ST-JEAN STREET – MONTÉE POUPART

MUNICIPAL CLASS ENVIRONMENTAL ASSESSSEMENT

Presented to:

Mr. Richard Campeau
Manager, Capital Projects
Infrastructure and Planning

City of Clarence-Rockland
1560 rue Laurier Street,
Rockland, Ontario,
K4K 1P7

Castleglenn Consultants
Engineers, Project Managers & Planners

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1.0 INTRODUCTION

1.1 PURPOSE OF STUDY

The City of Clarence-Rockland and the United Counties of Prescott-Russell retained Castleglenn Consultants Inc. (Castleglenn) to carry out a Municipal Class Environmental Assessment (EA) study to examine the improvement requirements necessary for the St. Jean Street–Montée Poupart corridor from a point 145m south of the existing entry road to the storm water management pond to the terminus of the east-west segment of Montée Poupart, a distance of 2.25 km, and establish the preferred long-term vision for the corridor as defined in the City of Clarence-Rockland's Multi-Modal Transportation Master Plan (MMTMP).

The following tasks were undertaken as part of this study:

- Confirmation of the existing and long-term mobility requirements along the corridor.
- Examination of the need and justification for transportation improvements in the study area to accommodate long-term transportation demands for all modes of travel.
- Identification of significant technical, environmental, and public issues, concerns and constraints associated with the provision of additional vehicular capacity within the project limits.
- Identification of a range of alternative solutions that recognize the contribution of various modes of travel and ways to integrate a long-term design vision for the surrounding adjacent lands.
- Completion of an assessment of alternative solutions and design concepts that incorporates the concerns and values of stakeholders and the design guidelines consistent with the surrounding existing and planned communities within the City of Clarence-Rockland.
- Identification of measures needed to mitigate impacts and concerns associated with the recommended improvements.
- Preparation of a preliminary design for the improvements.
- Preparation of an Environmental Study Report (ESR) that documents all public input and comments and complies with the requirements of the Municipal Class Environmental Assessment (MCEA) document[1] for Schedule C undertakings.

1.2 BACKGROUND

The City of Clarence-Rockland's current 2021 population was determined to be 26,505 persons residing in 10,095 dwellings[2]. The 2019 Transportation Master Plan indicated that "*Clarence-Rockland is forecast to experience a 36% increase in population by the year 2031, which would yield a population of around 33,200 new residents.*" The 9,100 dwellings forecast within the southern edges of the urban area was found to accommodate approximately 72 percent of these new residents[3].

1. June 2000, amended in 2007, 2011, 2015, major amendment 2020 (submitted).
2. 2021 Census, Statistics Canada - 2.626 persons-per-dwelling on average.
3. Based on the 2021 Census, Statistics Canada average of 2.626 persons-per-dwelling, the 9,100 new dwellings within southern edges of the urban area would result in approximately 23,900 new residents or 72 percent of the forecast 33,200 new residents by 2031.

Table 1-1 presents the historical growth trends of Clarence-Rockland, [five census periods 2001-thru-2021] and indicates that over the last two decades:

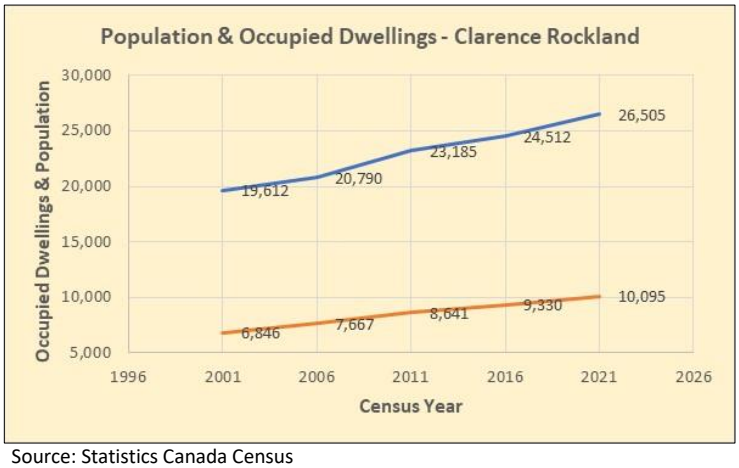
- the municipality's population has increased by 35% and the number of occupied dwellings by 47%.
- the average household size has declined by about 8% from 2.9 persons-per-household to 2.6 persons-per-household.
- the average annual growth rate of population has been about 1.76% per-year.
- the average annual growth rate of occupied dwellings has been about 2.37% per-year.

Table 1-1: Growth of Population and Occupied Dwellings – Clarence Rockland

Census Year	*Population*	Population Growth Since 2001	Occupied Dwellings	Growth in Dwellings Since 2001	Average Household Size	Average Annual Growth Percentages		
						Over Period	In Population	In Occupied Households
2001	19,612		6,846		2.9			
2006	20,790	6%	7,667	12%	2.7	over 5 years between 2001 and 2006	1.20%	2.40%
2011	23,185	18%	8,641	26%	2.7	over 10 years between 2001 and 2011	1.82%	2.62%
2016	24,512	25%	9,330	36%	2.6	over 15 years between 2001 and 2016	1.67%	2.42%
2021	26,505	35%	10,095	47%	2.6	over 20 years between 2001 and 2021	1.76%	2.37%

Source: Statistics Canada Census

Previous studies[4] have estimated that the planned new developments within the urbanized area of Clarence-Rockland will expand southward to accommodate an estimated additional 9,100 new dwellings estimated to generate an additional 8,000 two-way trips during the afternoon peak hour of travel demand. In addition to the residential growth in the southward expansion area, longer-term secondary plans are in place for the future Rockland West lands (approximately 40 hectares) to the west of Montée Poupart which will ultimately provide for a mix of commercial office, industrial, and retail shopping land uses.



Source: Statistics Canada Census

Figure 1-1: Growth in Population and Dwellings

The municipality's Multi-Modal Transportation Master Plan[5] (2019) indicated the need:

- to widen Montée Poupart between Richelieu Street and St-Jean Street from 2-lanes to 4-lanes along with new roundabouts.[6]
- convert the intersection at St. Jean Street/Montée Poupart to a roundabout.
- provide for a future 2-lane east-west collector roadway through the Morris Village subdivision that would connect to the terminus of the north-south St. Jean Street corridor. and

4. "*Transportation Impact Study*" Draft Plan of Subdivision, Morris Village, December, 2018
5. "*Multi-Modal Transportation Master Plan*", City of Clarence Rockland – June, 2019. Section 2.4: What We Heard, Page 21"
6. *This conclusion has since been modified recognizing that a 4-lane cross section is un-necessary to meet future forecast travel demands.*

- provide for a long-term north-westerly extension of the Montée Poupart Side Road EW corridor.

The municipality's Multi-Modal Transportation Master Plan (2019) after significant public consultation justified the need for these improvements.

> *"Residents identified traffic congestion as the biggest mobility issue in the city, particularly on east-west corridors like …. Poupart / St. Jean Street … which accounting for 52% of the transportation issues mapped by survey respondents."*

1.3 Study Area

1.4 Class EA Process

The Class EA process ensures that all projects are carried out with consistency, effectiveness, efficiency, and fairness. This planning process provides a consistent method of identifying and assessing economic, social, and environmental impacts and concerns before improvements or additions to municipal infrastructure are undertaken ensuring that potential impacts from all municipal projects are addressed and mitigated.

Figure 1-2 illustrates the Class EA process.

The Municipal Class EA document defines four schedules under which projects may be planned and the associated processes required for each. The four types of projects are referred to as schedules with projects classed as Schedule A, A+, B or C, depending on the anticipated level of environmental impact, and for some projects, the anticipated construction costs. The schedule in which a project applies determines the planning and design phases that must be followed.

- *Schedule A projects* are minor operational and upgrade activities and may go ahead without further assessment once Phase 1 of the Class EA process is complete (i.e. the problem is reviewed and a solution is confirmed).

- *Schedule A+ projects* are limited in scale, have minimal adverse environmental impacts, and require no documentation. However, the public is to be advised of the project prior to implementation.
- *Schedule B projects* must proceed through the first two phases of the Class EA process. Proponents must identify and assess alternative solutions to the problem, inventory impacts, and select a *preferred* solution. They must also contact relevant agencies and affected members of the public. Provided that no significant impacts are found, and no requests are received to elevate the project to Schedule C, Schedule B projects have limited scope and consultation.
- *Schedule C projects* require more detailed study, public consultation, and documentation, as they may have more significant impacts. Projects categorized as Schedule C must proceed through all five phases of assessment. Schedule C projects may potentially result in adverse impact(s), and as such, a public consultation program is needed to ensure that stakeholders and residents within the study area are provided with the opportunity to provide meaningful input.

This study was conducted in accordance with Schedule "C" of the Municipal Class EA document. As a Schedule C project, the study proceeded under the full planning and documentation procedures.

The Schedule C process includes the following five phases:

- *Phase 1:* Identification of the problem or opportunity.
- *Phase 2:* Assessment and evaluation of alternative solutions.
- *Phase 3:* Assessment and evaluation of the alternative design concepts for the preferred solution.
- *Phase 4:* Documentation in an Environmental Study Report (ESR) for review by the public.
- *Phase 5:* Project Implementation.

As illustrated in Figure 1-2, the Clarence-Rockland MMTMP completed in 2019 was prepared and designed to assure that the first two phases in the Planning and Design Process of a Class EA would be satisfied for the projects addressed within this Environmental Study Report.

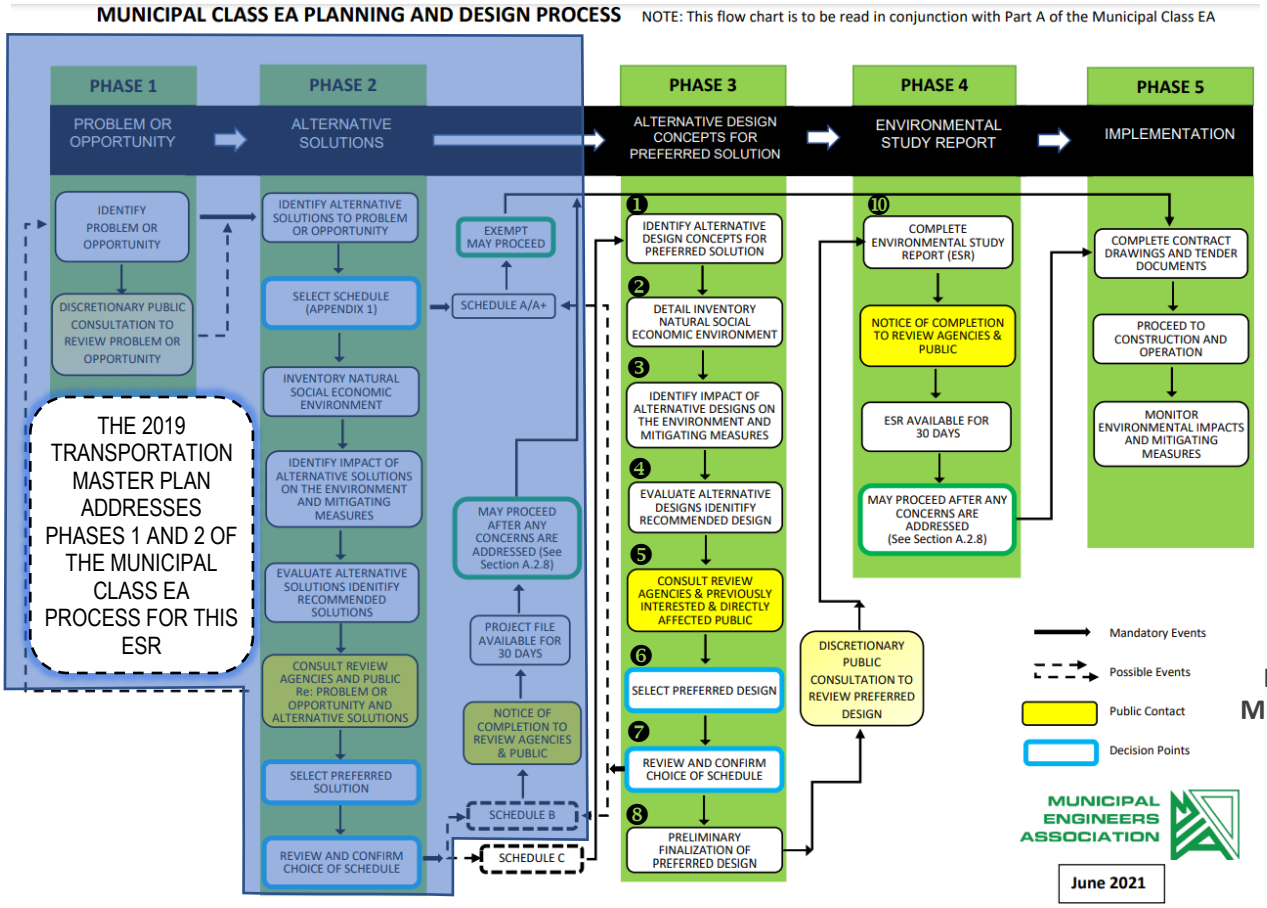


Figure 1-2: The Municipal Class EA Process

1.4.1 EA Principles and the Transportation Master Plan

The City of Clarence-Rockland completed their Multi-Modal Transportation Master Plan (MMTMP) in June, 2019. The study was developed according to the Municipal Class Environmental Assessment process (October 2000, as amended in 2007, 2011 & 2015) for Master Plans (in accordance with Approach 1). This approach recognized the benefits to using the EA process when comprehensive plans are undertaken for projects that have a relatively minor impact according to their environmental significance and the effects on the surrounding environment. The outputs of the MMTMP included road and active transportation projects, as well as recommendations relating to public transit. Under Approach 1, the Master Plan addressed Phase 1 and Phase 2 of the EA process. This Schedule C project must now only complete Phase 3 and Phase 4 prior to completing the ESR.

The Municipal Class EA process addresses Phases 1 and 2 of the EA process including the identification of problems & opportunities, as well as identifying and evaluating alternative solutions to address the problem and establish the preferred solution. MAE's Approach 1 for Master Plans involved the preparation of a Master Plan document at the conclusion of the first two phases of the Municipal Class EA. The MMTMP document was made available for public comment prior to being approved by the municipality and covered a broad level of assessment. It was understood at the time of the MMTMP that more detailed analysis or investigations at the project-specific level would be required to fulfill the requirements for several projects identified within the Master Plan. The intent of this document is to

assure that the required detailed analysis and/or investigations associated with the St. Jean Street Montée Poupart project are satisfied.

It is understood that Master Plans traditionally warrant review every five years to determine the need for an update caused by such triggers as a major changes in the original assumptions, a major changes to components of the master plan, significant new environmental effects or information, major changes in the envisioned timing of projects, changes/updates to funding opportunities, high level documents such as an Official Plan, and/or changes to external guiding documents may trigger a review of a Master Plan. Discussions with City of Clarence-Rockland Staff indicate that none of these potential triggers have occurred and the MMTMP remains relevant.

Key Principles of the EA Process that were Incorporated into the TMP

Section A.2.7 and Appendix 4 of the MCEA process highlights that the work undertaken in the preparation of a Master Plan should recognize the Planning and Design Process of a Class EA project and should incorporate the key principles of successful environmental assessment planning which include:

- *Consultation with affected parties early in and throughout the process, such that the planning process is a cooperative venture.*
- *Consideration of a reasonable range of alternatives, both the functionally different "alternatives to" and the "alternative methods" of implementing the solution.*
- *Identification and consideration of the effects of each alternative on all aspects of the environment,*
- *Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects.*
- *Provision of clear and complete documentation of the planning process followed, to allow "traceability" of decision-making with respect to the project.*

The Clarence-Rockland MMTMP was prepared and designed to assure that the first two phases (See Figure 1-2) in the Planning and Design Process of the Class EA would be satisfied. The following consultation sessions were conducted throughout the MMTMP.

- *Notice of Commencement: June 22, 2018;*
- *Online Engagement Survey: October 8 to November 8, 2018;*
- *Public Information Centre #1: February 12, 2019 (Notice sent out 3-to-4 weeks prior);*
- *Public Information Centre #2: February 28, 2019 (Notice sent out 3-to-4 weeks prior); and*
- *Stakeholder Meetings with key land use developers, community groups, local, county, and neighbouring community representatives.*
- *The on-line engagement survey engaged some 889 individuals, the public information centers resulted in 25 attendees and 35 participants attended the various stakeholder meetings. In total, some 949 persons were engaged in the MMTMP.*

1.4.2 Moving Foreword: The Class EA Process

As indicated in Section 1.4, this study was conducted in accordance with Schedule "C" of the Municipal Class EA document. The Class EA study process indicates that the filing of an Environmental Study Report (ESR) for public review completes the planning and preliminary design stage for Schedule C projects.

It is mandatory that the ESR is available for public review for a thirty (30) calendar day period following the filing of a Notice of Study Completion.

If no outstanding concerns are brought forward during the review period, the City of Clarence-Rockland would proceed to project implementation when considered appropriate.

If members of the public, interest groups and/or government agencies feel that their concerns have not been addressed through the Class EA study process, there is a provision that allows for changing the status of a project from a Schedule C Class EA to an Individual Environmental Assessment.

During the 30-day review period, affected parties have the opportunity to request the Minister of the Environment to make an order for the project to comply with Part II of the EA Act.

Anyone wishing to request a Part II Order must submit a written request within the thirty (30) calendar day review period, to the Minister of the Environment at the following address, with a copy to the proponent of the project to the City of Clarence-Rockland.

Ministry of the Environment, Conservation and Parks	**City of Clarence Rockland (Proponent)**	**Questions or Comments Regarding the Study**
Hon. David Piccini Minister of the Environment, Conservation and Parks 11th Floor, Ferguson Block 77 Wellesley Street W. Toronto, Ontario M7A 2T5 minister.mecp@ontario.ca **Copy to: Director, Environmental Assessments and Permissions Branch** Ministry of the Environment, Conservation and Parks 135 St. Clair Ave West, 1st Floor Toronto, Ontario M4V 1P5 MOECCpermissions@ontario.ca	Attention: Mr. Richard Campeau **City of Clarence-Rockland** City Clerk & Solicitor Department 1560 Laurier Street, Rockland, Ontario, K4K 1P7	Attention: Mr. Richard Campeau Manger, Capital Projects **City of Clarence-Rockland** 1560 Laurier Street, Rockland, Ontario, K4K 1P7 (613) 446-6022 Ext #2239 rcampeau@clarence-rockland.com Attention: Mr. Jean Decour President **Atrel Engineering** 1-2884 Chamberland Street Rockland, Ontario K4K 1M6 (613) 446-7423 Ext #22 jeandecoeur@atrel.com Attention: Mr. Arthur Gordon Consultant Project Manager **Castleglenn Consultants Inc.** 2460 Lancaster Road, Suite 200 Ottawa, Ontario K1B 4S5 (613) 731-4052 agordon@castleglenn.ca

2.0 CONSULTATION

2.1 STUDY COMMENCEMENT NOTICES

Appendix "A" provides copies of the study commencement notices that were either e-mailed directly or by way of Canada Post to interested parties on February 3rd & 4th, 2023.

2.1.1 Study Notices

A total of 45 interested governments, agencies and organizations were notified of this commencement of this environmental assessment study. These included:

- federal and provincial government agencies;
- related associations, authorities, and agencies;
- constituent school boards;
- utilities;
- representatives of the development community active within Clarence-Rockland.
- first nation and métis organizations;
- adjacent cities and counties (City of Ottawa, United Counties of Prescott-Russel);
- bus lines;
- emergency service; and

Appendix "A" contains the full list of government departments and agencies/services that has been contacted. An attempt was made to establish personal contact at each of the above organizations. Where a personal contact was established, the choice was given between having the study commencement mailed by Canada Post or e-mailed. The study commencement notices were forwarded as follows:

- 12 individual letter notices went out by Canada Post on February 4th, 2023.
- Individual e-mails were sent out to 33 different contacts at the various agencies, developers, school board etc. on Friday, Feb 3rd, 2023.
- The Ministry of the Environment, Conservation and Parks (Mr. Jon Orpana) was notified of the study commencement on Friday, Feb 3rd, 2023 (but unfortunately did not receive the e-mail) and was re-forwarded the email on February 23rd, 2023. A request to complete a "streamlined EA Project Information Form" was received on February 23rd, 2023. The form was completed and returned by e-mail on March 3rd, 2023.

2.1.2 First Nations and Aboriginal Peoples Contacts

The MECP Regional Office was contacted and by way of the Aboriginal and Treaty Rights Information System (ATRIS) was accessed to determine the appropriate first nations and aboriginal peoples organizations to be informed of the study commencement. This included the following five entities that were forwarded letters by way of Canada Post on February 4th, 2023:

- Southern Ontario Treaties (Aamjiwnaang)
- Algonquins of Ontario (AOO)
- Metis Groups in Ontario
- Algonquin Anishinabeg Nation (Tribal Council)
- Kitigan Zibi Anishinabeg First Nation

Correspondence from the MECP's Regional Office dated March 8th, 2023 indicated that the following additional first nations/peoples are to be contacted.

- Algonquins of Pikwàkanagàn First Nation
- Huron-Wendat Nation: The MECP indicated that this First Nation is to be included if any archeological studies had been undertaken or if any work related to archeological resources is required to be undertaken. An archeological report was indeed carried out and it was concluded that, however it was confirmed that "*No further archaeological study is required for the study area.*"

Letters to the additional two first nations groups notifying them of the study commencement were forwarded from the City of Clarence-Rockland.

2.2 ADJACENT LANDOWNERS CONSULTATION

Figure 2-1 illustrates a boundary that was first identified as the general impact area of the project for the purposes of directly notifying property owners that could potentially be directly impacted by the outcome of this EA study.

The City of Clarence-Rockland notified by way of Canada Post those land-owners that own property adjacent to the study corridor. Figure 2-1 illustrates a shaded area that was used to identify 70 unique property owners that were mailed a study commencement letter and Flyer (French and English) on March 2nd, 2023 by the City of Clarence Rockland.

2.2.1 Adjacent Landowners Consultation

The City of Clarence-Rockland notified the general public of the EA study's commencement by way of their on-line web site. The notice on the City's web site was prepared in both official languages and went on-line on March 10th, 2023 and has continued to remain on-line throughout the duration of the project.

2.3 PUBLIC OPEN HOUSES

2.3.1 Public Consultation Centre No. 1 (June 15th, 2023)

The City of Clarence-Rockland arranged for a Public Consultation Centre event that was held on Thursday, June 15th, 2023 at the Optimist Hall, 1535 Du Parc Avenue in Rockland from 5pm-to-9pm. The first Public Consultation Centre invited members of the public to walk through at their own pace and examine the 44 presentation boards[7] that were available for viewing and discuss their concerns and raise questions.

The purpose of the information provided was to introduce the objectives of the study, explain the study process, present the various improvement alternatives that were being considered and identify potential issues and areas of concern. In addition. the forum was intended to generate an exchange of ideas and broaden the information base leading to better decision making. Representatives from the City of Clarence-Rockland and the consulting team were on-hand to explain the extent of the project, and to answer any questions or concerns those attendees may have had. Both English and French speaking staff was available.

7. See Appendix "C" to view presentation material.

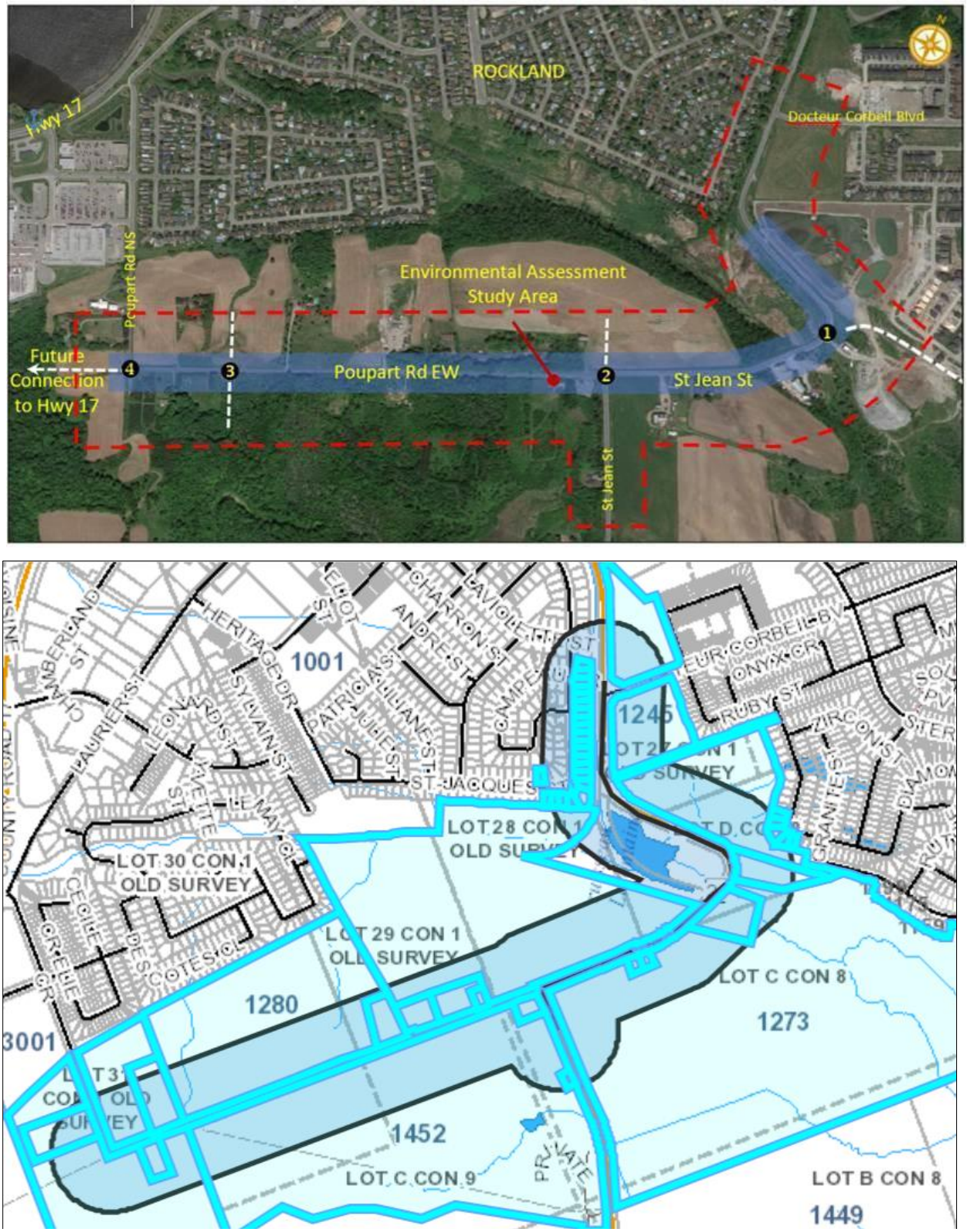


Figure 2-1: EA Study Area and Adjacent Land Owners Contacted Directly

The options presented included both widening options, signalized intersections and roundabout configurations, pedestrian and multi-use pathways. As well, visual representations of the corridor were provided by way of preliminary renderings that addressed the future requirements of the St-Jean Street/Montée Poupart corridor. The presentation material was available in both English and French.

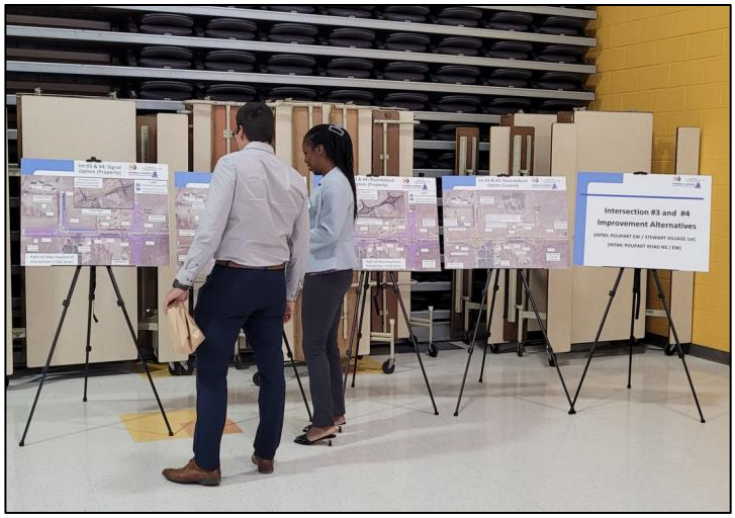


Figure 2-2: Public Consultation Centre 1

Advance notice of the first public consultation centre was forwarded to inform all agencies and residents/property owners and the development community, interested parties, residents of the opportunity to review and comment on the various alternatives for upgrading the corridor that were being considered by the consulting team.

Public involvement and feedback were encouraged at this venue and throughout the EA process. The public review was used to further evaluate and refine the alternatives and assist in the selection of the preferred design for a chosen solution.

Agencies and Organization Notifications

Advance notifications were sent out to 47 government agencies and organizations (12 by direct mail (Canada post, and 35 by e-mail) on Tuesday, May 23rd, 2023 inclusive of the two first nations groups noted in Section 2.1.2 above.

Notification of Public Consultation No. 1 Event

Advance notifications were sent out to 75 unique resident households representing 125 registered property owners. In addition, 5 separate organizations [public (e.g. Hydro One, Clarence-Rockland), and private (e.g. Spacebuilders)] were identified as owning property along the corridor. These individuals and organizations were also forwarded notices of the public consultation centre by direct mail (Canada post) and by e-mail where addresses were available) on Tuesday, May 29th, 2023.

The Public Consultation Centre presented the range of alternative solutions to the public which was then subject to further review by various technical, environmental, land use and constructability experts.

Comments from this first Public Consultation Centre was invited for incorporation into the planning and design of this project and all advance notices indicated that their comments, concerns, and suggestions regarding the material presented would be received for a period of 3 weeks after this first Public Consultation Centre (or until and including Friday July 7th, 2023). The public and agencies were informed that a final Public Consultation Centre to present the preferred solution would take place in the Fall of 2023 followed by an Environmental Study Report (ESR) which would be placed on public record for a 30-day review period where an additional opportunity would exist to communicate concerns.

Attendance, Comments and Concerns

A total of 19 people signed in at the Public Consultation Centre. All attendees were encouraged to complete comments sheets[8] relating to the project and a total of 17 survey responses were received. The public was encouraged to visit the City of Clarence-Rockland website that provided a copy of the presentation material and additional on-line comment and feedback opportunities.

Responses indicated that the following study area roadways are used quite frequently:

- St Jean (East-West) 7 times per week. (Values ranged from 0 to a high of 30 times/week)
- Poupart (East-West) 6 times per week. (Values ranged from 0 to a high of 28 times/week)
- St Jean (North-South 5 times per week. (Values ranged from 0 to a high of 30 times/week)

Table 2-1 presents a summary of the survey responses and the issues/concerns that were identified during the public engagement process.

2.3.2 Public Consultation Centre No. 2 (October 25th, 2023)

The second Public Consultation Centre took place Wednesday, October 25th, 2023, at the same Optimist Hall venue at 1535 Du Parc Avenue in Rockland from 5pm-to-9pm. Like the first event, there was no formal presentation of the material however there was a total of 44 presentation boards[9] available in both official languages for viewing at the event. The results of the first Public Consultation Centre had been incorporated within the design process along with input received from specialist sub-consultants that resulted in the selection of a preferred design solution that was presented. Representatives from the City of Clarence-Rockland and the consulting team were present to answer any questions or concerns that attendees may have had. Both English and French speaking staff were available.

Figure 2-3: Public Consultation Centre 2

Attendees were shown high level functional designs of the four proposed roundabouts and the roadway segments along the St. Jean Street- Montée Poupart corridor. In addition, summaries of the results of several specialist studies were prepared and presented that included:

- An Archeological Assessment
- A Fisheries Technical Report
- A study addressing Natural Heritage
- Utility plans.
- A Drainage-Stormwater Management Plan
- The results of a Geotechnical Investigation
- A Noise Study; and
- Conceptual Preliminary Costing

8 See Appendix "C" for copies of comment sheets provided.
9 See Appendix "E" for presentation.

Table 2-1: Comments Received from Public Consultation Centre No. 1

Comments/Concerns Related to Existing Conditions:	Project Non-Traffic Comments & Concerns:
• Road is to narrow, no space for cyclists or pedestrians	• Nice greenery and walkway designs
• Bad roadway condition	• Effects on wildlife habitats, Maple syrup groves
• Poupart/St Jean stop-controlled intersection may cause congestion in future	• Effects on native plants, insects and animal species
• No guardrails on the north side where the ditch is deep	• Effects on Poupart Woodlands
• Too much traffic for existing road	• Residences along Poupart corridor losing property value due to widening
• Hill unsafe in winter conditions	• Keep as many trees as possible
	• Roadway drainage
Most important Aspects:	**Other Roadway Upgrades:**
a. Easy and fast access to/from my home, or job. (4 votes)	• Rumble strips on the sides of the road
b. Access to newly developing lands to stimulate the economy and accommodate the forecast growth of the community. (1 vote)	• Consider future bus routes between Rockland and Ottawa
c. More convenient east-west access between the existing and planned communities. (3 votes)	• Use of native plants and flowers on roadside and median
d. For an alternative access route to the Highway 17 corridor. (4 votes)	• Hill is too steep
e. Additional roadside facilities to accommodate the needs of pedestrians and cyclists. (11 votes)	• Speedbumps to slow down drivers before sharp turn on Poupart
Pedestrian Safety:	**Motorist Safety:**
• Whole corridor is unsafe	• Sharp turn from Poupart EW to Poupart NS.
• No paths, narrow shoulder	• Road is narrow, with a deep ditch, many cars have ended up in the ditch
• Cars travel too fast along the roadways	•
Other Comments/Concerns:	
• Preference to roundabouts	
• Additional connection to the highway	
• Will there be parks, walking paths and planting of new trees	
• No notification of Annexation to owners of property to the south of Poupart	
• Roundabout 3 is too much, should be intersection	
• Track for winter sports (snow shoeing, cross country skiing)	
• The correct name for Poupart Road is “Montée Poupart”.	
• Increase commercial land use (convenience store, fast food, etc.)	
• Happy about sidewalk all the way to Walmart	
• 5 roundabouts in a row is a lot	
• Roundabout 3 and 4 are too close to each other	
• Move Poupart alignment to the south	
• Educate the public on Ontario rules and regulations that Clarence Rockland must adhere to	
• What is the need for a 4-lane roadway	

Agencies and Organization Notifications

Advance notification of the October Public Consultation Centre was sent out to 49 government agencies and organizations (12 by direct mail (Canada post, and 37 by e-mail) on Tuesday, September 26th, 2023, inclusive of the Algonquins of Pikwàkanagàn First Nation and the Huron-Wendat Nation that was brought to the attention of the consulting team in March, 2023 (as noted in Section 2.1.2 above).

