JLR No.: 33322-003
Revision: e03

January 31, 2025

Transportation Impact Assessment

Conseil des Écoles publiques de l'Est de l'Ontario, 2405 & 2419 Mer-Bleue Road, Orléans

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ENGINEERS · ARCHITECTS · PLANNERS

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Introduction

The City of Ottawa's updated 2023 Transportation Impact Assessment (TIA) Guidelines, presents a total of four separate submissions required for City review/approval. Each submission is a component/section of a formal TIA, which includes:

- *Step 1 – Screening*
- *Step 2 – Scoping*
- *Step 3 – Analysis*
- *Step 4 – TIA Submission* (i.e., Findings and Recommendations)

This report has been structured with these above noted *Steps 1-4* as numbered sections, accordingly, as outlined in the City's TIA Guidelines.

1.0 Screening

Regarding *Step 1 – Screening*, this is a form that contains a list of triggers to determine if the size, type, and location of a proposed development will require a formal TIA, as part of the City's development application approval process (e.g., not all new developments require a TIA).

In accordance with the City of Ottawa's 2023 Transportation Impact Assessment (TIA) Guidelines, the proposed development (described below in Section 2.1) triggered the trip generation criteria outlined in the City's TIA Step 1 – Screening form. Given this trigger was met, a formal TIA (i.e., completed Steps 1-4) must accompany the subject development application. Refer to **Appendix A** for the completed Screening form.

2.0 Scoping

2.1 Existing and Planned Conditions

Description of Proposed Development

Based on the information provided, it is our understanding that the Conseil des Écoles Publiques de l'Est de l'Ontario (CEPEO) is seeking City of Ottawa approval for the development of approximately 52,457 square meters of vacant land located at 2405 and 2419 Mer-Bleue Road, Orléans. The subject site is zoned as Minor Institutional Zone (I1A/RZ3) and is situated approximately 120 meters south of the Mer-Bleue Road and Renaud Road intersection.

The latest Site Plan outlines the proposed development, which includes approximately 7,873 square meters of gross floor area for the main high school building, as well as an asphalt basketball court, and an asphalt parking lot. The parking lot design accommodates approximately 93 vehicle parking spaces, including 5 accessible spaces and 4 spaces equipped with electric vehicle (EV) charging stations. Access to the site will be provided via a two-way driveway connecting to Mer-Bleue Road. Additionally, a school-bus-exclusive access lane is proposed at the southern end of the site. This entrance will feature a two-way driveway leading to a bus loop designed to facilitate safe and efficient student drop-off and pick-up operations.

The development is planned to be constructed in a single phase, with full build-out anticipated by the year 2027. The site's local context is illustrated in **Figure 1**, while the proposed Site Plan is depicted in **Figure 2**.

Figure 1: Local Context

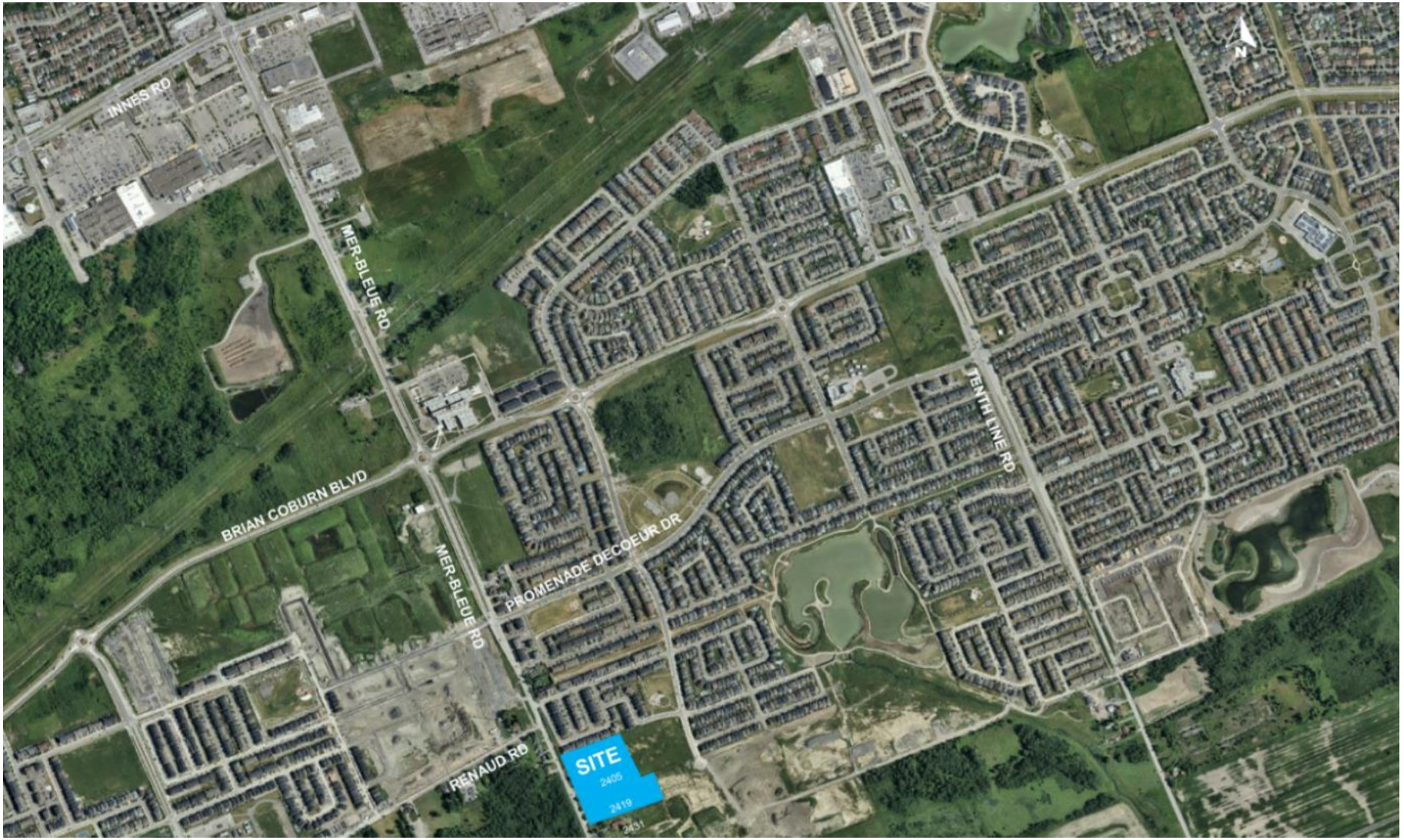
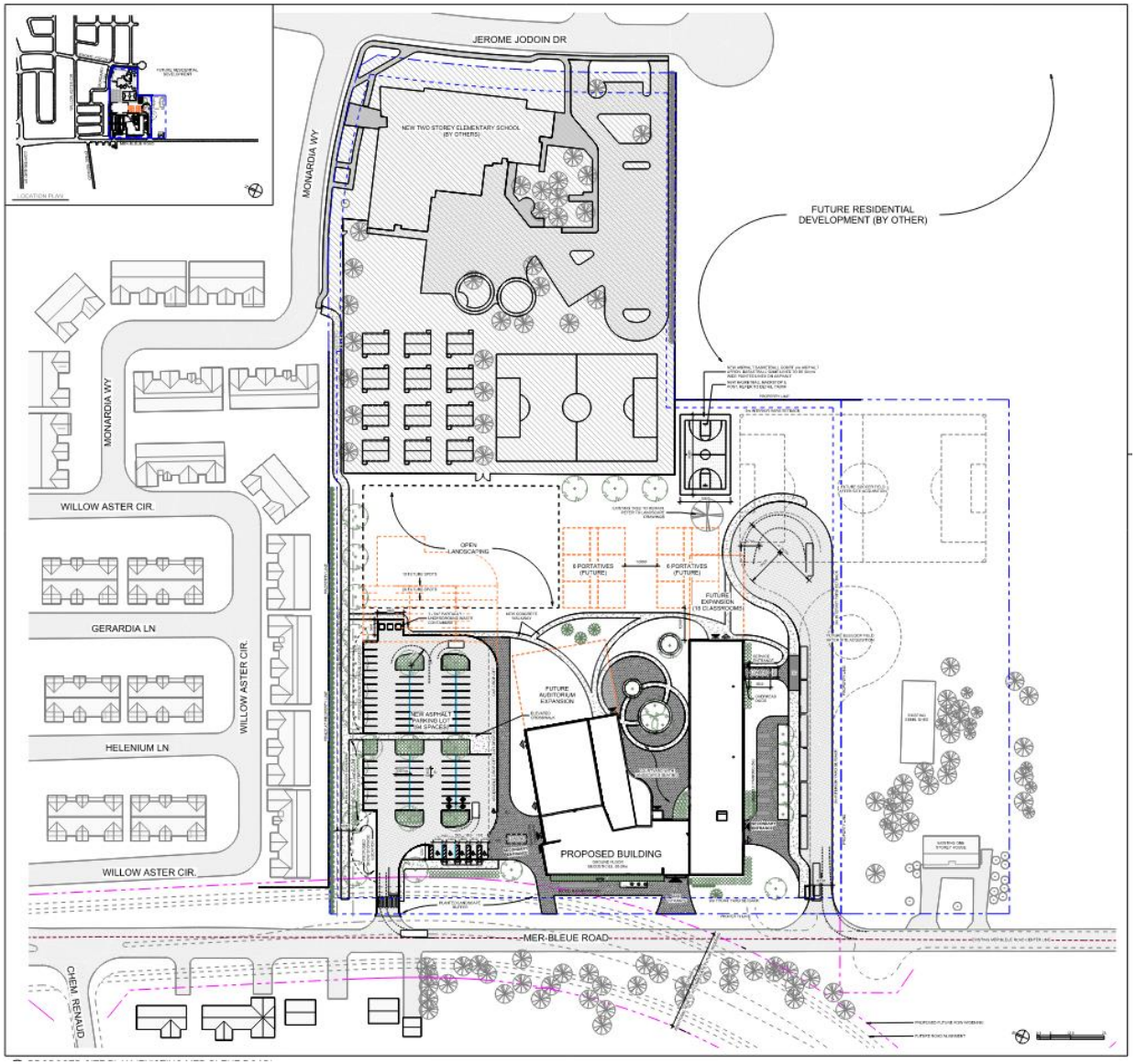


Figure 2: Proposed Site Plan



Existing Conditions

Area Road Network

Mer-Bleue Road begins at Innes Road as a four-lane arterial roadway (two travel lanes in each direction) and transitions into a two-lane arterial north of Renaud Road. South of Renaud Road, it becomes a rural cross-section collector road with a single travel lane per direction, continuing to Navan Road. Within the vicinity of the subject site, Mer-Bleue Road has a posted speed limit of 60 km/h north of Renaud Road and 50 km/h south of Renaud Road. There are no posted regulations regarding on-street parking in this area.

Renaud Road is a two-lane east-west collector roadway, featuring one travel lane in each direction. It extends from Anderson Road in the west to Mer-Bleue Road in the east, serving as a key connector within the local road network. In the vicinity of the subject site, the posted speed limit is 50 km/h. On-street parking regulations are not posted.

Study Area Intersections

Mer-Bleue/Renaud

The Mer-Bleue/Renaud intersection is an unsignalized three-legged intersection with STOP control on all approaches. All approaches consist of a single shared lane that accommodates all possible movements.

