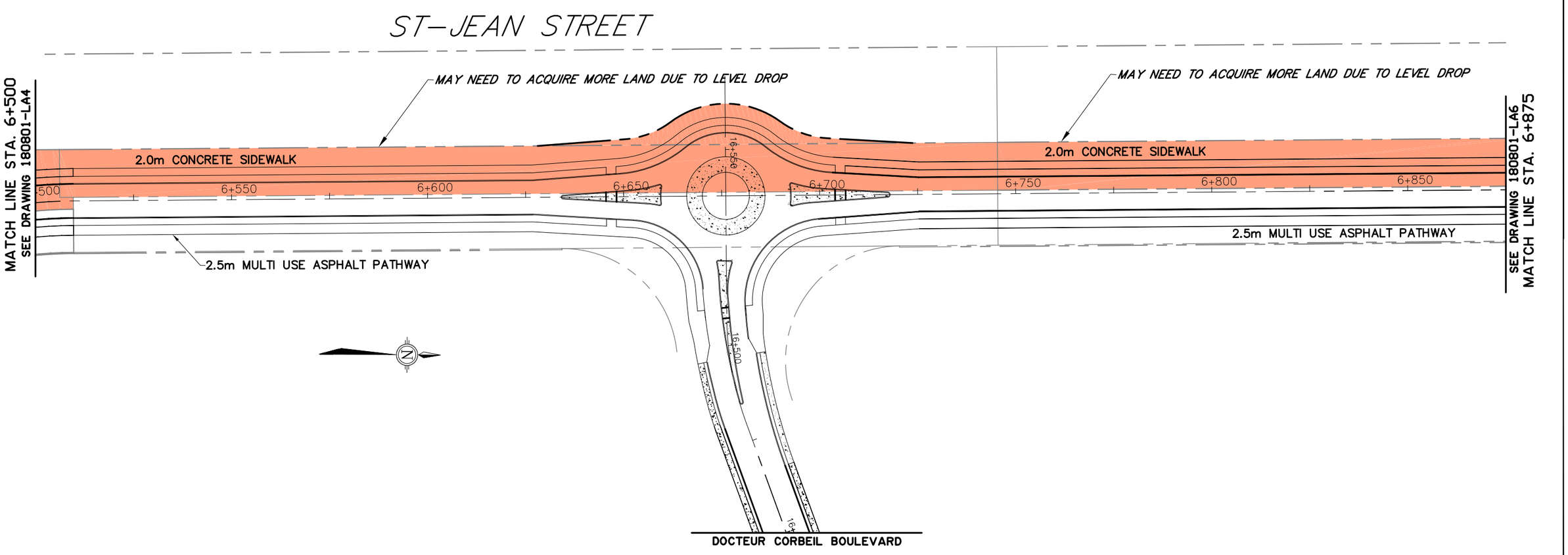
ST-JEAN STREET
STATION 3+750 TO STATION 6+500

CLIENT No.
111

PROJECT No.
180801

DATE
OCTOBER, 2018

DRAWING No.
180801-LA4

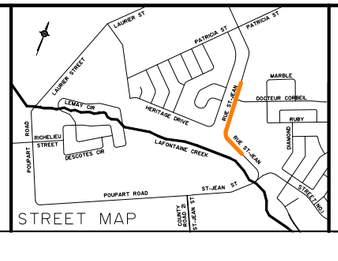


NOTES:

1- EXACT RIGHT OF WAY (R.O.W.) WIDTH "REQUIREMENT" TO BE SURVEYED BY OLS.

LEGEND:

LAND ACQUISITION REQUIREMENT



ATREL Engineering Ltd.
Engineers - Ingénieurs

SCALE:
1 : 1000
10m 0 10 20 30m

CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN
LAND ACQUISITION PLAN

PLAN

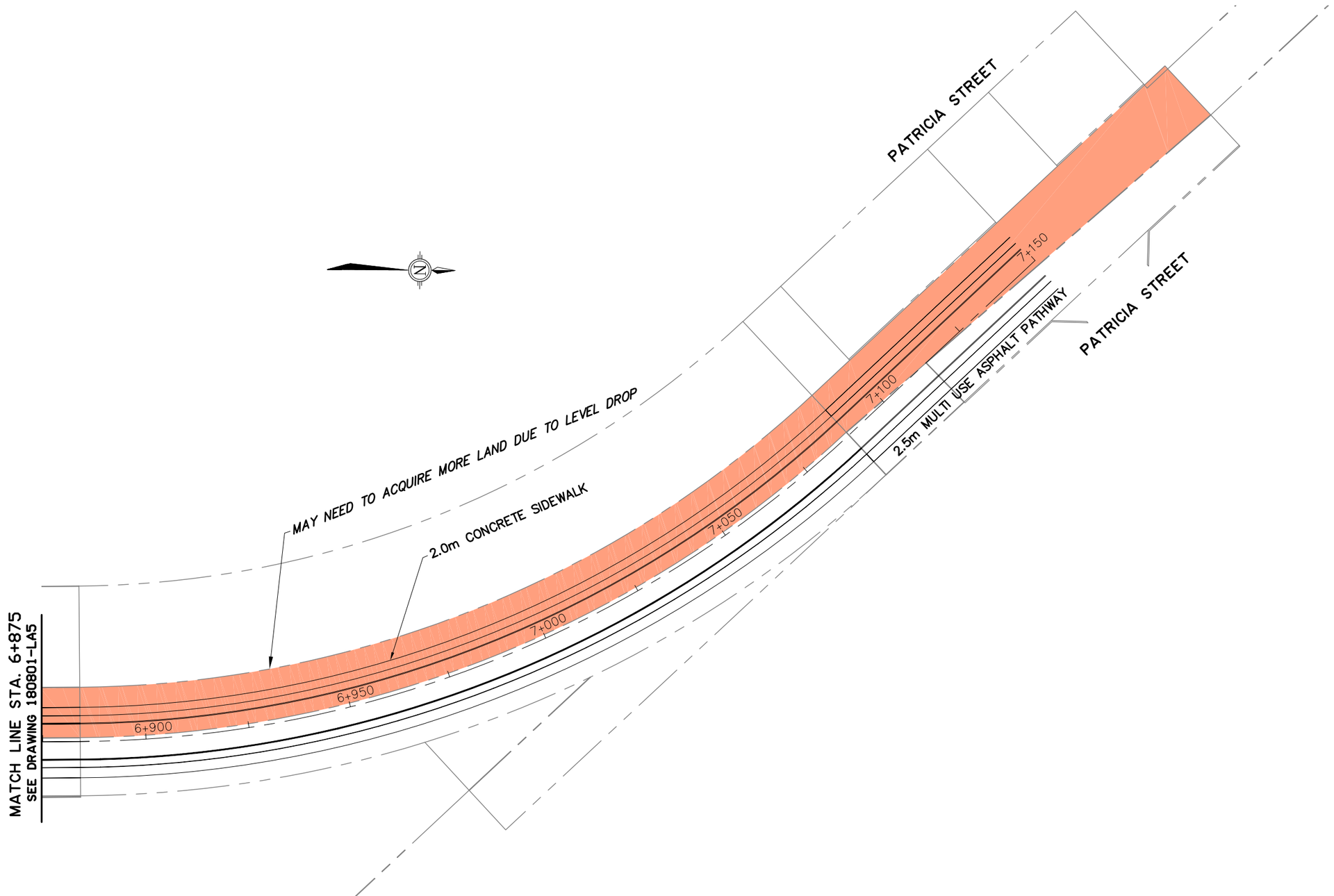
ST-JEAN STREET
STATION 6+500 TO STATION 6+875