Land Owner and Resident Notifications

Advance notifications were sent out to 75 unique resident households representing 125 registered property owners along the St. Jean Street-Montée Poupart corridor. In addition, 5 separate organizations [public (e.g. Hydro One, Clarence-Rockland), and private (e.g. Spacebuilders)] were identified as owning property along the corridor. These individuals and organizations were also forwarded notices of the October public consultation centre by direct mail (Canada post) and by e-mail where addresses were available) on Friday, September 29th, 2023.

Attendance, Comments and Concerns:

A total of 21 people signed in at the Public Consultation Centre. The comments received during the event were recorded and responses provided.

Attendees were encouraged to complete comment sheets[10] and express their comments and concerns that related to the project. As well, the public was also encouraged to visit the City of Clarence-Rockland website which has assured that a copy of the presentation was accessible[11] and additional feedback opportunities could be provided. The public and attendees were notified that their comments, concerns, and suggestions regarding the material presented would be received for a period of up to 2 weeks after the 2nd Public Consultation Centre (or until, and including, Friday, November 10th, 2023).

Both the public and agencies were informed that the next stage in the EA process would be the production of an Environmental Study Report (ESR) which would be placed on public record for a 30-day review period where an additional opportunity would exist to communicate questions and concerns.

The Public Consultation Centre presented the Consultants preferred solution at that point in time which was then subject to further review by various technical, environmental, land use and constructability experts. Table 2-2 summarizes the comments from the second Public Consultation Centre that were incorporated into the planning and design of this project.

10. See Appendix "E"
11. The City of Clarence-Rockland was in full compliance with Ontario's "*Accessibility for Ontarians with Disabilities Act*", by assuring that an on-line narrated script was provided in both official languages that assured those with visual disabilities could also be provided with the presentation material.

Table 2-2: Comments Received from Public Consultation Centre No. 2

Pedestrian and Cyclist Issues	Roadway Controls:
• Pedestrian facilities including pedestrian safety at roundabouts, lighting and future extensions of the pathway network were noted as issues. • All of these are addressed within the EA document.	• People raised concerns regarding how motorists use roundabouts. • Signage and pavement markings, including sign location, size and position are to be incorporated into the detailed design of the roundabouts that would emphasize lane directionality and assist motorists in proper vehicle operation when navigating the roundabouts.
• The proposed design would reduce the grade of the hill between Roundabouts No. 1 and No. 2 (14.5%) to 8% to better facilitate pedestrian and cyclist use and wheelchair accessibility. • The winding multiuse pathway provided along the corridor at the location of the 8% grade has been designed with convenient rest stops. • A separate pathway is also being considered that would link by way of multiuse trail the developments on both sides of the LaFontaine Tributary north of the St. Jean EW corridor.	• A question was raised regarding the operating speeds along the roadway corridor. • Speed signs would be provided along the length of the corridor and particularly along the approaches to the roundabouts. As well, the design of the roundabout approaches incorporated horizontal curves aimed at establishing a physical necessity to further encourage motorists to reduce their speeds when approaching a roundabout.
• Continued access to the existing dog park was raised as a concern. • The existing dog park is leased by the City and this land use is only permitted at the discretion of the property owner. The City's current plans involve developing a new facility to the north and then close the existing facility when required.	
Project Details:	**Miscellaneous:**
• What is the timing of this project? • It was communicated that although there is no specific schedule for completing the project, however, once initiated it was estimated that the entire project could take between 7-10 years to complete.	• Various questions were raised about additional topics including city water servicing, vegetation, electricity and noise impacts. • All of the above issues have either been resolved through this report, or will be resolved during the detailed design process, or within other City of Clarence-Rockland studies.
• The need for twinning of the roadway corridor was questioned. • It was emphasized that the future development of the St. Jean Street- Montée Poupart corridor is dependent upon growth of the City of Clarence-Rockland and that the City's Multi-Modal Transportation Master Plan confirmed the need and justification for the 4-laning of the facility.	

2.4 COORDINATION OF THE ASSESSMENT

A coordination committee was established to guide the progress of the environmental assessment study and provide coordination information which included the participation of the following individuals.

City of Clarence-Rockland

- Mr. Richard Campeau, Manager Capital Project, Community Development
- Mr. Jonathan Samson, Civil Engineer
- Mr. Alain Beaulieu, Coordinator Capital Projects, Community Development
- Ms. Marie-Eve Bélanger, Manager of Planning
- Mr. Julian Lenhart, Director of Community and Development

United Counties of Prescott Russel

- Mr. Pier-Luc Mainville, Public Works Engineer

Consultants

- Mr. Jean Décoeur, President, Atrel Engineering
- Mr. Arthur Gordon Consultant Project Manager, Castleglenn
- Mr. Andrey Kirillov, Lead Traffic Analysis, Castleglenn
- Mr. Konstantin Joulanov, Traffic Forecasting Specialist, Castleglenn
- Mr. Afshin Pakzadnia, Senior Transportation Design Engineer, Castleglenn
- Ms. Roza Malunga, Transportation Design Engineer, Castleglenn

Development (Sub-Division)

- Mr. Jean-Luc Rivard, VP Land Acquisition and Development, Brigil
- Mr. Jocelyn Péloquin, Director of Development, Spacebuilders

Regular organizational meetings were convened to assure that the study was coordinated with other ongoing projects and initiatives taking place within the vicinity of the project area.

3.0 EXISTING CONDITIONS

3.1 EXISTING LAND USE

The existing land uses:

- at the very east end of the St. Jean Street NS corridor are characterized by green space, a new storm water management facility and pumping station, the Lafontaine Creek natural area, a connection to the future Bronze Avenue and industrial/commercial land uses (Centennial Construction). As one proceeds to the west along St. Jean Street EW there are a few residential rural agricultural acreages on the south side of the St. Jean Street corridor which will ultimately be replaced by the envisioned Morris Village development.
- To the west of County Road 21 there is a Hydro One sub-station and a municipal dog park area on the south side of Montée Poupart Side Road corridor. On the north and south sides of the corridor lies the planned Stewart Village community with the north side currently in the process of being developed. The north side also is characterized by Poupart Excavation and a few residential rural acreages that front Montée Poupart Side Road. As one proceeds further to the west the area is characterized by additional rural acreages.

3.2 ROAD NETWORK

Figure 3-1 illustrates the Montée Poupart and St. Jean Street corridor within the City of Clarence-Rockland. The approximately 2.7-kilometer corridor (illustrated as blue shaded area) is the focus of this environmental assessment.

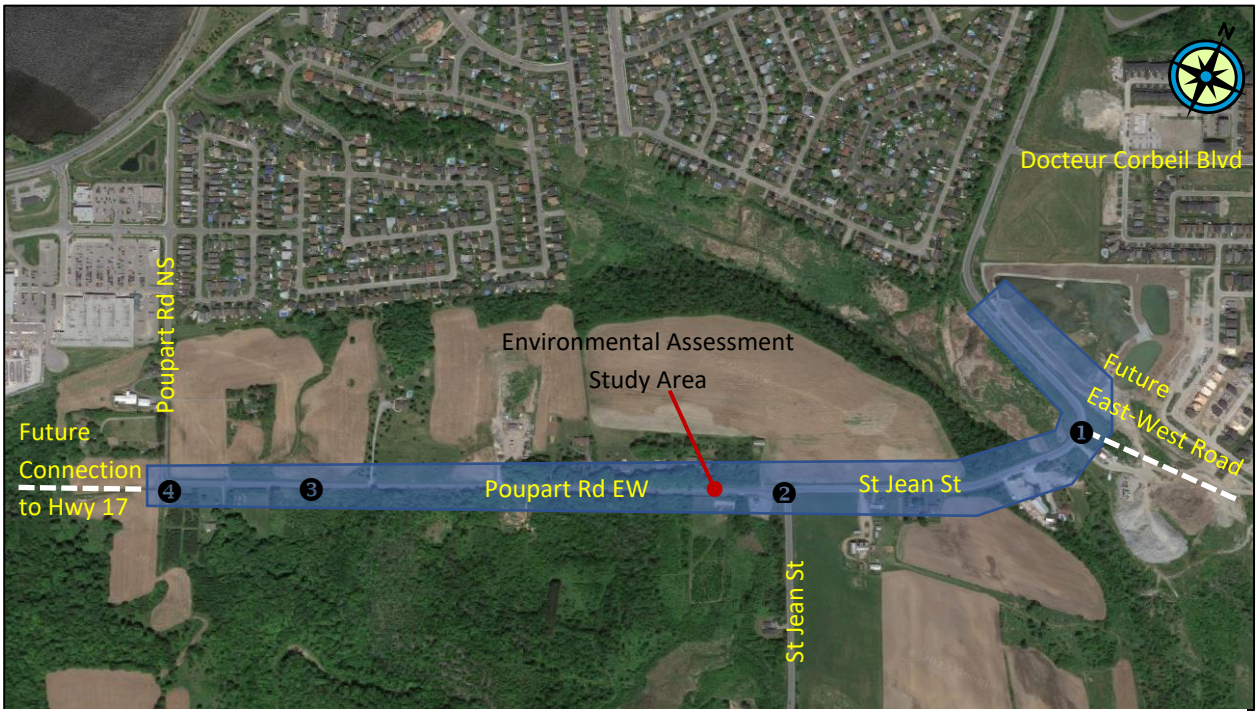


Figure 3-1: Study Area

The figure illustrates the location of the four intersections which are discussed within this document. Each intersection was to be assessed for possible solutions to address the future ultimate traffic conditions of the area.

The white dashed lined conceptually illustrate the locations of future roadways being:

- the connection to Highway 17 to the west; and
- the future east-west road (Bronze Avenue) connecting to Caron Street to the east.

3.2.1 Study Area Roadways

The following sub-section serve to characterize the primary roadways within the vicinity of the study area.

MONTÉE POUPART:

- Montée Poupart is presently a minor collector two-lane roadway within the City of Clarence-Rockland. It has a posted speed limit of 50 km/h. Intersections 2, 3 and 4 are located along the Montée Poupart corridor.

ST JEAN STREET:

- The St. Jean Street corridor is presently designated as a minor collector two-lane roadway within the City of Clarence-Rockland. Intersections 1 and 2 are located along St. Jean Street. St. Jean Street has a posted speed limit of:
  - 60 km/h south of the Montée Poupart / St. Jean Street intersection; and
  - 50 km/h to the east of the Montée Poupart / St. Jean Street intersection.

3.3 STUDY AREA INTERSECTIONS

The following section summarizes the existing study area intersections:

1. ST JEAN STREET &BRONZE AVENUE

- Figure 3-2 illustrates the St Jean Street / Bronze Avenue intersection.
- This is currently not an intersection.
- The future Roadway will become the new east leg of the intersection.

Existing Conditions:

- The ultimate forecast traffic indicated that the main traffic flow will occur between Bronze Avenue and the St. Jean Street EW corridor. The design configuration needed to facilitate this major movement.

Figure 3-2: St Jean Street and the Future Street No.1 (Bronze Avenue) Intersection

- The existing gradient on St. Jean Street EW corridor is currently 14.5%, which does not meet the minimum required design criteria of an urban collector of 8 percent.
- The existing driveways at the top of the grade would be requiring to near match the proposed profile with the driveways. The bottom of the grade would be required to be raised to accommodate an improved gradient of 8 percent.
- The existing intersection is located at a horizontal curve with a radius of 57m.
- The intersection is located on a sag curve, which provides good sight distances for the intersection. However, the drainage system within and adjacent to the intersection required consideration.
- An overhead power line currently crosses St. Jean Street at this intersection and continues along the north side of the corridor. Due to the need to raise the elevation of the intersection the power line crossing would be required to be raised.
- The City's transportation master plan[12] recommended a multi-use path (MUP) on the north side of St. Jean Street EW and on the north side of Bronze Avenue. Additionally, a sidewalk is recommended on the west side of St. Jean Street NS and on the south side of St. Jean Street EW. The sidewalks and MUP must be inter-connected at the proposed intersection.

Constraints

- There is a main culvert under the intersection; raising the profile and widening St. Jean Street will increase the length of the culvert as well as the eventual buried depth given the requirement to reduce the grade to 8 percent and the resulting overburden.
- There are four existing and two future accesses within the intersection influence area. These existing accesses are required to be addressed within the alternative configurations. The Centennial Construction access is located on the south side of St. Jean Street EW. Due to raising the St. Jean Street profile, this access must be re-profiled, re-aligned and reconstructed.
- The separation between the Centennial Construction access and the next intersection to the east is only 200.0m, which is less than the desired spacing between what could be traffic signal-controlled intersections[13]

12. "*Multi Modal Transportation Master Plan*", The City of Clarence-Rockland, Stantec, June 2019
13 "*Geometric Design Guide for Canadian Roads*", June 2017, Transportation Association of Canada (TAC), Chapter 9 : Intersections, Table 9.4.1

2. MONTÉE POUPART AND ST JEAN STREET

- Figure 3-3 illustrates the Montée Poupart and St Jean Street 3-leg all-way STOP controlled intersection.
- The future Steward Village 2nd Access will become the north leg of the intersection.

Figure 3-3: Poupart Road and St Jean Street Intersection

Existing Conditions and Constraints

- A Hydro One sub-station which serves a major portion of Clarence-Rockland is located on the southwest corner of the intersection. The accesses into, and out of, this critical facility by Hydro One vehicles must continue to be assured throughout, and after, construction of the upgraded corridor and intersection.
- A designated planned residential development community (Stewart Village) is planned on the north side of the intersection as one of the more short-term development initiatives. The property required for intersection improvements and right-of-way is constrained and limits the ability to widen the intersection and constrains the available space required for utility provisions.
- A hydro line and poles run along the south side of St. Jean Street EW and represent a constraint to widening the corridor and intersection further to the south.
- The east side of the intersection is planned to accommodate a future longitudinal gradient of 8%, however, the Urban Collector Undivided (UCU) roadway designation limits the design speed to 50 Km/h. The ultimate design of the intersections at the bottom of the grade and along the corridor must encourage lower speeds.
- The west side of the intersection is characterized by a terrain that is almost level, and the corridor classification was determined to be an Urban Collector Divided[14] (UCD) designation, where a design speed of 60 Km/h would be applicable.

14 "*Transportation Impact Study – Draft Plan of Sub-division*", Castleglenn Consultants, December 2018

3. MONTÉE POUPART & STEWART VILLAGE 1ST ACCESS

- Figure 3-4 illustrates the general location of a planned Montée Poupart Side Road / Steward Village 1st Access intersection.
- The north leg of the intersection would provide access to the future Stewart Village community which is envisioned to occur in the medium-term horizon.
- Future access provisions must be in place to support the longer-term development of a new residential community to the south.

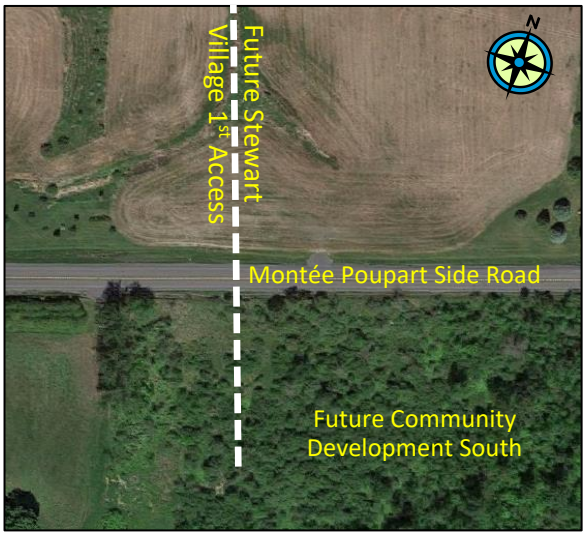


Figure 3-4: Poupart Road EW and Stewart Village 1st Access

Existing Conditions and Constraints

- See comments below regarding intersection separation.

4. MONTÉE POUPART NS & MONTÉE POUPART EW

- Figure 3-5 illustrates the Montée Poupart NS & Montée Poupart EW intersection which is currently configured as a right angle (90°) turn in the roadway.
- The future envisions the westerly extension of the Montée Poupart EW Side Road to connect to the Highway 17 corridor. Future upgrades to the intersection must ultimately plan for the western extension of the corridor.

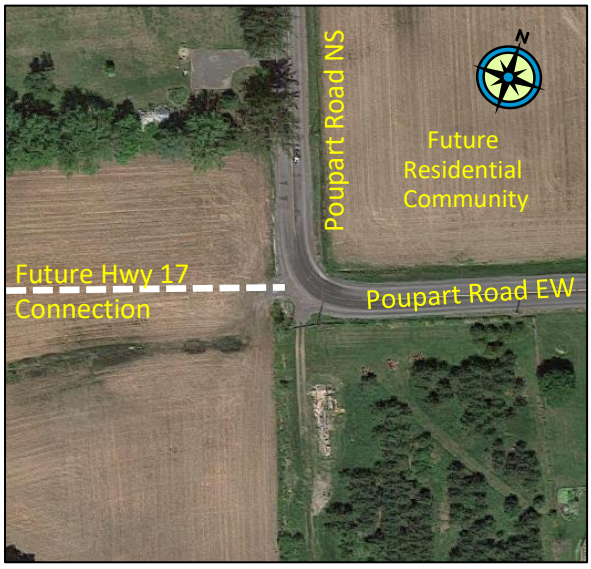


Figure 3-5: Poupart Road NS and Poupart Road EW Intersection

Existing Conditions and Constraint

- The planned separation between Intersections No. 3 and No. 4 is only 230m. This represents a constraint should two sequential traffic signal-controlled intersections be considered. This would result in merging, diverging and weaving constraints between the two intersections. Literature[15] indicates that the desirable spacing between traffic signal-controlled intersections with an average running speed of 50 km/h and a 60-second traffic signal cycle length would be 415m.
- A development area on the northeast corner of this Intersection was thought to potentially constrain the property requirements at this intersection.
- The existing accesses to the residential acreages on the south side of the Montée Poupart EW corridor would be required to be addressed.

15. "*Document*" June 2017, Transportation Association of Canada (TAC), Chapter 9 : Intersections, Table 9.4.1,

3.4 PEDESTRIAN AND CYCLING FACILITIES

There are currently no pedestrian or cycling facilities available along Montée Poupart. St Jean Street provides for a paved shoulder on both sides of the roadway within the study area.

3.5 TRANSIT FACILITIES

Figure 3-6, was referenced from the City's Transportation Master Plan (June 2019) and illustrates the previous Clarence-Rockland Transit service. However, in 2019 council decided to no longer administer a commuter bus system due to declining ridership and high cost. This decision proved to be prudent recognizing the advent of Covid in 2020 when transit services across North America significantly declined. Presently, there are no existing transit routes located within the EA study area along either the Montée Poupart or St. Jean Street corridors.

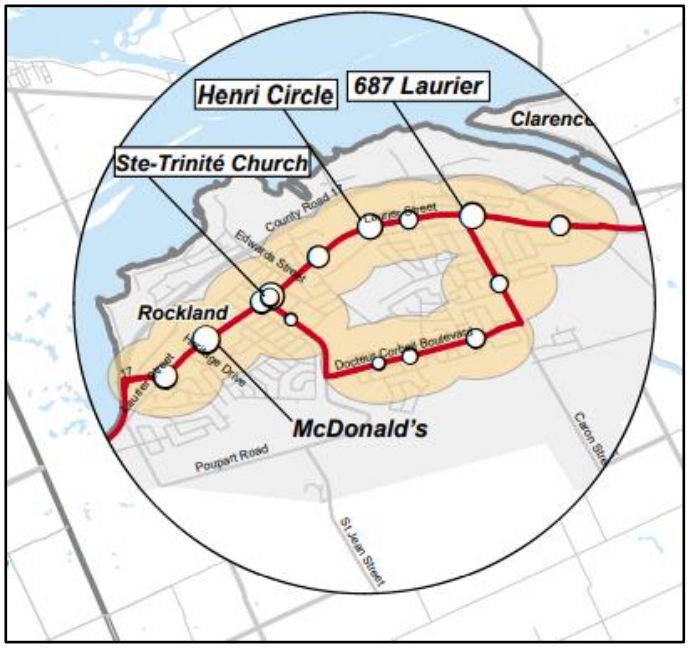


Figure 3-6: Existing Transit Network

3.6 GOODS MOVEMENT

Commercial vehicle in Ontario includes all trucks/tractors with a gross (including cargo) weight of more than 4,500 kilograms and includes buses, tow trucks and concrete trucks and mobile crane.

Despite, both the Montée Poupart Side Road and the St. Jean Street corridors being classified as a major-collector roadways, a review of the City's 2019 MMTMP indicates that the City of Clarence-Rockland presently designates a complete truck prohibition along the Montée Poupart Side Road corridor, through to the St. Jean Street NS (CR 21). There are no truck restrictions along the St. Jean Street corridor. Heavy vehicle routing should be revisited upon implementation of the St. Jean-Montée Poupart Side Road project.

3.7 EXISTING TRAFFIC OPERATIONS

Existing traffic operations were assessed based on the traffic counts found in the Castleglenn Rockland Subdivision TIS completed in December 2018 and the Stantec MMTMP completed in June 2019.

The previous results were adjusted to the existing year (2022), by applying a percentage background traffic growth rate, based on the historical traffic findings in the WSP report. Additionally, the traffic volumes were balanced between the intersections to assure that vehicle traffic leaving one intersection arrived at the next upstream intersection.

3.7.1 Existing Traffic Volumes (2022)

Figure 3-7 illustrates the existing (2022) intersection traffic volumes for the balanced morning and afternoon peak hours of travel demand.

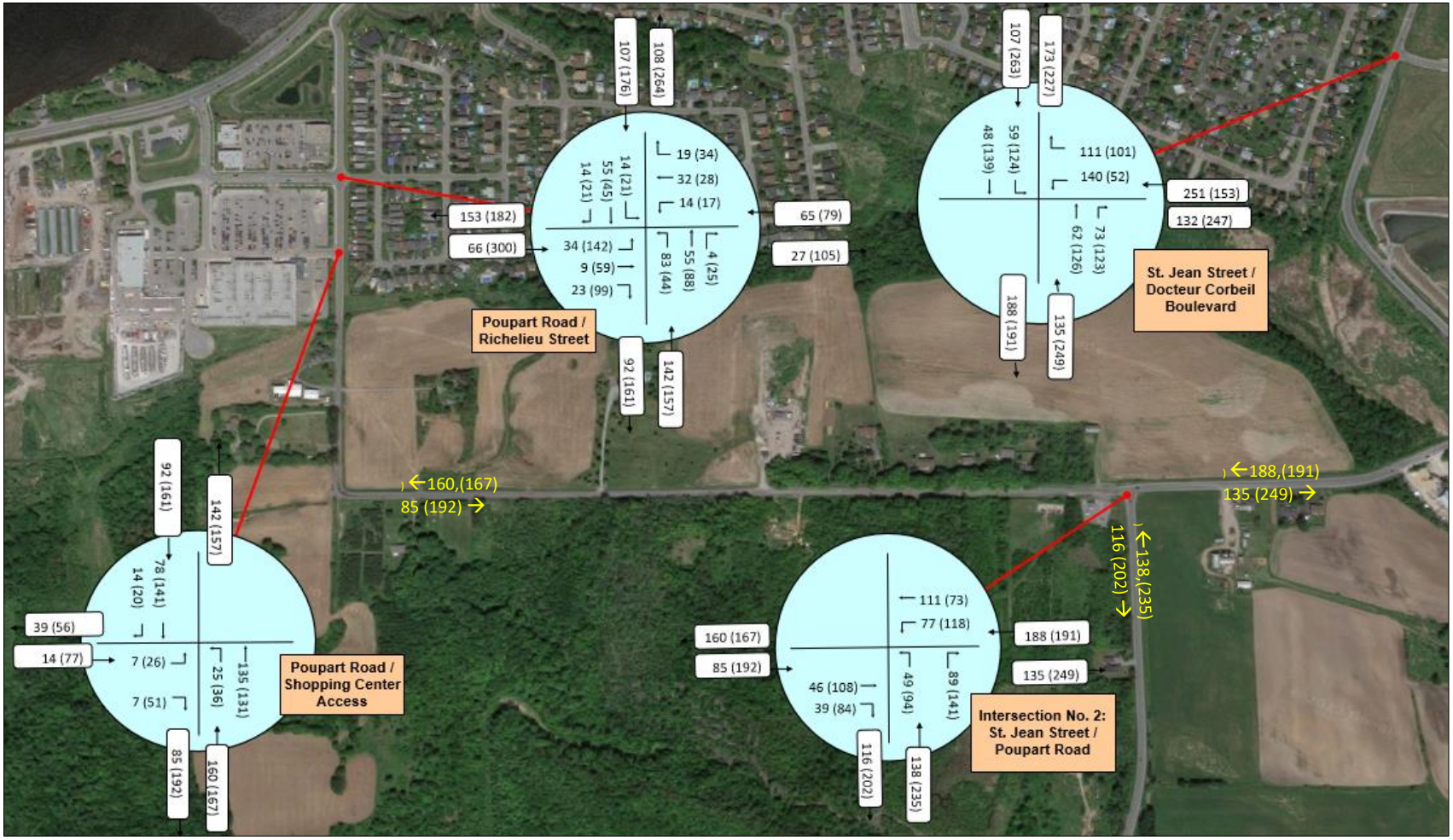


Figure 3-7: 2022 Balanced Traffic Counts

3.7.2 Existing Traffic Analysis

Intersection capacity analysis for the one all-way stop-controlled study area intersections was undertaken utilizing Synchro™ 10 analysis software. The software incorporates Highway Capacity Manual (HCM) 6th edition methodologies to determine level-of-service (delay-based) and volume-to-capacity (v/c) performance metrics. The analyses assumed a peak hour factor of 0.95 which simulates the busiest 15-minute-period of the overall peak hour. Appendix "F" documents the resulting Synchro output sheets indicating the existing operational performance.

Table 3-1 summarizes the intersection capacity analyses results that assume the existing 2022 traffic count information and the existing intersection configurations. The table indicates that all four of the existing intersections were found to operate at an acceptable Level-of-Service "B"-or- higher. Average delays are relatively low, with the longest delay (12.8 seconds) recorded at the St. Jean Street/Docteur Corbeil Boulevard intersection.

Table 3-1: Existing (2022) Intersection Capacity Analysis Result

Intersection	**Control Type**	**Critical Approach/ Movement**	**Weekday Morning Peak Hour (Afternoon Peak Hour)**			
			Average Delay per Vehicle (seconds)	**Level of Service**	**95th Percentile Queue (m)**	**Volume-to-Capacity Ratio (v/c)**
St. Jean Street/Docteur Corbeil Boulevard	Minor (East) Leg STOP	WB (WB)	12 (12.8)	B (B)	11.25 (7.5)	0.34 (0.26)
Poupart Road/St. Jean Street	All-way STOP	WB (NB)	8.9 (9.7)	A (A)	7.5 (10.5)	0.244 (0.316)
Poupart Road/Shopping Center Access	Minor (West) Leg STOP	EB (EB)	9.5 (10.2)	A (B)	0.75 (3.0)	0.018 (0.105)
Poupart Road/Richelieu Street	All-way STOP	NB (EB-LT)	8.5 (10.3)	A (B)	5.25 (6.75)	0.185 (0.24)

Numbers/values outside of brackets represent Morning Peak Hour values.
Number/values in brackets represent Afternoon Peak Hour values.

3.8 UTILITIES

Appendix "G" illustrates plans that depict the existing utilities along the corridor which include such services as telephone, hydro, cable/internet and in some cases the services to existing dwellings.

Table 3-2 indicates the current utilities within the study corridor. Due to the proposed widening and re-profiling of the corridor, these utilities need protection or relocation. The necessary actions for existing utilities to improve intersections and the corridor are specified in the table. The assessed impacts of improvements on the existing utility corridors reveal that there are no noticeable differences between signalized and roundabout configurations. Further information on existing utilities can be found in the drawings provided in Appendix "G".

Table 3-2: Existing utilities

Item	Unit	Approximate Quantity	Location	Required Action
Hydro post	No.	40	Along the St Jean Street and Poupart Road	Due to the widening of St Jean Street and Poupart Road required to be relocated.
Overhead Hydro and Bell	m	210	120m east and 90m north of Intersection #4.	To be relocated.
Overhead Hydro and cable vision	m	890	along the north side of St Jean Street to Intersection #2 and then toward the south of Intersection #2 on the east side.	To be relocated.
Overhead Hydro	m	907	125m east and 515m west of Intersection #2 on the south side and 145m west of Intersection #2 on the north side of Poupart Road.	To be relocated.
Buried Hydro	m	100	The east side of St. Jean Street, north of Intersection #1. This utility is ended at the pump station.	This utility is under the proposed multi-use path and may need only to be protected during the construction time.
Buried Bell	m	1230	644m along ST Jean Street and 337m along Poupart Road, west of Intersection #2.	To be protected or relocated.
Service to Dwelling	No.	10	Connected services to the existing dwellings	may require to be relocated.

3.9 GEOTECHNICAL REQUIREMENTS

A geotechnical report (See Appendix "H") was conducted by Paterson Consultants in November, 2022 to assess the existing conditions along the St. Jean Street-Montée Poupart Side Road corridor. A total of 54 boreholes were drilled, distributed to provide general coverage of the corridor while considering the placement of future roadway reconstruction/widening, roundabouts, municipal urban services and other underground utilities and site features, to a maximum depth of 7.5 meters.

The report concluded that the site is suitable for the proposed reconstruction of the St. Jean Street-Montée Poupart Side Road corridor, with a portion of the roadway and municipal services expected to be founded on undisturbed hard to very stiff silty clay, glacial till, or bedrock layers. However, due to the presence of a silty clay layer, there's a permissible grade raise restriction. Regarding bedrock, the report notes the shale of the Rockcliffe Formation to the north, transitioning to limestone and/or dolomite with interbedded shale of the Gull River Formation towards Poupart Road. Overburden drift thickness is estimated to range from 1 to 10 meters in depth. Groundwater considerations include the possibility of trapped surface water within backfilled boreholes, leading to higher than typical groundwater levels.

Additionally, the culvert replacement of the Lafontaine Creek culvert was anticipated to require special construction considerations.

3.10 PREVIOUS DESIGN PLANS AND MASTER CONCEPT PLANS

Section 3.2.3 of the City of Clarence-Rockland's Multi-modal Transportation Master Plan (2019) (TMP) noted that previously planned transportation improvements that were outlined in the 2005 Strategic Plan, the City's Official Plan, and completed Environmental Assessments that were forecast to be required by the future 2031 horizon year. As concerns this EA, the TMP denoted the following required improvements:

Roadway Improvement	Recommended Road Classification and Improvements
Montée Poupart between Richelieu Street and St. Jean Street.	• Future Designation: Major Collector Classification • Widening from two-lanes to four lanes.[1] • Convert existing intersection at Montée Poupart/St. Jean Street to a roundabout. • A multi-use path on the north side of the road • A sidewalk on the south side of the roadway • New roundabouts to replace the existing stop-controlled intersection. • New roundabout to replace the future intersection with the new east-west road.
St Jean Street (E-W) from the Montée Poutpart Road/St. Jean Street Intersection to the St. Jean Street (N-S) Corridor.	• Future Designation: Major Collector Classification • Road Widening required. • New roundabouts for the new intersection with the new east-west road
A north-westerly extension of Montée Poupart to ultimately connect with County Road 17.	• Future Designation: Major Collector Classification • This long-term roadway extension would delineate approximately 43 hectares of lands designated in the City's official plan as a Special Study Area (SSA1) identified in secondary plan studies[16] and traffic impact studies[17]. • Alignment and design will be confirmed at either a secondary plan or plan of subdivision. • Roadway should include provisions for active transportation including pedestrian and cycling facilities by way of a continuation of the planned multi-use and pedestrian pathways along Montée Poupart.
New E-W roadway through Morris Village in south Rockland.	• Future Designation: Major Collector Classification • New 2-Lane E-W Roadway connection that would connect St. Jean Street (N-S) corridor to Caron Street and ultimately David Street in the north • Multi-use path on the north side of roadway. • A sidewalk along the south side of the roadway.

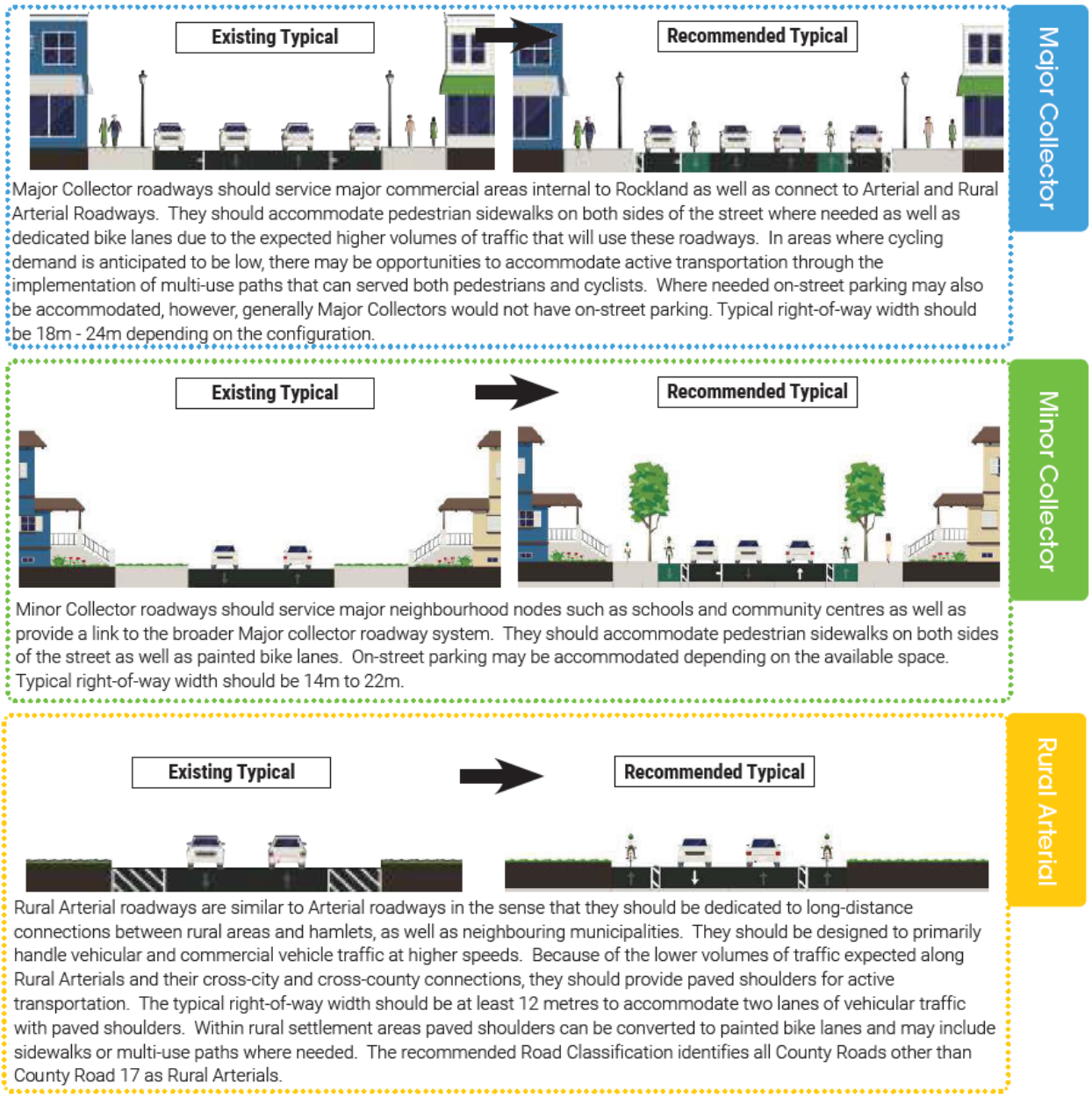
1. This conclusion was revisited. The north-south segment of Montée Poupart between Richelieu Street and Montée Poupart EW was determined not to require a 4-lane cross-section assuming the future westerly extension of Montée Poupart beyond the limit of this study to be in place.