No movement is prohibited at this location.

Existing Driveways to Adjacent Development

As depicted in the following **Figure 3**, there are approximately 12 driveways connections within a 200 m boundary of the future site driveway connection; The mentioned driveways provide access/egress to existing residential properties.

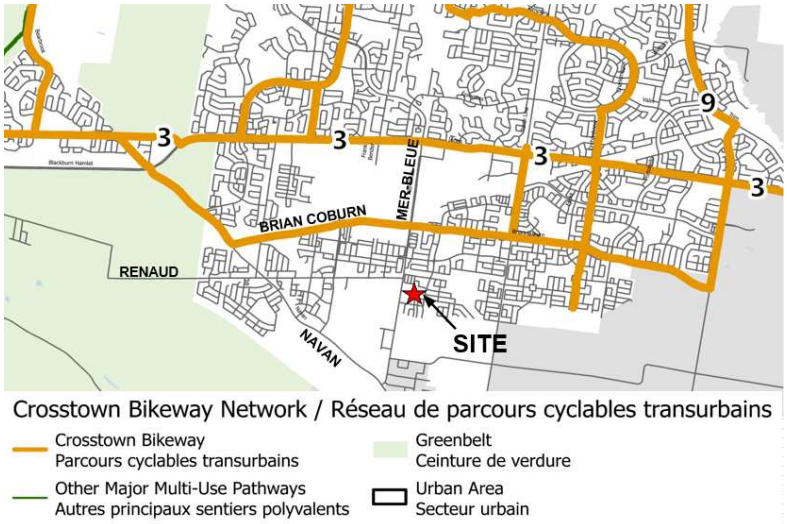
Figure 3: Adjacent Driveways

Pedestrian/Cycling Network

Within the direct vicinity of the subject site, there are no existing pedestrian facilities on Renaud Road or Mer-Bleue Road. However, there are existing pedestrian facilities adjacent to the study area, located within the subdivision north of the site. These include a sidewalk on the south side of Willow Aster Circle and Monardia Way. The eastern section of Monardia Way has concrete sidewalks on both sides that continue up to Jerome Jodoin Drive.

The cycling network near the subject site currently consists of designated painted bike lanes, which terminate approximately 500 meters west of the site at Ascender Avenue, and 300 meters north of the site at Copperhead Street/Decoer Drive. Directly in front of the site and near the Mer-Bleue Road / Renaud Road intersection, no dedicated cycling facilities are available, and cyclists use the paved shoulders. The nearest connection to a Crosstown Bikeway as designated in the City's 2023 TMP is at Brian Coburn Boulevard, north of the site. Refer to *Crosstown Bike Network* as shown in **Figure 4** below.

Figure 4: Crosstown Bike Network, Ottawa



Source: https://documents.ottawa.ca/sites/default/files/tmp_active_networks_en.pdf

Detailed maps of the existing pedestrian and cycling networks within the study area, and their connections to the broader network, are shown in **Figure 5** and **Figure 6**, sourced from GeoOttawa. It should be noted that the pedestrian network data has not been updated in the City's data sources, as several new facilities have been implemented (e.g., concrete sidewalks on Jerome Jodoin Drive).

Figure 5: Existing Pedestrian Network

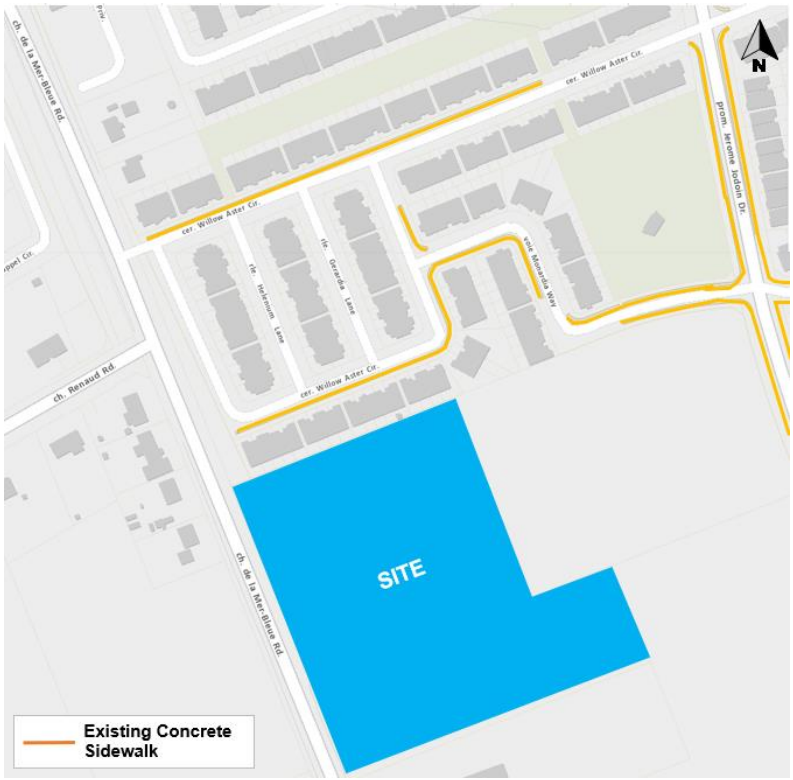


Figure 6: Existing Cycling Network

Transit Network

There are two (2) OC Transpo bus stops that are located within a 200 m walking distance to/from the subject development site. The following **Table 1** summarizes existing bus stops and their associated routes.

Table 1: OC Transpo Stop Information

Stop #	Location	Route Identifier	Direction
5762	Jerome Jordoin / Bartonia	32	Northbound
5763	Jerome Jordoin / Willow Aster	32	Southbound

The following **Figure 7** depicts transit stop locations within the vicinity of the subject development site.

Figure 7: Transit Stops Within Study Area

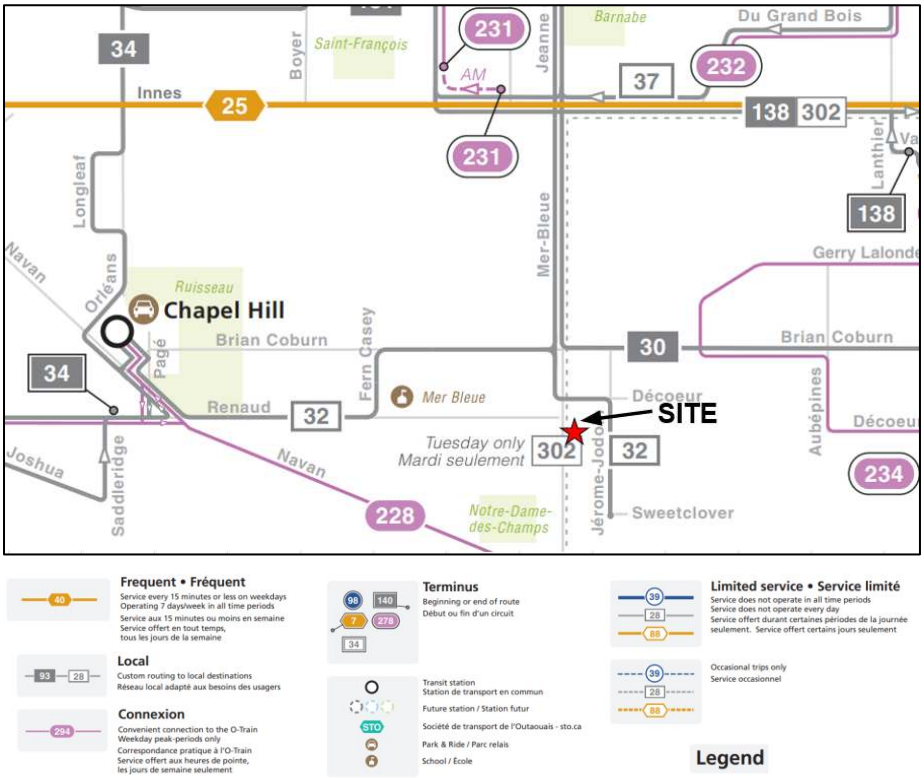
Table 2 provides additional information related to OC Transpo services identified in **Table 1**.

Table 2: OC Transpo Route Information

Route	Origin/Destination	Service Type	Peak Hour Headway AM Peak (PM Peak)
32	Blair ↔ Chapel Hill	Local	15 (30) mins
302	St-Laurent / Place D'Orleans ↔ Cumberland	Special	Once a day

Note that route 302 only functions one time on Tuesdays AM direction St-Laurent / Place D'Orleans and PM direction Cumberland; The nearest stop location to the subject site is Navan / Mer-Bleue which is 1.4 km to the south. The following **Figure 8** depicts the OC Transpo routes within the vicinity of the subject development.

Figure 8: Transit Routes Within Study Area



Source: https://www.octranspo.com/images/files/maps/systemmap.pdf, accessed 2024-10-04

Area Traffic Management

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

- Pavement markings (e.g., painted gore area approaching Mer-Bleue / Renaud Road and stop bars, roundabout approaching markings, designated cycling lanes (painted bike lanes) on Brian Coburn Blvd and Renaud Rd.
- Information signage (e.g., area speed limit 60 km/h north of Renaud Road and 50 km/h south along Mer-Bleue Rd.)
- Vertical line treatments to give drivers a lane-narrowing effect (e.g., centreline)

Peak Hour Travel Demands

For the purpose of this assessment, the following study area intersection has been identified for intersection capacity analysis:

- Mer-Bleue/Renaud

Traffic counts at the above-mentioned intersection were completed by JLR personnel on October 10, 2024. The peak hours were observed to be between 7:15 AM to 8:15 AM for the morning peak hour and 4:00 PM to 5:00 PM for the afternoon peak hour. The following **Figure 9** depicts the observed weekday morning and afternoon peak hour vehicular volumes at study area

intersections, and **Figure 10** depicts pedestrian and cyclist movements over the same peak hours. Detailed traffic volume data is provided as **Appendix B** .

Existing Road Safety Conditions

The most recent collision history for the latest five (5) years was obtained from the City (i.e., available collision data for the years of 2017 – 2022, inclusive). The collision data includes all collisions occurring at intersections and roadway segments within the study area surrounding the subject development site.

Based on the most recent available historical collision data, the five-year total number of recorded collisions within the study area is 6 collisions. Most of the collisions within the study area resulted in property damage only (a total of 5 collisions, or 83%), and the remaining resulted in non-fatal injuries (1 collision, or 17%). The most frequent types of collisions, as cited by police, were angle (67%), and Rear-end and SMV other (16% each).

The following **Figure 11** depicts the location and year of collisions within the study area.