CLIENT No.
III

PROJECT No.
180801

DATE
OCTOBER, 2018

DRAWING No.
180801-LA5

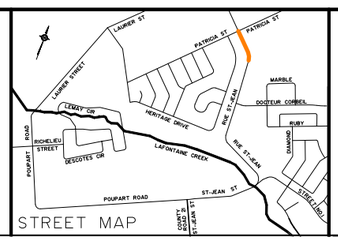


NOTES:

1- EXACT RIGHT OF WAY (R.O.W.) WIDTH "REQUIREMENT" TO BE SURVEYED BY OLS.

LEGEND:

LAND ACQUISITION REQUIREMENT



ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

SCALE:
1 : 1000
10m 0 10 20 30m

CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN
LAND ACQUISITION PLAN

PLAN

ST-JEAN STREET
STATION 6+875 TO STATION 7+150

CLIENT No.
111

PROJECT No.
180801

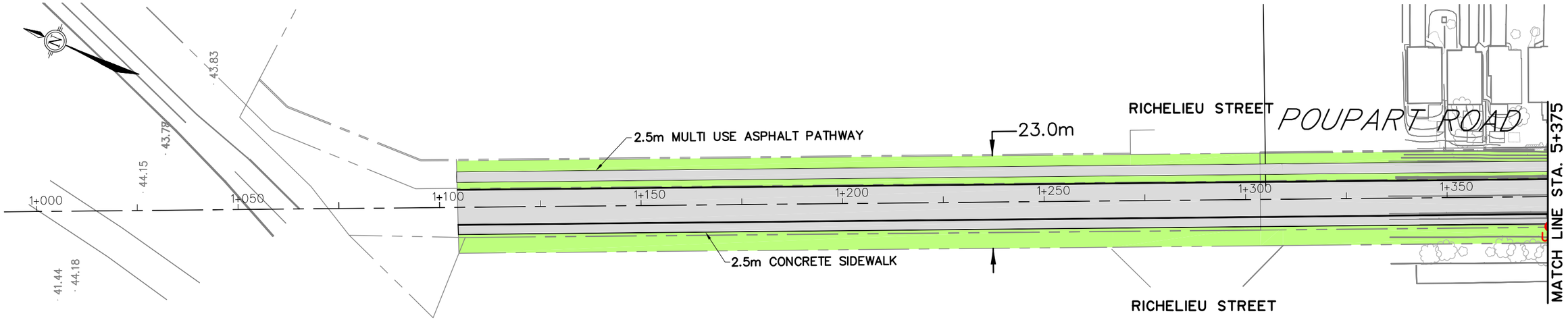
DATE
OCTOBER, 2018

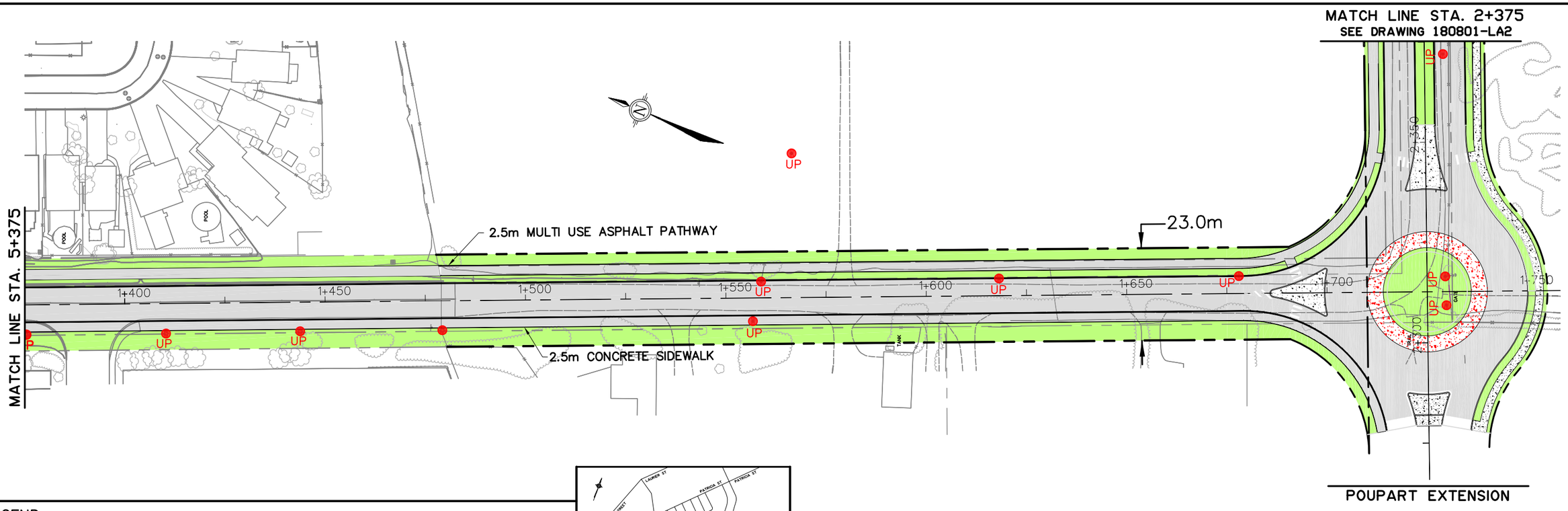
DRAWING No.
180801-LA6

APPENDIX "G"