16. "*Rockland West Secondary Plan*", Expansion Lands Secondary Plan JL Richards, and "Commercial and Industrial Market Demand Study" Shore-Tanner & Associates (Feb. 2022)
17. "*Traffic Impact Study for the Morris Village Development*", Castleglenn Consultants, 2018

4.0 DESIGN CRITERIA

4.1 DESIGN CRITERIA

Table 4-1 provides the general design criteria that were established for the St. Jean Street and Montée Poupart roadway corridors and each of the individual connecting roadways. The criteria accounted for the designated roadway classification of each roadway as referenced from the City of Clarence-Rockland's Multi-Modal Transportation Master Plan (MMTMP) and established design criteria as referenced from the Transportation Association of Canada (TAC) and Ministry of Transportation of Ontario's (MTO's) Geometric design standards for Ontario highways.



Referenced from City of Clarence-Rockland's Multi-Modal Transportation Master Plan (MMTMP), Section 5.3.4

Exhibit 4-1: Recommended Roadway Classifications

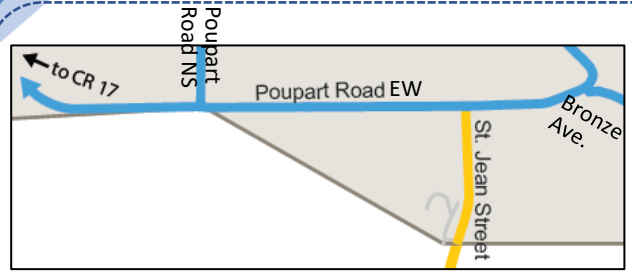


Exhibit 4-2: Recommended Road Classifications (MMTMP[8])

Table 4-1: General Design Criteria for Various Roadway Segment

Item	*St. Jean Street*			*Poupart*		*Street No.1 (Bronze Ave.)*	*North Leg of Int #2: Stewart Village 1st Road Segment*	*North & South Legs of Int #3 Stewart Village NS Road Segments*
	(From 140m north of the Pump Station to Int. #1)	*(From Int. #1 to Int. #2)*	*(From Int #2 to the South)*	*Poupart (East-west)*	*Poupart (North-South)*			
Classification[18]	Urban Major Collector		Major Collector	Urban Major Collector			Urban Minor Collectors	
	2-lane UCU	4-lane UCU	4-lane UCU	4-lane UCD	2-lane UCU	2-lane UCU	2-lane UCU	2-lane UCU
Design Speed	60 km/h	50 km/h	60 km/h	60 km/h	60 km/h	50 km/h	50 km/h	50 km/h
Lane width	2 x 4.25m	4 x 3.75m	4 x 3.75m	4 x 3.75m	2 x 4.25	2 x 5.5m	2 x 4.25m	2 x 4.25m
Shoulder	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Median width	n/a	n/a	n/a	5.0m	n/a	n/a	n/a	n/a
Boulevard Between road and MUP (+ Curb)	9.3m	2.0m	2.0m	1.5m	2.0m	0.2m	0.2m	0.2m
Multi-Use Path[19] (Asphalt)	2.5m (north)	2.5m (west)	2.5m (east)	2.5m (north)	2.5m (east)	2.5m (north)	n/a	n/a
Boulevard Between Road and sidewalk (+ Curb)	2.0m	2.0m	2.0m	2.0m	n/a	0.2m	1.95m	0.2m
Sidewalk (concrete)	2.0m (south)	2.0m (east)	2.0m (west)	2.0m (south)	2.0m (west)	1.8m (south)	1.80m (west)	n/a
Buffer to ROW	Varies	3.0m (west)	4.00m (east)	1.0m (north)	3.8m (east)	4.8m (north)	4.55 (east)	7.55m (east)
	6.0m (south)	3.5m (east)	4.50m (west)	1.0 (south)	3.4m (west)	5.5m (south)	1.0m (west)	7.55m (east)
Basic ROW Width	26.0m	30.0m	32.0m	30.0m	23.0m	26.0m	18.0m	24.0m
Min. ROW Width (MMTMT Pg. 72/73)	18-to-24m	18-to-24m	Basic	18-to-24m	18-to-24m	18-to-24m	14-to-22m	14-to-22m
Design Vehicle	WB-20	WB-20	WB-20	WB-20	WB-20	WB-20	HSU	HSU

NOTE: The section of St. Jean Street between Intersection 1 (St. Jean Street & Bronze Avenue) and Intersection 2 (St. Jean Street & Poupart N/S) was designed without a median (undivided). The design calls for the reduction of the existing 14.5% grade to an 8% maximum grade as indicated within Table 4-2. Current geometric design standards would require a 6% grade to be established if a median were to be considered. However, the western portion of this segment (to the west of Intersection 2) is characterized by grades less than 6% and provided the opportunity to develop a median.

18. "*Multi-Modal Transportation Master Plan*", Figure 5.22, City of Clarence Rockland – June, 2019, Page 72. Figure 5.22
19. "*Transportation Impact Study*, *Draft Plan of Sub-Division*", presented to Atrel Engineering by Castleglenn Consultants, December 2018

Table 4-2 details the adopted design criteria for various segments and intersection configurations (traffic signals and roundabout configurations) along the St. Jean-Poupart corridor.

Table 4-2: Design Criteria for Intersections and Approaches

Design Criteria		***Values***		***References***
Criteria Common to both Roundabouts and Traffic Signal Controlled Configurations				
General Segment Criteria	Design Speed	60 km/h	50 km/h	*Section 4.8.4* [1]
	Max. gradient	6.0%	8.0%	*Section 3.3.1* [1]
	Min. Horizontal Curves Radius	150.0m	100.0m	*Table 3.2.3* [1]
	Min. S.S.D. on level	85.0m	65.0m	*Table 2.5.3* [1]
	Min. "K" value (Crest Curves)	11.0	7.0	*Table 3.3.2* [1]
	Min. "K" value (Sag Curves)	18.0	13.0	*Table 3.3.4* [1]
	Tangent Cross Slope	2.0%		*Section 4.8.4* [1]
	Max. Side Slope Ratio	2:1 (See Geotechnical Report, Section 6: Design and Construction Precautions, (Jan 13, 2023))		*OPSD 216.010*
Criteria Specific to Roundabouts and Traffic Signal Controlled Configurations		***Values***		***References***
Signalized Intersection	Right-Turn Taper	14:1-17:1	11:1-17:1	*Table 9.14.2*[1]
	Approach and departure Taper for Left-Turn	15:1-36:1	8:1-30:1	*Table 9.17.1*[1]
	Bay Taper for Left-Turn	10:1-12:1	10:1	*Table 9.17.3*[1]
	Auxiliary Lane Width	3.5m		*Section 4.3.2* [1]
	Desirable Approach Grades	0.5%-3.0%		*Section 9.7.3.4* [1]
Roundabout Intersection	Entry Width	5.0-6.0m for single lane and 9.0 to 10m for a double lane		*Table 6.4*[2]
	Exit Width	5.0 to 6.5m single lane and 10.0m double lane		*Section 6.46*[4]
	Cross-fall	1-3%		*Table 6.4*[2]
	Design Speed of Roundabout	40 to 50 km/h		*Table 9.21.1*[1]
	Inscribed Circle Diameter	50-67 for WB-20		*Table 6.1*[2]
	Entry Angle	20-60 degree		*Table 6.4*[2]
	Max. Entry Radius	70.0m single lane and 100.0m double lane		*Table 6.4*[2]
	Exit Radius	20.0-100.0m		*Table 6.4*[2]
	Effective Flare length	5.0-25.0m		*Table 6.4*[2]
	Entry Path Curvature	<100m		*Table 6.4*[2]
	Circulatory Roadway Width	5.5m single lane and 10.0m double lane		*Table 6.4*[2]
	Truck Apron	3.0-4.0m - *Based on turning movements*		
	Max. Approach Grades	4%		*Section 6.8.3* [2]

(1) Geometric Design Guide for Canadian Roads, Chapter 2; Chapter 3; Chapter 4; and Chapter 9 (June 2017)
(2) Canadian Roundabout Design Guide (January 2017)
(3) Ontario Provincial Standard Drawing, OPSD 216.010 (Nov 2017)
(4) NCHRP 672, Roundabouts and Informational Guide (2010)

The above design criteria were used to develop two primary alternative intersection (roundabout and a signalized intersection) configurations for the 4 primary intersections along the corridor. Each of these were then evaluated using criteria consistent with the MCEA process aimed at determining the preferred configuration option.

5.0 ALTERNATIVE DESIGN SOLUTIONS

The City of Clarence-Rocklands Multi-Modal Transportation Master Plan has addressed the alternative solutions to adding additional lanes onto the St. Jean- Montée Pourpart Side Road corridor and as such was found to satisfy Phase 1 and 2 of the MCEA process. The master plan concluded that "*Montée Poupart widening between Richelieu Street and St. Jean Street from two lanes to four lanes with a multi-use path on the north side of the road.*"[20] was the preferred solution. Phase 3 and 4 of the MCEA process involved identifying alternative design concepts for the preferred solution.

The following sections describe the alternative design concept that were considered. These included:

- The intersection configuration (roundabout vs. conventional traffic signal control)
- Road segments (median divided vs. undivided)
- Existing Access/driveway provisions (Hydro One, private driveways, SWM pump house etc.)
- Widening Impacts to adjacent properties.

Prior to assessing the alternative design solutions, it was considered worthwhile to compare each solution to a do-nothing base case as the basis of relative comparison of each alternative to one another.

5.1 THE DO NOTHING ALTERNATIVE

The Official Plan (2021) of the City of Clarence-Rockland illustrated a plan view of future developments along the study corridor. Based on this plan and forecast traffic volumes, the existing intersections along the St. Jean Street-Poupart corridor and intersection configurations were determined to be inadequate to meet forecast traffic demands for the following reasons:

- The existing road segments and existing intersection configurations were found to have deficient capacity to accommodate future forecast traffic volumes.
- The existing geometry of the intersection require improvements to meet current safety and turning movement design standards. e.g. The hill formed by St. Jean Street from the bottom of Intersection No. 1 to Intersection No. 2 at the top of the hill has a longitudinal gradient of ~14.5%, which is not acceptable for a designated Urban Major Collector design standard.
- Future planning/design provisions are necessary to accommodate future planned developments (Stewart Village, Morris Village etc.) while assuring safe accessibility. Planned improvements to the Poupart Corridor must be designed to assure the appropriate location and accesses+ to these future developments.

The City's Multi-Modal Transportation Master Plan did not recommend a do-nothing solution.

5.2 INTERSECTION CONFIGUATIONS

Several methods are available to control the conflicting traffic flows at intersections and assign the right-of-way to motorists. The selection of the appropriate intersection control considers traffic volume, roadway designation, pedestrian circulation, cyclist requirements, heavy vehicle turning movements, grades, safety elements, etc. The two general design alternatives considered for the intersections along the St. Jean-Poupart corridor included both traffic signals and roundabouts. In addition, other alternative traffic control strategies were considered.

20. "*Multi-Modal Transportation Master Plan*", Figure 5.22, City of Clarence Rockland – June, 2019, Page 58. Figure 5.14 (2023 Road Network) The north-south segment of Montée Poupart between Richelieu Street and Montée Poupart EW was determined not to require a 4-lane cross-section assuming the future westerly extension of Montée Poupart beyond the limit of this study to be in place.

5.2.1 Intersections: Traffic Signals

Traffic signals are a conventional intersection control configuration, which are intended to reduce the number of conflict points by assuring only specific movements are permitted entry to the intersection at specific times determined by the traffic signal phasing/timing strategy. Different factors, such as traffic and pedestrian/cyclist volumes are considered in determining warrant for this configuration option. Traffic signals:

- can maximize the degree of control and assign the right-of-way to conflicting traffic movements.
- can provide separate timing for pedestrians to safely cross the roadway.
- are able to adjust the phasing/timing to accommodate varying travel demands throughout the day.
- provide dedicated time/phasing to accommodate minor roadway traffic movements when the dominant direction of travel is congested.
- can be used to increase intersection capacity when compared to un-controlled (STOP/YIELD-controlled) intersections.

However, traffic signals have some negative impacts, such as:

- traffic signals have a higher incidence of rear-end collisions.
- traffic signals can increase traffic delay in comparison to un-controlled (STOP/YIELD-controlled) intersections.
- annual maintenance costs are thought to be higher for traffic signals as compared to roundabout configured intersections.

5.2.2 Intersections: Roundabouts

Roundabouts, have, over the last two decades become a popular intersection control type that offers several advantages over conventional intersection designs. Roundabouts were found to:

- offer enhanced vehicle safety. Motorists are forced by the design to decrease their speed on approaching the roundabout.
- result in less severe damage/injuries related to collision incidents.
- facilitate traffic calming in neigbourhoods as motorists are less prone to “race-toward-the-intersection” to catch a green light.
- provide a break in the monotony of travel along long segments of a roadway.
- require less maintenance cost.
- offer reduced vehicle stop-starts and breaking prolonging vehicle life-cycle and reduced vehicle maintenance.
- offer improved traffic operational performance such as eliminating delays associated with left turns.
- allow for continuous movement/circulation through the roundabout.
- facilitate U-turn movements.

However, in general, roundabouts were determined to require additional property than conventional intersection and have a higher construction cost.

Roundabout Design Elements

In terms of multi-lane roundabouts, literature[21] suggests three possible cases:

Case 1: Roundabout: Where vehicles track across adjacent lanes as they enter, circulate and exit the multi-lane roundabout;

Case 2: Roundabout: Where vehicles continue in their own lane through the entry but not as they circulate and exit the multi-lane roundabouts; and

21 . “*Canadian Roundabout Design Guide*” Transportation Association of Canada (TAC), January, 2017, Page 80-to-83.

Case 3: Roundabout: Where vehicles continue in their own lane as they enter, circulate and exit the multi-lane roundabout.

In general, TAC infers that Case 2 is applicable for "normal" traffic. (i.e. in the absence of high volumes of heavy vehicle traffic.)

In addition, the design of multi-lane roundabouts should consider the following elements:

- *Approach Speed:* The geometric configuration of the approaches to the roundabouts should be designed to:
  - assure that the physical configuration of the approaches must achieve the desired design speed transitions between the straight portions and the lanes internal to the roundabout; and
  - provide successive curves with large enough radii in advance of the roundabouts to ensure the intended speed reductions.
- *The inscribed Circle Diameter (ICD):* The inscribed circle diameter (ICD) should be designed to be between 50-67m to accommodate the turning movements of heavy design vehicles (such as a WB-20).
- *Heavy Vehicle Provisions:* Truck aprons are intended to accommodate the turning movements of heavy vehicles.
- *Vertical Profile Approaching and Within the Roundabout:* The vertical profiles for the corridors approaching and through the roundabout, should be a maximum of 3 percent.
- *Lighting:* Roundabouts must be provided with continuous lighting on the approaches covering a distance of approximately 120m.

5.2.3 Intersections: Other Options Considered

Other intersection control types were considered for the early staging of the major intersections before traffic signal or roundabout configurations would be warranted. During the early stages of development of the adjacent communities and prior to significant east-west traffic growth materializing, the following staging option remain worthwhile to consider for Intersections No. 3 and No. 4:

- *YIELD Control:* YIELD control access could be used to accommodate minor movements onto the St. Jean-Poupart corridor if east-west traffic volumes permit this.
- *STOP Control:* STOP control access can be used as in interim stage of development to facilitate minor movements.

However, these options are proven to be unacceptable in the long-run when auxiliary turning lanes become warranted and the concept remains inconsistent with the ultimate preferred east-west St-Jean-Poupart main-line designation as a major urban collector facility that is anticipated to be characterized by considerable east-west demands.

5.3 INTERSECTION ALTERNATIVES CONSIDERED

This section serves to describe, and illustrate, the alternative geometric configurations that were considered for the four major intersections planned along the widened St. Jean Street-Montée Poupart Side Road corridor. In general, both traffic signal-controlled and roundabout configurations were evaluated based on the ultimate forecast traffic volumes and intersection capacity analyses results.

5.3.1 St. Jean Street and Bronze Avenue Intersection (#1)

Traffic Signal-Controlled Configuration

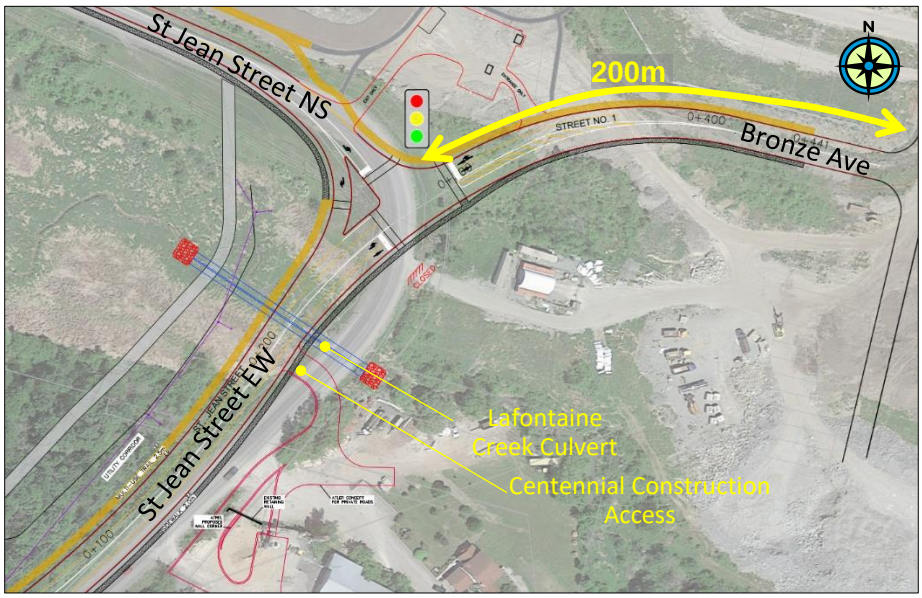


Figure 5-1: Intersection No. 1: Traffic Signal Controlled Alternative

- The main traffic flow based on the traffic volumes is from Bronze Ave to/from St. Jean Street EW which is to be designed as a major corridor. St. Jean Street NS is designated as a an urban minor collector corridor.
- St. Jean Street NS and Bronze Avenue were designed as 2-lane corridors and St. Jean Street EW as a 4-lane corridor. The lane configuration was based on forecast traffic analyses and was determined to result in satisfactory traffic operations.
- This configuration was assumed to provide for a southbound right turn channelized island to facilitate movements from St. Jean Street NS onto the 4-lane St. Jean Street EW.
- The concept accommodates the Centennial Construction access by way of a realigned, reprofiled service road network[22] as illustrated in Figure 5-2. The plan requires a service road retaining wall and removal of approximately 7m of a retaining wall on the north side of the loading bay and parallel to St. Jean Street. The sight distances at this access were checked and are illustrated within Annex "A". A 10m wide swath of land beyond the north sidewalk (3m) and boulevard was designated for use by Hydro One. This was determined to not be feasible in the vicinity of the planned culvert, hence, the boulevard was reduced to ~1m leaving a shared utility/boulevard corridor approximately 11.6m in width to address this requirement.
- The 79m long Lafontaine Street culvert was determined to be a fixed constraint.
- Oneway Entry-Exit Accesses are provided to SWM pond on the NE portion of the roundabout.
- EB Vehicles travelling down the 8% grade may race to catch the green light at the intersection.
- Access to the construction area south of Bronze Avenue will be closed.

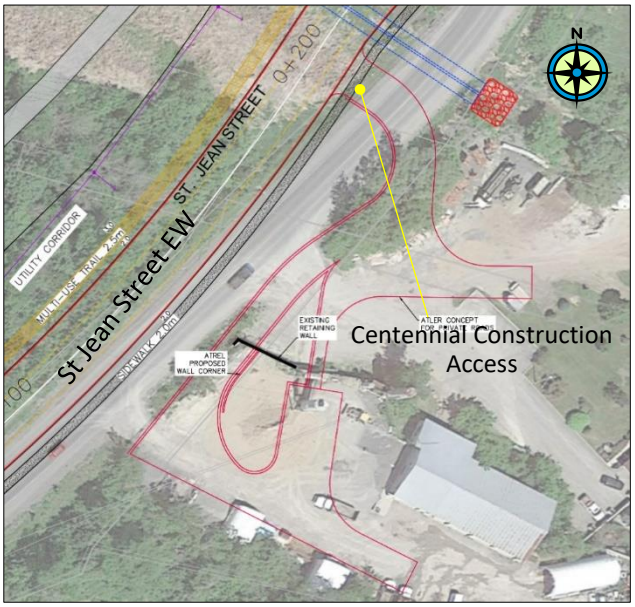


Figure 5-2: Centennial Construction Access

22. Designed by Atrel Engineering.

- Table 5-1 indicates the storage lengths and tapers for the required auxiliary lanes.

Table 5-1: Intersection No. 1: Auxiliary Lane Requirements

Direction	*Storage (m)*	*Taper*
W-to-E Left-Turn	30.0	15:1
E-to-S widening to 2-lane	55.0	20:1

Roundabout Configuration

- A roundabout configuration for this intersection were found to require a minimum Inscribed Circle Diameter (ICD) of 64.0m[23].
- The design required consideration of the following elements:
  - the angle between the intersection legs.
  - safety factors such as the fastest path.
  - the location of the new Pump Station located to the north of the intersection.
  - the access re-location and re-profiling of the Centennial Construction access on the south side of St. Jean Street EW.
  - the design requirements necessary to accommodate a heavy vehicle (WB-20) turning movements.

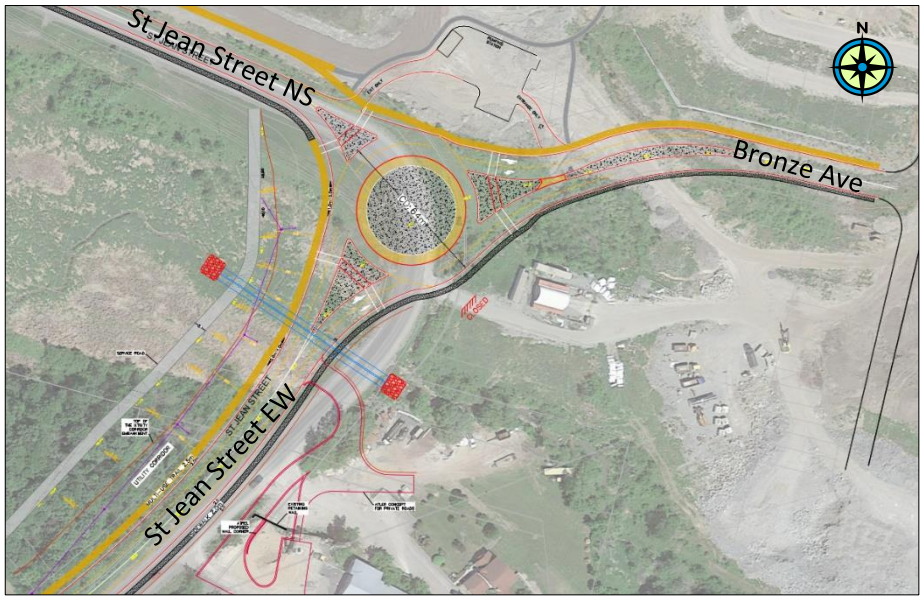


Figure 5-3: St. Jean Street & Bronze Avenue: Roundabout Option

- The roundabout would include a 4m wide truck apron to accommodate heavy vehicles turning movements.
- This roundabout is designed to have circulatory width of 10.0m (2-lane) on the St- Jean Street EW and Bronze Ave approaches and a 6.0m (single-lane) circulatory width leading to/from St Jean Street NW.
- The three raised median approach islands would be designed to control the entry angles to the roundabout and also serve as a safe pedestrian refuge area to facilitate crossings of the roundabout.
- Safety design factors, such as the fastest paths (to ensure that vehicles cannot go faster than the design speed), satisfactory entry angles, and sight distances, were checked throughout the design process.

5.3.2 St. Jean Street & Poupart EW Intersection (#2)

Traffic Signal-Controlled Configuration

- A 5.0m wide median on the west side of the intersection was narrowed to 1.5m to provide for a 3.5m wide EB left-turn lane.

23. This was based on design criteria that would accommodate a WB-20 design vehicle that specified an ICD of 50m-to-67m.

- The intersection was shifted approximately 5.0m to the north to protect the existing Hydro Poles that front the south side of Montée Poupart Side Road and to continue to provide access to the Hydro sub-station.
- Traffic analyses indicated that a channelized right turn island would be warranted that would connect the St. Jean Street NS to the St. Jean Street EW corridor.
- The design vehicles for the Montée Poupart Side Road EW and St. Jean Street EW and NS corridors were determined to be a WB-20. A Heavy Single Unit (HSU) truck was adopted for the design vehicle for the Stewart Village access.

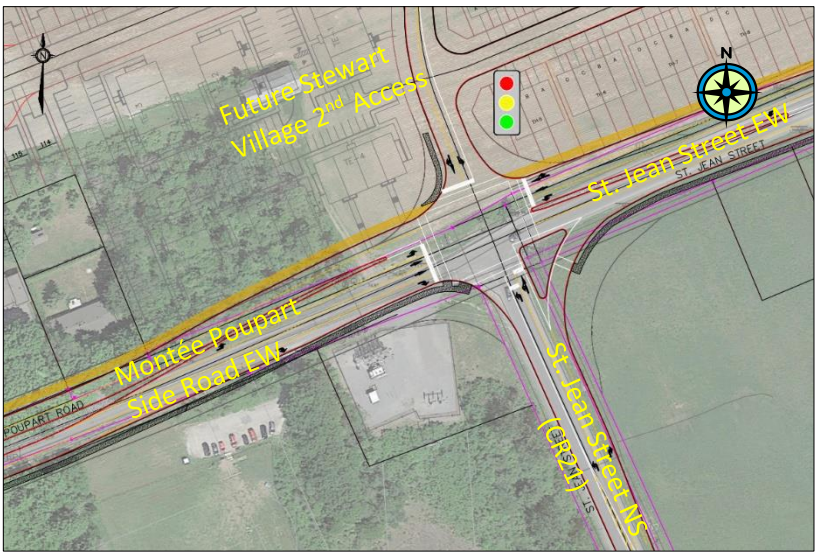


Figure 5-4: Intersection No. 2: Traffic Signal Controlled Alternative

- A 2.5m wide MUP along the north side of the intersection with a 1.0m wide boulevard between the MUP and the edge of the roadway within the area of the intersection.
- A 2.0 wide sidewalk was included along the south side of the corridor and on the west side of the Stewart Village access. There is a 2.0m wide boulevard between the sidewalk and the edge of the roadways.
- The storage capacities of the right and left turn lanes have been determined based on the analyses of the forecast ultimate traffic volumes. The values indicated within Table 5-2 were incorporated within the geometric design.
- The above design vehicles were used to design intersection corner curvature as indicated within Table 5-3.

Table 5-2: Intersection No. 2: Auxiliary Lanes Requirements

Direction	*Storage (m)*	*Taper*
WB Left-Turn	100.0	20:1
EB Right-Turn	40.0	20:1
EB Left-Turn	60.0	20:1
SB Left-Turn	25.0	14:1
NB Left-Turn	80.0	15:1
NB Right-Turn	80.0	15:1

Table 5-3: Intersection No. 2: Corner Curvatures

Corner	*Radii (m)*	
	Compound curves	*Simple Curve*
NE Quadrant	13.5 + 43.5	-
NW Quadrant	14.0 + 26.0	-
SE (Channelized) Quadrant	-	41.0
SW Quadrant	16.5 + 46.5	-

Roundabout Configuration

- The roundabout's Inscribed Circle Diameter (ICD) of 60m was selected based on the required turning movements of a WB-20 design vehicle and consideration of safety factors. This value falls within the permitted range (50m-to-67m) of the design criteria.
- A 4.0m truck apron was selected to facilitate turning movements of heavy vehicle traffic.
- The roundabout was shifted ~ 14m to the east of the existing intersection to assure continued access to the Hydro sub-station.
- A mountable area of the median on the west leg of the roundabout was designed to assure continued access for Hydro One vehicles into, and out of, the existing hydro sub-station.
- The MUP and sidewalk configurations are identical to the traffic signal-controlled option.

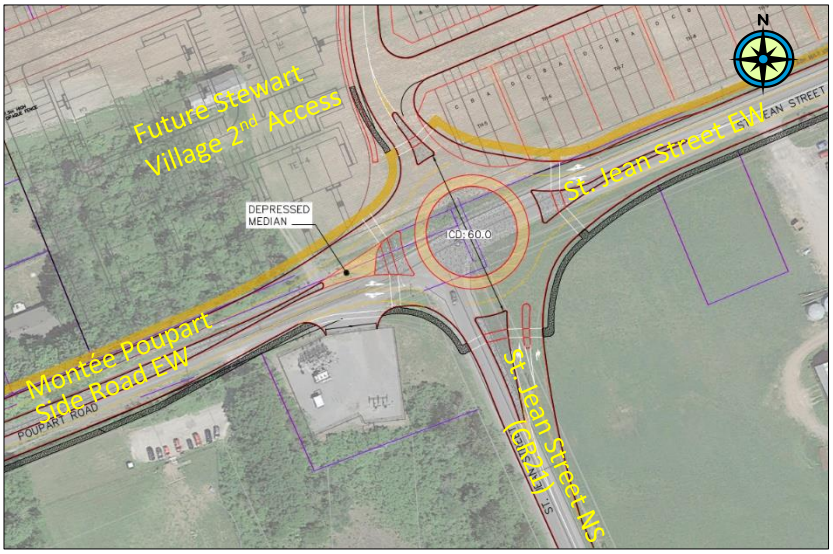


Figure 5-5: Intersection No. 2: Roundabout Option

- The circulatory roadway width internal to the roundabout was designed as 10.0m to accommodate a two-lane approach and 6.0m to accommodate a single lane approach.
- The high forecast NB right turn traffic volume was accommodated by producing a slotted right turn lane approach on the south leg of the roundabout. This is intended to avoid queues building on the north approach to the roundabout.

5.3.3 St. Jean Street and Poupart EW Intersection (#3 and #4)

Traffic Signal Controlled-Configuration

- As indicated in Section 3.3, the separation between Intersections No. 3 and No. 4 is only 230m which represents a constraint for potential forecast merging, diverging and weaving movements. Although Figure 5-6 illustrates two sequential traffic signal-controlled intersections side-by-side, this option should **not** be considered. Rather, the concept was intended to illustrate the alternative of having either Intersection No. 3 **or** No. 4 being considered as traffic signal-controlled intersection, but not both.
- The concept illustrates a 5.0m wide median which would be narrowed to 1.5m within the intersection area to accommodate 3.5m wide left-turn lanes.
- The driveway accesses on the south side of Poupart were re-located to assure a minimum 55m clearance from either traffic signal-controlled intersection, based on TAC guidelines[24].
- The design vehicles for Montée Poupart Side Road EW and NS corridors were determined to be a WB-20 configuration, and a Heavy Single Unit (HSU) truck for the Stewart Village access.

24. TAC, Chapter 8 Access Management, Figure 8.8.2, June 2017

Figure 5-6: Intersection No. 3 & No. 4: Traffic Signal Controlled Alternative

- The design vehicles' right-turn movements were used to design intersection corner curvature.
  - intersection No. 3 assumed a Heavy Single Unit (HSU) design vehicle and would require a 25m corner radius.
  - intersection No. 4 assumed a WB-20 design vehicle and was found to require a radius of 18.0 and 55.0m.
- A 2.5m wide MUP would extend along the north side of Montée Poupart Side Road EW corridor with a 1.5m wide boulevard between the MUP and the edge of the roadway.
- A 2.5m wide MUP would also be provided along the east side of Montée Poupart Side Road NS corridor with a 2.0m wide boulevard between the MUP and the edge of the roadway.
- A continuous 2.0m wide sidewalk would be provided along the south side of Montée Poupart Side Road EW with a 2.0m wide boulevard between the sidewalk and the edge of the roadway.
- A continuous 2.0m wide sidewalk would be provided along the west side of Montée Poupart Side Road NS.
- The storage capacities of the right and left turn lanes were determined based on the results of ultimate traffic volumes analyses and have been incorporated into the geometric design. The details of the auxiliary lane configurations are indicated within Table 5-4.

Table 5-4: Intersection No. 3 & 4: Auxiliary Lanes Requirements

Direction	***Intersection #3***		***Intersection #4***	
	Storage (m)	***Taper***	***Storage (m)***	***Taper***
WB Left-Turn	45.0	17:1	-	-
WB Right-Turn	-	-	40.0	17:1
EB Left-Turn	55.0	17:1	25.0	17:1
SB Left-Turn	20.0	20:1	-	-
NB Left-Turn	20.0	20:1		
NB Right-Turn	-	-	40.0	14:1

Roundabout Configuration

- Figure 5-7 illustrates the concept where 2 roundabouts (side-by-side) are presented separated by the same 230m distance between Intersection No. 3 and No. 4.