Figure 9: Existing Peak Hour Traffic - Vehicles

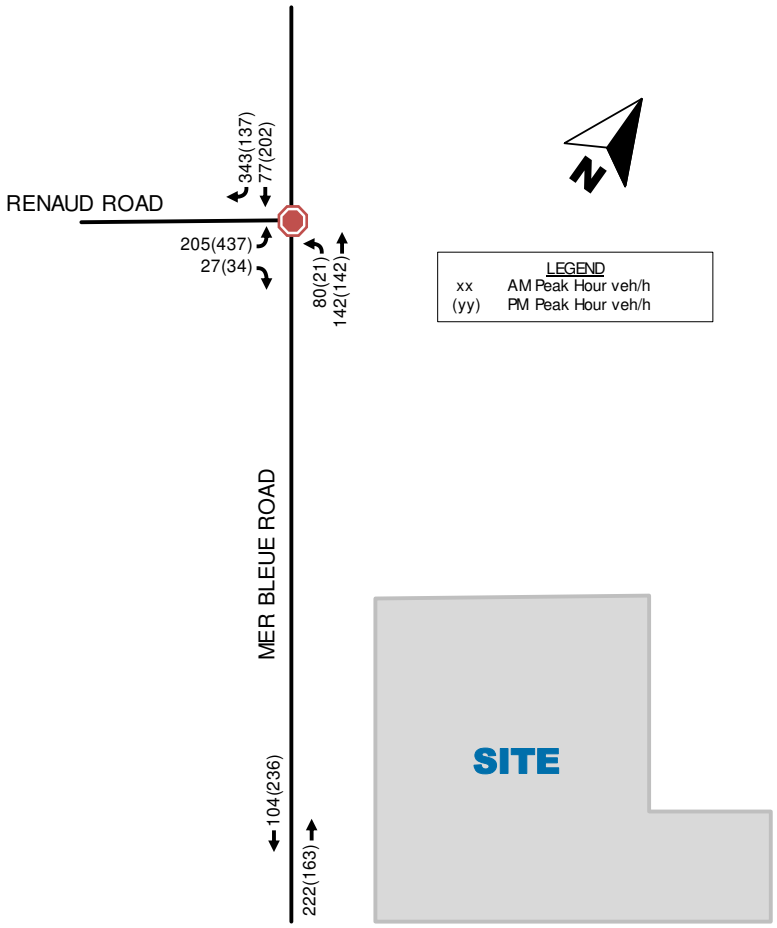


Figure 10: Existing Peak Hour Counts – Active Modes

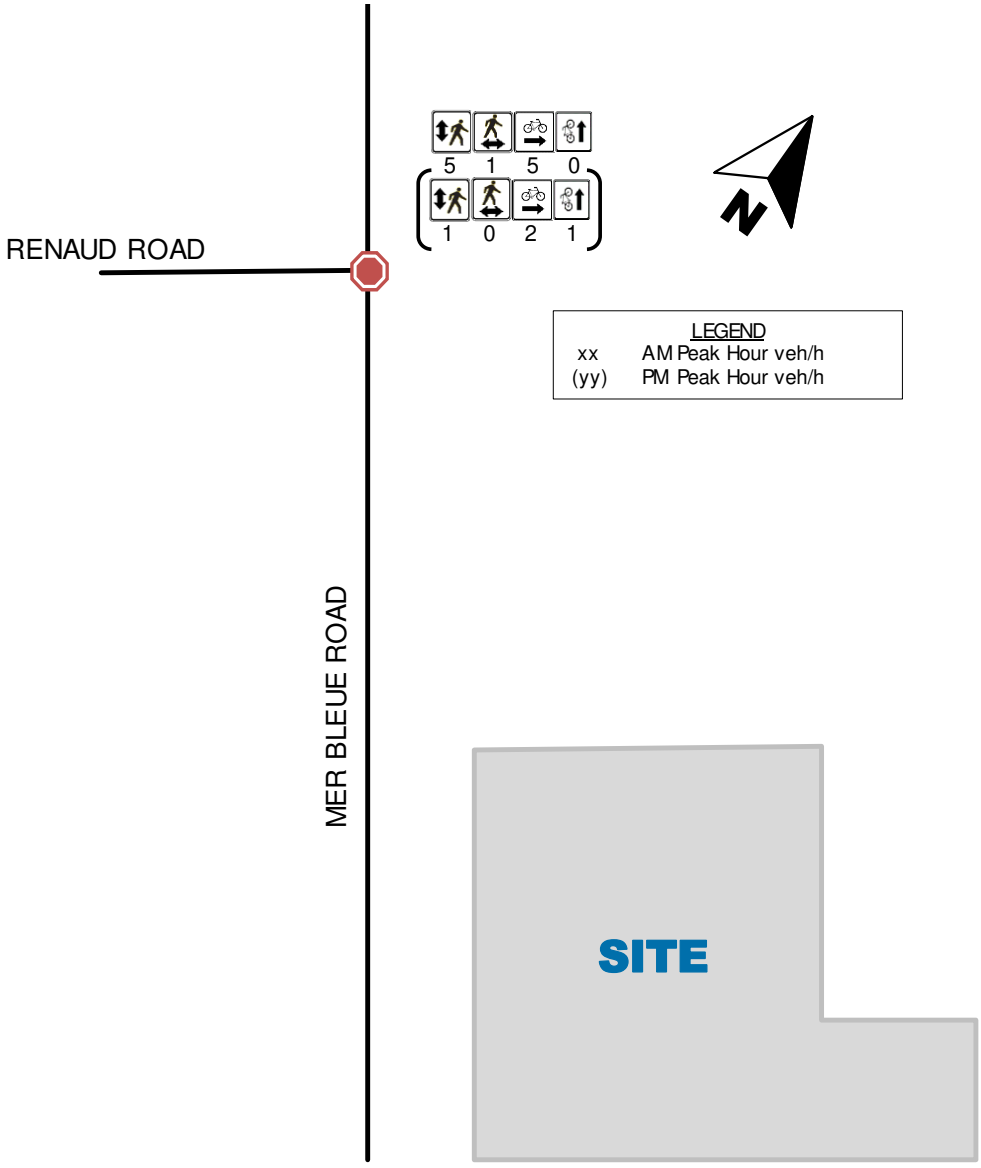
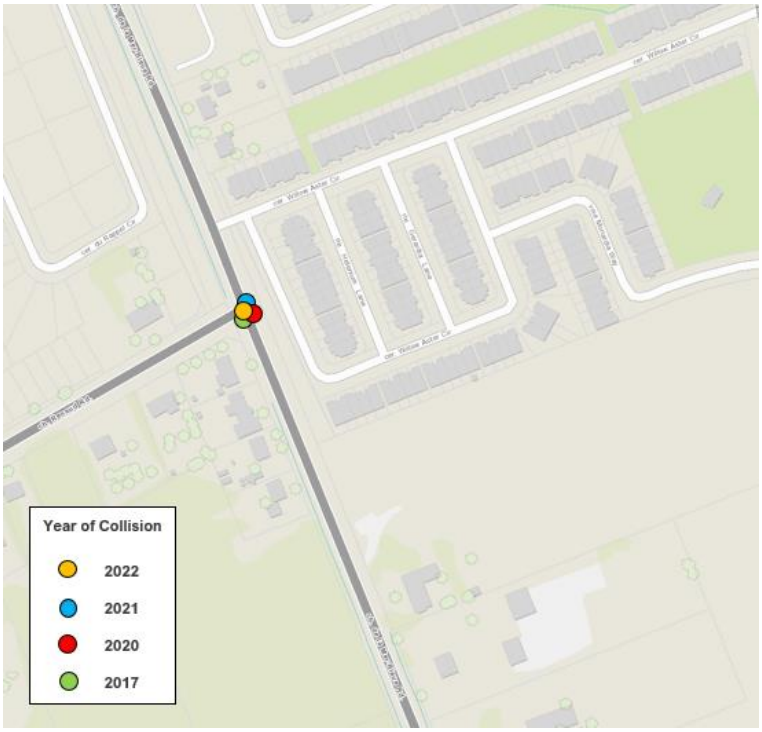


Figure 11: Collison Frequency



The source collision data is provided in **Appendix C ,** and a more detail collision analysis is included in the subsequent *Step 4 – Analysis* section of the report.

Planned Conditions

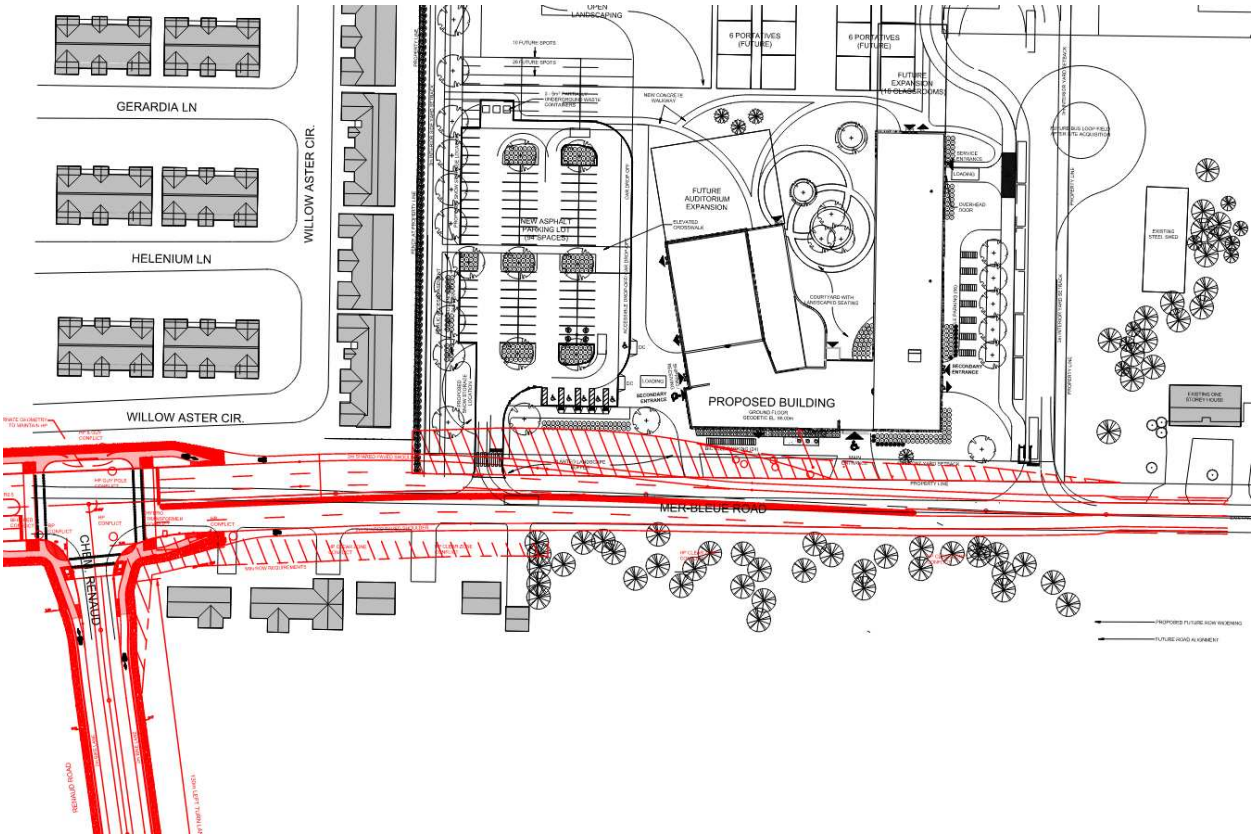
Study Area Transportation Network Changes

As outlined in the City of Ottawa Transportation Master Plan (TMP) and illustrated in **Figure 13**, **Figure 14** and **Figure 15**, the City has proposed the widening of Mer-Bleue Road from a two-lane to a four-lane roadway between Decoeur Drive and Renaud Road. Based on information provided by the City, this project is expected to be completed after the 2027 horizon year and before the 2032 horizon year. Based on the above, the analysis for the 2032 horizon year in this report is based on a 4-lane cross-section for the section of Mer-Bleue north of Renaud.