Road Schematic Plans

180801-RD1 (Poupart)
180801-RD2 (Poupart)
180801-RD3 (Poupart/St-Jean)
180801-RD4 (St-Jean)
180801-RD5 (St-Jean)
180801-RD6 (St-Jean)

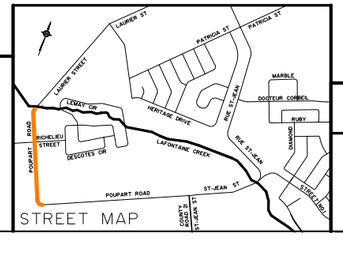




POUPART EXTENSION

LEGEND:

- GRASS AREA
- ASPHALT AREA (ROAD AND MULTI-USE PATHWAY)
- CONCRETE AREA
- OTHER MATERIAL
- UP UTILITY POLE



SCALE:

1 : 1000

10m 0 10 20 30m

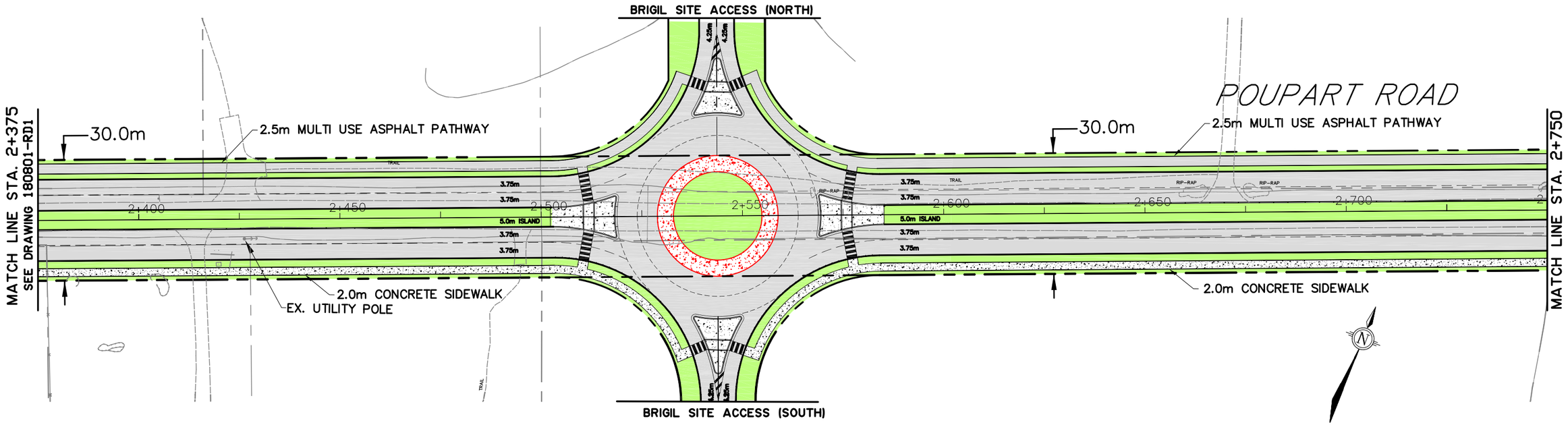
ATREL Engineering Ltd Ltée.
Engineers - Ingénieurs

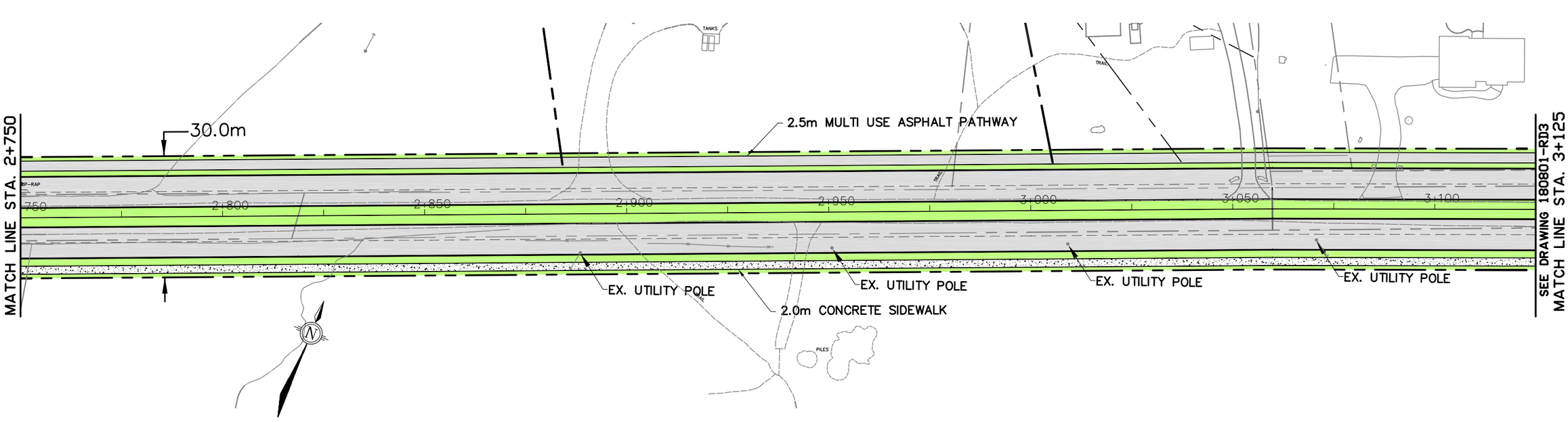
CITY OF CLARENCE-ROCKLAND

POUPART / ST-JEAN ROAD SCHEMATIC PLAN

PLAN
POUPART ROAD
STATION 1+000 TO STATION 2+375

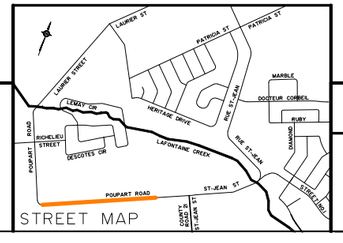
CLIENT No. III
PROJECT No. 180801
DATE OCTOBER, 2018
DRAWING No. 180801-RD1