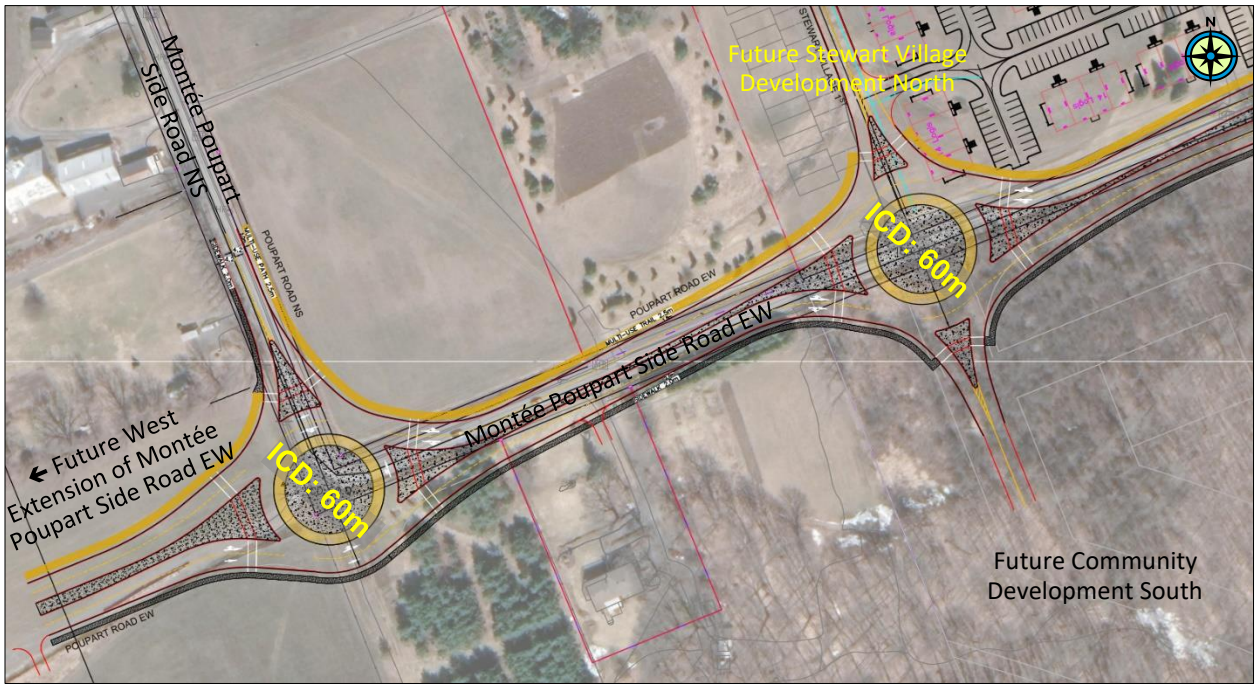


Figure 5-7: Intersection No. 3 & No. 4: Roundabout Alternative

- Both roundabout's Inscribed Circle Diameters (ICD) were selected to be 60.0m based on the WB-20 design vehicle turning movements and after consideration of safety factors. This value falls within the range of the design criteria.
- A 4.0m truck apron was selected to facilitate heavy vehicles turning movements.
- The median width between the two roundabouts was reduced to 2.0m to limit property impacts and reduce construction costs.
- The concept depicts a slightly skewed center line between the two roundabouts (rotated ~6 degrees counter-clockwise) to satisfy the roundabout required fastest path (to ensure that vehicles cannot go faster than the design speed) design criteria.
- The MUP and sidewalk configurations are identical to the traffic signal-controlled alternative.
- The circulatory roadway width internal to the roundabout was designed as 10.0m to accommodate a two-lane approach and 6.0m to accommodate a single lane approach.
- The fastest path and entry angles for both roundabouts were reviewed, and they have been found to satisfy the range of design criteria (50m-to-67m).

5.4 ROAD SECTIONS BETWEEN THE INTERSECTIONS

Each of the road segments detailed in Table 4-1 were considered to either be characterized by the presence of a centre median or an undivided cross-section. In general, median serve to separate opposing flows of traffic and may be warranted for the following reasons:

- *Safety:* Medians are known to reduce the likelihood of head-on collisions. They serve to limit access to certain areas of the roadway, and they allow for safer turning movements They serve to enhance safety where higher speeds would be characterized.
- *Traffic Flow:* Medians serve to limit turning movements. This is particularly effective where high volumes of through traffic would be interrupted by vehicles turning into individual resident driveways.
- *Traffic Operations and Functionality:* By limiting mid-block turning movements, median are often used to facilitate the dominant direction of heavy travel demand where high traffic volumes are evident.
- *Aesthetics/Landscaping:* Medians can serve to enhance the urban environment through trees, shrubs and flowers which could be used to obscure the sight of oncoming traffic and head lights.
- *Planning for New Developments:* Medians can facilitate broad land use objectives and promote mixed-use developments, enhance the pedestrian environment, and create a sense of place.
- *Pedestrian Refuge Area: Medians can provide a refuge area for pedestrians that permit crossing the road in two stages rather than a single stage.*

The St. Jean-Montée Poupart corridor between the major intersections can be segmented into three distinct sections. The remaining connection are predominantly newly established and link to new subdivisions.

Section "A" Between Intersection No. 1 and Intersection No. 2

A median was initially considered for the portion of the St. Jean Street EW corridor between Intersection No. 1 and No. 2. However, the existing gradient along this section of roadway is currently 14.5% which was re-designed to accommodate an 8 percent grade. Design standards[25] indicate that for an 8% grade, an urban residential collector with an "undivided" cross section would be required.

The horizontal alignment along this section of the corridor primarily occurs in the vicinity of Roundabout No. 1 at the bottom of the hill with the alignment being shifted northward where the design of the approach to the roundabout requires motorists to reduce their speed before entering the roundabout, while still providing sufficient separation to permit accessibility to a realigned and reprofiled Centennial Construction internal access roadway.

25. "*Geometric Design Guide for Canadian Roads*", June 2017, Chapter 3: Alignment and Lane Configuation, Table 3.3.1 Maximum Gradients. As referenced from 1999 publication of same document.

Section "B" Between Intersection No. 2 and Intersection No. 4

This section of the corridor provides for a horizontal alignment adjustment which is minimal, but aimed at straightening the roadway corridor, with a planned widening on both sides of the existing road into a four-lane major divided collector cross-section. Efforts have been made to maintain a vertical profile similar to the existing profile to facilitate a smooth transition to each of the connecting driveways along the length of the corridor. Nevertheless, some vertical curve enhancements have been implemented to ensure a smoother overall roadway profile. Proposed vertical curves adhere to a minimum K value of 23 for the crest curves and 25 for the Sag curves. The grade along this section would adhere to the design criteria detailed within Table 4-2 of the corridor and range between 0.5-to-5.0 percent.

The section between Roundabouts No. 3 and No. 4 (Montée Poupart Road NS), features a 6^{o} counterclockwise rotation to regulate and decrease vehicle speed approaching the roundabouts. The vertical profile along this segment of roadway is predominantly straight and slopes approximately 1.0% toward the west.

A median was determined to be warranted along this 1.1 km distance separating Intersection No. 2 and No. 4. The design speed of this section of the Montée Poupart Side Road corridor was determined to be 60 Km/h, however, given the straight east-west alignment of this corridor a potential safety concern was identified should the corridor be undivided. Forecast traffic along this section of the corridor was felt to warrant consideration of a raised median to minimize the potential of head-on collisions. In the area of the existing Hydro One sub-station a section of depressed median was found to be required to facilitate periodic access of Hydro vehicles into, and out, the sub-station.

6.0 TRAFFIC FORECAST

6.1 FORECAST (2031) BUILD-OUT TRAFFIC VOLUMES

Figure 6-1 illustrates the morning and afternoon peak hour forecast (2031) traffic volumes for each of the four planned major intersections along the St. Jean Street-Montée Poupart Side Road corridor.

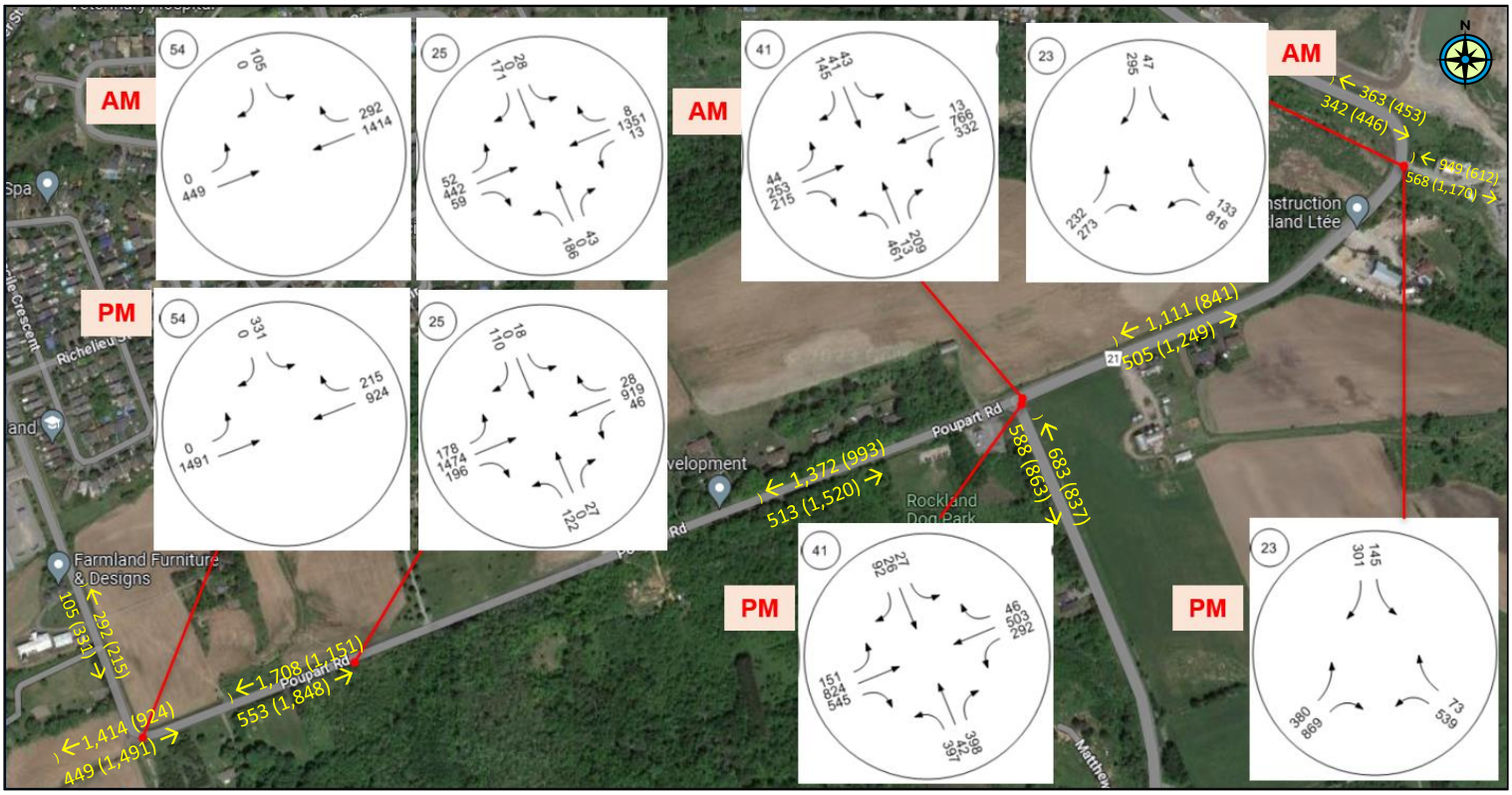


Figure 6-1: Forecast (2031) Morning and Afternoon Peak Hour Traffic Volumes

The forecast peak hour link volumes indicate on their own that without improvements, the future 2031 peak hour forecasts would result in significant deteriorated intersection operations along Montée Poupart Side Road which is a key corridor for both internal and external travel needed to sustain future residential growth.[26]

26. "*Multi Modal Transportation Master Plan*", The City of Clarence-Rockland, Stantec, June 2019 Pg. 27

7.0 EFFECTS AND EVALUATION OF ALTERNATIVES

7.1 EVALUATION CRITERIA

The following factors were evaluated to assist in evaluating the alternative design solutions of the alternative configurations:

- Traffic Operations
- Active Transportation (Pedestrians Cyclists)
- Safety - Speed Calming – Collision Severity
- Overall Property Impacts
- Costing (Capital and Maintenance)

7.1.1 Traffic Operations

Traffic operational analysis was conducted assuming the ultimate forecast traffic volumes for both traffic-signal controlled and roundabout intersection configurations.

Synchro intersection capacity analysis software was used to analyze traffic signal-controlled intersections and Sidra roundabout capacity analysis software was used to undertake the roundabout traffic analysis. The detailed results have been included in Appendix "I".

Table 7-1 summarizes the results of traffic operational factors for each intersection that was evaluated assuming the ultimate stage, traffic forecast volume. Clearly, the roundabout configuration was found to offer superior operational characteristics for all four intersections considered.

The three primary factors conventionally considered within traffic operations consist of:

- *Level of Service (LOS)* is an alphabetic grade intended to represent the qualitative measure of traffic flow at an intersection. The "overall" grade represents an intersections overall level of performance. LOS indicators can also be determined for specific turning movements as well. LOS is correlated to the average stopped delay-per-vehicle for a peak 15-minute analysis period which can range from "little or no delay" to "saturation". LOS "A" is indicative of less than a 5 second delay; LOS "B", between 5-and-15 seconds; LOS "C", between 15-and-25 seconds; LOS "D", between 25-and-40 seconds; LOS "E", between 40-and-60 seconds; LOS "F", greater than 60 seconds.
- *Average delay* is measured in terms of the average number of seconds of delay experienced by each vehicle over a peak 15-minute interval during the peak hour of travel demand.
- *Queue length* is measured in meters and represents the average number of vehicles that cannot be effectively processed through the intersection. Queue length is determined by the arrival rate (number of vehicles per 15-minute interval multiplied by the average waiting time (which includes wait time and the time taken to process the vehicle through the intersection.
- *Volume-to-capacity (v/c)* is a measure of the amount of traffic on a given roadway approach relative to the amount of traffic the roadway/approach was designed to accommodate. In general, a v/c ratio of less than 0.85 is indicative of being "under capacity"; between 0.85-to-0.95 being "near capacity"; between 0.95-to-1.00 being "at capacity"; and greater than 1.00 being "over capacity".

Table 7-1: Summary of Traffic Operational Analysis Results ("Ultimate" Build-Out Traffic Volumes)

Intersection	*Direction*	*AM /PM*	*Signalized Option[1]*				*Roundabout Option[2]*			
			Avg. delay (Sec.)	*Queue (m)*	*(Max. V/C ratio)*	*LOS*	*Avg. Delay (Sec.)*	*Queue (m)*	*(Max. V/C ratio)*	*LOS*
#1 St Jean St/ Bronze Avenue										
Overall Traffic Operations		AM	13.9		(0.86)	B	7.0		(0.37)	A
		PM	21.4		(0.88)	C	6.2		(0.45)	A
Critical Movements	LT from ST Jean West to St. Jean North (NEB LT)	AM	42.8	80	(0.86)	D	9.6	1	(0.17)	A
		PM	20.1	68	(0.75)	C	7.8	3	(0.45)	A
	Bronze Ave East to St. Jean West (SWB Th)	AM	7.1	46.6	(0.45)	A	9.4	2	(0.36)	A
		PM	24.7	58	(0.65)	C	10.0	2	(0.26)	A
	LT from St. Jean North to Bronze Ave East	AM	25.4	16	(0.12)	C	5.6	2	(0.37)	A
		PM	23.4	33	(0.34)	C	6.0	2	(0.43)	A
#2 St. Jean St./ Montée Poupart Side Road EW / Stewart Village 1st Access										
Overall Traffic Operations		AM	27.0		(0.86)	C	7.5		(0.51)	A
		PM	26.7		(0.86)	C	7.5		(0.64)	A
Critical Movements	WB LT	AM	50.9	103	(0.86)	D	10.7	4	(0.51)	B
		PM	45.9	89	(0.80)	D	11.2	3	(0.42)	B
	NB-LT	AM	42.0	80	(0.77)	D	10.2	2	(0.38)	B
		PM	45.2	75	(0.76)	D	12.0	3	(0.49)	B
#3 Montée Poupart Side Road EW / Stewart Village 2nd Access										
Overall Traffic Operations		AM	16.9		(0.85)	B	4.7		(0.53)	A
		PM	18.0		(0.90)	B	4.5		(0.62)	A
Critical Movements	EB LT	AM	25.7	19	(0.46)	C	4.2	1	(0.19)	A
		PM	38.1	12	(0.78)	D	4.6	5	(0.62)	A
	SB-LT	AM	14.7	7	(0.07)	B	7.9	2	(0.32)	A
		PM	19.9	7	(0.06)	B	6.1	1	(0.17)	A
#4 Montée Poupart Side Road EW / Montée Poupart Side Road NS										
Overall Traffic Operations		AM	15.0		(0.86)	B	3.4		(0.54)	A
		PM	18.2		(0.9)	B	5.2		(0.65)	A
Critical Movements	WB Th	AM	19.4	110	(0.86)	B	2.9	4	(0.54)	A
		PM	11.7	54	(0.56)	B	3.1	3	(0.38)	A
	EB Th	AM	9.0	24	(0.27)	A	2.7	1	(0.16)	A
		PM	22.7	134	(0.90)	C	6.3	7	(0.65)	A
	SB-LT	AM	16.7	29	(0.34)	B	10.4	1	(0.21)	B
		PM	27.0	38	(0.71)	C	12	2	(0.39)	B
	EB-LT	AM	9.9	3	(0.09)	A	3.1	1	(0.16)	A
		PM	13.1	12	(0.29)	B	6.3	7	(0.65)	A

1. Analysis undertaken with Synchro 11
2. Analysis undertaken with Sidra 12

Table 7-1 indicates that the roundabout configured alternative results in considerably higher levels of service, much shorter queueing of vehicles and considerably less vehicle delay than the traffic signal-controlled alternative.

7.1.2 Safety

The following four factors were considered when evaluating the relative safety factor associated with the alternative intersection configurations:

- Number of Conflict Points
- Speed Calming
- Pedestrian Safety Collision Severity
- Collision Severity

a. Motor-Vehicle Conflict Points

Conflict points refer to the number of points within an intersection where the turning movements associated with opposing vehicles can potentially collide with one another.

Table 7-2 serves to differentiate the type of potential vehicle conflict (eg. diverging, merging, weaving, and crossing) under both the traffic signal controlled and roundabout alternatives that were considered.

Table 7-2: Conflict Points: Traffic Signal Controlled vs. Roundabout Configurations

Intersection	Traffic Signal Control	Roundabout	Preferred Option
#1 St Jean St/ Bronze Ave. [T – Intersection]	**9 conflicts:** • 2 diverging • 3 merging • 4 crossing	**12 conflicts:** • 5 diverging • 5 merging • 2 crossing	The signalized option was found to have fewer conflict points. However, crossing conflicts often result in more severe collisions.
#2 St. Jean St./ Montée Poupart Side Road [4-leg Intersection]	**44 conflicts:** • 8 diverging • 9 merging • 28 crossing	**20 conflicts:** • 8 diverging • 8 merging • 4 crossing	The roundabout option offers considerably less conflict points than the traffic- signal controlled alternative and considerably less crossing conflicts which often result in more sever collisions.
#3 Montée Poupart Side Road/ Stewart Village Access [4-leg Intersection]	**40 conflicts:** • 8 diverging • 8 merging • 24 crossing	**20 conflicts:** • 8 diverging • 8 merging • 4 crossing	
#4 Montée Poupart Side Road EW/ Montée Poupart Side Road. NS [T – Intersection]	**11 conflicts:** • 3 diverging • 3 merging • 5 crossing	**12 conflicts:** • 5 diverging • 5 merging • 2 crossing	Both traffic signal controlled and roundabout alternatives have a similar number of conflict points, but the number of crossing conflicts associated with traffic signals is higher.
Total	**104 Conflicts**	**64 Conflicts**	**Roundabout Configuration**

- Crossing Conflicts: These conflicts are considered "major" conflicts as they could lead to a severe accident. The conflict occurs when two vehicle paths conflict perpendicularly within an intersection.
- Diverge Conflicts: These conflicts are considered "minor" conflicts as they most often result in rear-end or angle collisions which are less severe. The conflicts are associated with lane changes where a vehicle slows with an inattentive, motorist following too closely.
- Merge Conflicts: These conflicts are considered "minor" conflicts as they most often result in sideswipe or angle collisions which are less severe. These conflicts occur when a vehicle attempts to merge into a lane without assuring the lane is clear.
- Weaving Conflicts: This type of conflict is a hybrid of merge and diverge conflicts where high volumes of lane changes take place within a relatively short distance.

b. Speed Calming

The City's transportation master plan designated the St. Jean - Montée Poupart Side Road corridor as a major collector roadway that would assure accessibility for higher volumes of traffic and accommodate the requirements of both existing and future urban residential developments.

Roundabouts are well known to be a better configuration offering enhanced safety by controlling speed and assuring transitioning traffic from high-speed to low-speed environments. The roundabouts offer opportunities for signs and markings which are key treatments used to communicate to motorists that they must slow down as they approach the roundabout. When navigated appropriately, roundabouts can eliminate or reduce the severity of crashes, reduce delays as well as reduce fuel consumption and represent a safer alternative to traffic signals and stop signs. Figure 7-1 illustrates the proposed posted and design speeds for the roundabout concept. A similar exhibit had been prepared for the alternative traffic signal alternative.

The St. Jean - Montée Poupart Side Road corridor between intersections #1 and #4 (1.62km) is almost straight without any significant curves. Along this straight-away, in the traffic-signal controlled option, when an east-west green phase occurs, motorists are encouraged to increase their speed to reach the next green light before it changes. However, the geometric layout design of the roundabout option discourages motorists from speeding along the corridor and forces them to slow down to properly navigate around the discontinuity.

c. Pedestrian/Cyclist Safety at Intersections

Literature[27] indicates that between 33%-to-50% of collisions with pedestrians occur at intersections and other studies[28] concluded that replacing intersections controlled by traffic lights or stop signs with roundabouts, where conditions permit, offers considerable potential for reducing lateral collisions. Above all, roundabouts can potentially reduce injuries and deaths due to lower speeds. Statistics collected showed collisions were reduced by:

- 61% when a single lane roundabout replaced stop signs,
- 5% when a multi-lane roundabout replaced stop signs, and
- 35% when a single-lane roundabout replaced traffic lights.

In the case of roundabouts, there are often less lanes that pedestrians are required to cross. The wide splitter islands associated with roundabout configurations offer pedestrian and cyclist a wider crossing surface than traditional medians associated with conventional traffic-signal controlled intersections. The islands provide a wide refuge area for pedestrian/cyclists providing them with the opportunity to concentrate at crossing one motor vehicle stream at a time without the need to consider left, right and through turn maneuvers of motor vehicle traffic in both directions.

In general, roundabouts are safer for pedestrians as pedestrians walk on sidewalks around the perimeter and cross only one direction of traffic at a time. The crossing distances are relatively short, and traffic speeds are lower than at traditional intersections.

27. "*Pedestrian Safety, Urban Space and Health, International Transport Forum*". (2012). OEDC Publishing. Retrieved from oecd-ilibrary.org: http://www.oecd. org/publications/pedestrian-safety-urban-space-andhealth-9789282103654-en.htm
28. "*Urban Traffic Calming and Health*", Institut nationale de santé publique, Quebec. (2011)

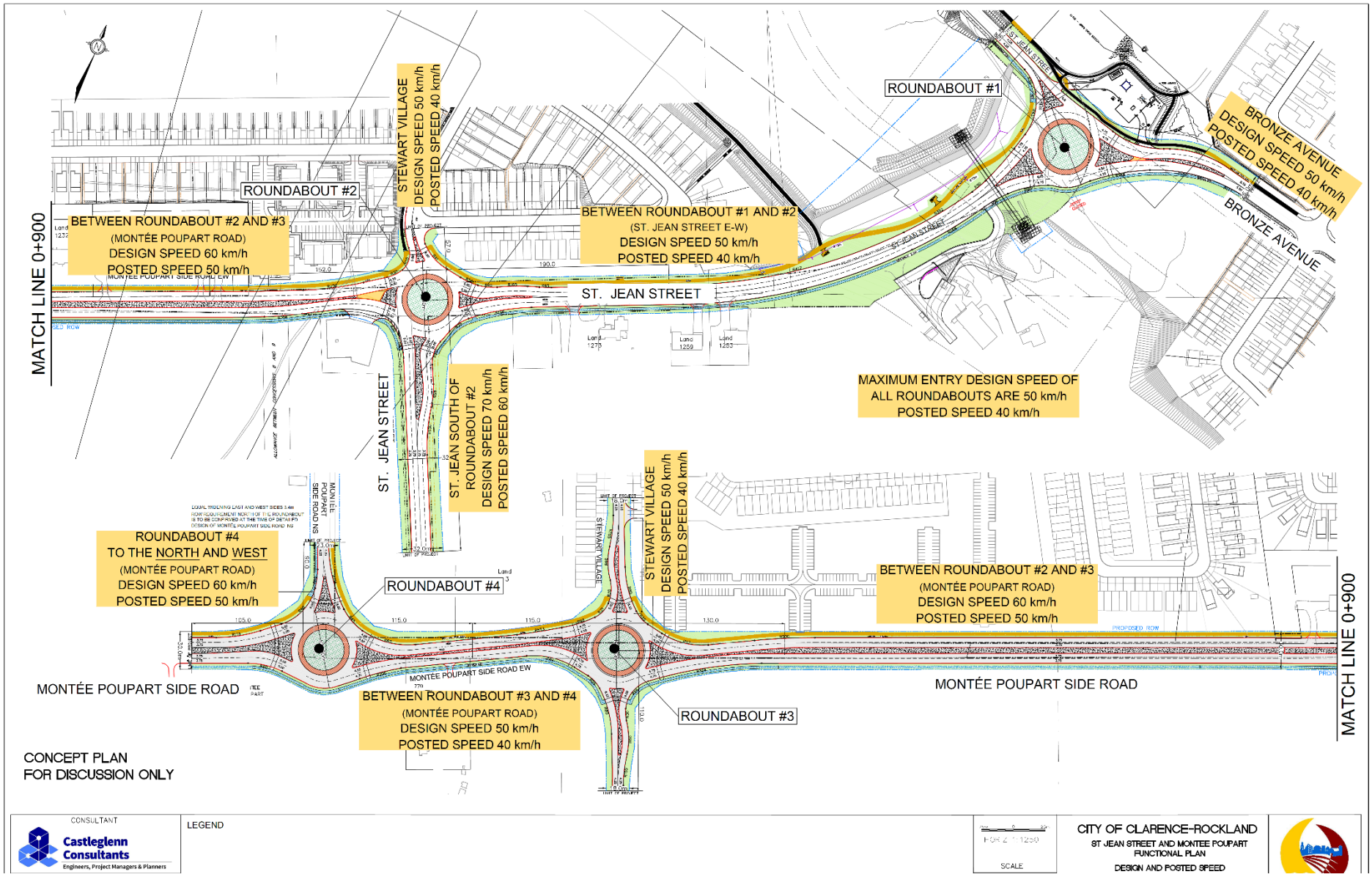


Figure 7-1: Proposed Design and Posted Speeds Associated with Roundabout Concept

Roundabout design criteria require crosswalk provisions to be placed approximately one car length (6m) in advance of the motor vehicle YIELD line at the entrance to the circulatory roadway. This requires motorists to initially pay attention to crossing pedestrians and, only in the absence of pedestrian traffic, then approach the YIELD to then concentrate on finding an acceptable gap to enter the roundabout.

It is worthwhile to also note that roundabouts can also be signalized with pedestrian actuated signals in the case where pedestrian traffic become heavy.

d. Collision Frequency and Severity

As noted in (a) above, traffic-signal controlled configurations typically have more crossing conflicts than roundabouts, which can result in higher-severity collisions such as right-angle and head-on collisions. In contrast, roundabouts due to merging and diverging vehicles at an acute angle can mitigate these types of collisions. In addition, the tighter circle of a roundabout forces motorists to slow down, and the most severe types of intersection crashes are unlikely.

In general, less significant reductions in collisions are associated with two-lane roundabouts when compared with single-lane roundabouts[29] However, a more recent study[30], indicated that the safety of two-lane roundabouts improves over time, as motorists become more familiar with them. The research indicated:

- crashes at two-lane roundabouts decreased an average of 9% a year.
- incapacitating injuries decreased by nearly one-third annually, and
- 2-lane roundabouts must include design elements that prevent right-of-way mistakes and reduce speeds.

Summary

In terms of safety evaluation, roundabouts were determined to outperform signalized intersections for both pedestrians and vehicles (cyclists and motorists) across all four intersections.

7.1.3 Active Transportation

Sidewalks and Multi-use Pathways

The selection of roundabouts versus traffic-signal controlled intersections was evaluated as regards identification of the preferred configuration that would best integrate with the network of sidewalks and multiuse pathways within Clarence-Rockland.

Both the traffic signal-controlled concepts and the roundabout concepts connect to the identical supporting sidewalks and multiuse pathway designs along the St. Jean - Montée Poupart Side Road corridor, however, it is at these very intersection locations where pedestrians and cyclists, which travel at slower speeds, are expected to navigate through higher speed, higher volumes of motor-vehicle traffic. It is therefore imperative to assure that the active transportation network, not only seamlessly integrates with the future St. Jean - Montée Poupart Side Road corridor design by encouraging walking, cycling and

29. "*Roundabouts in the United States*" (2007) National Cooperative Highway Research Program; Transportation Research Board.

30. "*Long-term Crash Trends at Single and Double Lane Roundabouts in Washington State*", August 2019, Hu, Wen / Cicchino, Jessica B. Journal of Safety Research

active transportation modes such as walking, in-line skating, skateboarding, etc, but also assures the safety of these alternative modes of travel.

Roundabouts offer reduced speed characteristics over the conventional traffic signal alternative. When there is a higher speed difference between competing modes of travel the probability of more severe injuries resulting from collisions is also higher. In addition, roundabouts:

- That are characterized by wider splitter islands provide a safer respite area for the non-motorized travel modes.
- pedestrian/cyclist crossing at a roundabout cross only a single stream of traffic at a time and pedestrians are only required to be aware of oncoming traffic as opposed to traffic signal configurations where pedestrians must pay attention to on coming vehicles in multiple lanes as well as the pedestrian timing device across the street and even opposing left turning traffic coming from other directions.
- Have crosswalks designed to be one car length (6m) behind the yield line at the entrance to the circulatory roadway. This allows motorists to first pay attention to crossing pedestrians and only then concentrate on finding a gap in the circulatory roadway to merge with traffic on the roundabout.

The roundabout configuration was determined to be the preferred configuration best suited to integrate with active transportation modes.

7.1.4 Property Impacts

The following factors were considered in evaluating the required property requirements along the St. Jean Street-Montée Poupart corridor. The property requirements were identified from the initial intersection concepts that were prepared. This included an evaluation of:

- Geometric design, including right turn curves and multi-use paths.
- Sight distance requirements.
- Minimum 1.0 distance from the multi-use path/sidewalk to the theoretical property line.
- Initial estimates of right-of-way based on a worst-case scenario.

Table 7-3 presents a tabulated estimate of the total required property associated with the two-alternative configurations for the proposed four intersections.

- The table does not distinguish between lands that are already publicly owned, from those that are privately owned, or those lands that may be conveyed to the city as part of an ongoing or future development application.
- The table only includes those lands in the vicinity of the intersection locations indicated in Table 7-5. The segment of Montée Poupart Side Road EW between intersection #2 and #3, which is approximately 580m in length is not included since this section is common to both alternative configurations.
- The additional property required to support traffic signal-controlled intersections at the four intersections summed to approximately 7 acres and roundabout configurations was found to require approximately 8.5 acres of additional property.

Table 7-3: Conceptual Estimate of Required Property in Vicinity of Intersections (Acres)

Intersection and Connection	Traffic Signal Controlled Configuration		Roundabout Configuration		Difference
	SM	Acres	SM	Acres	Acres
Intersection No. 1: St Jean St/ Street No. 1 (Bronze Ave.)	9,806	2.42	12,086	2.99	-0.57
Intersection No. 2: St. Jean St./ Montée Poupart Side Rd.	4,292	1.06	5,029	1.24	-0.18
Intersection No. 3: Montée Poupart Side Road/ Stewart Village 2nd Access	8,619	2.13	9,583	2.37	-0.24
Intersection No. 4: Montée Poupart Side Road EW / NS	5,882	1.45	7,580	1.87	-0.42
Total	**28,599**	**7.06**	**34,278**	**8.47**	**-1.41**

Poupart Road is formally known as Montée Poupart Side Road

- in all cases the traffic signal-controlled configuration requires less property than the roundabout solutions.
- The roundabout configured intersections were found to require approximately 1.4 more acres of property when compared to the traffic signal-controlled configurations.
- Intersection No. 1, located at the bottom of the hill, was found to account for approximately 0.6 acres or 40 percent of the total 1.4-acre difference.
- Intersection No. 2, located at the top of the hill, had little difference (0.2 acres) in overall property requirements between the two configurations.

The roundabout configurations typically require a greater amount of ROW than the traffic-signal controlled configurations.

7.1.5 Comparative Conceptual Level Costing

Appendix "J" details the conceptual level costing exercises undertaken on behalf of this MEA.

Table 7-4 provides more summary cost information and indicates that:

- traffic signal configurations are marginally cheaper for Intersection No. 1 and 4.
- roundabout configurations are marginally cheaper for Intersection No. 2 and 3.
- Roundabout configurations for all four of the major intersections along the corridor were found to be in the order of $1.6M more expensive than traffic signal-controlled configurations along the entire corridor.