The City of Ottawa has identified the need to reconstruct the Mer-Bleue/Renaud intersection. At the time of this report's preparation, functional design plans for the intersection were still under development. The proposed improvements include signalization of the intersection and an expansion of the south leg of Mer-Bleue Road, as shown in **Figure 12**.These improvements will incorporate two through lanes, a dedicated left-turn lane for the departure lane, and a widened receiving lane with two lanes. The preliminary design provided by the City also includes a concrete median on the south leg of the intersection, terminating approximately 30 meters before the school bus-exclusive access lane. However, as the detailed signal timing and implementation timeline for the intersection have not yet been confirmed, this report assumes the existing all-way stop control for both the 2027 and 2032 horizon years. This assumption represents a conservative approach, as the future signalized intersection is expected to provide greater capacity and

improved traffic flow compared to the current all-way stop configuration. For reference, additional information provided by the City regarding the intersection reconstruction is included in **Appendix I.**

Figure 12 Mer-Bleue/Renaud future intersection

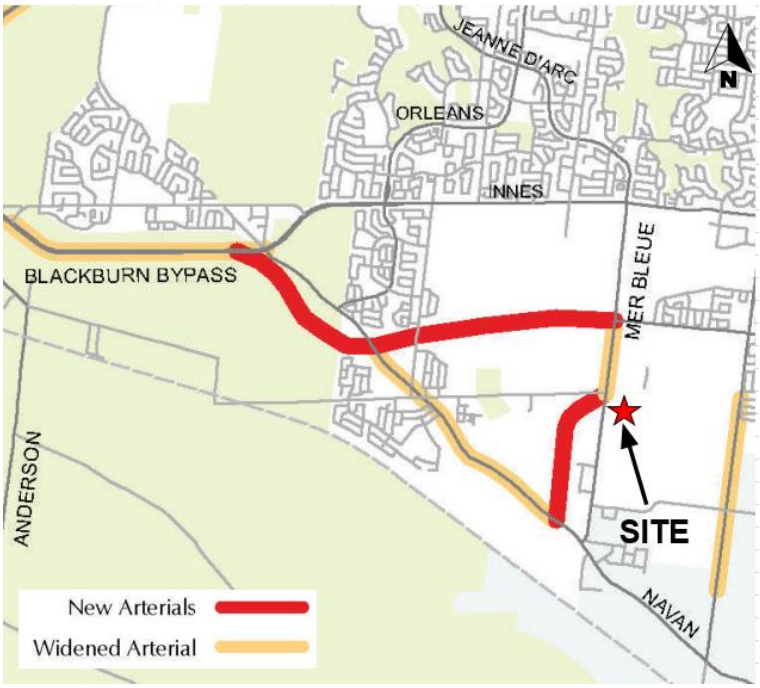


Additionally, the Transportation Master Plan (TMP) identifies the realignment of Mer-Bleue Road south of Renaud Road, extending to Navan Road. However, the City has confirmed that there is currently no established timeline for this project. As such, this potential network modification has not been incorporated into the analysis, as it is anticipated to occur after the horizon years analyzed in this report.

Figure 13: Transportation Master Plan (Road Network)

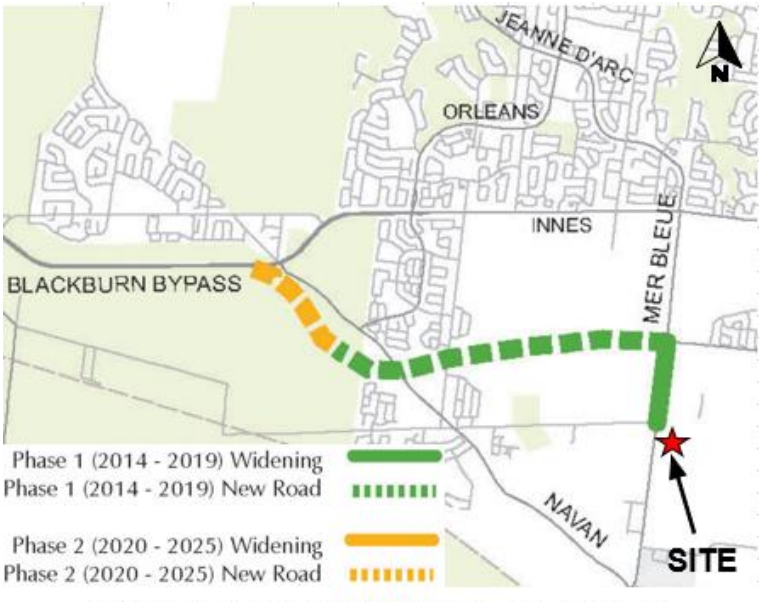
Source: https://documents.ottawa.ca/sites/default/files/documents/tmp_map_6_en.pdf, accessed 2024-10-11

Figure 14: Transportation Master Plan (Road Network-2031 Network Concept)



Source: https://documents.ottawa.ca/sites/default/files/documents/tmp_map_10_en.pdf, accessed 2024-10-11

Figure 15: Transportation Master Plan (Road Network-2031 Affordable Network)



Source: https://documents.ottawa.ca/sites/default/files/documents/tmp_map_11_en.pdf, accessed 2024-10-16

Other Area Development

Using the City's online Development Application Tool, some proposed developments in the vicinity of the subject development site may impact the surrounding transportation network as outlined in **Table 3** below and illustrated in **Figure 16.**Error! Reference source not found.

Table 3: Other Area Developments Surrounding the Study Area

Development	Location	Development Size	Estimated Build-Out	Status
Richcraft Homes Trailsedge Phase 3	2284 Mer-Bleue Road and 6429 Renaud Road	**Phase 3:** Approximately 753 residentials units	2029	No TIA Available
Richcraft Homes Trailsedge Phase 4	2284 Mer-Bleue Road and 6429 Renaud Road	**Phase 4-1:** 93 single units, 114 townhouse units, 75 back-to-back townhouse units **Phase 4-2:** 49 single units, 53 townhouse units, 40 back-to-back townhouse units, commercial development (approximately 181 jobs) **Phase 4-3**: Mixed use development (352 apartment units and 296 jobs)	Phase 4-1 build-out: 2031 Full build-out: 2036	TIA Available
Claridge Homes Mer-Bleue Phase 1	2503 Mer-Bleue Road and 2666 Tenth Line Road	274 single-family homes, 370 townhomes and approximately 2100 sq. m shopping centre	2025	TIA Available
2345-2351 Mer-Bleue Road	2345 & 2351 Mer-Bleue Road	2 low-rise apartments (planned unit development with a total of 30 residential units)	Not Available	Initial stages: No TIA has been prepared yet
Caivan Subdivision	2275 Mer-Bleue Road	32 back-to-back townhouse units, 80 standard townhouse units, 0.75 hectare mid-rise mixed-use development block	2024	TIA Available: A desktop review indicates this development has not been constructed yet.

Figure 16 Other Area Developments

2.2 Study Area and Time Periods

Study Area

As previously discussed, the study area for this assessment includes the Mer-Bleue Road and Renaud Road intersection. Other intersections north of the site were assessed and reviewed in previous Traffic Impact Assessments conducted for developments closer to those roadways and intersections; due to their nature as residential subdivisions, these developments generate significantly more traffic than the current proposed site. Given this context, we have compared the trip generation for the proposed development with the trip generation data from those prior studies. This comparative approach provides a more efficient and meaningful framework for analysis by leveraging the findings from earlier assessments, while ensuring the current site's specific traffic characteristics are accurately addressed.

Time Periods

The high school traffic coincides only with the morning peak hour of the surrounding road network, including the Mer-Bleue/Renaud intersection. Therefore, this assessment focuses on the weekday morning peak hour.

Horizon Years

For the purpose of this assessment, the following development timeline was assumed:

- **2027** – Estimated full build-out of the subject development
- **2032** – 5-years beyond full build-out, required under the City's TIA Guidelines

3.0 Forecasting

3.1 Development Related Travel Demand

Trip Generation & Travel Mode Shares

The previous Scoping and Forecasting submission estimated the projected site-generated traffic using trip generation rates from the 11th Edition of the *Institute of Transportation Engineers (ITE) Trip Generation Manual.* However, due to the significant variability in trip generation for schools—particularly influenced by the availability or absence of school bus services—this approach may not fully capture the site-specific characteristics of the proposed school development. Based on feedback from the City of Ottawa and additional data provided by CEPEO, an updated approach was adopted for this submission. Projected site-generated traffic was recalculated using the anticipated population of 793 students, 65 staff members, and 11 school buses, each with a capacity of 35 students.

Key considerations for the Site-Generated Person Trips calculation include a 20% reduction to student trips to account for carpooling, families with multiple siblings, and students arriving outside peak hours due to early drop-offs, late arrivals (e.g., medical appointments), or absences. Staff-related trips are adjusted to reflect typical work patterns, with the assumption that most staff will arrive before the analyzed morning peak hour. As a conservative measure, only 50% of staff trips

are considered during the peak hour analysis. This updated approach provides a more accurate forecast of site-generated trips, incorporating local conditions and aligning with best practices. Additionally, a review of the 2020 TRANS Trip Generation Manual was conducted to estimate the anticipated modal shares for students and staff arriving at and departing from the site. The school is located in a Suburban Sector classified as "Orleans 300." The mode share analysis was developed using a combination of information provided by the TRANS Trip Generation Manual, Site-specific details provided by the school, a first-principles approach with knowledge of the area and professional experience. Key factors incorporated into the analysis include the expected number of school buses and the corresponding number of students using this mode, the availability of bike parking spaces for students traveling via non-motorized modes and the proximity of residential areas.

Table 4 summarizes the person trips generated by mode for students, while **Table 5** provides a summary of the person trips generated by mode for staff.

Table 4: Projected Person Trips Generated by Mode for Students

Travel Mode	Mode Share	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	5%	32	0	32	0	32	32
Auto Passenger	10%	63	63	126	63	63	126
Non-motorized	30%	190	0	190	0	190	190
School Bus	55%	349	0	349	0	349	349
Bus Equivalent		11	11	22	11	11	22
Students - Total 'New' Vehicle Trips		**106**	**74**	**180**	**74**	**106**	**180**

Table 5: Projected Person Trips Generated by Mode for Staff

Travel Mode	Mode Share	AM Peak Hour (Person Trips/h)			PM Peak Hour (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	80%	26	0	26	0	26	26
Auto Passenger	15%	5	5	10	5	5	10
Non-motorized & Transit	5%	2	0	2	0	2	2
Staff - Total 'New' Vehicle Trips		**31**	**5**	**36**	**5**	**31**	**36**

Table 6 summarizes the total combined student and staff trip volumes during the weekday morning and afternoon peak hours based on the calculations above. The trip-generation values presented in **Table 4** and **Table 5**, represent the peak trip generation of the school. Based on the anticipated opening hours of the school, it is expected that the trip generation of the school for the AM period will coincide with the peak hour of the adjacent road traffic. For the PM period,

it is anticipated that traffic generated by the school will peak and largely dissipate before the start of the PM peak hour of the adjacent road network (4:00-5:00pm). Based on the above, the AM peak hour was carried forward for analysis as this represents the worst-case scenario for the road network. Site-generated traffic during the PM peak hour of the road network will be negligible and was not analysed further.

Table 6: Total Peak Period Vehicle Trips

	AM Peak Hour (Person Trips/h)		
	In	**Out**	**Total**
Total 'New' Vehicle Trips	137	79	216

As summarized in **Table 6,** the proposed development is projected to generate approximately 216 two-way vehicle trips per hour during the weekday morning peak hour.