LEGEND:

- GRASS AREA
- ASPHALT AREA (ROAD AND MULTI-USE PATHWAY)
- CONCRETE AREA
- OTHER MATERIAL



SCALE:

1 : 1000

10m 0 10 20 30m

ATREL Engineering Ltd. Ltée.
Engineers - Ingénieurs

CITY OF CLARENCE-ROCKLAND

POUPART / ST-JEAN
ROAD SCHEMATIC PLAN

PLAN
POUPART ROAD
STATION 2+375 TO STATION 3+125

CLIENT No. III
PROJECT No. 180801
DATE OCTOBER, 2018
DRAWING No. 180801-RD2

BRIGIL SITE ACCESS (NORTH)

ST-JEAN S1

MATCH LINE STA. 3+125
SEE DRAWING 180801-RD2

30.0m

EX. UTILITY POLE

2.5m MULTI USE ASPHALT PATHWAY

EX. UTILITY POLE

EX. UTILITY POLE

EX. UTILITY POLE

EX. UTILITY POLE

EX. UTILITY POLE

EX. UTILITY POLE

2.0m CONCRETE SIDEWALK

3+150 3+200 3+250 3+300 3+350 3+400 3+450

3.75m 3.75m 5.0m ISLAND 3.75m 3.75m

4.25m 4.25m

SLIP LANE

MATCH LINE STA. 3+500

ST-JEAN STREET / COUNTY ROAD 21

STREET

2.5m MULTI USE ASPHALT PATHWAY

EX. UTILITY POLE

EX. UTILITY POLE

ST-JEAN STREET

EX. UTILITY POLE

EX. UTILITY POLE

MATCH LINE STA. 3+500

3+500 3+550 3+600 3+650 3+700

2.00% 3.40% 3.60% 7.05%

RETAINING WALL

2.0m CONCRETE SIDEWALK

SEE DRAWING 180801-RD4

MATCH LINE STA. 3+750

STREET MAP

LAURIER ST
PATRICIA ST
MARBLE
DOCTEUR CORBEIL
RUBY
DIAMOND
RUE ST-JEAN
HERITAGE DRIVE
LEMAY DR
LAFONTAINE CREEK
DESCOTES DR
RICHELIEU STREET
POUPART ROAD
ST-JEAN ST
COUNTY ROAD 21 ST-JEAN ST

LEGEND:

- GRASS AREA
- ASPHALT AREA (ROAD AND MULTI-USE PATHWAY)
- CONCRETE AREA
- OTHER MATERIAL

SCALE:

1 : 1000

10m 0 10 20 30m

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CITY OF CLARENCE-ROCKLAND

POUPART / ST-JEAN
ROAD SCHEMATIC PLAN

PLAN
ST-JEAN STREET
STATION 3+125 TO STATION 3+750

CLIENT No. III
PROJECT No. 180801
DATE OCTOBER, 2018
DRAWING No. 180801-RD3

MATCH LINE STA. 6+175

MATCH LINE STA. 3+750
SEE DRAWING 180801-RD3

PROPOSED CULVERT

EX. UTILITY POLE

2.5m MULTI USE ASPHALT PATHWAY

EX. UTILITY POLE

3+800

3+850

3+900

SLIP LANE

SLIP LANE

2.0m CONCRETE SIDEWALK

EX. UTILITY POLE

TRAIL

AREA UNDER CONSTRUCTION

5.50m

5.50m

STREET No.1 (MORRIS VILLAGE)

EX. UTILITY POLE

EX. UTILITY POLE

2.0m CONCRETE SIDEWALK

EX. UTILITY POLE

MATCH LINE STA. 6+175

RIGHT TURNING LANE

6+200

6+250

6+300

6+350

6+400

6+450

2.5m MULTI USE ASPHALT PATHWAY

ST-JEAN STREET

EX. UTILITY POLE

SEE DRAWING 180801-RD5
MATCH LINE STA. 6+500

LEGEND:

- GRASS AREA
- ASPHALT AREA (ROAD AND MULTI-USE PATHWAY)
- CONCRETE AREA
- OTHER MATERIAL

STREET MAP

SCALE:

1 : 1000

10m 0 10 20 30m

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CITY OF CLARENCE-ROCKLAND

POUPART / ST-JEAN
ROAD SCHEMATIC PLAN

PLAN
ST-JEAN STREET
STATION 3+750 TO STATION 6+500

CLIENT No. III

PROJECT No. 180801

DATE OCTOBER, 2018

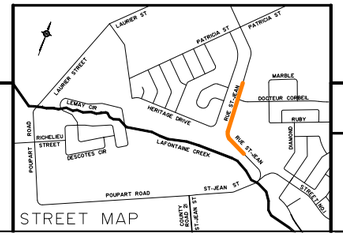
DRAWING No. 180801-RD4

ST-JEAN STREET

MATCH LINE STA. 6+500
SEE DRAWING 180801-RD4

SEE DRAWING 180801-RD6
MATCH LINE STA. 6+875

EX. UTILITY POLE
2.0m CONCRETE SIDEWALK
2.5m MULTI USE ASPHALT PATHWAY
4.25m
5.50m
6+500
6+550
6+600
6+650
6+700
6+750
6+800
6+850
16+550
16+500
DOCTEUR CORBEIL BOULEVARD