Table 7-4: Summary of Intersection Costs ($M)

Intersection and Connection	Traffic Signal Controlled Configuration	Roundabout Configuration
Intersection No. 1: St Jean St/ Street No. 1 (Bronze Ave.)	$9.51	$11.19
Intersection No. 2: St. Jean St./ Montée Poupart Side Rd.	$5.71	$5.46
Intersection No. 3: Montée Poupart Side Road/ Stewart Village 2nd Access	$4.33	$4.05
Intersection No. 4: Montée Poupart Side Road EW / NS	$3.71	$4.20
Sub-Total	**$23.26**	**$24.90**
Roadway Segment between intersection #2 and #3 (580m)	**$ 7.24**	
Total	**$30.51**	**$32.14**

Poupart Road is formally known as Montée Poupart Side Road

Table 7-5: Conceptual-Level Costing of Intersection Options ($M)

	Intersection No. 1		Intersection No. 2		Intersection No. 3		Intersection No. 4	
Summary: Preliminary Construction Cost Estimate	**Traffic Signal Option**	**Roundabout Option**	**Traffic Signal Option**	**Roundabout Option**	**Traffic Signal Option**	**Roundabout Option**	**Traffic Signal Option**	**Roundabout Option**
Roadway Sub-Total	$3.82	$5.08	$2.35	$2.65	$1.70	$2.00	$1.62	$2.19
Drainage System Sub-Total	$0.70	$0.72	$0.63	$0.63	$0.51	$0.51	$0.41	$0.41
Traffic Signal Sub-Total	$0.27	$0.00	$0.53	$0.00	$0.53	$0.00	$0.29	$0.00
Pavement Marking, Signage and Barrier Sub-Total	$0.04	$0.08	$0.03	$0.06	$0.03	$0.05	$0.02	$0.05
Street Light Sub-Total	$0.23	$0.27	$0.18	$0.22	$0.05	$0.07	$0.07	$0.09
Service Roads and Utility Corridor Sub-Total	$1.04	$1.03	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Construction Cost	**$6.10**	**$7.17**	**$3.72**	**$3.55**	**$2.82**	**$2.63**	**$2.41**	**$2.73**
Mobilization and Engineering (15%)	$0.91	$1.08	$0.56	$0.53	$0.42	$0.40	$0.36	$0.41
Utility Protection/Relocations (5%)	$0.30	$0.36	$0.19	$0.18	$0.14	$0.13	$0.12	$0.14
Culvert Crossings	$0.30 (5%)	$0.36 (5%)	$0.11 (3%)	$0.11 (3%)	$0.08 (3%)	$0.08 (3%)	$0.07 (3%)	$0.08 (3%)
Temporary Traffic Control Plan and Services during Construction (5%)	$0.30	$0.36	$0.19	$0.18	$0.14	$0.13	$0.12	$0.14
Contingency (20%)	$1.59	$1.86	$0.95	$0.91	$0.72	$0.67	$0.62	$0.70
Total Cost Estimate	**$9.51**	**$11.19**	**$5.71**	**$5.46**	**$4.33**	**$4.05**	**$3.71**	**$4.20**

The conceptual costing of the study intersections is presented within Table 7-5. However, at this conceptual level, the following items were excluded from the cost estimate:

- Property acquisition cost.
- Power transformer supply to accommodate traffic signals.
- The Lafontaine Creek culvert crossing at intersection #1.
- Staging Cost.
- Property Acquisition Costs
- Specialized drainage system requirements & culvert costs.
- High-voltage power lines.
- Streetlights and required power transformer supply.
- Erosion and sedimentation control measures.
- Proposed new utilities and utility protection/relocation.
- Landscaping requirements instead of grass.

Table 7-5 indicates the conceptual level costing that was undertaken for each of the intersection alternatives as illustrated within Section 5.3 and summarized within Table 7-4. The identical approach distances indicated opposite were assumed for both traffic-signal controlled and roundabout configuration alternatives.

Limit of Approach Distances for Cost Estimate Purposes (m)

Intersection	East	West	North	South
Intersection No. 1: St Jean Street / Bronze Avenue	160	332	98	n/a
Intersection No. 2: St. Jean St./ Montée Poupart Side Rd.	190	152	90	152
Intersection No. 3: Montée Poupart Side Road/ Stewart Village 2nd Access	130	115	100	100
Intersection No. 4: Montée Poupart Side Road EW / NS	115	105	130	n/a

7.2 THE PREFERRED ALIGNMENT AND CONFIGURATIONS

Table 7-6 summarizes the results of the evaluation by way of check marks "√" for each of the criteria that were evaluated within this section. The table indicates that the roundabout configuration for each of the intersection considered was determined to be the preferred configuration.

The result of this evaluation was used to proceed onto the design of the preferred roundabout configuration at each of the major intersections along the St. Jean - Montée Poupart Side Road corridor.

Table 7-6: Summary Results of Evaluation of Alternative Designs

Criteria	Intersection No. 1		Intersection No. 2	
	Signalized	Roundabout	Signalized	Roundabout
Traffic Operation		√		√
Safety		√		√
Safety: Conflict Points		√		√
Safety: Speed Calming		√		√
Safety: Pedestrian/Cyclist Safety		√		√
Safety: Collision Severity		√		√
Active Transportation		√		√
Overall Property Impact	√		√	√
Environmental Impact	√	√	√	√
Cost (Capital Construction)	√		√	√
Total		√		√

Criteria	Intersection No. 3		Intersection No. 4	
	Signalized	Roundabout	Signalized	Roundabout
Traffic Operation		√		√
Safety		√		√
Safety: Conflict Points		√	√	√
Safety: Speed Calming		√		√
Safety: Pedestrian/Cyclist Safety		√		√
Safety: Collision Severity		√		√
Active Transportation		√		√
Overall Property Impact	√		√	
Environmental Impact	√	√	√	√
Cost (Capital Construction)	√	√	√	
Total		√		√

8.0 THE PREFERRED DESIGN

Based on the evaluation of alternative designs, and comments received through the Public Consultation Centres, the recommended plan for the widening of the St. Jean Street- Montée Poupard Side Road corridor and the intersections within it, are outlined in the following sections.

8.1 INTERSECTION CONFIGURATIONS DESIGN

The following sections describe the preferred intersection configurations for each of the 4 intersections along the St. Jean Street- Montée Poupard Side Road corridor.

8.1.1 Intersection No. 1: St. Jean Street and Bronze Street

Figure 8-1 illustrates the preferred design of a 3-leg roundabout at this location. (See Annex "A" for the complete design plans.)

The roundabout at this location would be characterized by:

- A 64m Inscribed Circle Diameter (ICD).
- 2 circulating lanes approaching from the St. Jean Street (west leg) and the Bronze Street (east leg) of the roundabout. Bronze Street further to the east tapers to a single lane in each direction.
- A single circulating lane for the St. Jean Street approach (north leg) to the roundabout.
- Median Islands would be located at each approach that would be used to channelize vehicle movements while also serving as a safe refuge area for pedestrians crossing the intersection.
- An entry into the new pumping station would be provided from Bronze Avenue along with a depressed median to permit eastbound left turns into the site. The exit from the pumping station would be located onto St. Jean Street northbound only.
- A 79-meter-long Lafontaine Creek culvert would traverse under the west leg of the roundabout.

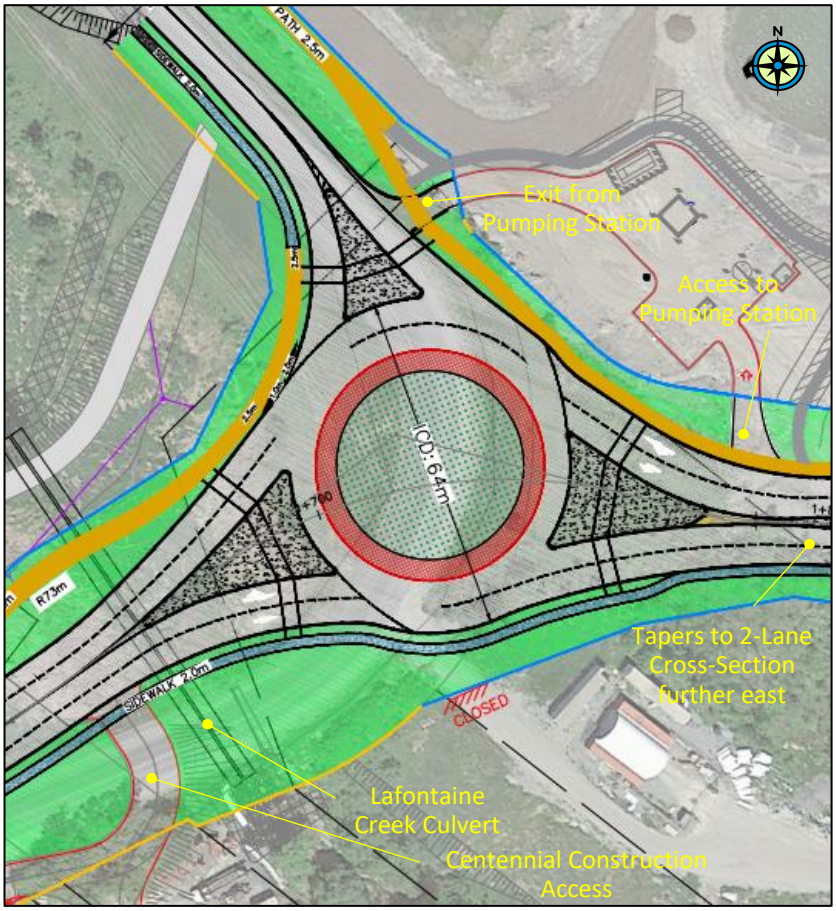


Figure 8-1: Intersection No.1: Roundabout Design

- The internal access /circulation roads of the Centennial Construction site located on the south side of the west leg of the roundabout would be required to be realigned, reprofiled and reconstructed.
- A significantly raised vertical profile well above the current intersection elevation.
- A network consisting of sidewalks / multi-use pathways on all sides on the roundabout and the approaching roadways have been provided.

8.1.2 Intersection No. 2: St. Jean Street and Montée Poupart Side Road

Figure 8-2 illustrates the preferred design of a 4-leg roundabout at this location. (See Annex "A" for the complete design plans.) The roundabout would be characterized by the following features:

- A 60m inscribed circle diameter (ICD).
- 2 circulating lanes connecting St. Jean Street (east leg) and Montée Poupart Side Road (west leg.
- 1 north-south circulating lane within the roundabout that accommodates traffic from the Future Stewart Village through to what will ultimately be a 4-lane cross section for the St. Jean Street (CR 21) (south leg) corridor.
- Median Islands are proposed at each of the approaches to the roundabout which would in turn serve as pedestrian refuge areas.
- The existing gated accesses (two accesses currently exist along the fence line) to the Hydro One sub-station located within the southwest corner of the roundabout would remain undisturbed. Vehicle turning movement analysis was undertaken and a grading plan was produced that assures that both gated accesses would remain accessible for Hydro One vehicles. As well, a depressed portion of the median on the west leg of the roundabout has been designed to further facilitate access for Hydro vehicles into the site.

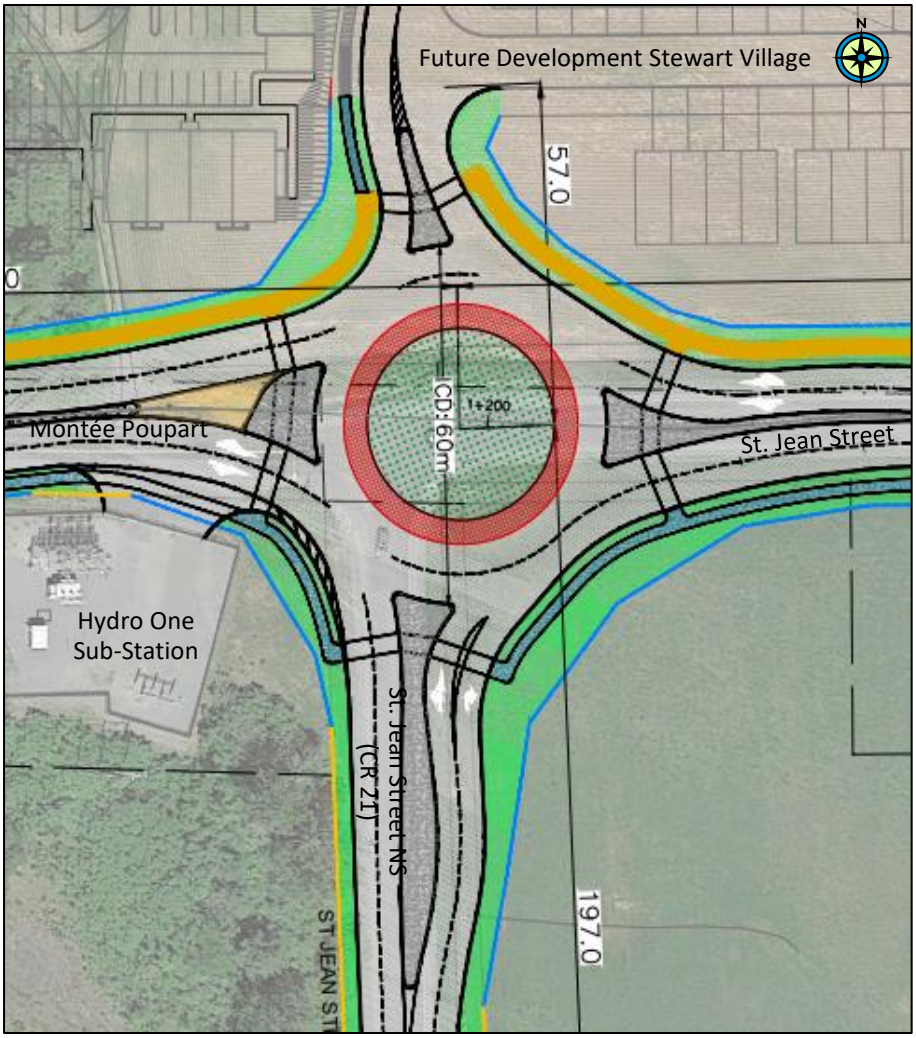


Figure 8-2: Roundabout No. 2 Design

- Sidewalks and multi-use pathways are provided on all quadrants of the roundabout and on the sides of the approaching roadways to facilitate and promote active transportation requirements.
- The future local roadway providing access to the future development (Stewart Village) to the north of the roundabout would be STOP controlled. This local roadway access has been evaluated to assure sufficient sight lines and efficient traffic operations along the north leg approaching the roundabout.
- All of the lands on both east and west sides of St. Jean Street NS (CR 21) have been planned to support future residential development communities in the ultimate time frame. However, the initial stage of the St. Jean Street (CR 21) (south leg) corridor would be designed as a 2-lane roadway. The EA provides for the ultimate widening to accommodate a 4-lane urban cross-section from the Intersection No. 2 roundabout to the southern limit of the City of Clarence-Rockland's boundary where an additional roundabout at the City's southern boundary is envisioned to provide access to these future communities.

Intersection No. 3: Montée Poupart Side Road EW and Stewart Village

Figure 8-3 illustrates the preferred design for a 4-leg roundabout. (See Annex "A" for the complete design plans.) that is intended to serve the future developments to the north and south of the planned communities. The roundabout would be characterized by the following features:

- A 60m inscribed circle diameter (ICD).
- 2 circulating lanes connecting the east and west sides of Montée Poupart Side Road.
- A single north-south circulating lane through the roundabout connecting the planned Stewart Village community to the north tie the future community development to the south.
- Median Islands are proposed at each of the approaches to the roundabout which would in turn serve as pedestrian refuge areas.
- Sidewalks would be provided on the south side of the roundabout and a multi-use pathway runs along the north side of the roundabout which are intended to serve as facilities that would encourage active transportation within the community.

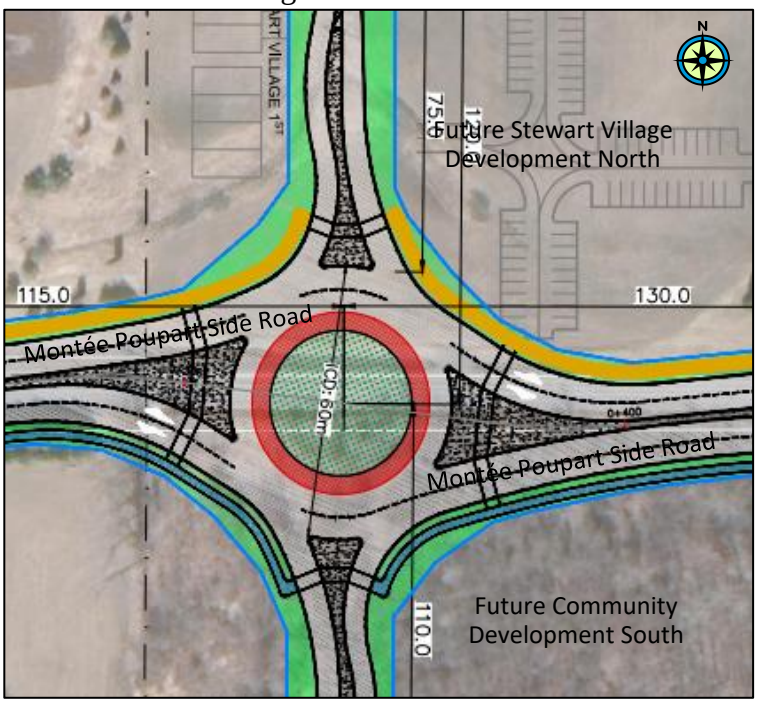


Figure 8-3: Roundabout No. 3 Design

8.1.3 Intersection No. 4: Montée Poupart Side Road EW and NS)

Figure 8-4 illustrates the preferred design for an ultimate 3-leg roundabout at the intersection of Montée Poupart Side Road NS and EW. The roundabout provides for:

- 2 east-west lanes.
- A single circulating lane to provide access to/from the Montée Poupart Side Road NS.
- A 60m inscribed circle diameter (ICD).
- Median Islands at each of the 3 roundabout approach which would also serve as pedestrian refuge areas.
- Sidewalks and multi-use pathways on all sides on the roundabout and approaches.
- the future westerly extension of Montée Poupart Side Road.
- The staging strategy envisions the west leg of the roundabout being terminated until such time as an environmental assessment of the westerly extension to Highway 17 has completed and approved.

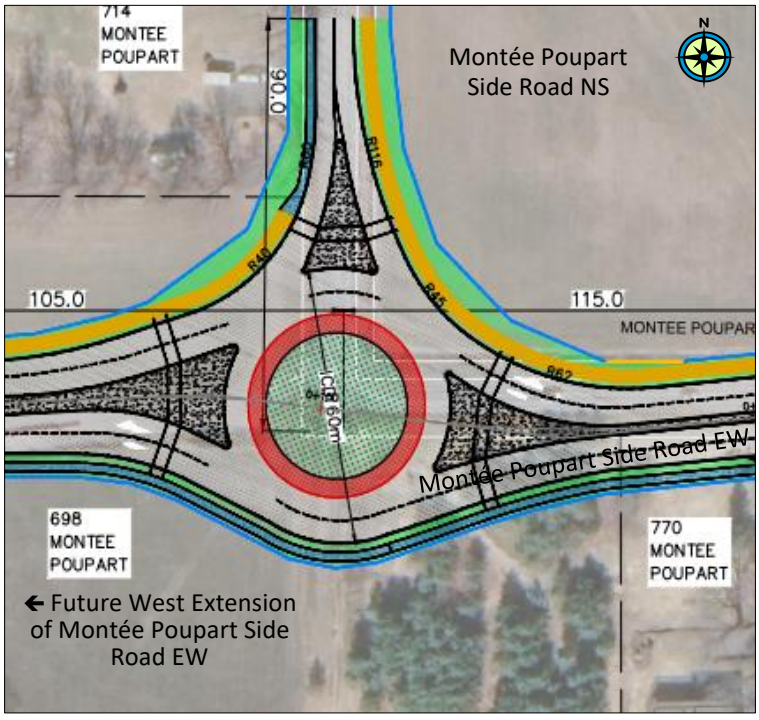


Figure 8-4: Roundabout 4 Design

8.2 ROAD SEGMENTS

This section serves to illustrates the typical cross-sections of those roadways that would approach each of the four roundabouts along the St. Jean Street-Montée Poupart Side Road corridor. The cross sections illustrate the widths associated with individual roadways elements (lanes, boulevards, sidewalks, pathways, landscaping, utility corridors etc.) within the proposed right-of-way.

8.2.1 Approach Roads Connecting to Intersection No. 1:

Figure 8-5 illustrates the typical cross-sections associated with those roadways approaching Roundabout No. 1. The roadway segments are described as follows:

St. Jean Street North:

- Will remain as a 2-lane roadway and be designed as an urban major collector;
- A multi-use path will be provided on the east side of the roadway; and
- A sidewalk will be provided on the west side of the roadway.

Bronze Street:

- Will taper down from 4-lanes to 2-lanes and designed as an urban major collector;
- A multi-use path will be provided on the north side of the roadway.
- A sidewalk will be provided on the south side of the roadway.

St. Jean Street West:

- St. Jean Street will widen from 2-lanes to 4-lanes as an undivided urban major collector.
- The widening will occur mainly to the north of the roadway.
- A multi-use path will be provided on the north side of the roadway.
- A sidewalk will be provided on the south side of the roadway.
- Due to a high grade of 8% along this approach, the sidewalk and multi-use pathways. may be relocated to accommodate for accessibility.

8.2.2 Approach Roads Connecting to Intersection No. 2

Figure 8-6 illustrates the typical cross-sections associated with those roadways approaching Roundabout No. 2. The roadway segments are described as follows:

St. Jean Street East:

- St. Jean Street will be widened from 2 lanes to a 4-lane undivided urban major collector.
- A multi-use path will be provided on the north side of the roadway.
- A sidewalk will be provided on the south side of the roadway.

Montée Poupart Side Road:

- Will be widened from 2 lanes to a 4-lane divided urban major collector.
- A multi-use path will be provided on the north side of the roadway.
- A sidewalk will be provided on the south side of the roadway.

St. Jean Street South:

- St. Jean Street will be widened from 2 lanes to 4 lanes undivided;
- Will be designed as an urban major collector; and
- No sidewalks will continue south along the roadway.

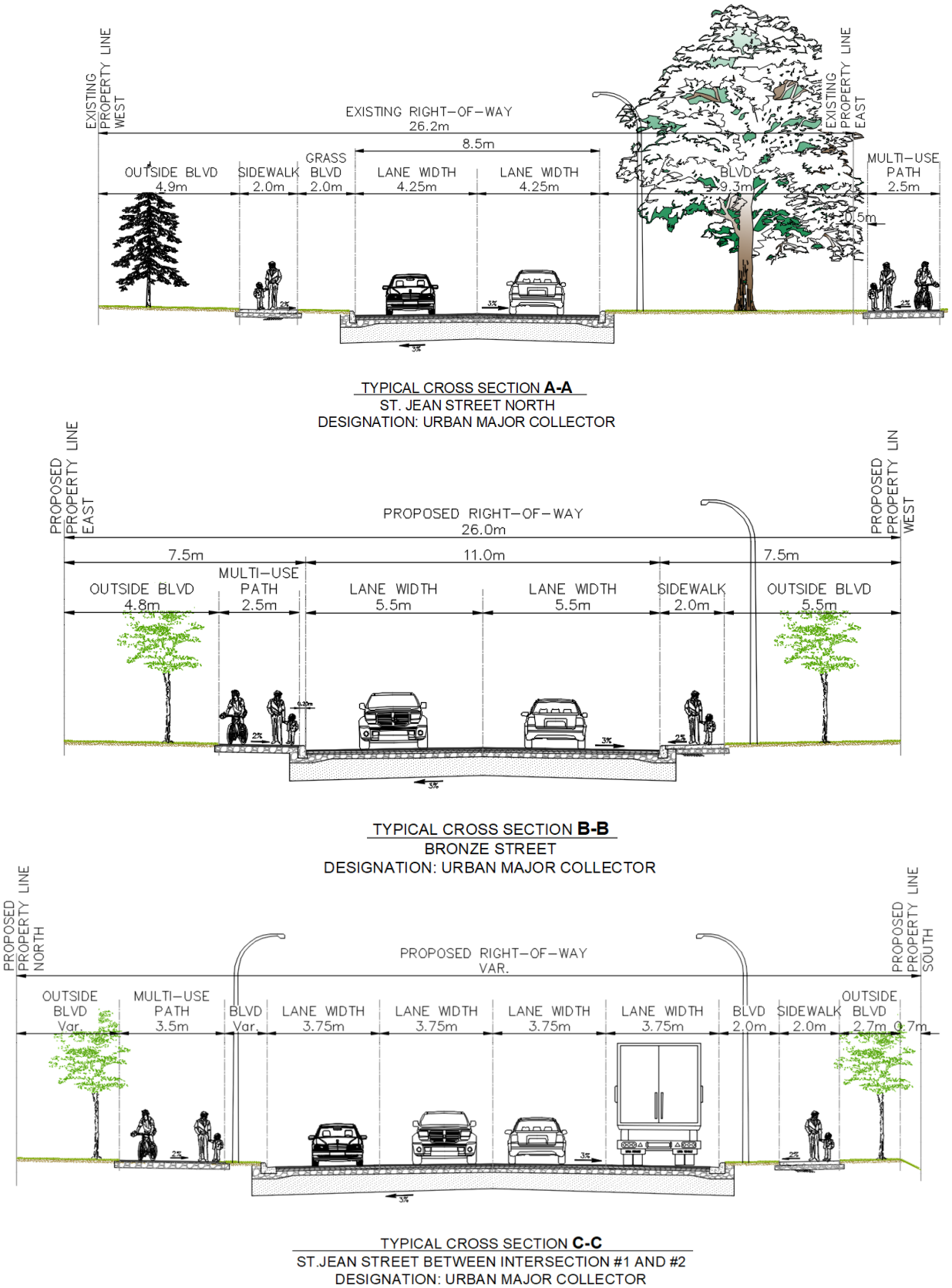
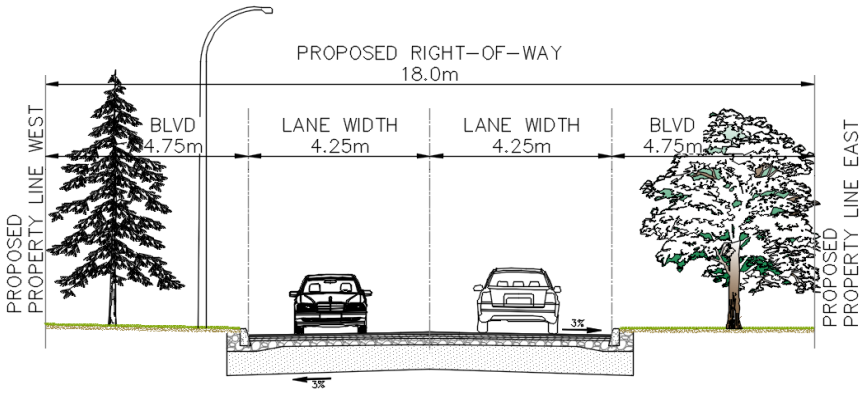
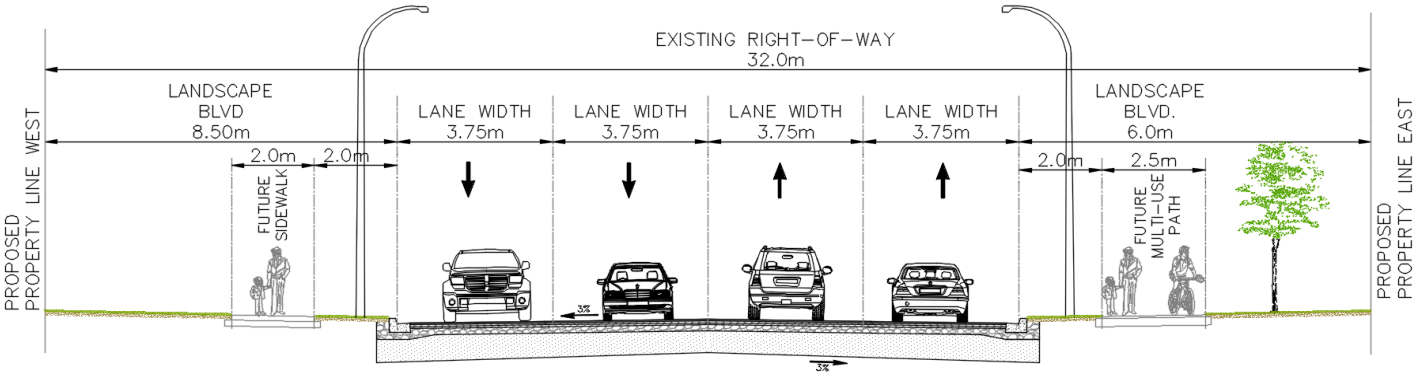


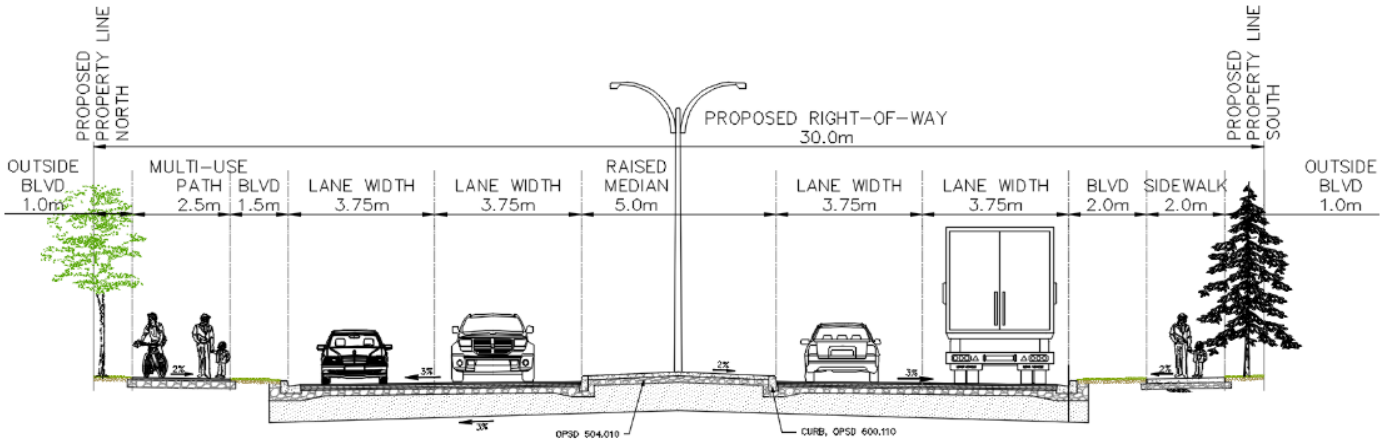
Figure 8-5: Typical Cross-Sections of Roadways Approaching Roundabout No. 1



TYPICAL CROSS SECTION **G-G**
STEWART VILLAGE 1ST
DESIGNATION: LOCAL STREET



TYPICAL CROSS SECTION **F-F**
ST. JEAN STREET, SOUTH OF INTERSECTION #2
4-LANE URBAN COLLECTOR



TYPICAL CROSS SECTION **E-E**
POUPART ROAD EAST-WEST
DESIGNATION: URBAN MAJOR COLLECTOR

Figure 8-6: Typical Cross-Sections of Roadways Approaching Roundabout No. 2

8.2.3 Approach Roads Connecting to Intersection No. 3

Figure 8-7 illustrates the typical cross-sections associated with those roadways approaching Roundabout No. 2. The roadway segments are described as follows:

Stewart Village Access:

- The Stewart Village Access would be designed as a 2-lane undivided local roadway.

Montée Poupart Side Road EW:

- Will be widened from a 2-lane to a 4-lanes divided urban major collector;
- A multi-use path will be provided on the north side of the roadway;
- A sidewalk will be provided on the south side of the roadway; and
- Accesses to existing properties will be provided along the corridor.

Future South Roadway:

- The future roadway to the south would be designed as a 2 lanes undivided local roadway.

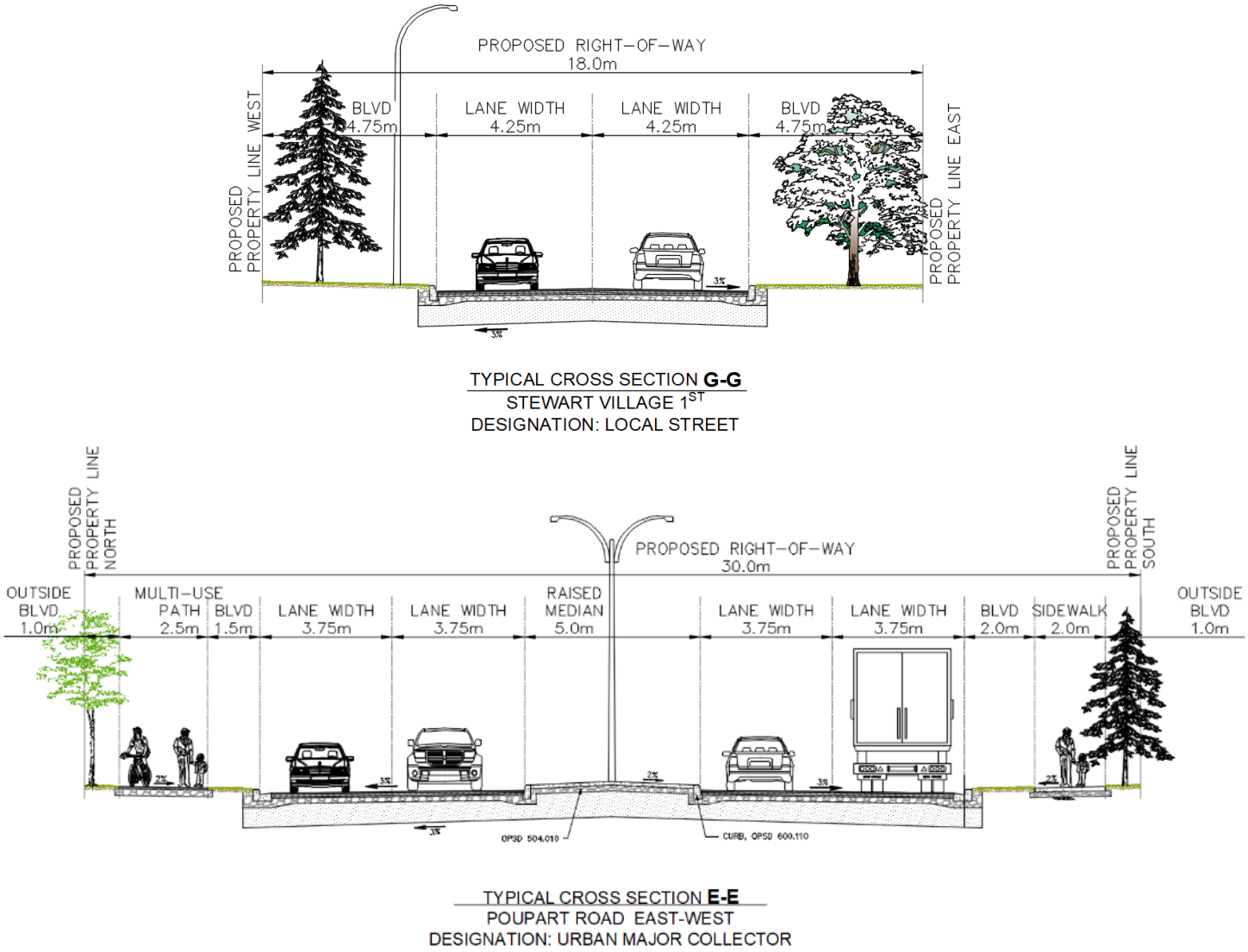


Figure 8-7: Typical Cross-Sections of Roadways Approaching Roundabout No. 3

8.2.4 Approach Roads Connecting to Intersection No. 4

These typical cross sections provide the widths of the roadways and their structural make-up. The intersection approaches are described as follows:

Montée Poupart Side Road EW:

- Will be widened from a 2-lanes to a 4-lanes divided urban major collector.
- A multi-use path will be provided on the north side and a sidewalk on the south side.
- Accesses to existing properties will be provided along the corridor.