Trip Distribution

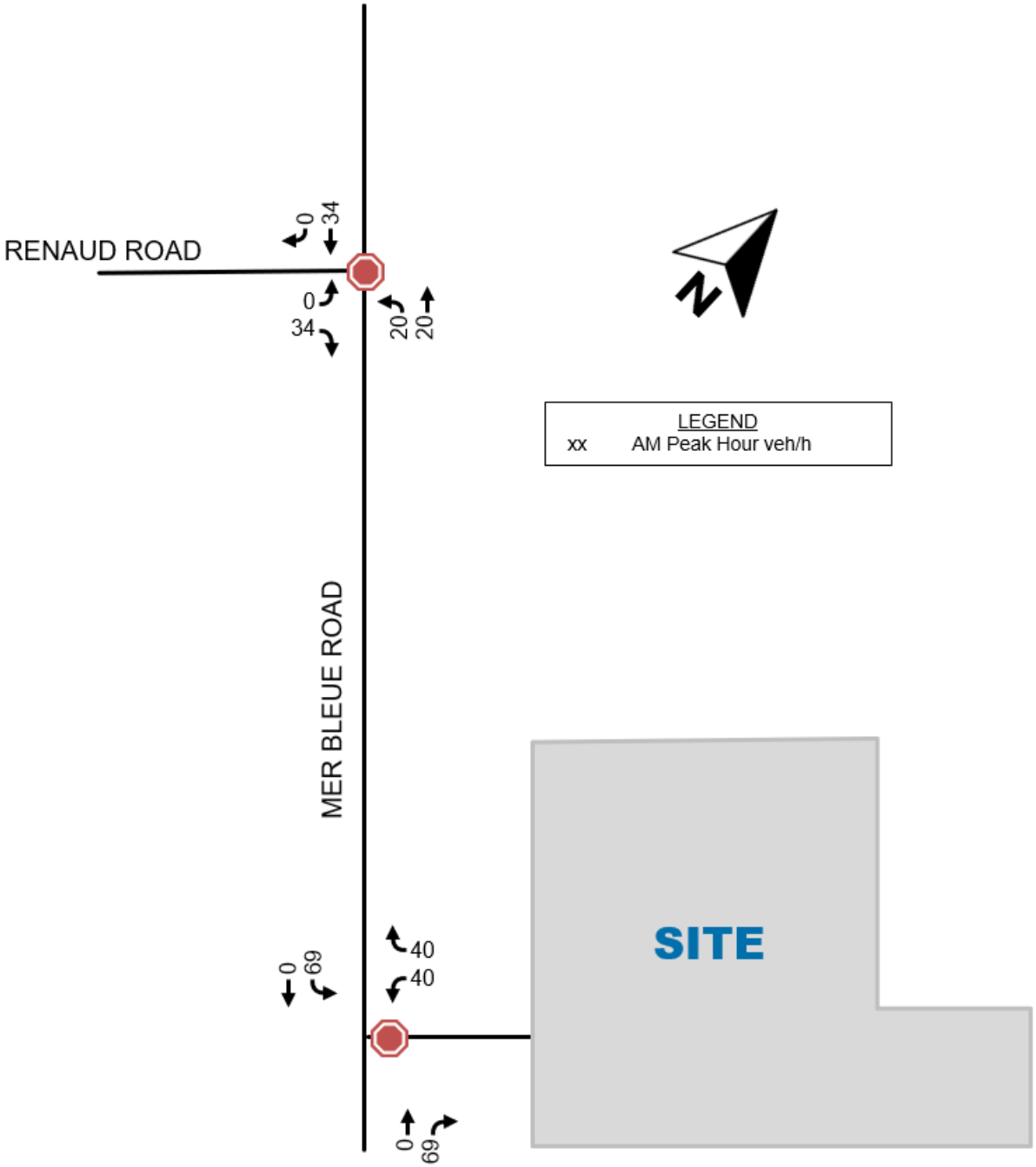
The projected distribution of site-generated traffic was derived based on the 2011 TRANS OD Survey (Orleans Area district), existing travel patterns, the site's connections to/from the surrounding road network, and our local area knowledge. Based on the foregoing, the following approximate distribution of projected site-generated traffic for the proposed development was assumed:

50% to/from the north via Mer-Bleue Road;
50% to/from the south via Mer-Bleue Road;
100%

Trip Assignment

Based on the above assumed distribution, projected 'new' site-generated traffic was assigned to the study area network and is depicted in the following **Figure 17**. Given the context of the site, it was assumed that site generated trips will be predominantly new trips. As such, no pass-by or internal trip reductions have been applied in the subsequent analysis, ensuring that the projected traffic volumes are a conservative estimate.

Figure 17: 'New' Projected Site-Generated Traffic



3.2 Exemptions Review

Given the size and nature of the proposed subject development site, **Table 7** outlines which elements identified in the 2023 Transportation Impact Assessment Guidelines that can be exempt from this analysis and that which is required in the Final Strategy Report.

Table 7: Module Exemption Review

Element	Exemption Criteria	Exemption Status
Design Review Component		
4.1.1 Development for Sustainable Modes	Required for All	***Required***
4.1.2 Circulation and Access	Required for All	***Required***
4.1.3 New Street Networks	Required for Plans of Subdivisions	Exempt
4.2.1 Parking Supply	Required for All	***Required***
4.2.2 Spillover	Deleted	Exempt
4.3 Boundary Street Design	Required for All	***Required***
4.5.1 Context for TDM	Required for All	***Required***
4.5.2 Need and Opportunity	Required for All	***Required***
4.5.3 TDM Program	Required for All	***Required***
3.2 Background Network Travel Demands	>75 auto and/or transit trips	***Required***
3.3 Demand Rationalization	>75 auto trips	***Required***
Network Impact Component		
4.6.1 Adjacent Neighborhoods	Reference Criteria	Exempt
4.7.1 Transit Route Capacity	Required when projected site new site transit trips are greater than 75	Exempt
4.7.2 Transit Priority Requirements	Required when projected site new site auto trips are greater than 75	***Required***
4.8 Network Concept	Required when development is projected to generate more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning	Exempt
4.9.1 Intersection Controls & 4.4.2 Access Control	Required when projected site new site auto trips are greater than 75	***Required***
4.9.2 Intersection Design & 4.4.3 Access Design	Required when projected site new site auto trips are greater than 75	***Required***

3.3 Background Network Travel Demands

Transportation Network Plans

The *Transportation Master Plan (TMP) 2023 – Part 1* does not include details on future road networks. Confirmation from the TMP Project Team indicates that Part 2 of the TMP (Capital Infrastructure Plan) is scheduled for completion in 2025. **Figure 13, Figure 14** and **Figure 15** illustrates the 2031 Network Concept and the 2031 Affordable Network as defined in the 2013 Transportation Master Plan. These plans identify a planned road widening on Mer-Bleue Road between Décœur Drive and Renaud Road, to be included in the 2032 horizon year analysis. Additionally, a realignment of Mer-Bleue Road south of Renaud Road is shown; however, no specific timeline has been provided for this project, and the City has confirmed that there is currently no established timeline for this project. As such, this potential network modification has not been incorporated into the analysis, as it is anticipated to occur after the horizon years analyzed in this report.

Other Area Developments

Using the City's online Development Application Tool, the following proposed developments in the vicinity of the subject development site that may impact the surrounding transportation network were identified:

- Richcraft Homes Trailsedge Phase 3
- Richcraft Homes Trailsedge Phase 4
- Claridge Homes Mer-Bleue Phase 1
- 2345-2351 Mer-Bleue Road
- Caivan Subdivision
- 2405 Mer-Bleue Elementary School

Additional information regarding these developments is presented in **Table 3** and **Figure 16**.

Background Growth

Following a review of background TIA studies prepared for nearby developments between 2019 and 2023, as outlined in Section 2.1, some gaps were identified in the site-generated traffic volumes for these developments. Using information provided by the City of Ottawa, included on **Appendix I**, and the TRANS model, which compares 2022 and 2046 auto volumes the annual growth rate is about 6% for the study area. To project background traffic volumes for the 2027 and 2032 horizon years, the 6% growth rate was applied to through movements on Mer-Bleue Road. However, for movements in and out of Renaud Road, a 1% growth rate was applied. This adjustment was made because, when projecting traffic volumes based on 2024 counts and comparing them to the City's 2046 forecasts, the calculated values for Renaud Road movements were nearly double those provided by the City. This discrepancy suggests that the existing traffic counts have already captured the anticipated growth from nearby developments along Renaud Road, aligning with expected build-out timelines and on-site traffic data. This approach was deemed conservative, as it accounts not only for traffic generated by nearby developments but also for larger-scale developments that the City anticipates may utilize the area's transportation corridors.

Figure 18 and **Figure 19** illustrate the total projected background traffic volumes for the 2027 and 2032 horizon years, respectively. These figures also demonstrate the impact of the future area developments on the analyzed intersection.