LEGEND:
- GRASS AREA
- ASPHALT AREA (ROAD AND MULTI-USE PATHWAY)
- CONCRETE AREA
- OTHER MATERIAL

SCALE:
1 : 1000
10m 0 10 20 30m

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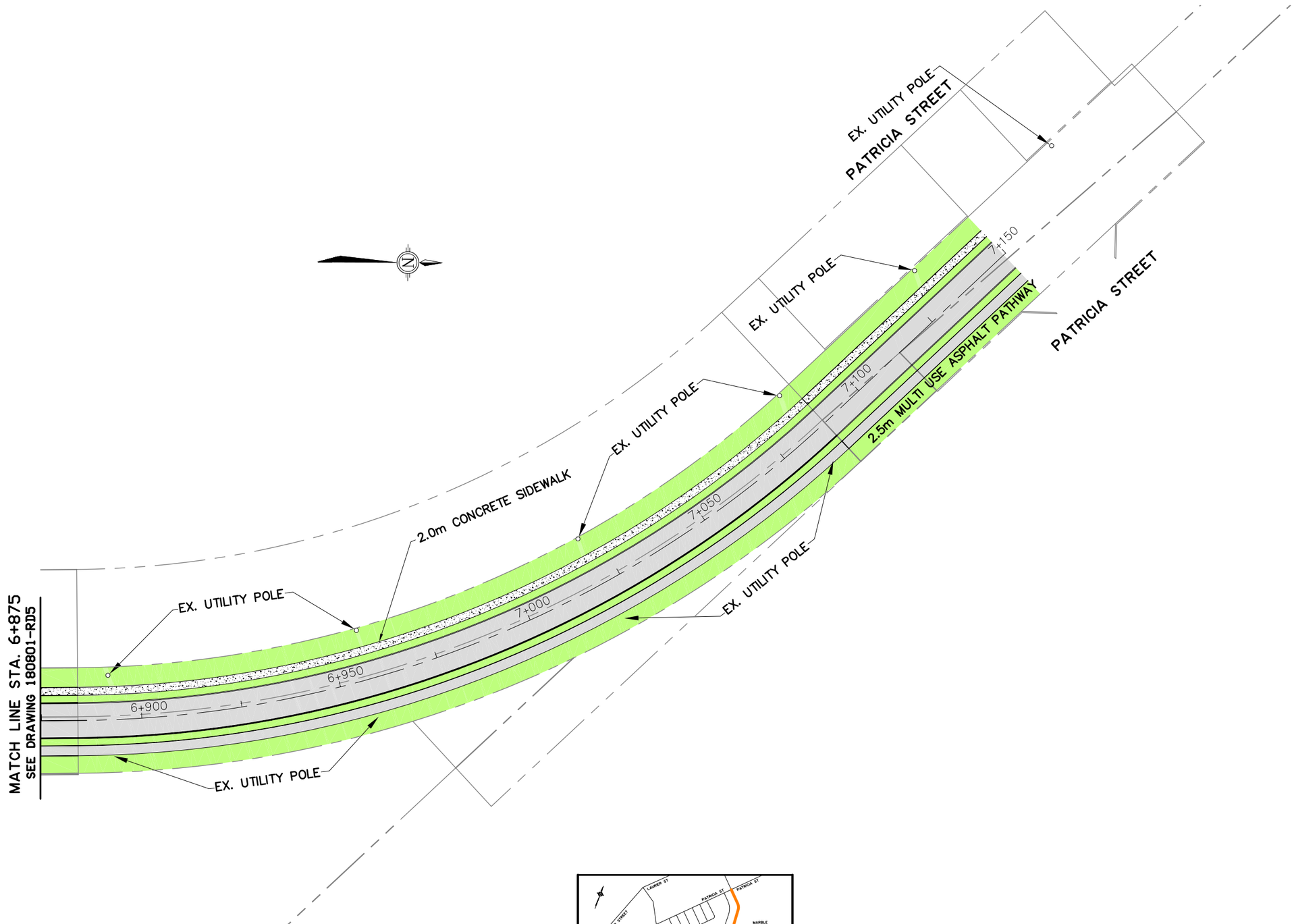
CITY OF CLARENCE-ROCKLAND
POUPART / ST-JEAN
ROAD SCHEMATIC PLAN

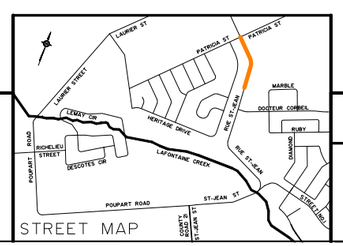
PLAN
ST-JEAN STREET
STATION 6+500 TO STATION 6+875

CLIENT No. III
PROJECT No. 180801
DATE OCTOBER, 2018
DRAWING No. 180801-RD5



LEGEND:

- GRASS AREA
- ASPHALT AREA (ROAD AND MULTI-USE PATHWAY)
- CONCRETE AREA
- OTHER MATERIAL



SCALE:

1 : 1000

10m 0 10 20 30m

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CITY OF CLARENCE-ROCKLAND

POUPART / ST-JEAN
ROAD SCHEMATIC PLAN

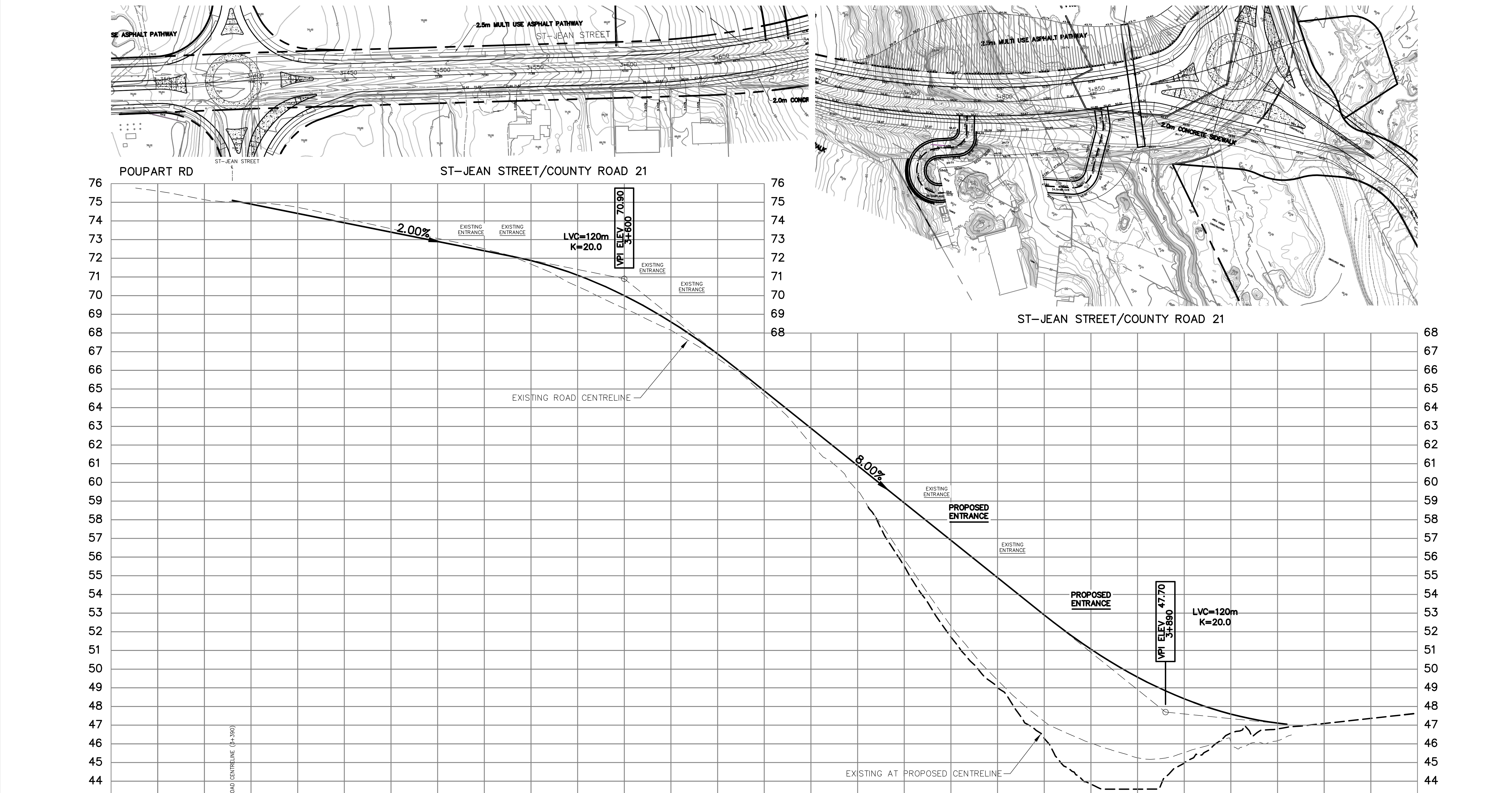
PLAN
ST-JEAN STREET
STATION 6+875 TO STATION 7+150

CLIENT No. III
PROJECT No. 180801
DATE OCTOBER, 2018
DRAWING No. 180801-RD6

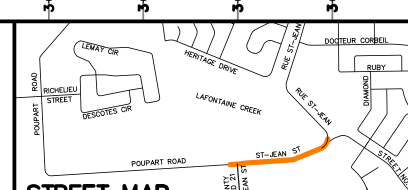
APPENDIX "H"

St-Jean Hill Plans

180801-HILL - St-Jean Preliminary Hill Plan and Profile
180801-DS1 - St-Jean Residential Preliminary Driveway Slopes
180801-DS2 - St-Jean Commercial Preliminary Driveway Slopes



CHAINAGE	PROPOSED ℄ ROAD ELEVATION	EXISTING ℄ R.O.W. ELEV.
3+350		
3+375		
	75.10	
3+400	74.90	
3+425	74.40	
3+450	73.90	
3+475	73.40	
3+500	72.90	
3+525	72.40	
3+550	71.88	
3+575	71.09	
3+600	70.00	
3+625	68.59	
3+650	66.88	
3+675	64.90	
3+700	62.90	
3+725	60.90	
3+750	58.90	
3+775	56.90	
3+800	54.90	
3+825	52.90	
3+850	51.07	
3+875	49.57	
3+900	48.41	
3+925	47.59	
3+950	47.11	
3+975		
4+000		



STREET MAP

SCALE:

1 : 200

2m 0 2 4 6m

VERTICAL

SCALE:

1 : 2000

20m 0 20 40 60m

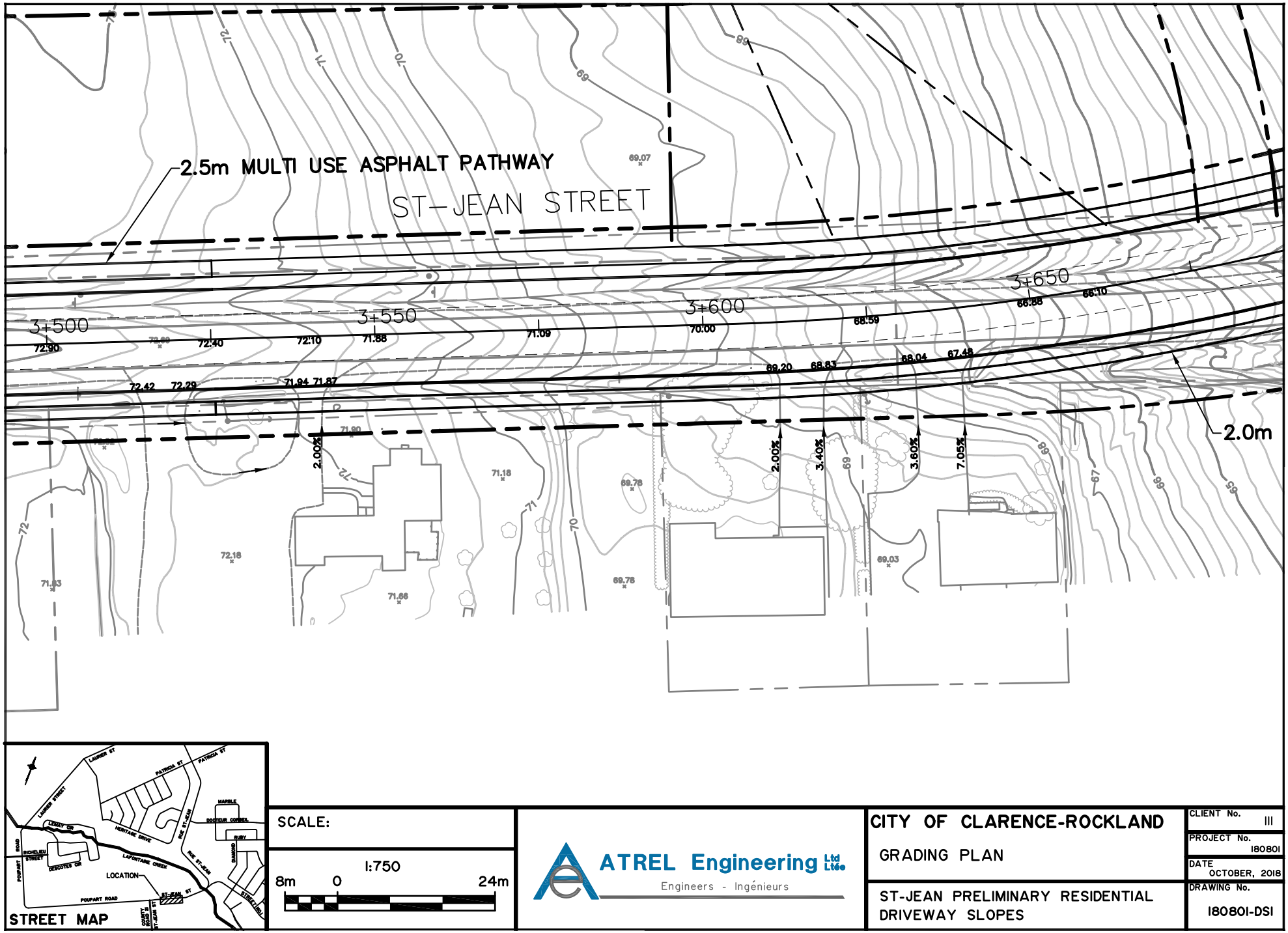
HORIZONTAL

CITY OF CLARENCE-ROCKLAND

POUPART/ST-JEAN
PRELIMINARY HILL PROFILE

PLAN AND PROFILE
ST-JEAN HILL
STATION 3+325 TO STATION 4+000

CLIENT No.	111
PROJECT No.	180801
DATE	OCTOBER, 2018
DRAWING No.	180801-HILL



SCALE:

1:750

8m 0 24m

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GRADING PLAN

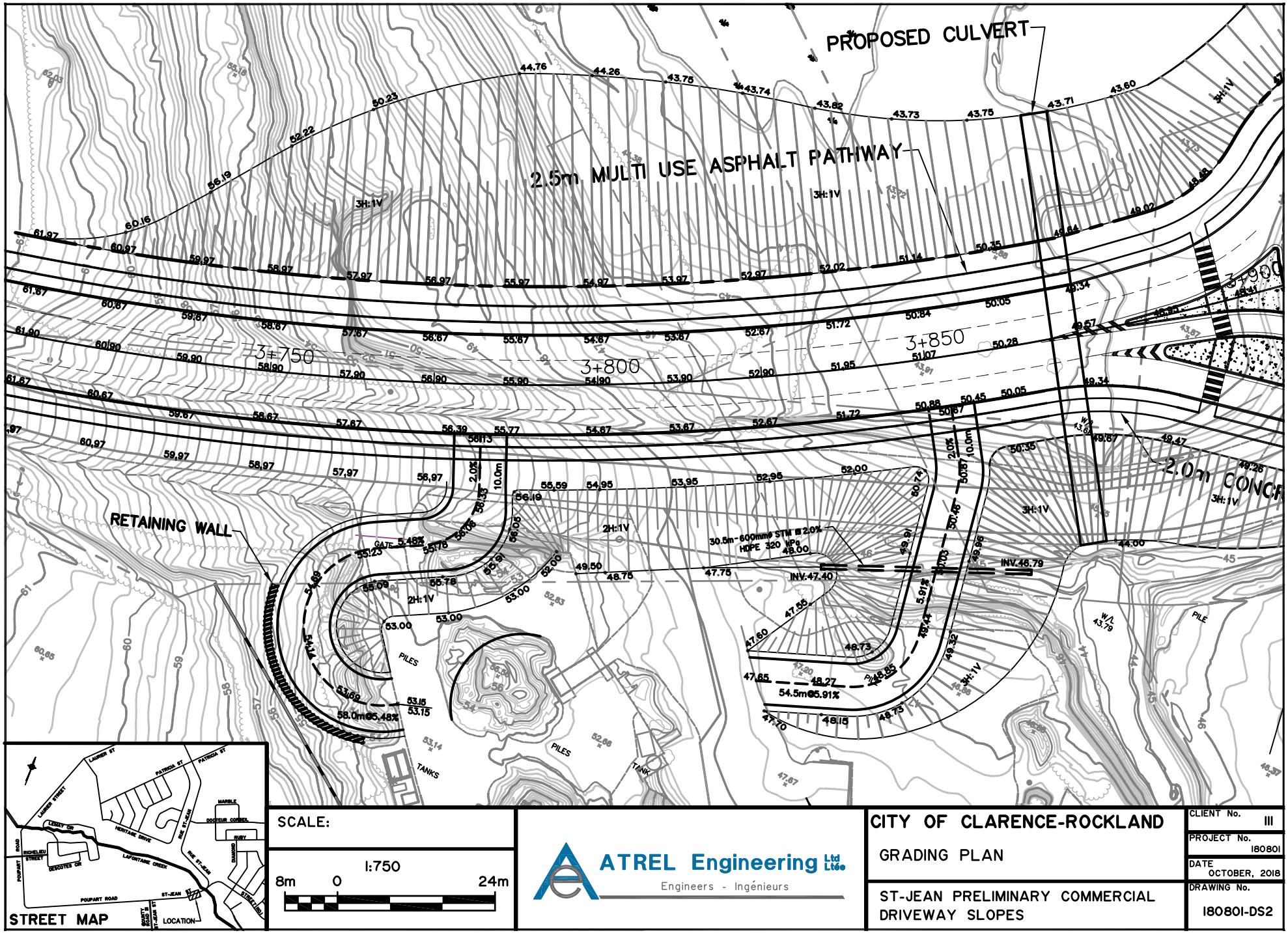
ST-JEAN PRELIMINARY RESIDENTIAL DRIVEWAY SLOPES