Montée Poupart Side Road NS:

- Will be designed as a 2-lane undivided urban major collector roadway.
- A multi-use path will be provided on the east side and a sidewalk on the west side.

Future West Connection:

- Will be designed as a 4-lanes divided urban major collector.
- A multi-use path will be provided on the north side and a sidewalk on the south side.
- This connection is not expected to be built-out for the foreseeable future.

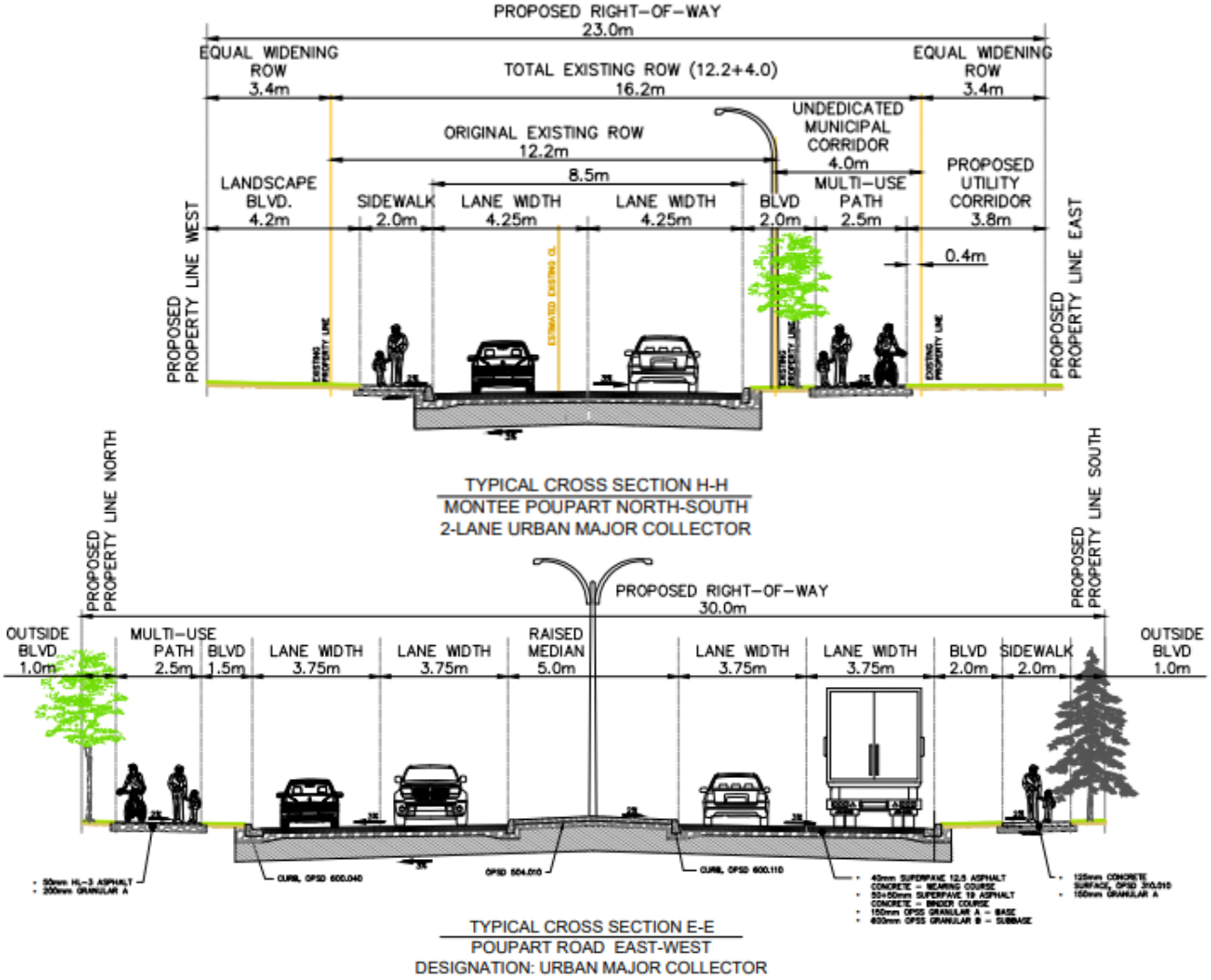


Figure 8-8: Typical Cross-Sections of Roadways Approaching Roundabout No. 4

8.2.5 Access Management

Table 8-2 indicates the general location and land uses of each of the driveways and accesses that currently connect to the St. Jean Street-Montée Poupart Side Road corridor. The table also indicated planned modifications to the driveways/accesses consistent with the preferred design concept. The concept would see:

- 7 accesses/driveways [1224, 1228 (2 driveways), 1232, 703, 770 & 698 Poupart] would be converted to right-in-right-out access only with motorists using the intersection to affect the required U-turns to access the properties.
- 2 driveways (1240 & 1280 Poupart) including conversion to full intersections that would provide access to future planned subdivisions.
- 2 access would be closed (Dog park facility and 1452 Montée Poupart).
    - The access to the existing dog walk facility on Poupart was assumed to be closed once a new facility has been opened and the lease extended to the municipality expires.
    - The access to the agricultural acreage at 1452 Montée Poupart would be closed, and motorists would access the new subdivision to the south by way of Intersection No. 3.
- It is recommended that the City of Clarence-Rockland also consider a 2nd access to/from County Road 21 near the southern City limit and roughly 300m to the south of Montée Poupart Side Road to accommodate the future sub-divisions located on either side of St. Jean Street NS (CR 21).

8.2.6 Pedestrian and Multi-Use Pathway Facilities

Table 8-1 indicates that the preferred design for the St. Jean Street-Montée Poupart Side Road project would involve roughly 2.2 km of new sidewalks and 2.2 km of new multi-use pathways that would serve the southern portion of the community. Numerous comments received during the consultation sessions expressed the need to address the absence of pedestrian and cycling facilities along the corridor and concerns regarding safety given the existing narrow roadway corridor.

Table 8-1: Length of Sidewalk and Multi-Use Pathway Associated with Preferred Design
(meters)

Segment	Sidewalk	MUP
• Poupart Road	1,255	1,231
• St Jean Street	622	657
• Bronze Ave	108	115
• St Jean Street (south of Intersection No. 2)	147	155
Total	**2,132**	**2,158**

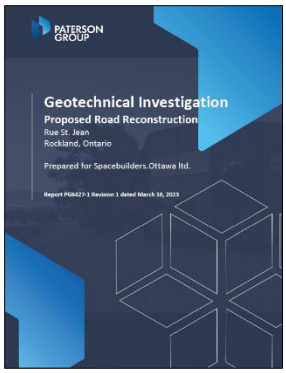
Table 8-2: Existing Accesses Along Corridor and Planned Modifications

Existing Access / Driveway	Planned Modifications to Existing Accesses / Driveways
• Access to existing SWM Pump House Facility on the east side of St. Jean NS north of Intersection No. 1;	• The access provisions to this facility are new and have just been incorporated into the design by way of providing an entrance to the facility from Bronze Avenue and an exit from the facility onto St. Jean Street North.
• Centennial Construction (1211 Rue St. Jean) on the south side of Rue St. Jean to the west of Intersection No. 1;	• The access provisions for this facility have been incorporated into the design by way of continuing to provide a new access onto the realigned and reprofiled St. Jean Street corridor.
• 3 Farming acreages (1273, 1259 & 1253 Rue St. Jean) along the south side of Poupart between Intersection No. 1 and No. 2	• Access from the St. Jean EW corridor will continue to be provided to these individual acreages, however, in the future should these acreages be part of a future sub-division, access is to take place by way of a future intersection with the St. Jean NS corridor (County Road 21).
• Hydro One Utility Sub-Station located in the SW quadrant of Intersection No. 2	• Access to the Hydro One sub-Station will remain unchanged by the proposed development of Intersection No. 2.
• An access to a Dog-Park facility located on the south side of Montée Poupart west of the Hydro Sub-Station and west of Intersection No. 2	• The Dog Park facility is currently leased from private owners. The City of Clarence-Rockland is in the process of developing an alternate facility to the north-east of the Highway 17 corridor. Ultimately, the Montée Poupart Dog Park facility may well be closed as the lease may expire. The plans illustrate the closure of this access.
• 4 Residential Dwellings located on the north side of Montée Pourpart Side Road west of the Intersection No. 2 (1224, 1228 has 2 driveways & 1232)	• Access to these 4 driveways on the north side of Montée Poupart will be maintained however, the planned centre median extending from Intersection No. 2 will limit access to RI-RO movements only. Motorists would use Intersections No. 3 and No. 4 to access Montée Poupart WB.
• A residential driveway connects to 1240 Montée Poupart.	• This access was assumed to be closed as the existing dwelling would be demolished and form part of the future sub-division on the north side of Montée Poupart.
• Poupart Excavation (1280 Montée Poupart) located on the north side of Montée Poupart	• This commercial access was assumed to be closed as it would form part of the future sub-division on the north side of Montée Poupart.
• A residential dwelling (also 1280 Montée Poupart) is located on the north side of Montée Pourpart Side Road.	• This residential access was assumed to transition to the future Intersection No. 3 access serving Stewart Village.
• Access to an agricultural acreage (1452 Montée Poupart)	• This access would be closed.
• A residential dwelling access located on the north side of Montée Pourpart Side Road between Intersection No. 3 and No. 4 (703 Montée Poupart).	• This access is to be maintained as a RI-RO only access as long as 703 Montée Poupart is not part of a future sub-division. In the case, where the property does become a future subdivision, the access would be closed, and access would be provided by way or Montée Poupart NS.
• Two access to farm acreages (770 & 698) on the south side of Montée Poupart near Intersection No. 3 and No. 4.	• These two accesses onto the south side of Montée Poupart would revert to RI-RO access only given the median between Intersection No. 3 and No. 4. Motorists would use Intersections No. 3 or 4 to access Montée Poupart EB.

8.2.7 Drainage and Storm-Water Management

Appendix "K" provides illustrations depicting the flow patterns associated with the major and minor drainage strategy envisioned to accommodate the storm drainage flows along the proposed upgraded St. Jean-Montée Poupart Side Road corridor.

8.2.8 Geotechnical Requirements



As was noted in Section 3.9, a geotechnical report (See Appendix "H") was conducted by Paterson Consultants in November, 2022. The report noted the following:

- *Existing Paved Surface*: Should be removed or pulverized along the entirety of the existing paved surface during construction.
- *Topsoil, Deleterious Fill, Organic Materials or Peat*: should be stripped from under municipal structures and paved areas before placing fill to raise the grade.
- *Ground Water Levels*: Levels are subject to seasonal fluctuations, which could affect construction.
- *Grading Plan Review:* A review of the grading plan from a geotechnical perspective is recommended.
- *Bearing Surface Observation*: Observation of all bearing surfaces before placing municipal services and road structures is advised.
- *Fill Material Testing*: Sampling and testing of fill materials are recommended to ensure quality.
- *Excavation Side Slopes*: Side slopes should be cut back or shored up from the start of excavation until backfilled. Slopes above groundwater at depths up to 3 m should be 1H:1V or flatter; below groundwater, 2:1V is advised. Trench boxes should be used for safety, and excavations should not be left open for long periods. Excavation of side slopes in sound bedrock can be almost vertical, with a minimum one-meter-wide horizontal ledge between the bottom of the overburden excavation and the top of the bedrock surface to accommodate potential sloughing.
- *Excavation Side Slope Monitoring*: Periodic observation of unsupported excavation side slopes over 3 meters in height, if applicable, is advised.
- *Culvert Waterproofing Inspection*: Periodic inspection of the installed culvert waterproofing system is recommended.
- *Pavement Structure Design*: Recommended pavement structures for arterial roadways with bus traffic and local roadways are provided, along with the thickness specifications for each layer in the table below.

Table 8-3: Recommended Pavement Structure Design

Material Description	**Arterial Roadways with Bus Traffic**	**Local Roadways, Access Lanes and Heavy Vehicle Parking**
	Thickness (mm)	
Wear Course – Superpave 12.5-FC2 Asphaltic Concrete	40	
Upper Binder Course – Superpave 19.0 Asphaltic Concrete	50	
Lower Binder Course – Superpave 19.0 Asphaltic Concrete	50	0.0
BASE – OPSS Granular A Crushed Stone	150	
SUBBASE – OPSS Granular B Type II Crushed Stone	600	400
SUBGRADE - Either fill, in situ silty clay or sand/crushed stone material placed over in situ soil.		

- *Subgrade Inspection*: Observation of all subgrades before backfilling and placing a granular pad or lean concrete trench is advised.
- *Field Density Tests*: Field density tests are to be conducted to determine the achieved compaction.
- *Bituminous Concrete Testing*: Sampling and testing of bituminous concrete, including mix design reviews, are recommended.
- *Fill Placement*: Fill beneath pavement should be clean imported granular fill, tested and approved before delivery. Silty sand or gravel, free of debris, can also be used. It should be placed in lifts no thicker than 300 mm and compacted to at least 95% of standard density.
- *Lafontaine Creek – Culvert and Road Crossing*: The need for a culvert replacement at the Lafontaine Creek roadway crossing, emphasizing the importance of special construction considerations for the proposed culvert. Plans suggest the construction of twin concrete box culverts, each approximately 2.4 meters by 1.8 meters in size and spanning about 80 meters in length to facilitate the flow of Lafontaine Creek beneath the roadway. It is recommended that the road bank near the crossing be built with a maximum slope of 2H:1V, with a minimum covering of 500 millimeters of silty clay material near the waterway.
- *Backfill and Frost Treatment*: To prevent frost penetration and heaving of the foundation, it's advisable to install rigid insulation panels beneath unheated concrete structures or above municipal sewer services with less than 2.1 meters of soil coverage. Following the examination of the proposed site servicing plans, placing 100mm thick and 1.2 meters wide HI-40 rigid insulation panels under the concrete box culvert and above the underlying municipal services within 2.1 meters of the proposed finished grades was recommended.

8.2.9 Utilities and Services

Table 8-4 outlines the proposed utilities along the study corridor. Additional details regarding the proposed utilities are available in the drawings presented in Appendix “G” which highlights the plans which were envisioned to accommodate utilities along the corridor which include such services as telephone, hydro, cable-internet, and services to existing dwellings. The plans illustrate concepts for buried and overhead services which remain to be confirmed through discussions with utility entities which are on-going and remain to be confirmed at the time of detailed design.

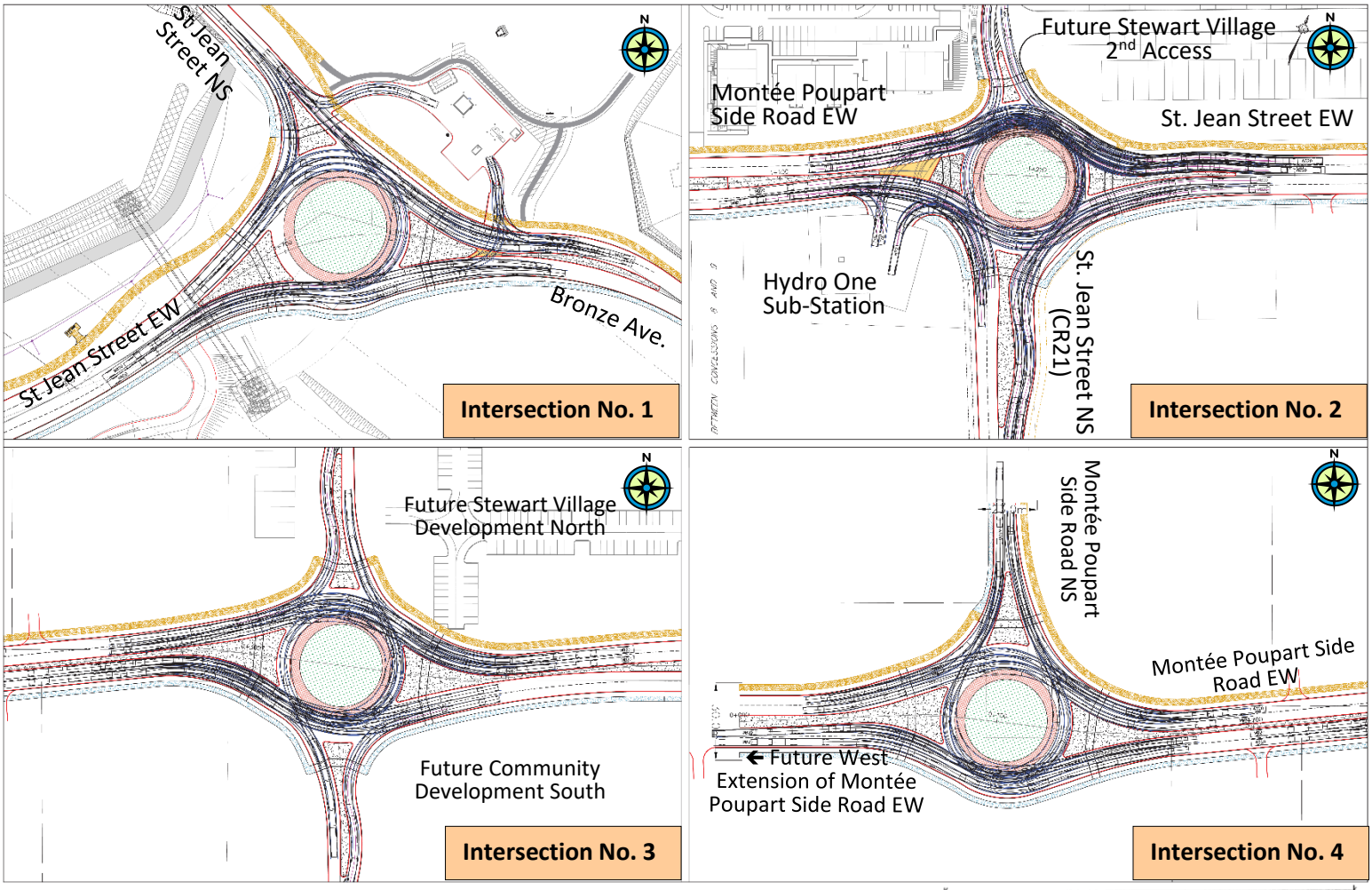
Table 8-4: Proposed Future Utility Provisions

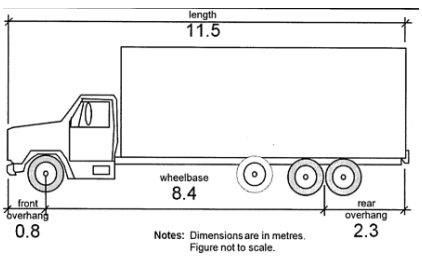
Utility	Location
Overhead Hydro (To be confirmed, option 1)	• North side of St Jean Street from Intersection #1 to #2 • South side of Poupart Road from Intersection #2 to #4 • East side of Poupart NS north of Intersection #4
Buried Hydro (To be confirmed, option 2)	• North side of St Jean Street and Poupart Road from Intersection #1 to #4 • East side of Poupart NS north of Intersection #4
Buried Hydro (By others)	• West of Stewart Village north of Intersection #2
Gas line (By others)	• East of Stewart Village north of Intersection #2
Interim Gas (By others)	• North side of Bronze Ave. • North side of St Jean Street from Intersection #1 to 270m to the west to the development area
Gas Line	• North side of St Jean Street and Poupart Road from Intersection #1 to west of Intersection #4 • East side of Poupart NS north of Intersection #4 • East of St Jean Street south of Intersection #2
Buried Bell and Cable vision	• North side of St Jean Street and Poupart Road from Intersection #1 to west of Intersection #4 • East side of Poupart NS north of Intersection #4 • East of St Jean Street south of Intersection #2

8.2.10 Turning Movements

Figure 8-9 illustrates the turning movement of the selected design vehicles at each of the critical intersections along the St. Jean-Montée Poupart Side Road corridor.

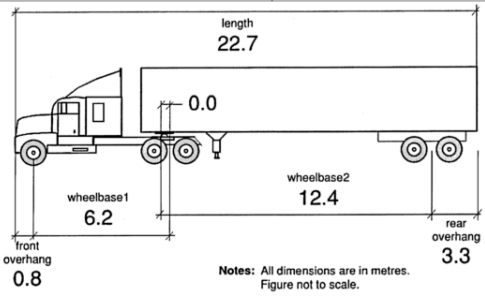
- The design vehicles selected for the Montée Poupart Side Road EW and the St. Jean Street EW and NS and the Bronze Avenue corridors was a WB-20.
- The design vehicle selected for the Stewart Village accesses and future community accesses was a Heavy Single Unit (HSU) truck.





HSU Heavy Single Unit Truck Dimensions

Figure 8-9: Turning Movements of Design Vehicles



WB-20 Tractor-Semi-trailer Dimensions

8.3 STAGING

The Overall Staging Strategy

The project was envisioned to initially proceed from the east to the west and involve the following 4 sequential stages.

- Stage 1: Initial Set-up in vicinity of Roundabout No. 1 inclusive of clearing, hydro relocates and getting ready for reprofiling of the corridor and supply and install the new Lafontaine Creek culvert replacement.
- Stage 2: Roundabout No. 1 and No. 2 and the Road Section between them.
- Stage 3: Roundabout No. 3 and the Road Section Between Roundabout No. 2 and No. 3
- Stage 4: Roundabout No. 4.

The staging strategy was oriented at following the development pattern of the adjacent developing communities.

Intersection No. 2: An Initial Stage

Figure 8-10 illustrates a staging strategy that was developed that involved the St. Jean Street NS (CR 21) corridor. The forecast traffic demand along the south leg of Intersection No. 2 is highly dependent on the future development of the communities on either side of the corridor. As mentioned in Section 8.1.2 and 8.2.5, it was recommended that the City of Clarence-Rockland consider a 2nd access to/from County Road 21 near the southern City limit and roughly 300m to the south of Montée Poupart Side Road roundabout to accommodate the future communities on either side. These subdivisions are anticipated to trigger the need for the 4-lane widening of the major urban collector with four lanes.

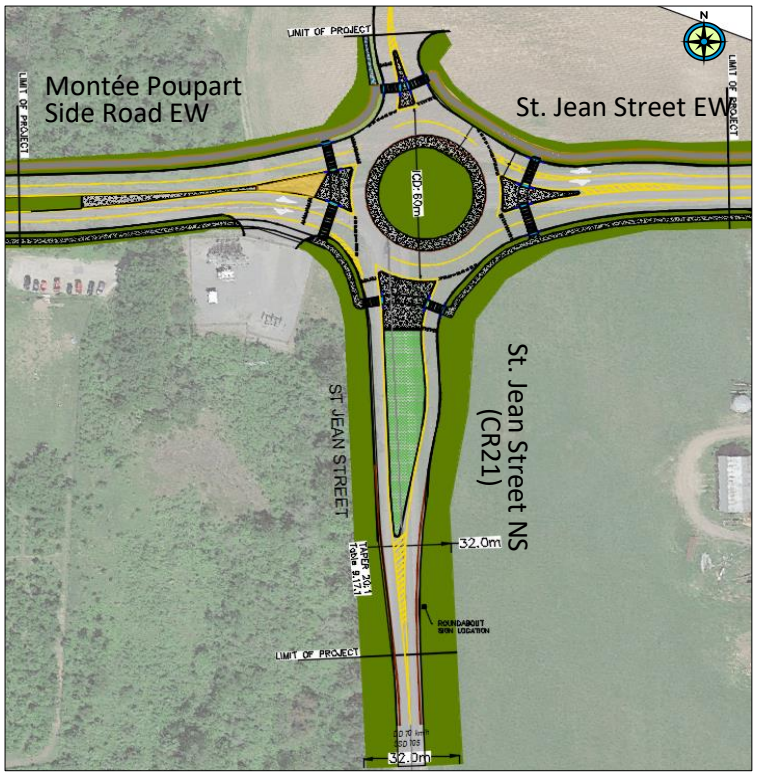


Figure 8-10: First Stage of Intersection No. 2

However, this warrant may well not be reached for approximately two decades. As a result, in the initial stage, the roundabout configuration is planned to be staged such that:

- Roundabout No. 2 would be configured to ultimately accommodate an urban divided four-lane St. Jean Street south cross section, however in the interim the south leg of the roundabout would transition to the existing rural two-lane CR 21 alignment.
- During the first stage, only the outer two lanes, complete with curbside and catch basins at the outer edge, will be constructed. The inner lanes will be incorporated into the median, which will extend 70 meters to the south. Beyond the median, the outer lane, with an appropriate taper, will connect to the existing rural road. In the final stage, the road will widen inside to meet the future four-lane requirement.

8.4 PROPERTY/ RIGHT-OF-WAY REQUIREMENTS

8.4.1 Widening Impacts to adjacent properties

The widening required to accomplish a 4-lane cross sections along the St. Jean Street-Montée Poupart Side Road corridor was undertaken using an approach that would essentially equalize the impacts to property owners on either side of the roadway corridor. The existing roadway corridor was assumed to be nearing the end of its life cycle and roadway reconstruction would therefore be required. The salvage value associated with the existing corridor was determined to be negligible.

In addition, transitioning from an existing rural (ditch) cross section to an urban (curb & gutter) cross-section would require the placement of new services and as such minimize the property requirements that would affect property owners on both sides of the corridor.

There are cases where property impacts were determined not to be exactly equivalent on each side. This was attributed to:

- the need to accommodate future utility provisions.
- the existing right-of-way not being divided equally on each side of the roadway centreline.
- the existing centreline along St. Jean Street-Pourpart Road EW not being perfectly straight.
- the sight distance requirements and turning movements provisions in the vicinity of intersections required additional property.

8.4.2 Required Right-of-Way

Annex “A-3” provides an exhibit that illustrates the required right-of-way necessary to implement the preferred design for the St. Jean Street-Montée Poupart Side Road corridor. Table 8-5 presents the required right-of-way for each individual parcel indicating ownership, legal description and the area in square meters and acres. A total of just over 15.2 acres was found to be required to be secured to implement the preferred design.

Table 8-5: Summary of Property Required to Implement the Preferred Design

No.	Name	Assumed Development	P.I.N.	Part	M^2	Acre
1	Spacebuilders		69060-1344(LT)	8 50R-8899/8 50R-8767	3,275	0.81
2	Spacebuilders		69060-0189(LT)	4 50R-7727	2,140	0.53
3	Spacebuilders	Public Use: Creek	69064-0744(LT)	6 50R-177 / 7 50R-8767 / 7 50R-8899	9,536	2.36
4	Spacebuilders		69064-0742(LT)	7	2,213	0.55
5	Spacebuilders		69064-0742(LT)		256	0.06
6	Spacebuilders	Public Use: Culvert	69060-0121(LT)	1 50R-9806 / 3 50R-7727	86	0.02
7	Marie-Anne & Pierre Filion	Public Use: Culvert	6960-0190(LT)	2 50R-7727	266	0.07
8		Public Use: Culvert	6960-0190(LT)	3 50R-3273 / 3 50R-3451	50	0.01
9	Louise & Lucien Laviolette		69060-0192(LT)	1 50R-827	103	0.03
10	Robert & Claire Laviolette		69060-0193(LT)	2 50R-418	150	0.04
11	Spacebuilders	Morris Village	69060-1121(LT)	3 50R-418	76	0.02
12	Spacebuilders	Morris Village	69060-1121(LT)	1 50R-9806 / 1 50R-5309	2,350	0.58
13	3223701 Canada Inc.	Brigil North-East	69064-1044(LT)	1 50R-10007 / 2 50R-9408	5,728	1.42
14	UCPR	Public Use	69060-0004(LT)	1 50R-7836	1,054	0.26
15	3223701 Canada Inc.	Brigil North-East	69064-1044(LT)	1 50R-10007 / 2 50R-9408	2,883	0.71
16	Hydro		69065-0016(LT)		538	0.13
17	3223701 Canada Inc.		69064-1044(LT)	1 50R-10007 / 2 50R-9408	68	0.02
18	Nicholas Poupart		69064-0054(LT)	1 50R-1564	252	0.06
19	Gilles & Marilyn Laviolette		69064-0055(LT)	5 50R-4912 / 1 50R-838	434	0.11
20	3223701 Canada Inc.	Brigil South	69065-0078(LT)	3 50R-10013	998	0.25
21	Road allowance Between Concessions 8 and 9	Brigil South		1 50R-9528	140	0.03
22	3223701 Canada Inc.	Brigil South	69065-0078(LT)	1 50R-10013	3,683	0.91
23	Liliane Cardarelli		69064-0056(LT)	2 50R-4912	328	0.08
24	Liliane Cardarelli		69064-1043(LT)	5 50R-10223 / 5 50R-10007	37	0.01
25	Stephane Poupart	Brigil North-West	69064-0855(LT)	2 50R-9244 / 1 50R-1043	757	0.19
26	3223701 Canada Inc.	Brigil North-West	694-1044(LT)	1 50R-1007 / 50R-9408	886	0.22
27	Stephane Poupart	Brigil North-West	69064-0855(LT)	1 50R-9244	6,860	1.70
28	3223701 Canada Inc.	Brigil South	69065-0078(LT)	1 50R-10013	6,852	1.69
29	Spacebuilders	Public Use: Creek	69064-0742(LT)	2 50R-127	947	0.23
30	Donna & Gerald Poupart		69065-0087(LT)		5,988	1.48
31	Hubert Poupart		69064-0005(LT)	1 50R-8347 / 3 50R-654	616	0.15
32	Donna & Gerald Poupart		69065-0086(LT)	1 50R-10462	482	0.12
33		Brigil North-West	69064-0004(LT)	2 50R-654	1,354	0.33
34	Austin & Elizabeth Nunan		69065-0052(LT)	Lot 31	175	0.04
				Total	**61,561**	**15.21**

8.5 CONCEPTUAL LEVEL COSTING

Table 8-6 presents the conceptual level construction costs by the envisioned staging strategy that may be used for budgetary purposes associated with the preferred design of the St. Jean Street-Montée Poupart Side Road project.

Table 8-6: Conceptual Construction Cost: St. Jean Street-Montée Poupart Side Road project

Project Stage	Phase 2		Phase 3	Phase 4	Total
Component	**Roundabout No. 1 and No. 2 and the Road Section Between Them**	**Supply and Install New Lafontaine Creek Culvert**	**Roundabout No. 3 and the Road Section Between Roundabout No. 2 and No. 3**	**Roundabout No. 4**	**Entire Project**
Items included	Site preparation, removals, water main, sanitary sewer, storm sewer, mass earth movement, base course, services, curb, sidewalks, landscaping, wear course, miscellaneous, utilities, and Centennial Construction re-profiled and realigned internal circulation roads	This item is included separately within the Phase 2 cost estimate.	Site preparation, removal, storm sewer, mass earth movement, base course, curbs, sidewalks, landscaping, wear course, miscellaneous, and utilities (watermain)	Site preparation, removal, storm sewer, mass earth movement, base course, curbs, sidewalks, landscaping, wear course, miscellaneous, and utilities (watermain)	
Sub-Total ($M) 2023	**$17.59**	**$1.73**	**$9.96**	**$3.42**	**$32.69**
Contingency allowance (20%)	$3.52	$0.35	$1.99	$0.68	$6.54
Engineering fee (15%)	$2.64	$0.26	$1.49	$0.51	$4.90
Total (2023)	**$23.74**	**$2.33**	**$13.44**	**$4.61**	**$44.13**
Total 2024-7% added	$25.41	$2.50	$14.38	$4.93	$47.22
Total 2025-7% added	$27.18	$2.67	$15.39	$5.28	$50.52
Total 2026-7% added	$29.09	$2.86	$16.47	$5.65	$54.06
Total 2027-7% added	**Phase 3 and 4 Only →**		$17.62	$6.04	$23.66
Total 2028-7% added			$18.85	$6.47	$25.32
Total 2029-7% added			$20.17	$6.92	$27.09
Total 2030-7% added			$21.58	$7.40	$28.99

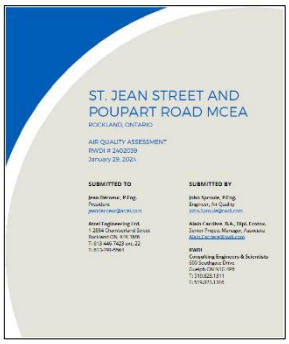
Table 8-6 represents a joint effort in that:

- Atrel Engineering was responsible for developing cost estimates associated with the preferred design for the section of the corridor from Intersection No. 1 through to, and including, Intersection No. 2. The estimate included an estimate for the LaFontaine Creek culvert replacement and the Centennial Construction realigned/reprofiled internal roadways.
- Castleglenn Consultants estimated the costing related to Roundabout No. 3 and No. 4 and the segment of Montée Poupart Side Road between Roundabout No. 2 and No. 3.

Appendix "J" provides additional detail regarding the background costing information, unit prices and quantity assumptions that were adopted for the purpose of this environmental assessment.

9.0 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION

9.1 AIR QUALITY ASSESSMENT


ST. JEAN STREET AND POUPART ROAD MCEA
ROCKLAND, ONTARIO
AIR QUALITY ASSESSMENT
PAQI # 2402039
January 29, 2024
SUBMITTED TO
SUBMITTED BY

As part of this Environmental Impact Assessment an Air Quality Assessment was undertaken that generally followed the methodology described within the Ministry of Transportation of Ontario's (MTO's) guidelines[31]. (See Appendix "L")

The air quality assessment:

- used vehicle emissions modelling techniques to estimate tailpipe, brake wear, tire wear and road dust emissions associated with the forecast 2031 traffic levels. [See Section 6.1.]
- compared future 2031 air quality conditions without the project in place, (this was known as the No-Build or "do-nothing" scenario), against 2031 conditions with the designed St. Jean Street-Montée Poupart Side Road project in place; (this was labelled as the Build scenario.). This was undertaken using a computer simulation of atmospheric dispersion that predicted contaminant concentrations associated with vehicle emissions.
- Used historical monitoring data to establish background concentrations for each contaminant presently within the surrounding area.
- combined the dispersion model results with the background concentrations which were then compared to applicable air quality thresholds, and
- conducted a semi-quantitative assessment to determine the incremental impact of greenhouse gases within the context of provincial emissions.