Figure 18: 2027 Background Traffic Volumes

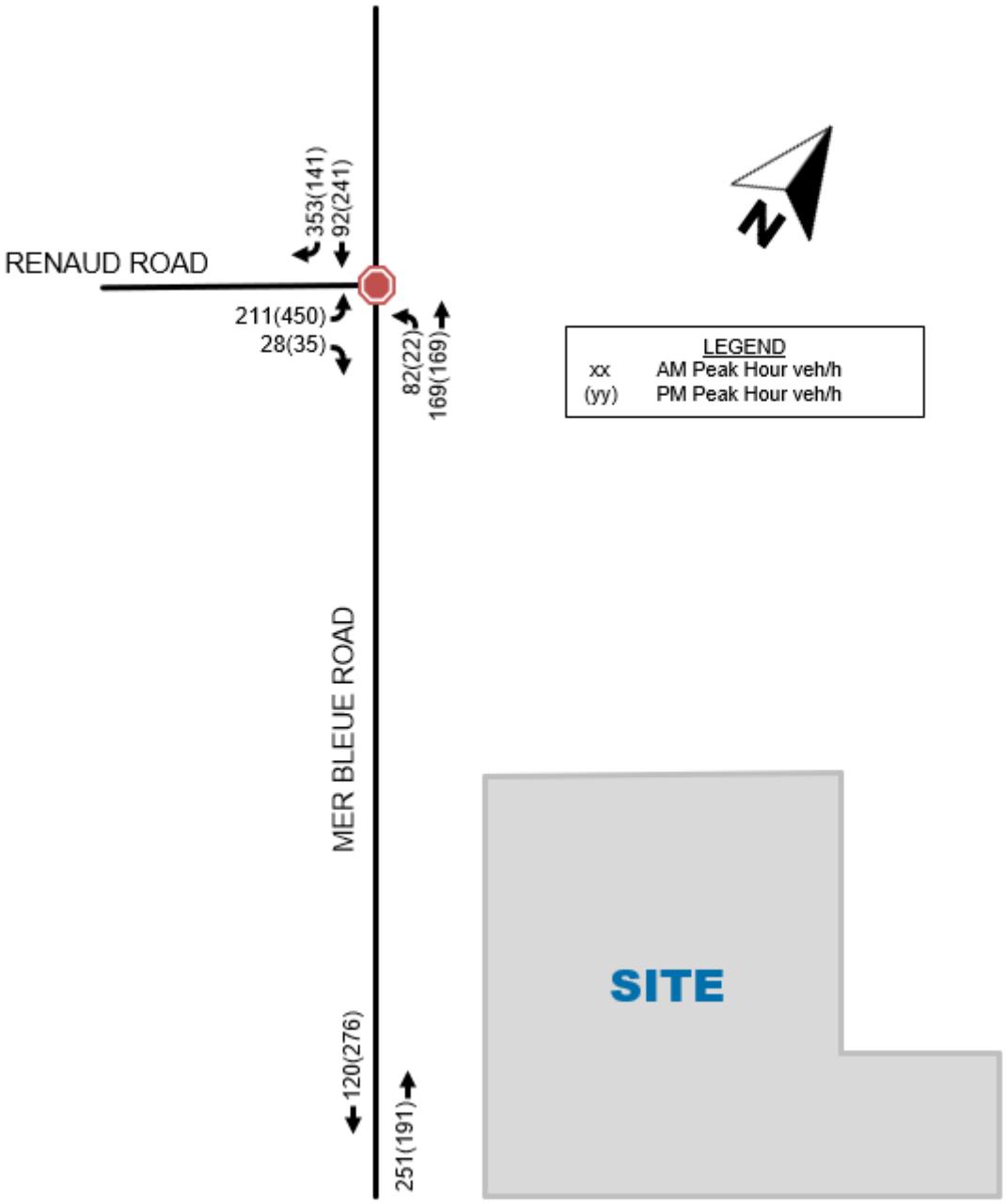
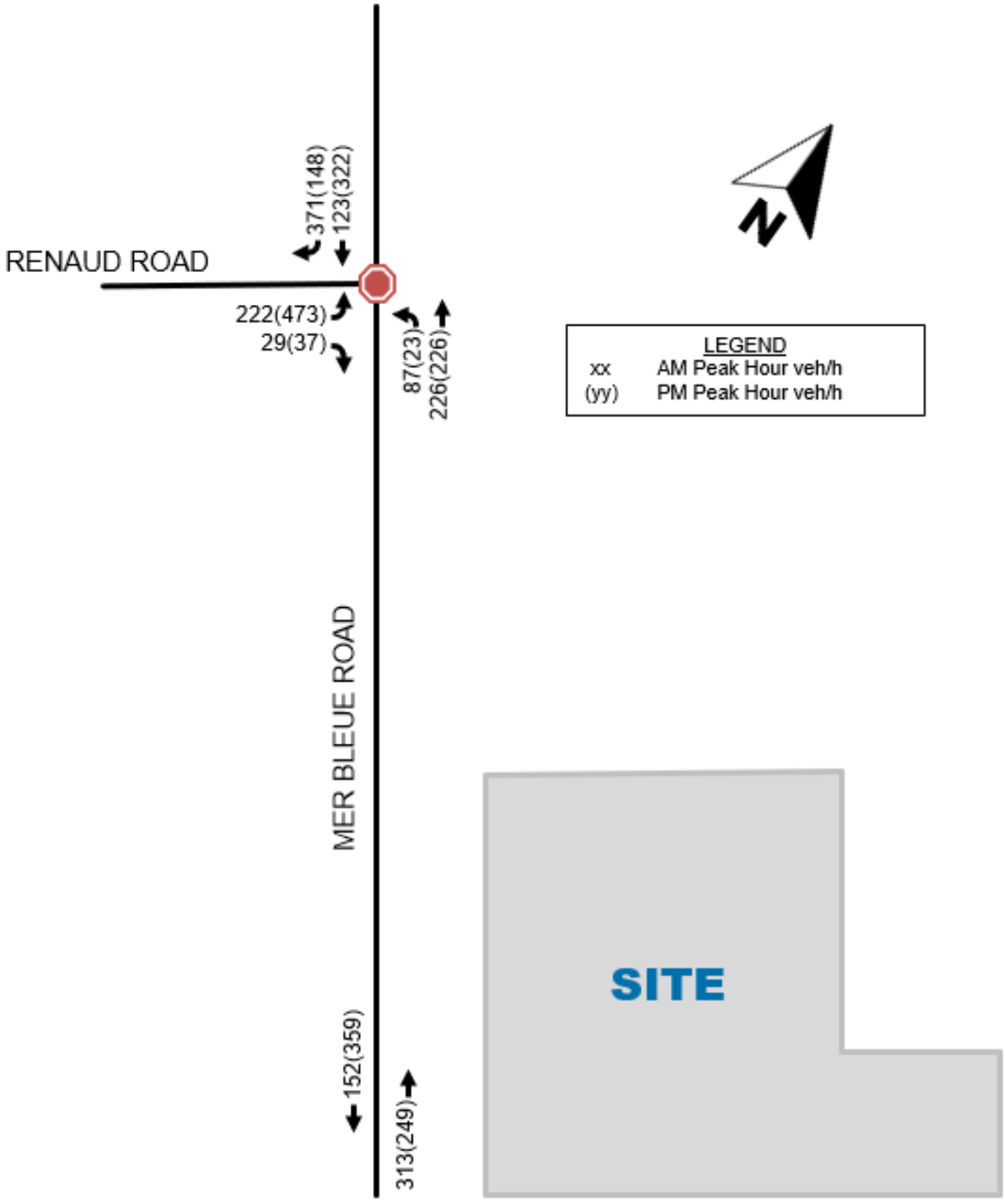


Figure 19: 2032 Background Traffic Volumes



3.4 Demand Rationalization

The following section summarizes the vehicular intersection capacity analysis of existing, and future background scenarios. Using the intersection capacity analysis software Synchro (v11), study area intersections were assessed in terms of vehicle delay (seconds), 95th percentile queues (meters), a volume-to-capacity ratio (V/C ratio) and a corresponding Auto Level of Service (LOS). It should be noted that the overall performance of a signalized intersection is calculated as a weighted V/C ratio and assigned a corresponding LOS, and individual vehicular movements are assigned a LOS based on their respective V/C ratio. The overall performance of an unsignalized intersection is an LOS output from Synchro, which is based on an Intersection Capacity Utilization (ICU) method, and each movement is assigned a LOS based on their respective V/C ratio.

Existing Conditions & Future Background Operation

The following **Table 8** summarizes the existing and projected background conditions at the study area intersection, excluding the impact of the proposed development and assuming the previously mentioned Mer-Bleue Road widening between Renaud Road and Decoeur Road is constructed after 2027 but before 2032. The objective of this analysis is to assess whether network improvements will be required to accommodate background traffic or if projected future demand should be adjusted. For example, once the auto network becomes saturated, a modal shift could be expected as users adapt to other transportation options. Detailed Synchro output data for existing and background conditions are provided in **Appendix D** for further reference.

Table 8: Study Area Intersection Operations – Existing Conditions and Background Volumes

Movement	Lanes	AM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)
Existing Conditions Mer Bleue/Renaud - Unsignalized					
EB	1 L/R	0.41	12.8	A	0
NB	1 T/L	0.37	11.7	A	0
SB	1 T/R	0.59	14.2	A	0
Overall		**0.6**	**13.2**	**B**	**-**
Background 2027 Mer Bleue/Renaud - Unsignalized					
EB	1 L/R	0.39	12.4	A	0
NB	1 T/L	0.38	11.7	A	0
SB	1 T/R	0.57	13.7	A	0
Overall		**0.73**	**12.9**	**C**	**-**

Movement	Lanes	AM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)
Background 2032 (Including Widening of Mer-Bleue from Decoeur to Renaud) Mer Bleue/Renaud - Unsignalized					
EB	1 L/R	0.42	13.5	A	0
NB	1 T/L	0.49	14.1	A	0
SBT	1 T/L	0.13	8.6	A	0
SBR	1 R	0.60	14.4	B	0
Overall		**0.64**	**13.6**	**B**	**-**

As shown in **Table 8**, each approach at the Mer-Bleue / Renaud intersection currently operates at an excellent Level of Service (LOS) 'A', with an overall intersection LOS of 'B'. This is attributed to a theoretical intersection capacity utilization of 60.1% under existing conditions. By 2027, the intersection is projected to operate with an overall LOS of 'C' during the weekday morning peak hour. By 2032, the intersection is projected to operate with an overall LOS of 'B' during the weekday morning peak hour. It is important to highlight that the LOS is expected to improve between the horizon years analyzed due to the City's proposed projects in the area.

A signal warrant analysis was conducted for the Mer-Bleue / Renaud intersection following the methodology outlined in the Ontario Traffic Manual (OTM) Book 12 - Traffic Signals. The analysis was performed using Justification 7 - Projected Volumes, as eight-hour traffic counts were not available to complete Justifications 1 and 2 under the OTM procedure. The results of this analysis are provided in **Appendix H**.

For the calculation, the average hour of projected data for the 2027 build-out and the 2032 horizon year was used. The average hours were calculated by totaling the AM and PM peak hours and dividing by four, as specified in Book 12. Additionally, the minimum roadway volume thresholds were increased by 120%, as outlined in Table 22, Section 4.10 of Book 12.

- 2027 Horizon Year: The signal warrant was not triggered under the projected background volumes for this year.
- 2032 Horizon Year: The signal warrant is met based on the projected background volumes for this horizon year.

These findings are consistent with other TIAs conducted in the area and provide additional support for the proposed intersection improvements at the Mer-Bleue / Renaud intersection, currently under design by the City of Ottawa.

4.0 Analysis

In accordance with the City of Ottawa TIA Guidelines, this section evaluates the proposed transportation network elements within the development study area. The analysis ensures that the network provides effective access for all users, while fostering an environment that prioritizes walking, cycling, and transit use. Additionally, the review emphasizes safety as a fundamental

consideration for all modes of transportation, aligning with the City's objectives for sustainable and inclusive mobility.

4.1 Development Design

Design for Sustainable Modes

Pedestrian Facilities: No pedestrian walkways exist along Mer Bleue Road except for an asphalt shoulder along the rural road cross-section. Ultimately, a concrete sidewalk is proposed along the entire frontage of the school property on Mer-Bleue Road, providing pedestrian access to the main high school building. However, this is planned with the re-alignment of Mer Bleue Road as a four lane arterial. A public access easement complete with a 3.0 m wide walkway is currently proposed on the north side of the site to connect the main building, parking lot, and interior concrete walkways with an elementary school and Monardia Way. As noted in previous sections and illustrated in **Figure 5**, Monardia Way features concrete sidewalks on both sides of the roadway. A pedestrian connection on public ROW between the new signalized intersection at Renaud and the school property (and MUP on the school block) will be constructed as a Capital project. To the south of the site, there are no existing sidewalks, which currently limits pedestrian connectivity in that direction.

Cycle Facilities: As illustrated in **Figure 6**, the cycling network near the subject site consists of designated painted bike lanes. These lanes terminate approximately 500 meters west of the site at Ascender Avenue and 300 meters north of the site at the intersection of Copperhead Street and Decoeur Drive. Directly in front of the site and near the Mer-Bleue/Renaud intersection, there are currently no dedicated cycling facilities, and cyclists must rely on the paved shoulders for travel. The proposed site plan includes two dedicated bicycle parking areas with a total capacity for up to 80 bicycles. These facilities are strategically located on the south and east sides of the main building, ensuring convenient access for cyclists.