CLIENT No. III

PROJECT No. 180801

DATE OCTOBER, 2018

DRAWING No. 180801-DSI



SCALE:

1:750

8m 0 24m

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CITY OF CLARENCE-ROCKLAND

GRADING PLAN

ST-JEAN PRELIMINARY COMMERCIAL DRIVEWAY SLOPES

CLIENT No. III

PROJECT No. 180801

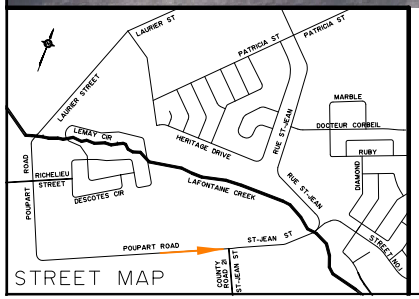
DATE OCTOBER, 2018

DRAWING No. 180801-DS2

APPENDIX "I"

Hydro Station Sketches

180801-HS1 - Hydro Station Street View
180801-HS2 - Hydro Station Top View



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TRANSPORTATION IMPACT STUDY

PLAN

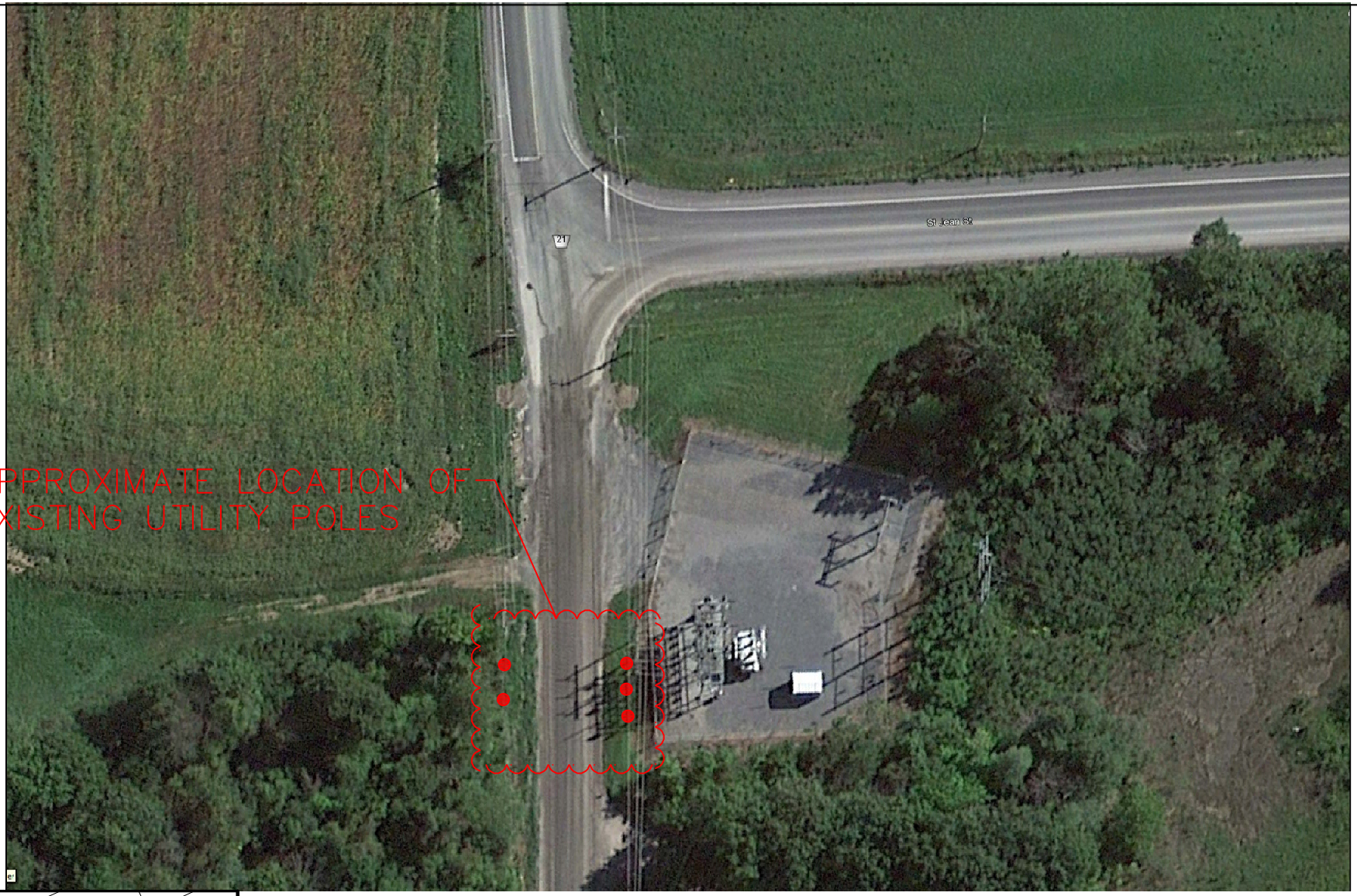
HYDRO STATION STREET VIEW

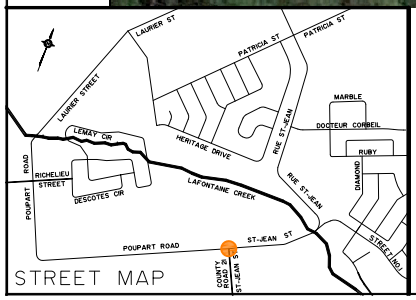
CLIENT No. III

PROJECT No. 180801

DATE OCTOBER, 2018

DRAWING No. 180801-HSI





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CITY OF CLARENCE-ROCKLAND

TRANSPORTATION IMPACT STUDY

PLAN

HYDRO STATION TOP VIEW

CLIENT No. III

PROJECT No. 180801

DATE OCTOBER, 2018

DRAWING No. 180801-HS2