The salient findings associated with the assessment were that the widening of the St. Jean Street-Montée Poupart Side Road corridor in concert with the four roundabouts would allow for improved traffic flow and reduced vehicle idling which in turn would result:

- in a decrease in concentrations for all contaminants when compared to doing nothing, and
- a decrease in annual regional greenhouse gas emissions when compared to doing nothing.

Overall, the emissions from this roadway network are small in relation to Provincial totals.

During Construction:

The air quality assessment qualitatively assessed construction related impacts and recommended measures aimed at minimizing potential air quality impacts during construction. An Air Quality Management Plan aimed at minimizing dust and other emissions was to be considered as part of the construction tender process with some best practices such as:

31. "*Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects*" (May 2020) (the "MTO Air Quality Guide")

- reducing emissions from construction equipment by using reformulated or emulsified fuels, exhaust catalysts and filtration technologies, cleaner engine repowers, and new alternative-fueled trucks.
- remove construction-caused debris and dust by ensuring regular cleaning of construction sites and access roads subject to the area being free of sensitive plant, water or other ecosystems that may be affected by dust suppression chemicals.
- Assure loads are covered when hauling fine-grained materials.
- Ensure paved streets/roads where tracking of soil, mud or dust has occurred are promptly cleaned.
- Tire washes and other methods to prevent trucks and other vehicles from tracking soil, mud or dust onto paved streets or roads.
- Ensure stockpiles of soil, sand, and aggregate, are covered as necessary.
- Ensure construction traffic complies with posted and advisory warning speed limits and consider implementing further speed reductions within the construction sites and on unpaved surfaces.

The assessment concluded that mitigation measures are not recommended, beyond those which are already in place through phased-in federal regulations for on-road vehicle and engine emissions, which are expected to reduce NO2 and other tailpipe emissions beyond the 2031 horizon year. The emissions from the project compared to the regional provincial emissions of greenhouse gas CO2 are low (less than 0.2%) and therefore the project is not expected to have an impact on the regional air quality.

9.2 SOCIO-ECONOMIC ENVIRONMENT

The planned land uses surrounding the St. Jean Street-Montée Poupart Side Road corridor represent a mix of planned residential communities that will ultimately support future parks, schools, community centres as well as commercial establishments. The planned improvements to the transportation infrastructure, in concert with the development of these planned communities, will result in an efficient transportation network that facilitates connectivity with the surrounding urban center and enhances the mobility and accessibility for all Clarence-Rocklands residents.

There are numerous other socio-economic factors associated with the improved corridor that will contribute to the growth and prosperity of the larger community that include:

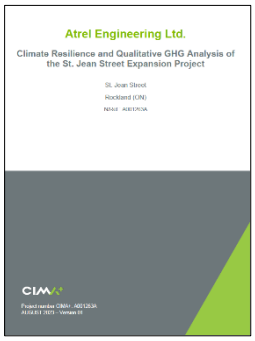
- *Community Cohesion:* The expanded transportation network in concert with the proposed land uses will facilitate the development of a stronger sense of community and belonging, with close-knit neighborhoods, local events, and community organizations that promote social interaction and cooperation among residents.
- *Access to Employment Opportunities:* The improved corridor is located within commuting distance of the urban center of Clarence-Rockland and provided existing and future residents with access to a wide range of employment opportunities while offering a more relaxed lifestyle adjacent to place-of-work environment.
- *Opportunities for Affordable Housing:* Plans for the improved major collector roadway will assure accessibility to more affordable housing options compared to that offered in the adjacent City of

Ottawa, attracting individuals and families seeking homeownership or larger living spaces at a lower cost.

- *Access to Retail and Services:* The improved corridor will facilitate economic growth by assuring future accessibility to a variety of retail and service businesses that cater to the needs of residents, providing employment opportunities and contributing to the local economy.
- *Enhanced Quality of Life:* Improvements to the corridor have been designed to offer the "feeling" to motorists that they would be entering a suburban community characterized by slower speeds and a pleasant surrounding environment rather than "a dragstrip". The environment surrounding the corridor is to offer a quieter, less congested environment with green space and recreational amenities, appealing to those seeking a better quality of life away from the hustle and bustle of larger urban centres.
- *Supportive Infrastructure:* The improved corridor will likely catalyze newer supportive infrastructure developments, including supporting connecting roadways, schools, healthcare facilities that contribute to a higher standard of living and attract additional businesses and residents.

Overall, the combination of these social and economic factors is expected to contribute to the growth and prosperity of Clarence-Rockland assuring residents of an attractive place to live, work, and raise families.

9.3 CLIMATE RESILIANCE AND GREEN HOUSE GASSES



In accordance with MEA guidelines, this EA also considered climate impacts that followed provincial methodologies[32]. (See Appendix "M".) The study provided an understanding of the possible risks and vulnerabilities that climate change would have on the St. Jean Street-Montée Poupart Side Road project.

The study referenced[33] the following climate hazards as being "Very High Likelihood" going forward:

- frequent freeze-thaw cycles
- More extreme wind gusts
- More frequent heavy precipitation events
- increased snow water content and snow loads
- Longer and more frequent heat waves/extreme heat events

Table 9-1 suggests mitigation measures aimed at providing climate resiliency and minimizing future risks over an anticipated 60-year service life of the project (e.g. flooding, extreme temperatures).

32. *"Companion Guide for Municipal Class EA Manual"* and *"Consideration of Climate Change in Environmental Assessments in Ontario (CC Guide)"*
33. *"Consideration of Climate Change in EA in Ontario"* Government of Ontario, 2017, Table 3.

Table 9-1: Potential Climate Hazards "High likelihood" Risks and Mitigation Measures

Climate Hazard	Adaptive Mitigation Measure for Consideration
More frequent freeze-thaw cycles:	Increase use of road de-icing materials
Increased Snow/Water Content and Snow Loads	Consider applying anti-icing solution prior to events when freezing precipitation is forecasted
	Install snow fencing to mitigate blowing snow
Longer and More Frequent Heatwaves/Extreme Heat Events	Utilize more heat-resistant paving materials
	Integrate more roadside trees and other vegetation to increase shading
	Operators and employees to follow ministry guidelines for safe operations for working in heat
	Consider the use of a spray-on coating with a higher reflectivity of near infrared rays and lower reflectivity for the visible range This helps prevent glare and blinding drivers from a higher reflective road surface.
	Check with asphalt provider if selected materials can support the near term heat projections and adjust the asphalt type for more heat tolerance if required
More Frequent Heavy Precipitation Events	Integrating forecasting of increased precipitation levels and volumes into roadway designs
	Improvements to stormwater management infrastructure and lower impact developments like vegetation
	Utilize permeable paving material for increased sub-surface drainage and infiltration
	Increase ongoing maintenance and clearing of culverts and drainage systems
	Plan for detour roads in the instance of roadway flooding, this is to be a temporary mitigation measure
	To lower the water table and protect the road materials, plant tree and bushes around the edge of the road
More Extreme Wind Gusts	Integrate infrastructure with higher resilience to turbulent wind scenarios.
All Climate Hazards	Increase planned ongoing maintenance of roadway and signalling
	Allocate emergency operation budget for emergency response measures
	Review emergency response procedures and resources

Source: "*Climate Resilience and Qualitative GHG Analysis of the St. Jean Street Expansion Project*", August 2023, CIMA+, Section 2.4 Adaptation Measures

The study also outlined a qualitative analysis of the greenhouse gas (GHG) emissions anticipated to be released into the atmosphere from the construction and operation of the corridor. The study concluded that the majority of emitting GHGs would be associated with emissions linked to the embodied carbon within the material utilized for the construction of the roadway.

Table 9-2 highlights the measures put forth for consideration aimed at limiting the contributory effects of climate change and CO^2 emissions generated by the project.

Table 9-2: High Potential Green House Gas Mitigation Measures Categorized by Impact

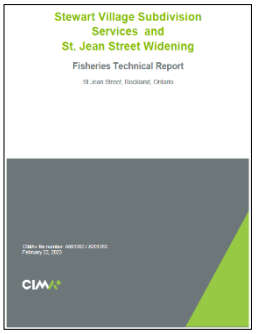
Mitigation Measure	GHG Reduction	Description

Natural Asset/Environmental Restoration	High	• Landscape plans for the surrounding subdivisions are to incorporate one (1) tree per lot. This reforestation measure and planting of native species will compensate for the felling of trees from the roadway widening project.
		• The project is to account for the quantitative emissions associated to the change in land-use activities on site, specifically related to the disturbance of peat lands and wetlands.[34]
		• The following additional mitigation measures were recommended in reducing loss, remediating, and restoring the natural assets:
		  • Reducing the surface area of the disturbance zone.
		  • Reforestation of the temporary disturbance zone required for construction activities.
		  • Reforestation of the surrounding area by planting native species.
		  • Recycling merchantable/harvested wood on the lumber market to reduce GHG emissions associated with deforestation.

Alternative Power Sources for the Site	High	• Emissions can be avoided by utilizing local (HydroOne) power for onsite operations and site office trailers. Assuming a typical diesel generator for power, (if the project ran for a total of 2,310 hours) would emit a total of ~89 tons of CO^2.
Locally Supplied Materials	Medium	• Decrease emissions by sourcing materials from local suppliers which would effectively decrease the trip length to/from the site. Transportation emissions are quite small when compared to other source categories for onsite construction emissions. • Concrete should be sourced as near as possible to the site, with the fuel efficiency being 74.9 L/100km, almost double the emissions of a traditional hauler at 39.5 L/100km. • Reusing aggregate on site is the best way to reduce transportation distance.
Material Embodied Carbon	High	• Consider the use of alternative materials such a integrated recycled asphalt, biochar, or crumb rubber. Alternative mixes can significantly reduce the 74.68 k2 CO^2 per MT of emissions associated with asphalt. Construction of the asphalt surface of roads and pathways account for most emissions when calculating a project's carbon footprint. • Consider the use of higher amounts of supplementary cementitious materials (SCMs) like fly ash and slag or other alternatives to address concrete requirements (curbs, sidewalks, truck aprons etc.) In terms of kg CO^2 per m^3 of concrete accounts for 306.3 kg CO^2. • Consider the use of recycled materials to be used in the construction of the roadway for fill, landscaping, and erosion control etc. to decrease emissions pertaining to supply materials. Sharing materials from adjacent construction projects in the vicinity of the roadway project may present opportunities to reduce waste and emissions.

34. The methodology can be followed through the Government of Canada's Draft "*Technical Guide Related to the Strategic Assessment of Climate Change*", Annex B (Government of Canada, 2021b)

9.4 FISHERIES



Given the anticipated significant raise in grade in the vicinity of Intersection No. 1; the presence of the Lafontaine Creek; the required widening of the St-Jean Street/Bronze Avenue corridor; the planned future roundabout; replacement of the existing Lafontaine Culvert with a longer box culvert; the planned wetland removal/replacement and new infill requirements; compliance with the Fisheries Act was thought to be essential.

As such, this EA document commissioned a Fisheries Technical Report (See Appendix "N".) that provided a background review, field studies, fish community sampling, site investigations along with an evaluation and assessment of the potential impact to fish and fish habitat.

The report addressed:

- Use of Industrial Equipment
- Vegetation clearing
- Excavation
- Grading
- Dredging
- The change in timing, duration and frequency of flow (Temporary cofferdams);
- The addition/removal of aquatic vegetation
- Placement of materials or structures in water
- Wastewater Management (dewatering)
- Temporary & Permanent Fish Passage

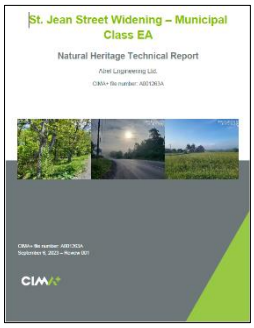
The report identified the potential effects/impacts to the fish and fish habitat associated with the Lafontain Creek area of the project and determined the impacts to be "moderate" due to the short duration of work, the assurance of best management practices being implemented, there being no indication of endangered or threatened aquatic species; the ability to minimize fish mortality, the ability to recreate and improve upon fish habitat. The report highlighted:

- Highlighted where changes in design could be implemented to avoid impacts to fish.
- Identified mitigation measures related to planning, erosion, and sedimentation control.
- Identified Measures related to fish and fish habitat protection.
- Identified Measures related to contamination and spill management.
- Estimated a total footprint consisting of 5,535m^2 (1.37 acres) mostly consisting of robust emergent wetland habitat.

The report concluded that the proposed works, activities, and undertaking associated with project will result in impacts to indirect and direct fish habitat and noted that DFO review and approval will be necessary.

Communication with the Department of Fisheries and Oceans dated June 23, 2023, was received by the City of Clarence-Rockland (See Appendix "N") that recommended implementing the measures outlined in the above report. The letter concluded that the proposed approach and measures outlined in the report and if properly implemented within the design and construction stages of the project would be unlikely to result in the contravention of DFO legislated/regulated prohibitions and requirements.

9.5 NATURAL HERITAGE



A report addressing the natural heritage was undertaken as part of this environmental assessment (See Appendix "O") that addressed:

- The Terrestrial Environment
- Incidental Wildlife Observations, and
- Species at Risk
- The Aquatic Environment

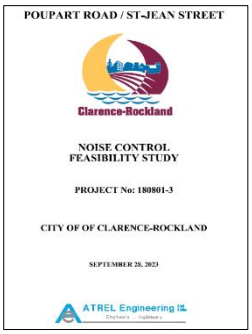
The purpose of this report was to assemble information gathered from a background review, site investigations and field studies with respect to the presence/absence of natural heritage features. When present, their boundaries, attributes, connectivity, and functions were evaluated and the potential to impact these features was assessed. Recommendations were then formulated for avoidance and mitigation measures.

- Significant Valleylands
- Significant Wetlands
- Significant Wildlife Habitat
- Fish and Fish Habitat.
- Endangered and Threatened Species (SAR) & Habitat
- Significant Woodlands
- Significant Areas of Natural and Scientific Interest

The report concluded that the St. Jean Street-Montée Poupart Side Road project will require minor clearing of vegetation within 15m of the existing centre line for almost all the alignment to meet safety requirements of the road. Additional lands would be impacted in the vicinity of Lafontaine Creek. The report determined that there is confirmed or assumed natural heritage features within the direct or indirect area of impact. However, pending consultations with Province (MECP) with respect to endangered and/or threatened species, it is likely that most of the impacts can be minimized/eliminated through the avoidance and mitigation measure detailed within the report and by following the timing windows. The following action items were emphasized within the report:

- Consultation with MECP on endangered/threatened species (including with respect to Black Ash).
- Avoidance of alterations to drainage patterns, or changes to the water quantities/qualities reaching wetland and aquatic habitats.
- Avoidance of clearing any vegetation between the April 1st and September 30th time frame.
- Confirming the absence of raptor nests if clearing in the Spring.
- Upon completion of the detailed design update the reports information based on new findings/guidelines.

9.6 NOISE CONTROL FEASIBILTY STUDY



A report (See Appendix "P") was commissioned by the City of Clarence-Rockland to conduct a Noise Control Feasibility Study that would determine the noise related impacts associated with forecast roadway traffic volumes along the St. Jean-Montée Poupart Side Road corridor. The noise impacts were assessed upon the existing residential dwellings as well as the theoretical subdivision layouts for the proposed Stewart Village and Morris Village residential developments.

The noise study also referenced City of Ottawa Noise Control Guidelines which contains warning clauses applicable to new residential dwellings. Type "A" and "B" warming clauses refer to clauses that must be communicated advising purchasers of roadway (transit, rail and air) sound levels the exceed the City's and Provincial noise criteria.

The noise study assessed noise level impacts to both outdoor living areas and indoor conditions during both day-time and night-time periods. As well, various setback conditions were evaluated for noise levels corresponding to noise levels ranging from 45 dBA-to-65 dBA. (decibels)

- *Existing Dwelling Impacts: Building Face:* The forecast noise levels during the day-time period at the building face areas were determined to be between 55-to-65dBA and between 50-to-60dBA during the night-time for all but two dwellings along the St. Jean-Montée Poupart Side Road corridor. These levels were found to be above the MOECC guideline limits given the existing setbacks.
- *Existing Dwelling Impacts: Outdoor Living Areas:* The noise study determined, as concerns outdoor living areas, that mitigation measures due to the proposed St. Jean–Montée Poupart Side Road corridor road widening and forecast traffic volume would be unnecessary.

The noise study concluded that no mitigation measures were found to be necessary and that the existing residents along the St. Jean–Montée Poupart Side Road corridor will be advised that "*sound level due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as sound levels were found to exceed the Ministry of Environment's noise criteria*".

9.7 ARCHEOLOGICAL RESOURCES

A Stage 1 and 2 Archeological Assessment was a component undertaken as part of this EA study. (See Appendix "Q") in accordance with provincial standards and guidelines[35].

- The Stage 1 assessment included a review of the updated MCM archaeological site databases, a review of relevant environmental, historical, and archaeological literature, as well as primary historical research including: historical maps, land registry, and census records. The Stage 1 portion of the assessment determined that the study area had archaeological potential and was thus recommended for a Stage 2 assessment.

35. "*Standards and Guidelines for Consultant Archaeologists*" Ministry of Citizenship and Multiculturalism (2011)

- The Stage 2 assessment involved a visual inspection of the study area where field notes were recorded and photographs taken on October 31 and November 14, 2022, to document the current land conditions. The assessment identified that the entire study area was exempt from subsurface testing due to permanently wet conditions, steep slopes, and extensive and deep land alterations through ditches, driveways, fill, and buried utilities. The Stage 2 assessment resulted in no evidence of archaeological or cultural heritage interest or value.

Given the negative results of the assessment, it was concluded that no further archaeological investigation would be warranted.

9.8 AESTHETIC AND LANDSCAPING REQUIREMENTS

The preferred four roundabouts within this EA document are to be landscaped in a manner that offers consistency and aesthetic beauty to the surrounding community. In addition to meeting all safety regulations, the landscaping should also assure the effectiveness of the intersection treatment. Landscaping cannot obstruct motorist's views of the layout or the visibility of oncoming vehicle traffic.

Considerations should include:

- The major urban collector designation of the roadway corridor,
- The design speed along the corridor, (See Figure 7-1), and
- the quantity of space allotted for landscaping.

The features or landscaping of the roundabouts should ideally blend in with the future neighborhoods, not divert attention from passing cars, nor impede pedestrian safety, nor attract pedestrians to enter onto the central island. Landscaping should not just be added as an afterthought after construction.

Figure 9-1: Rue Du Prado and Boulevard du Plateau, Gatineau, Québec

The following elements should be considered at the time of detailed design:

- *Landscaping Treatments:* Landscaping of the roundabouts center island can contribute to enhanced safety by encouraging slower speeds while still assuring that sight distances are maintained but not

surpassed. As such, distinct factors should be accounted for in the interior and exterior regions of the central island. The size of the roundabout and the necessary sight distances will determine the breadth of the planting zone inside the central island. To lessen salt splashing, enhance plant growth, and control weeds, a raised middle island filled with mulch and garden soil rather than topsoil would be preferred. Raising the soil's depth to at least 30 cm will also lessen the effects of droughts and control a large portion of the rainfall that falls on the roundabout.

Current practice is to landscape the central island with grass and/or low maintenance/drought tolerant plants. Landscaping should be low maintenance, salt resistant and drought resistant design that provides continuous vegetative colour between the spring and fall months. Given that these roundabouts are all characterized by an inscribed circle diameter of 60m or greater, the size of the roundabout should influence the landscaping features.

- *Pedestrians:* Landscaping treatments should not be designed to encourage pedestrians into the centre island. If concrete treatments are part of a design, they should not resemble a sidewalk or pathway. The use of coloured or textured concrete can be an effective measure to discourage pedestrians.
- *Utilities:* Major landscaping features must not interfere with the access to utilities or ability to perform maintenance on utilities in the vicinity of the roundabouts. Shrubs or movable features can be considered. Irrigation systems should not be provided within the roundabout due to high maintenance and water spraying onto the roadway surface.
- *Low Impact Features (LIF):*
  - Stormwater planning can be used to preserve/recreate natural landscape features and develop an appealing site drainage strategy as a resource rather than a waste product.
  - Splitters and approaches could also be used as locations for landscape features.
- *Streetlighting.* Streetlighting should meet the City of Clarence-Rocklands requirements for lighting the roadway and pedestrian areas in the vicinity of the roundabouts. If decorative lighting is part of a design, solar lighting should also be investigated as utility connections within a roundabout are not desired.
- *Signage:* Roundabouts are a traffic control device and the landscaping is part of the design. The landscaping / feature elements should not include signs, lettering, third party signs or advertising that would distract motorists and / or entice pedestrians into the centre of the roundabout. The only exception would be a traffic signage or a community name.
- *Maintenance:* Maintenance of landscaping or features should be considered before the design of the roundabout is completed. Maintenance vehicle access should also be considered as part of the design.

10.0 FINDINGS AND RECOMMENDATIONS

The City of Clarence-Rockland and the United Counties of Prescott-Russell has undertaken a Municipal Class Environmental Assessment (MCEA) that has examined design alternatives to address and establish a preferred long-term vision for approximately 2.25 km of the St. Jean Street–Montée Poupart corridor. This project was determined to be a Schedule "C" project in the MCEA process.

The City's Multi-Modal Transportation Master Plan (MMTMP) (June, 2019) had fully addressed the need and justification phases [Phase 1 and Phase 2] of the MCEA process. This environmental study report (ESR) serves as the completion of Phase 3 of the MCEA process and represents the first step in Phase 4.

The study commencement notices for this project were forwarded on February 3rd and 4th, 2023 to:

- 45 interested governments, agencies and organizations and interested parties.
- 7 First Nations and Aboriginal Peoples.
- 70 land/property owners located adjacent to the corridor.
- In addition, a commencement announcement aimed at the community at large via the City's web site on March 10th, 2023 and has remained on-line to date.

In addition, two fully bilingual public consultation sessions (June 15th and October, 25th, 2023) were arranged, advertised and attended where the entire community was invited. In addition, information concerning the project has been readily available on the City's website.

Subsequent to acceptance of the DRAFT ESR by municipal officials and Councils, a formal Notice of Completion will be circulated for review and comment to the public, stakeholders as well as Provincial, Federal and regulatory agencies over a 30-day period. Subsequent to questions and concerns being addressed, the DRAFT ESR document would then to be refined as necessary and finalized.

10.1 EXISTING CONDITIONS

The St. Jean Street–Montée Poupart corridor is currently a 2-lane rural corridor with STOP controlled intersections that accommodates approximately 400 vehicles during the peak hours of travel demand. All four of the existing intersections along the corridor were found to operate at an acceptable Level-of-Service "B"-or- higher with acceptable delays (being less than 12.8 seconds).

The corridor traverses the LaFontaine Creek over an existing culvert and the rises at a gradient of 14.5% approaching County Road 21. The existing grade exceeds the minimum required design criteria for an urban collector roadway. The corridor does not provide any auxiliary pedestrian or cycling facilities along its length.

The corridor provides direct access to then new municipal pumping station, adjacent industrial developments (Centennial Construction, Poupart Excavation), several residential homes and agricultural acreages, a dog walk facility, a Hydro One Sub-station and serves as the primary east-west roadway to the south of the municipality that connects the retail centre to the west- to the - residential developments further east.

10.2 FORECAST CONDITIONS

Traffic forecasts, assuming ultimate development of the surrounding lands (Stewart Village, Morris Village etc.), in addition to background traffic growth from the community-as-a-whole, indicate that traffic volumes along the corridor will rise to 2,500-to-3,000 vehicles during the peak hours of travel demand. The City's transportation master plan (2019) and Official Plan (2021) did not recommend a "*do-nothing*" solution as the existing corridor was found to have deficient capacity to accommodate the future forecast traffic volumes and the existing geometry of the major intersections require improvements to meet current safety and vehicle turning movement design standards.

10.3 THE PREFERED ALTERNATIVE

This ESR explored several alternative design solutions for the corridor and the major intersections along its length in terms of traffic operations, safety, active transportation, overall property impacts and costing. The analysis and evaluation concluded that the preferred design would involve the adoption of roundabout configurations at each of the major intersections along the St. Jean - Montée Poupart Side Road corridor.

Section 8.0 highlights, and Annex "A" illustrates, the preferred design concept which would see:

- Approximately 2.3km of widening the east-west St. Jean Street–Montée Poupart corridor to a 4-lane major collector road cross section with urban (curb) services on both sides.
- The development of four 2-lane roundabouts that can accommodate large (WB-20) heavy vehicle turning movements along the major corridors.
- A reprofiling of the St. Jean Street EW corridor resulting in the reduction of the existing gradient (14.5%) to 8% along the St. Jean Street EW alignment between the new pumping station and County Road 21.
- The construction of a new extended (79m long) LaFontaine Creek culvert under the re-profiled St-Jean Street EW corridor.
- The development of roughly 2.2 km of new continuous sidewalks and 2.2 km of a new continuous interconnected multi-use pathways that would serve the community adjacent to the St. Jean Street–Montée Poupart corridor.

10.4 STAGING THE PLAN

A staging strategy was envisioned to implement the preferred alterative as follows:

Phase 2	**Supply and Install New Lafontaine Creek Culvert** **Roundabouts No. 1 and No. 2 and the Road Section Between the Two Roundabouts**	Site preparation, removals, water main, sanitary sewer, storm sewer, mass earth movement, base course, services, curb, sidewalks, landscaping, wear course, miscellaneous, utilities, and Centennial Construction re-profiled and realigned internal circulation roads
Phase 3	**Roundabout No. 3 and the Road Section Between Roundabout No. 2 and No. 3**	Site preparation, removal, storm sewer, mass earth movement, base course, curbs, sidewalks, landscaping, wear course, miscellaneous, and utilities (watermain)
Phase 4	**Roundabout No. 4**	Site preparation, removal, storm sewer, mass earth movement, base course, curbs, sidewalks, landscaping, wear course, miscellaneous, and utilities (watermain)

10.5 RIGHT-OF-WAY AND COSTS

The above improvements were determined to require:

- 15.2 acres of property to implement the preferred design. [This total does not distinguish between lands that are already publicly owned, from those that are privately owned, or those lands that may be conveyed to the city as part of an ongoing or future development application.]
- A conceptual estimate of approximately $44.1M was determined as the required budget (excluding the advent of the preparation work required for the LaFontaine Culvert and out of the ordinary Hydro One requirements.

10.6 ADDITIONAL CONSIDERATIONS

This ESR also recommends that the City of Clarence-Rockland consider an additional 5th roundabout to be located nearest the south City limit on County Road 21 roughly 300m to the south of Montée Poupart Side Road corridor that would accommodate future sub-divisions located on both sides of County Road 21 but located within the City's municipal urban boundary. This infrastructure was not addressed within the ESR but was also determined to require the future widening of County Road 21 to a 4-lane urban cross-section to the City's south urban boundary in addition to the 5th roundabout.

Numerous specialists have recommended a series of mitigation measures oriented at the construction and implementation of the planned improvements that are detailed throughout Section 9.0 of this document and included within the appendix document that accompanies this ESR. These measures are to be

reviewed at the time of detailed design and implemented as part of the overall project and future tendering process.

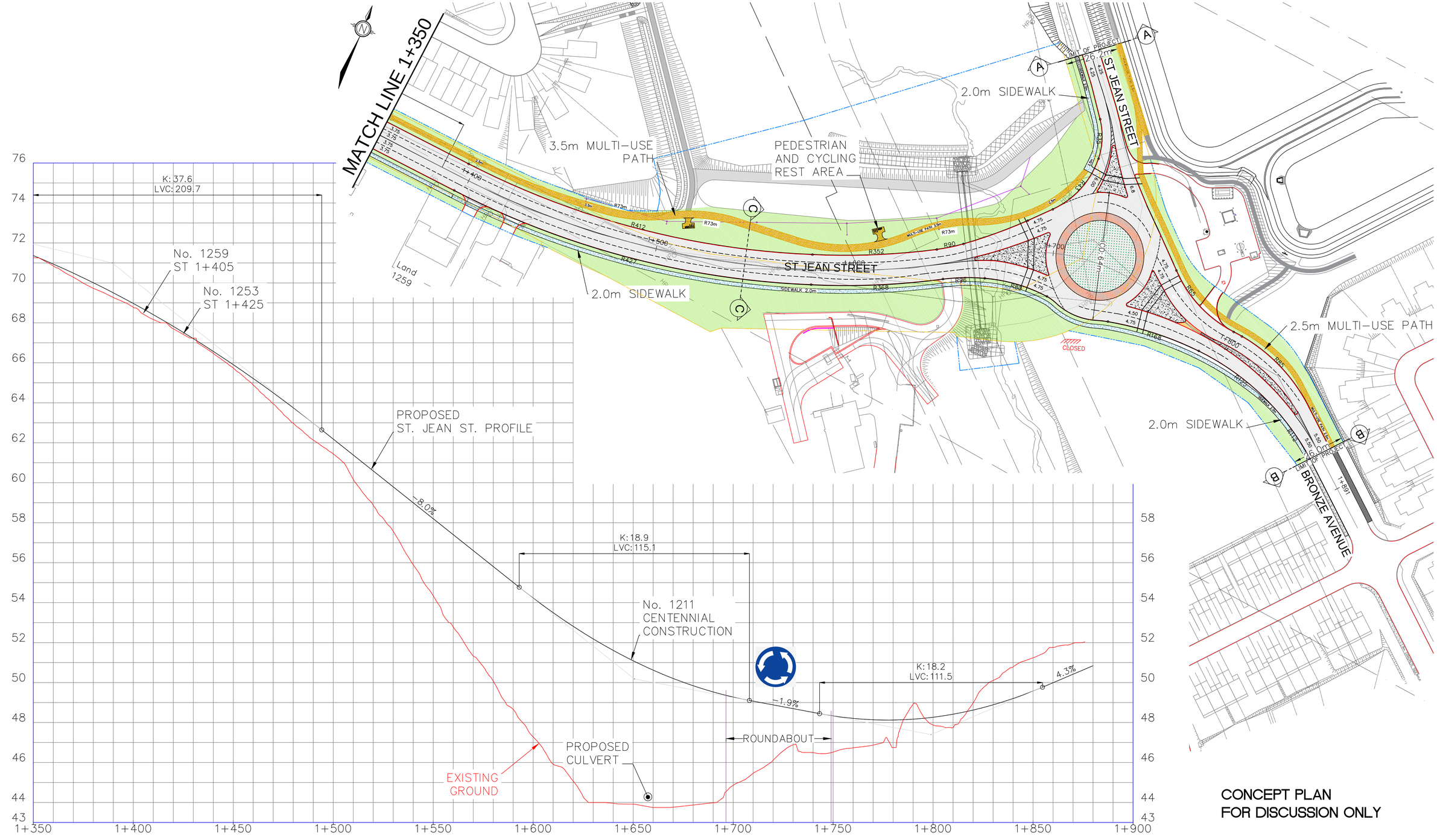
Once this ESR report has been submitted and reviewed by Provincial, Federal and regulatory agencies, it is likely that additional refinements will take place and form requirements to achieve approval of the permits necessary to proceed to implementation.