Transit Facilities: As outlined in Step 2 – Scoping, there are two OC Transpo bus stops located within a 200-meter walking distance of the proposed development site. These transit stops provide convenient access for users traveling to and from the site. **Figure 7** illustrates the locations of these transit stops in relation to the subject development site. Design for these facilities is in accordance with the *TDM – Supportive Development Design and Infrastructure* of the City's TIA Guidelines. This TDM checklist is provided in **Appendix E .**

Circulation and Access

As illustrated in **Figure 2**, access to the parking lot will be provided via a two-way driveway connecting to Mer-Bleue Road. The proposed access driveway is 8.0 meters wide, that connects with a parking lot with 6.9-meter-wide drive aisles on-site to facilitate efficient vehicular movement. Additionally, an 8.2-meter-wide school-bus-exclusive access lane is proposed at the southern end of the site. This entrance features a two-way driveway leading to a bus loop, specifically designed to support safe and efficient student drop-off and pick-up operations.

Following the future Mer-Bleue Road realignment, the site entrances will require adjustments to ensure safe and efficient access. The parking lot entrance will operate as a right-in/right-out access connected to the realigned Mer-Bleue Road. To ensure safe functionality, the entrance will be adjusted to accommodate this configuration. At a minimum, this will require the implementation of clear signage to inform users of the new operational restrictions, and possibly

even turning bays to restrict potentially unsafe movements by users who might miss the signage. The school-bus-exclusive access will connect to the old section of Mer-Bleue Road (south of the site), which will serve as a cul-de-sac. This future design will continue efficient and safe operations for buses while minimizing conflicts with other vehicles. The proposed storage and throat length of the parking lot egress lane is approximately 25 m. In the future, the egress storage lane will be reduced to approximately 15 m following the realignment and widening of Mer Bleue Road. Given the egress will be a right-out only movement, no modifications will be requiredto add additional on-site storage, as the expected queue length 95th for the westbound movement is expected to be 4.3m in the peak hour. This analysis is based on the detailed Synchro output data for future total projected conditions provided in **Appendix G** and summarized on **Table 14.**

4.2 Parking

Parking Supply

The proposed development is located in Area D (Rural), as identified in Schedule 1A of the City's Zoning By-law provisions for *"Parking, Queuing and Loading Provisions"*. The following **Table 9** and **Table 10** summarize the minimum parking and bicycle parking space requirements for the proposed land uses, in accordance with the City's Zoning By-law, *Section 101 - Minimum Parking Space Rates* and *Section 111 - Bicycle Parking Space Rates and Provisions*.

Vehicular Parking

The minimum parking requirements are to be calculated using the rates for Area D, as outlined under Section 101 of the City's Zoning By-Law (i.e., Column V of Table 101 in Section 101 of the Zoning By-Law).

The following **Table 9** summarizes appropriate vehicle parking rates and minimum parking requirements for the subject development.

Table 9: Vehicular Parking Supply

Land Use	Zoning Requirement	Classrooms	Minimum Parking Requirement	Vehicle Provided Parking
School, secondary	3 per classroom	31	93	93

As summarized in **Table 9**, the minimum vehicle parking space requirement for the subject development is 93 vehicle parking spaces. This minimum by-law is met as there will be 93 vehicle parking spaces provided including 2 'Type A' accessible spaces and 3 'Type B' accessible spaces.

Bike Parking

As outlined under Section 111 of the City's Zoning By-Law, bike parking is to be calculated using the rates found in Table 111A (i.e., Column II of Table 111A in Section 111 of the Zoning By-Law).

Table 10: Bicycle Parking Supply

Land Use	Zoning Requirement	GFA	Minimum Parking Requirement	Bicycle Parking Provided
School	1 per 100 m^2 of GFA	7,873 m^2	79	80

As summarized in **Table 10**, the proposed development is required to provide a minimum of 79 bicycle parking spaces. The proponent will be providing 80 bicycle parking spaces on-site, divided into two sections: 56 spaces located south of the site and 24 spaces located west of the site. This allocation satisfies the minimum bicycle parking requirement.

4.3 Boundary Street Design

In accordance with the City of Ottawa's TIA Guidelines, this section evaluates the design elements of boundary streets required to accommodate the proposed development. The analysis aligns with the City's Complete Streets philosophy and urban design objectives for the development area. The identified boundary street for the subject site is Mer-Bleue Road, which is owned and maintained by the City of Ottawa.

Mobility

A Multi-Modal Level of Service (MMLOS) analysis was conducted for the subject site's boundary street, Mer-Bleue Road. The MMLOS measures risk, comfort, and stress for active transportation modes (e.g., pedestrians and cyclists) and impedance, delay, and reliability for motorized modes (e.g., trucks and buses). Target MMLOS values for Mer-Bleue Road were obtained from Exhibit 22 of the City's MMLOS Guidelines and are indicated in **Table 11** (values shown in brackets). The detailed MMLOS assessment is included in **Appendix F** for further reference.

Segment MMLOS Summary

Within the vicinity of the subject site, Mer-Bleue Road is a collector road that consists of the following features:

- Two-lane roadway (i.e., one travel lane per direction);
- 1.5 m shoulder width on both sides of the road;
- 3.5 m wide lane
- Posted speed limit of 50 km/h
- No on-street parking
- Less than 3000 average daily curb lane traffic

The following **Table 11** is a MMLOS analysis summary of existing and proposed conditions for non-auto modes (i.e., pedestrian, cycling, transit, and trucks) along the road segment described above. Any LOS results highlighted in red indicate that the target MMLOS was not met for that segment. It should be noted that a MMLOS segment analysis focuses on local transit provided along boundary streets only (i.e., MMLOS worksheets are not sensitive to dedicated rapid transit facilities).

Table 11: Segment MMLOS – Existing LoS (Target LoS)

Road Segment	PLoS	BLoS	TLoS	TkLoS
Mer-Bleue Road (Existing Conditions)	F(A)	E(A)	N/A(N/A)	N/A(N/A)
Mer-Bleue Road (Proposed Conditions)	B(A)	E(A)	N/A(N/A)	N/A(N/A)

Based on the results summarized in **Table 11**, the following should be noted/considered:

Pedestrian LOS (PLoS)

- The pedestrian target Level of Service (PLoS) is not met under either the existing or proposed conditions along Mer-Bleue Road. For the existing conditions this segment of Mer-Bleue Road currently lacks pedestrian infrastructure, resulting in poor pedestrian accommodation. At best, the addition of a future interim sidewalk, combined with existing road conditions, results in an Exposure to Traffic PLoS rating of 'B' due to an estimated 1000 pedestrians/hour projection on a 2.0 m wide sidewalk. The relatively narrow 2.0 m wide sidewalk results in 'crowding' on an interim future sidewalk.
- To achieve the target PLoS and improve the Crowding PLoS, the effective sidewalk width should be increased to 3.0 meters. With the implementation of the Mer-Bleue Road realignment, further modifications to pedestrian infrastructure could be incorporated. These adjustments, however, are highly dependent on the proposed design and timeline for the roadway as well as the selected modifications for the Mer-Bleue/Renaud intersection.
- A pedestrian connection on public ROW between the new signalized intersection at Renaud and the school property (and MUP on the school block) will be constructed as a Capital project.

Bike LOS (BLoS)

- The bicycle target Level of Service (BLoS) is not met under either the existing or proposed conditions along Mer-Bleue Road. For both conditions, this segment of Mer-Bleue Road lacks dedicated bicycle infrastructure.
- To meet the target BLoS, it is recommended to implement a physically separated cycling facility along Mer-Bleue Road. This facility would enhance safety and comfort for cyclists, encouraging increased use of cycling as a mode of transportation.

Transit LOS (TLoS)

- There is no transit target LOS along Mer-Bleue Road as there are no transit facilities provided along the roadway.

Truck LOS (TKLoS)

- There is no truck target LOS along Mer-Bleue Road as the roadway is not a designated truck route.

Road Safety

For the purpose of a road safety review, collision records for boundary streets were examined to determine if locations exhibit any collision trends that might be mitigated by engineering

intervention. If there is a collision trend that is outside the norm of what is expected, then the potential exists to reduce the collision experience by addressing the over-represented collision trend. Whenever changes are being made to the road environment, it is an opportunity to examine whether a safety intervention could result in meaningful safety benefits. Where there are identifiable safety trends, it is worthwhile to mitigate those, such that the added traffic from a new development does not increase the risk of new collisions.

Based on a review of the most recent five (5) years of historical collision data (collected from January 1st, 2017 to December 31st, 2022, inclusive), the following **Table 12** summarizes the number and rate of collisions within the vicinity of the subject development site. Source collision data is included as **Appendix C**

Table 12: Historical Collision Data Summary by Intersection

Intersection	Total Collisions (5-year Total)	Classification		
		Property Damage	Non-fatal Injury	Fatal Injury
Mer-Bleue/Renaud	6	5	1	0

The Mer-Bleue / Renaud intersection currently experiences a low rate of collisions, as summarized in **Table 12**. The majority of these collisions resulted in property damage only, with only one reported collision involving a non-fatal injury. This pattern aligns with the characteristics of an all-way stop-controlled intersection, which typically reduces the likelihood of severe collisions (e.g., fatal injuries). It should also be noted that no cyclists or pedestrians were involved in any of the reported collisions. However, this may be attributed to the lack of existing infrastructure for these modes of travel and the rural nature of the area.

The intersection and surrounding road sections are expected to change significantly in the near future, with the proposed road widening on Mer-Bleue and the proposed reconfiguration of the Mer-Bleue / Renaud intersection. In alignment with the City of Ottawa's Road Safety Action Plan and its vision of progressing toward zero fatalities and major injuries, it is recommended that the City conduct an In-Service Road Safety Review (ISRSR) as part of the upcoming design for these road modification projects.

Neighborhood Traffic Management (NTM)

Given the subject development will only provide a connection to a collector roadway (i.e., Mer-Bleue Road), following the City's TIA Guidelines, a review of potential NTM strategies is not required.

4.4 Access Intersections

The City's TIA Guidelines indicates this module has been combined with Section 4.9 Network Intersections.

4.5 Transportation Demand Management

A review of Transportation Demand Management (TDM) strategies is a requirement for the subject development as indicated on the City's TIA Guidelines. TDM checklists, provided by the

City and titled *TDM – Supportive Development Design and Infrastructure* and the *TDM – Measures Checklist*, have been completed and are included as **Appendix E .** Given the proposed development is currently in planning/approval stages, not all TDM measures identified as 'required' in the TDM checklist can be committed to at this time. Further refinements to the proposed development design are anticipated during subsequent phases of the City's development application approval process.

Measures identified in the checklists include:

- Building location and Access points location: Display local area maps with walking/cycling access routes and key destinations at major entrances. Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations. Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort.
- Facilities for walking and cycling: Provide safe, direct, and attractive pedestrian access from public sidewalks to building entrances. Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas and provide marked pedestrian crosswalks at intersection sidewalks. Provide bicycle parking in highly visible and lighted areas.
- Bicycle parking was analyzed in previous sections.
- Ridesharing - Pick-up and drop-off facilities: Provide designated area for carpool drivers.

4.6 Neighborhood Traffic Management

As mentioned previously, given the subject development will only provide a connection to a collector roadway (i.e., Mer-Bleue Road), following the City's TIA Guidelines, a review of potential NTM strategies is not required.