ANNEXES

ANNEX "A-1"

FUNCTIONAL PLANS:

PLAN AND PROFILE
SHEETS 1-THRU-3



CONCEPT PLAN
FOR DISCUSSION ONLY

CONSULTANT

Castleglenn Consultants
Engineers, Project Managers & Planners

DESIGNED BY A.P.	CHECKED BY A.E.G.
CONSULTANTS JOB NO. 7307	

LEGEND

- SIDEWALK (CONCRETE)
- MULTI USE PATHWAY (ASPHALT)
- ROADWAY ASPHALT
- LANDSCAPE
- TRUCK APRON
- PROPOSED ROW
- EXISTING ROW

17.0m 0 17.0m
HORIZ 1:850
SCALE

PLAN NUMBER

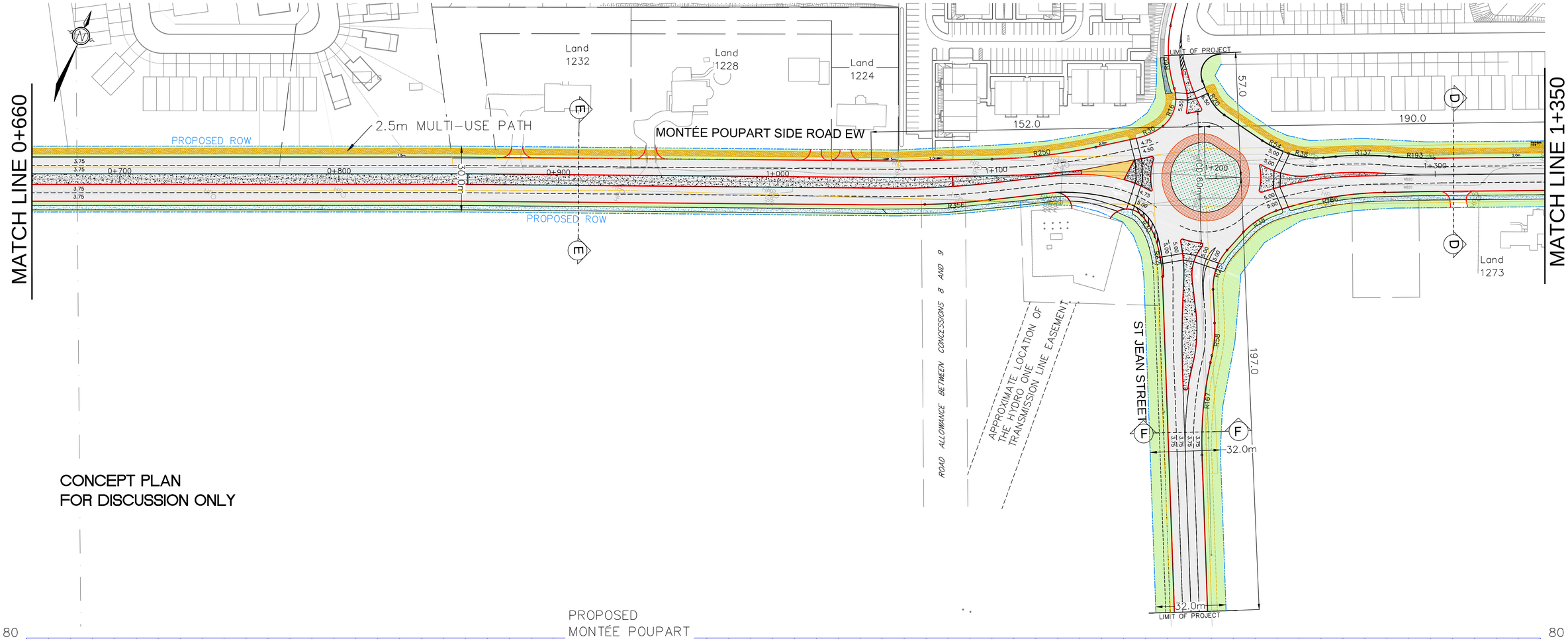
CITY OF CLARENCE-ROCKLAND

ST JEAN STREET AND MONTEE POUPART FUNCTIONAL PLAN

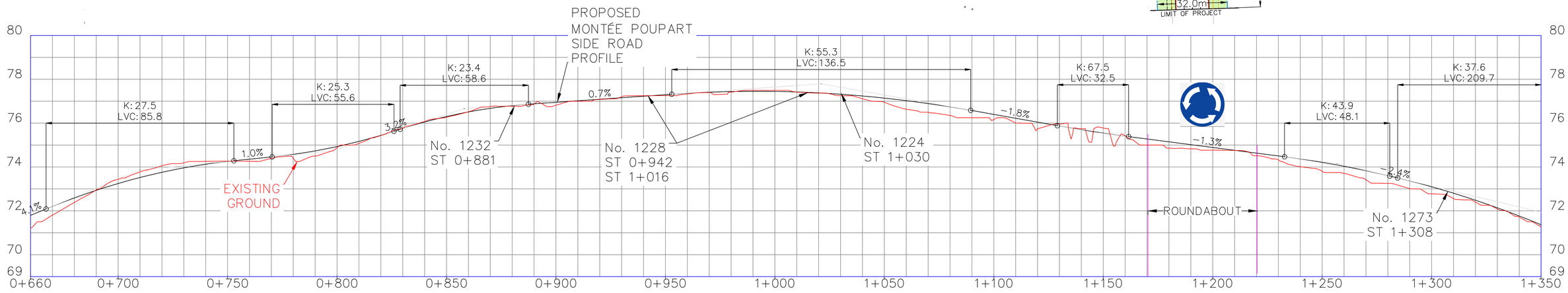
PLAN AND PROFILE

STATUS	DATE	SHEET
DRAFT	2024-02-28	01 OF 07

Clarence-Rockland



CONCEPT PLAN
FOR DISCUSSION ONLY



CONSULTANT

Castleglenn Consultants
Engineers, Project Managers & Planners

DESIGNED BY A.P.	CHECKED BY A.E.G.
CONSULTANTS JOB NO. 7307	

LEGEND

- SIDEWALK (CONCRETE)
- MULTI USE PATHWAY (ASPHALT)
- ROADWAY ASPHALT
- LANDSCAPE
- TRUCK APRON
- PROPOSED ROW
- EXISTING ROW

17.0m 0 17.0m
HORIZ 1:850
SCALE
PLAN NUMBER

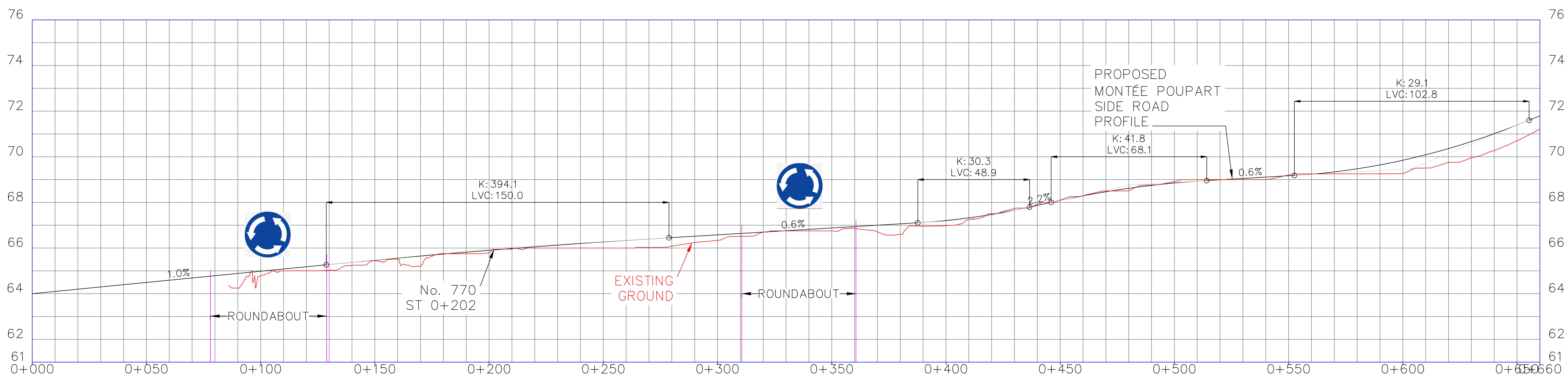
CITY OF CLARENCE-ROCKLAND

ST JEAN STREET AND MONTEE POUPART FUNCTIONAL PLAN

PLAN AND PROFILE

STATUS	DATE	SHEET
DRAFT	2024-02-28	02 OF 07

Clarence-Rockland



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Engineers, Project Managers & Planners

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CONSULTANTS JOB NO. 7307

LEGEND

- SIDEWALK (CONCRETE)
- MULTI USE PATHWAY (ASPHALT)
- ROADWAY ASPHALT
- LANDSCAPE
- TRUCK APRON
- PROPOSED ROW
- EXISTING ROW

HORIZ 1:850

SCALE

PLAN NUMBER

CITY OF CLARENCE-ROCKLAND

ST JEAN STREET AND MONTEE POUPART
FUNCTIONAL PLAN

PLAN AND PROFILE

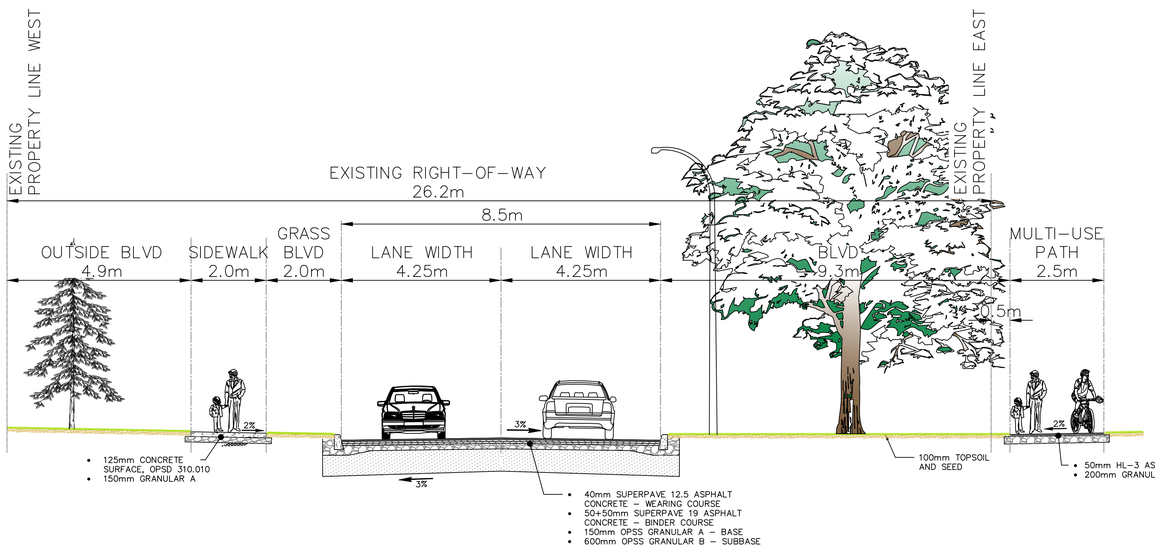
STATUS	DATE	SHEET
DRAFT	2024-02-28	03 OF 07

Clarence-Rockland

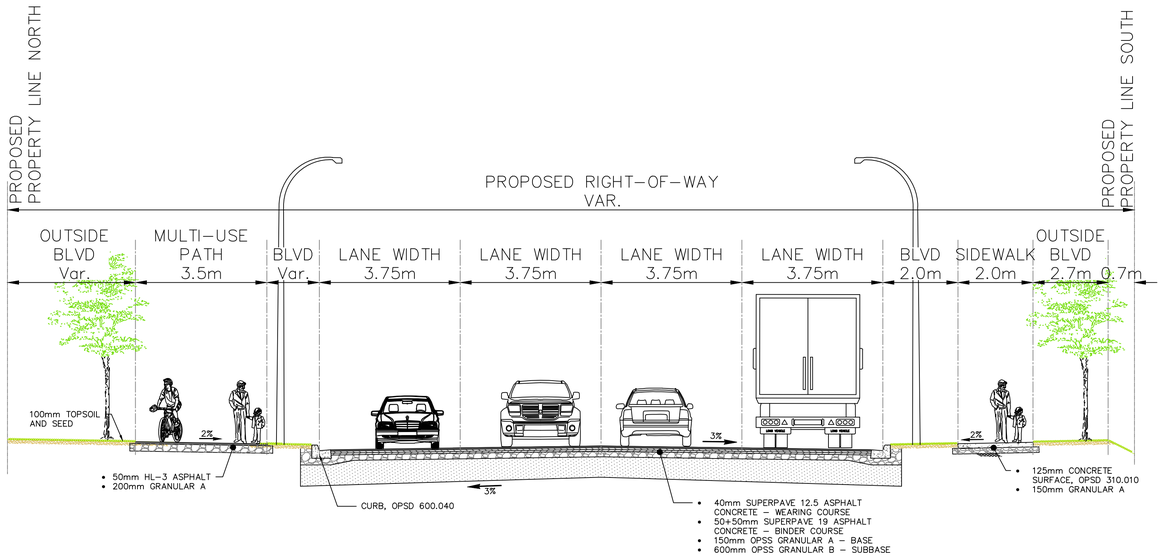
ANNEX "A-2"

FUNCTIONAL PLANS:

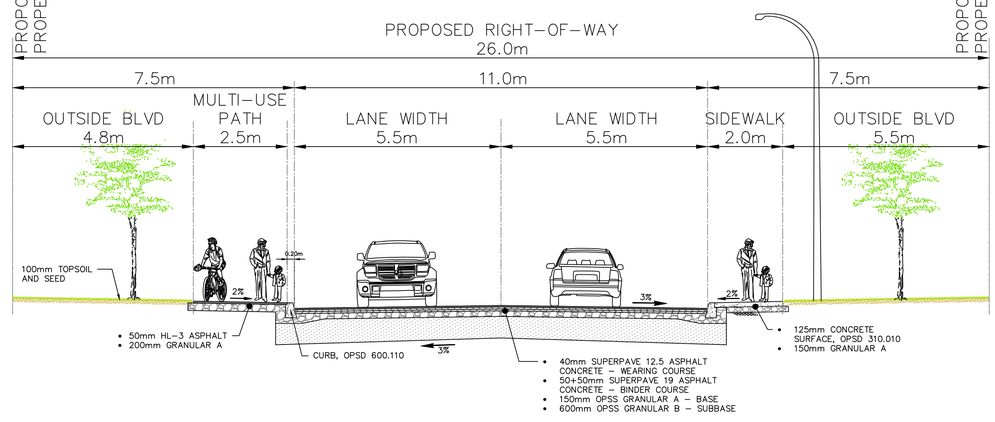
CROSS-SECTIONS
SHEETS 4-THRU-5



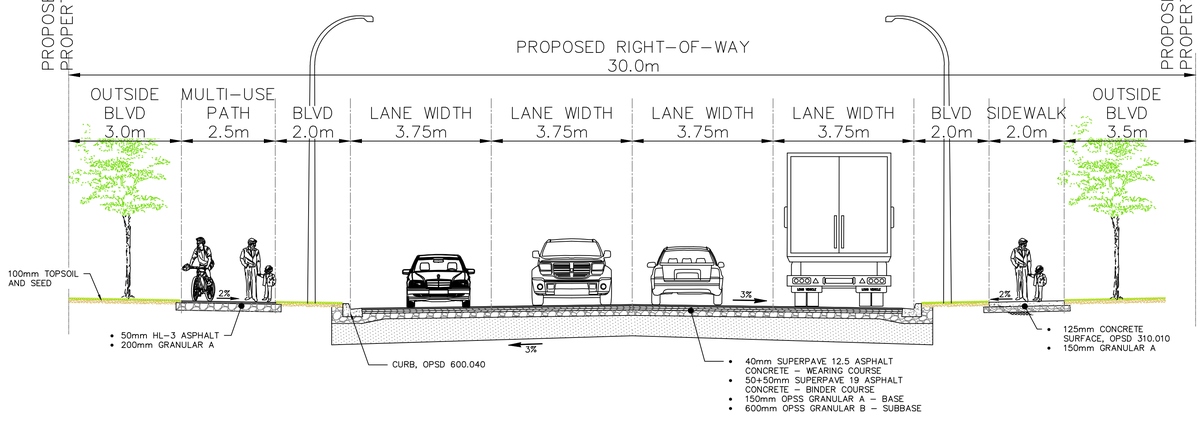
TYPICAL CROSS SECTION **A-A**
ST. JEAN STREET NORTH
DESIGNATION: URBAN MAJOR COLLECTOR



TYPICAL CROSS SECTION **C-C**
ST.JEAN STREET BETWEEN INTERSECTION #1 AND #2
DESIGNATION: URBAN MAJOR COLLECTOR



TYPICAL CROSS SECTION **B-B**
BRONZE STREET
DESIGNATION: URBAN MAJOR COLLECTOR



TYPICAL CROSS SECTION **D-D**
ST.JEAN STREET BETWEEN INTERSECTION #1 AND #2
DESIGNATION: URBAN MAJOR COLLECTOR

CONCEPT PLAN
FOR DISCUSSION ONLY

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Castleglenn Consultants
Engineers, Project Managers & Planners

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CONSULTANTS JOB NO. 7307	

LEGEND

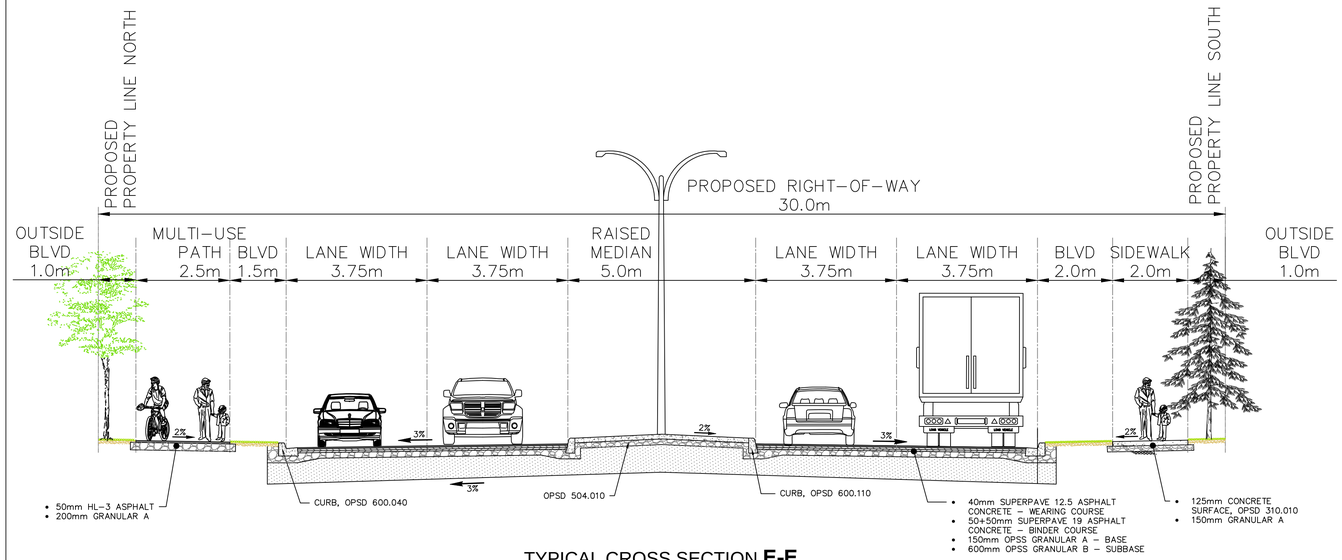
1.5m 0 1.5m
HORIZ. 1:75
SCALE

PLAN NUMBER

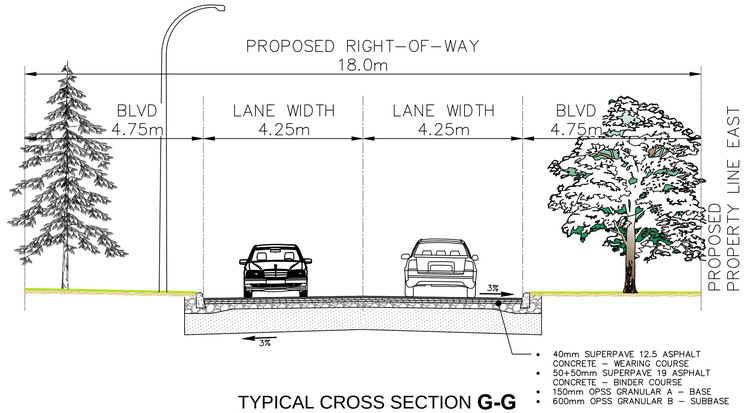
CITY OF CLARENCE-ROCKLAND
ST JEAN STREET AND MONTEE POUPART
FUNCTIONAL PLAN
PLAN AND PROFILE

STATUS	DATE	SHEET
DRAFT	2024-02-28	04 OF 07

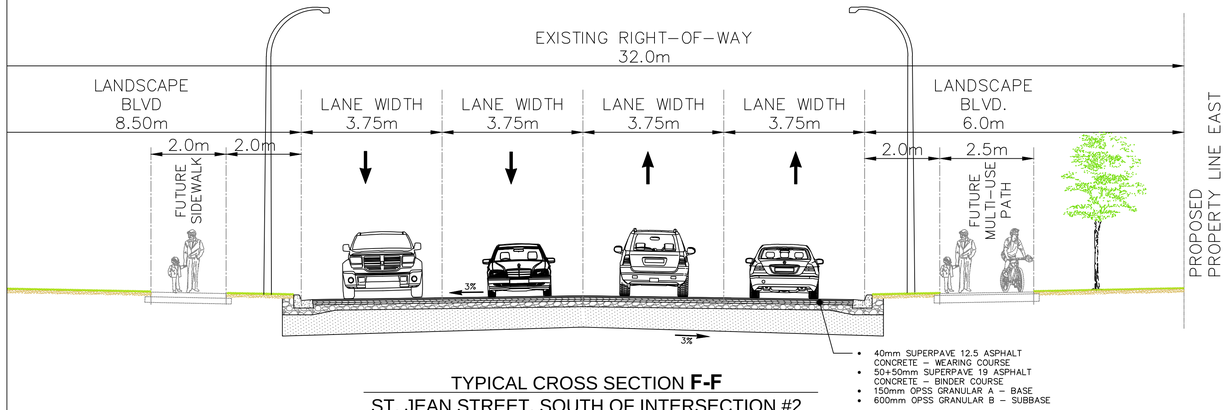
Clarence-Rockland



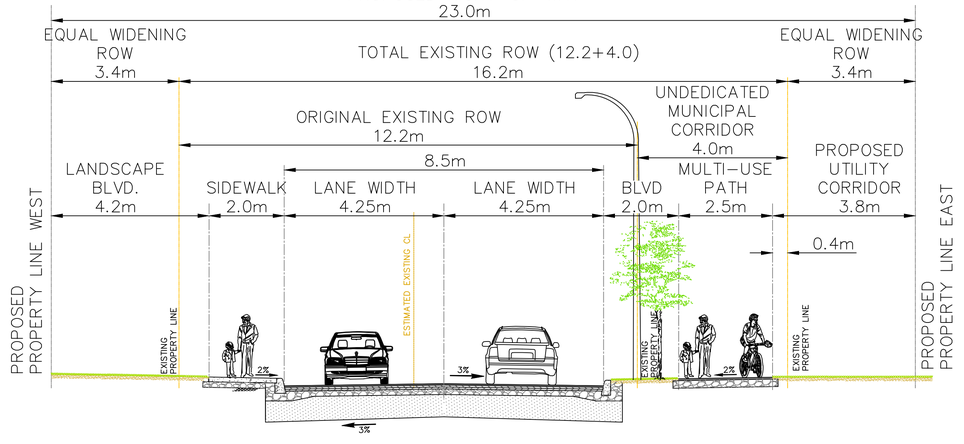
TYPICAL CROSS SECTION **E-E**
POUPART ROAD EAST-WEST
DESIGNATION: URBAN MAJOR COLLECTOR



TYPICAL CROSS SECTION **G-G**
STEWART VILLAGE 1ST
DESIGNATION: LOCAL STREET



TYPICAL CROSS SECTION **F-F**
ST. JEAN STREET, SOUTH OF INTERSECTION #2
4-LANE URBAN COLLECTOR



TYPICAL CROSS SECTION **H-H**
MONTEE POUPART NORTH-SOUTH
2-LANE URBAN MAJOR COLLECTOR

CONCEPT PLAN
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LEGEND

1.5m 0 1.5m
HORIZ. 1: 75
SCALE
PLAN NUMBER

CITY OF CLARENCE-ROCKLAND
ST JEAN STREET AND MONTEE POUPART
FUNCTIONAL PLAN
TYPICAL CROSS SECTIONS

STATUS	DATE	SHEET
DRAFT	2024–02–28	05 OF 07

Clarence-Rockland

ANNEX “A-3”

FUNCTIONAL PLANS:

RIGHT OF WAY REQUIREMENTS

MATCH LINE 0+900

MONTÉE POUPART SIDE ROAD EW

ST JEAN STREET

STEWART VILLAGE

LIS BRONZE AVENUE

COUNTY ROAD N° 21

RUE ST-JEAN STREET

CONCESSION 1 OLD SURVEY

CONCESSION 8

CONCESSION C

LOT 28

LOT 29

LOT 30

LOT 31

434 sqm 0.11 ac

252 sqm 0.06 ac

68 sqm 0.02 ac

2,883 sqm 0.71 ac

9,536 sqm 2.36 ac

947 sqm 0.23 ac

2,213 sqm 0.55 ac

5,728 sqm 1.42 ac

3,275 sqm 0.81 ac

2,140 sqm 0.53 ac

86 sqm 0.02 ac

256 sqm 0.06 ac

266 sqm 0.07 ac

50 sqm 0.01 ac

103 sqm 0.03 ac

150 sqm 0.04 ac

76 sqm 0.02 ac

2,350 sqm 0.58 ac

1,054 sqm 0.26 ac

888 sqm 0.22 ac

140 sqm 0.03 ac

110 sqm 0.03 ac

PROPERTY REQUIRED FROM HYDRO ONE 538 sqm 0.13 ac

175 sqm 0.04 ac

1,354 sqm 0.33 ac

616 sqm 0.15 ac

482 sqm 0.12 ac

353 sqm 0.09 ac

5,635 sqm 1.39 ac

6,860 sqm 1.70 ac

6,852 sqm 1.69 ac

886 sqm 0.22 ac

757 sqm 0.19 ac

37 sqm 0.01 ac

328 sqm 0.08 ac

3,683 sqm 0.91 ac

714 MONTEE POUPART

698 MONTEE POUPART

770 MONTEE POUPART

THE EXISTING ROAD WAS NOT DESIGNED TO BE CENTERED WITHIN THE EXISTING ROW. FOR THE PURPOSES OF THIS EA, THE DESIGN WAS BASED ON A 23m ROW SPACED 10.2m TO THE WEST AND 12.8m TO THE EAST TO ACHIEVE THE 23M ROW SO AS TO ASSURE THAT PROPERTY OWNERS ON EACH SIDE OF THE ROADWAY WOULD BE EQUALLY IMPACTED.

EQUAL WIDENING EAST AND WEST SIDES 3.4m ROW REQUIREMENT NORTH OF THE ROUNDABOUT IS TO BE CONFIRMED AT THE TIME OF DETAILED DESIGN OF MONTÉE POUPART SIDE ROAD NS

THE 32m WIDE ROW WOULD BE EXTENDED TO THE SOUTHERN URBAN BOUNDARY LIMIT OF CLARENCE-ROCKLAND. ADDITIONAL ROW REQUIREMENT WOULD BE NEEDED TO ACCOMMODATE INTERSECTIONS AND ACCESSES.

CONCEPT PLAN
FOR DISCUSSION ONLY

LEGEND

- PRIVATE PROPERTY TO BE OBTAINED THROUGH DEDICATION FOR USE AS ROADWAY ROW.
- PUBLIC LANDS TO BE AQUIRED/DEDICATED FOR USE AS ROADWAY ROW.
- NOT DEDICATED AS PUBLIC HIGHWAY
- PRIVATE PROPERTY TO BE OBTAINED EITHER THROUGH ACQUISITION OR THROUGH DEDICATION FOR USE AS ROADWAY ROW DEPENDING ON TIMING OF ROUNDABOUT NO.4 BEING WARRANTED.
- PROPERTY OWNED BY HYDRO ONE THAT IS REQUIRED FOR ROADWAY ROW.
- PRIVATE PROPERTY TO BE OBTAINED THROUGH ACQUISITION FOR USE AS ROADWAY ROW.
- EXISTING ROW
- PROPOSED ROADWAY ROW

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HORIZ 1:1250

SCALE

PLAN NUMBER

CITY OF CLARENCE-ROCKLAND

ST JEAN STREET AND MONTEE POUPART FUNCTIONAL PLAN

REQUIRED ROW PLAN

STATUS	DATE	SHEET
DRAFT	2024-02-28	06 OF 07

Clarence-Rockland

Parcel Line Table		
Line #	Length	Direction
L1	10.96	N61° 19' 07.94"W
L2	5.98	N33° 11' 36.84"E
L3	17.94	N33° 11' 36.84"E
L4	5.88	N33° 11' 36.84"E
L5	17.12	S55° 21' 18.10"E
L6	3.76	N60° 41' 04.96"E
L7	12.61	N60° 41' 04.96"E
L8	17.96	N64° 00' 41.44"E
L9	7.30	N64° 00' 41.44"E
L10	23.19	N67° 20' 17.92"E
L11	99.92	N67° 20' 17.92"E
L12	4.13	N67° 20' 17.92"E
L13	17.73	N64° 17' 56.66"E
L14	1.96	N58° 58' 46.70"E
L15	10.27	N58° 58' 46.70"E
L16	13.00	N56° 29' 19.84"E
L17	19.88	N36° 57' 32.27"E
L18	17.83	N14° 46' 40.44"E
L19	31.23	N17° 04' 18.96"W
L20	30.25	N11° 29' 03.48"W
L21	19.30	N19° 08' 06.09"W
L22	73.49	N24° 13' 26.65"W
L23	140.36	N24° 13' 26.66"W
L24	10.08	S61° 25' 56.31"W
L25	14.60	S69° 07' 48.56"W
L26	10.93	S81° 54' 15.40"W
L27	12.26	N89° 08' 35.16"W
L28	7.99	N59° 36' 34.22"W
L29	10.61	N42° 27' 58.09"W
L30	9.21	N29° 01' 07.75"W

Parcel Line Table		
Line #	Length	Direction
L31	12.48	N24° 13' 26.59"W
L32	4.36	S21° 37' 50.99"E
L33	16.27	S16° 20' 14.31"E
L34	14.47	S12° 15' 47.76"E
L35	29.91	S21° 41' 04.32"E
L36	13.31	S16° 07' 55.81"W
L37	15.82	S33° 40' 20.70"W
L38	20.00	S54° 12' 49.05"W
L39	20.00	S58° 04' 21.76"W
L40	16.50	S61° 20' 20.49"W
L41	18.63	S64° 09' 45.25"W
L42	40.84	S67° 48' 42.88"W
L43	125.49	S67° 48' 42.88"W
L44	69.80	S67° 48' 42.88"W
L45	112.52	S67° 48' 42.88"W
L46	58.75	S67° 48' 42.88"W
L47	202.87	S68° 20' 05.97"W
L48	10.61	S66° 41' 36.58"W
L49	9.25	S66° 35' 42.36"W
L50	10.90	S63° 22' 26.55"W
L51	0.32	S63° 22' 26.55"W
L52	11.39	S62° 14' 55.83"W
L53	13.61	S61° 21' 36.20"W
L54	16.88	S21° 58' 17.22"E
L55	27.15	S23° 32' 20.91"E
L56	15.91	S29° 57' 24.37"E
L57	14.44	S46° 15' 08.28"E
L58	16.20	S63° 10' 16.94"E
L59	14.32	S74° 02' 17.90"E
L60	4.24	N90° 00' 00.00"E

Parcel Line Table		
Line #	Length	Direction
L61	10.76	N90° 00' 00.00"E
L62	15.00	N72° 56' 20.42"E
L63	45.65	N62° 23' 53.18"E
L64	2.04	N62° 22' 44.56"E
L65	34.73	N62° 22' 44.56"E
L66	16.00	N61° 54' 36.16"E
L67	3.75	N61° 54' 36.16"E
L68	15.26	N55° 39' 49.68"E
L69	11.25	N51° 52' 13.99"E
L70	27.01	N49° 17' 21.44"E
L71	8.52	N59° 38' 30.46"E
L72	8.57	N74° 46' 52.00"E
L73	8.72	N86° 22' 56.77"E
L74	8.35	S79° 27' 39.17"E
L75	14.91	S85° 55' 55.68"E
L76	10.79	N87° 03' 51.48"E
L77	12.90	N74° 35' 11.18"E
L78	44.02	N67° 50' 17.27"E
L79	19.05	S67° 50' 17.27"W
L80	16.00	S63° 40' 43.71"W
L81	17.72	S54° 52' 44.81"W
L82	8.87	S48° 43' 23.58"W
L83	27.58	S32° 33' 50.84"W
L84	7.71	S1° 24' 44.79"W
L85	15.40	S1° 24' 44.79"W
L86	24.76	S21° 57' 49.18"E
L87	2.11	N21° 57' 49.18"W
L88	26.44	N28° 54' 24.96"W
L89	21.89	N42° 08' 23.81"W
L90	23.73	N67° 24' 23.96"W

Parcel Line Table		
Line #	Length	Direction
L91	18.24	S81° 08' 33.39"W
L92	45.94	S67° 50' 17.27"W
L93	24.94	S67° 50' 17.27"W
L94	22.99	S62° 16' 03.47"W
L95	17.31	S59° 40' 38.29"W
L96	19.21	S57° 48' 46.81"W
L97	8.36	S55° 07' 54.72"W
L98	22.10	S27° 43' 23.59"W
L99	10.07	S14° 51' 06.14"W
L100	28.97	S22° 22' 49.00"E
L101	30.08	S13° 59' 47.51"E
L102	13.97	S21° 58' 17.22"E
L103	11.20	N21° 15' 59.86"W
L104	7.38	N17° 08' 44.66"W
L105	7.40	N5° 58' 28.47"E
L106	9.39	N31° 14' 00.95"E
L107	18.00	N55° 42' 29.10"E
L108	20.83	N58° 13' 24.24"E
L109	18.00	N62° 47' 32.35"E
L110	25.04	N64° 55' 24.73"E
L111	24.96	N64° 55' 24.73"E
L112	0.25	N64° 55' 24.73"E
L113	30.23	N68° 20' 05.97"E
L114	91.44	N68° 20' 05.97"E
L115	61.92	N68° 20' 05.97"E
L116	18.97	N68° 20' 05.97"E
L117	1.35	N67° 48' 42.88"E
L118	76.94	N67° 48' 42.88"E
L119	93.35	N67° 48' 42.88"E
L120	69.57	N67° 48' 42.88"E

Parcel Line Table		
Line #	Length	Direction
L121	121.10	N67° 48' 42.88"E
L122	107.19	N67° 48' 42.88"E
L123	13.52	N89° 15' 00.74"E
L124	12.57	S67° 38' 33.45"E
L125	17.34	S58° 28' 06.46"E
L126	21.74	S34° 36' 27.37"E
L127	30.99	S23° 29' 03.56"E
L128	24.89	S21° 58' 17.22"E
L129	109.28	N23° 15' 28.92"E
L130	24.58	N23° 15' 28.92"E
L131	77.78	N25° 49' 43.13"E
L132	10.97	N64° 10' 16.87"W
L133	6.07	N57° 11' 50.52"W
L134	6.07	N43° 14' 57.83"W
L135	3.57	N36° 16' 31.48"W
L136	14.44	N40° 51' 08.55"E
L137	18.27	N56° 59' 39.01"E
L138	31.95	N60° 33' 38.58"E
L139	12.00	N65° 04' 50.25"E
L140	19.92	N65° 04' 50.25"E
L141	100.25	N67° 20' 17.92"E
L142	29.32	N71° 01' 21.45"E
L143	23.59	N65° 16' 16.03"E
L144	10.98	N80° 32' 49.05"E
L145	7.60	S87° 47' 09.67"E
L146	14.42	S78° 08' 56.07"E
L147	11.25	S69° 33' 20.87"E
L148	10.07	S55° 45' 28.69"E
L149	5.72	S5° 47' 24.61"W
L150	1.88	S77° 52' 14.63"E

Parcel Line Table		
Line #	Length	Direction
L151	37.83	S88° 04' 17.94"E
L152	30.09	N75° 26' 31.84"E
L153	29.66	N62° 04' 34.78"E
L154	38.41	N51° 27' 35.25"E
L155	33.85	S76° 42' 50.00"E
L156	32.85	N76° 13' 05.86"E
L157	15.98	S73° 59' 09.97"E
L158	24.25	S66° 43' 50.38"E

Curve Table					
Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C1	8.55	68.00	7.20	S80° 18' 53"E	8.54
C2	28.42	57.64	28.25	N89° 10' 37"E	28.13
C3	26.00	50.00	29.80	S88° 53' 02"E	25.71
C4	6.30	50.00	7.22	S70° 22' 28"E	6.30

CONSULTANT

Castleglenn Consultants
Engineers, Project Managers & Planners

DESIGNED BY A.P. | CHECKED BY A.E.G.

CONSULTANTS JOB NO. 7307

SCALE

PLAN NUMBER

CITY OF CLARENCE-ROCKLAND

ST JEAN STREET AND MONTEE POUPART
FUNCTIONAL PLAN

REQUIRED ROW PLAN

STATUS: DRAFT | DATE: 2024-02-28 | SHEET: 07 OF 07

Clarence-Rockland