4.7 Transit

Transit stops that serve the development site were previously mentioned in the *Step 2 – Scoping* section of this report, which included stop number, location, route identifier and directional information (summarized in **Table 1**). Additionally, transit route information, including frequency and service type, were previously summarized in **Table 2**. All transit stops are located within the OC Transpo service design guidelines (i.e., within 400 m walking distance to/from the site).

Route Capacity

This module is exempt based on the latest City of Ottawa TIA Guidelines as it is only required when projected new site transit trips are greater than 75.

Transit Priority Requirements

Given the relatively low volume of projected site-generated traffic and the limited number of transit routes using the analyzed roads and intersections, it is anticipated that transit travel times will not be impacted.

4.8 Review of Network Concept

This module is exempt based on the latest City of Ottawa TIA Guidelines.

4.9 Access and Intersection Design

This module determines the design elements of the points of access to/from the subject development site, and study area intersections required to accommodate the proposed development, consistent with the City's Complete Streets philosophy, MMLOS guidelines, and its urban design objectives for the development area.

Future Total Traffic Volume

Figure 20 and **Figure 21** illustrate the total projected traffic volumes for the 2027 and 2032 horizon years, respectively. These values reflect the combined impact of the traffic generated by the proposed site (as shown in **Figure 17**) as well as the background growth and new traffic generated by future area developments (as previously depicted in **Figure 18** and **Figure 19** and analyzed in earlier sections.

Figure 20: 2027 Total Traffic Volume

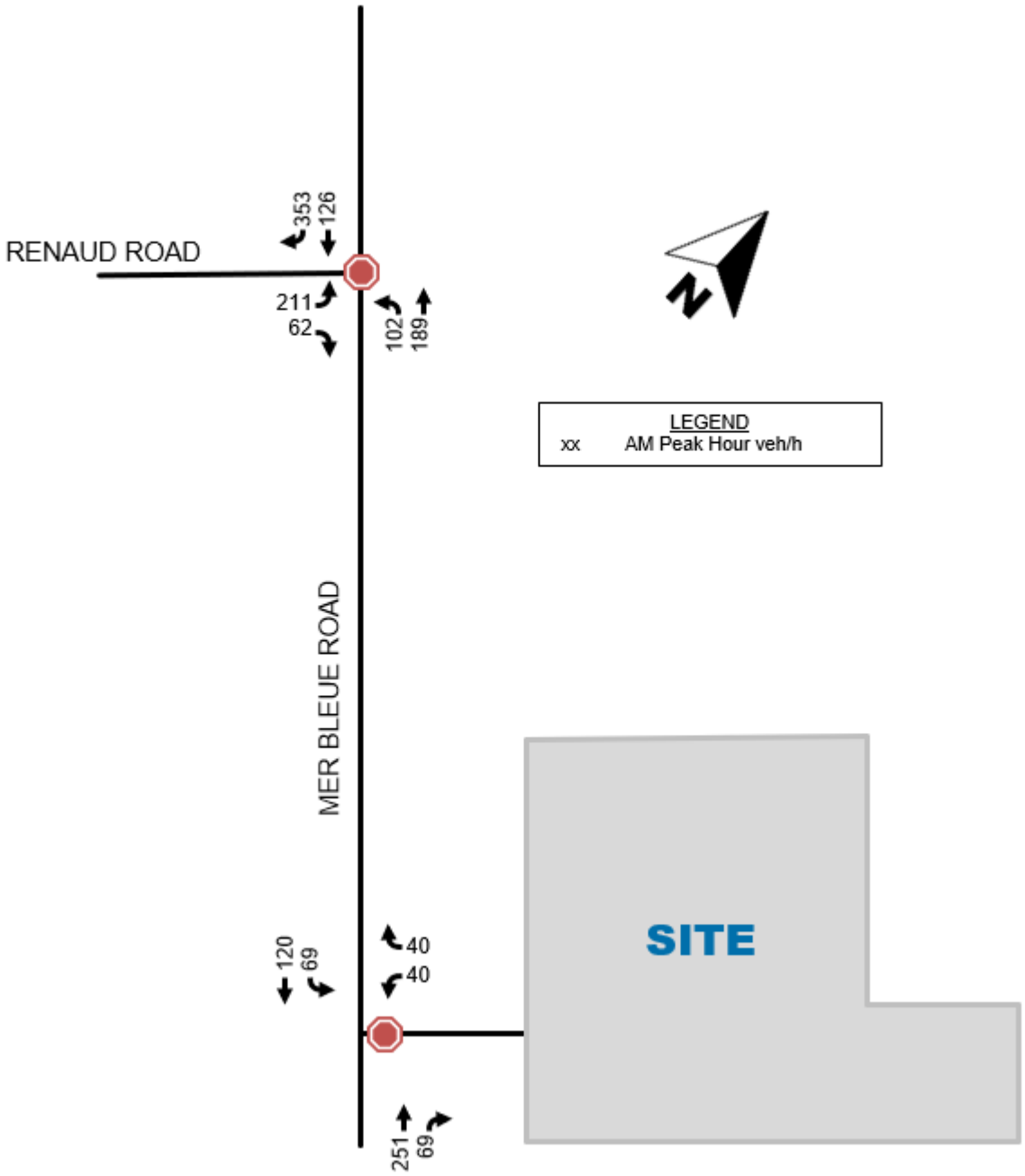
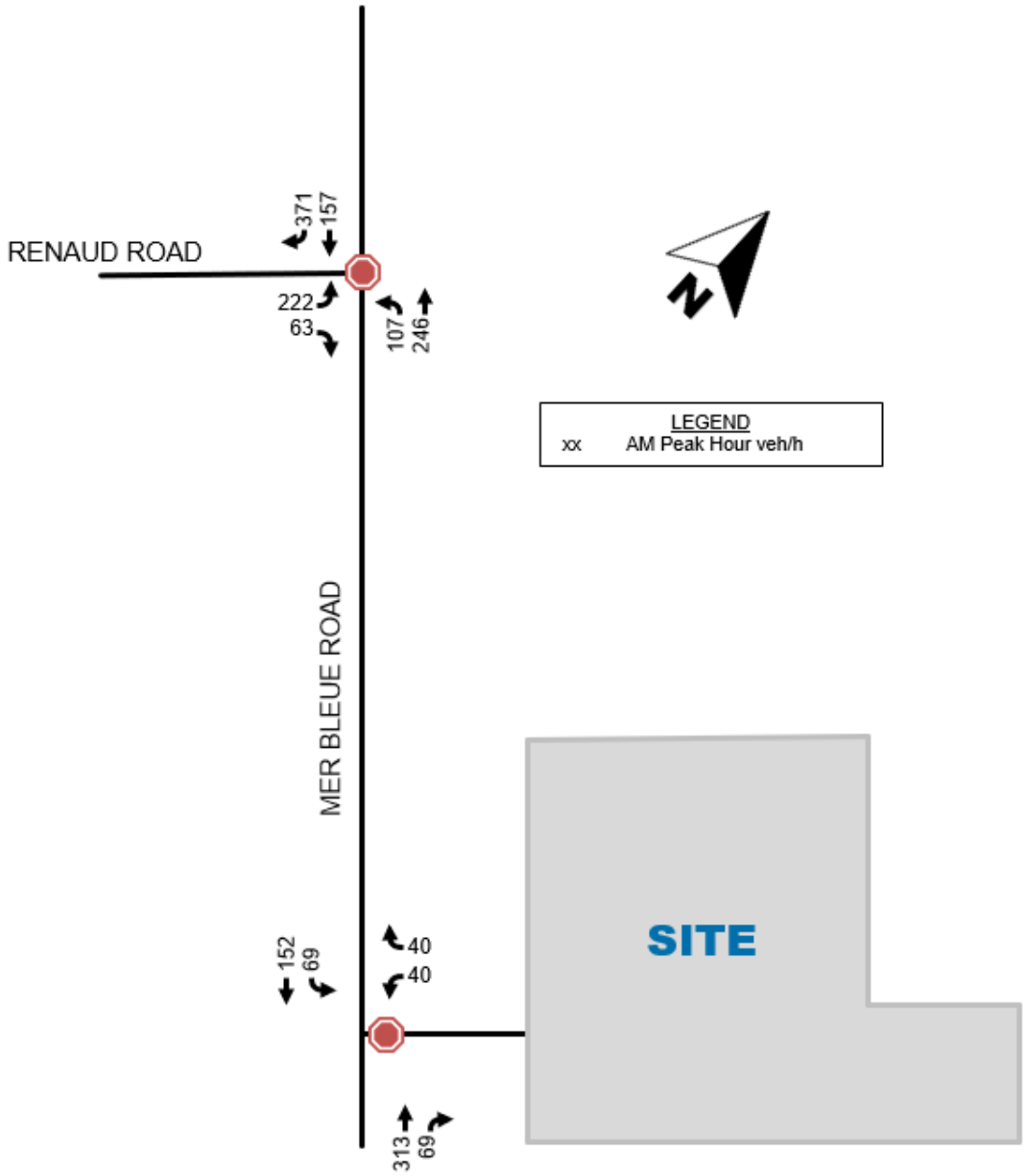


Figure 21: 2032 Total Traffic Volume



Future Total Traffic Conditions

Similar to the existing and background conditions previously presented in this report, future total traffic conditions were assessed using the intersection capacity analysis software Synchro (v11). It is assumed that the improvements to the Mer-Bleue / Renaud intersection will not be in place by 2027. **Table 13** summarizes the operational analysis of the intersection based on the total projected volumes depicted in **Figure 20**.

For the 2032 horizon year, it is assumed that the Mer-Bleue Road widening between Renaud Road and Decoeur Road will be completed. Since the detailed signal timing and implementation timeline for the intersection have not yet been confirmed, this report assumes the existing all-way stop control for both the 2027 and 2032 horizon years. This represents a conservative approach, as the signalized intersection is anticipated to provide higher capacity and improved operational efficiency compared to the current all-way stop control. Refer to **Table 14** for the operational analysis of the intersection using the 2032 total projected volumes, as illustrated in **Figure 21**.

The analysis incorporates all contributing factors to provide a comprehensive view of future traffic conditions in the study area. Detailed Synchro output data for future total projected conditions is provided in **Appendix G** for further reference.

Table 13: Study Area Intersection Operations – 2027 Total Traffic

Movement	Lanes	AM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)
Mer Bleue/Renaud - Unsignalized					
EB	1 L/R	0.46	13.9	A	0
NB	1 T/L	0.46	13.4	A	0
SB	1 T/R	0.65	16.7	B	0
Overall		**0.80**	**15.0**	**C**	**-**
Mer Bleue/Site Entrance - Unsignalized					
WB	1 L/R	0.14	12.2	A	4
NB	1 T/R	0.19	0	A	0
SB	1 T/L	0.06	3.3	A	1
Overall		**0.48**	**2.7**	**A**	**-**

Table 14: Study Area Intersection Operations – 2032 Total Traffic

Movement	Lanes	AM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)
Mer Bleue/Renaud - Unsignalized					
EB	1 L/R	0.49	15.2	A	0
NB	1 T/L	0.58	16.7	A	0
SBT	1 T	0.18	9.3	A	0
SBR	1 R	0.64	16.5	B	0
Overall		**0.70**	**15.6**	**B**	**-**

Movement	Lanes	AM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)
Mer Bleue/Site Entrance - Unsignalized					
WB	1 L/R	0.15	13.2	A	8
NB	1 T/R	0.22	0	A	0
SB	1 T/L	0.06	2.9	A	2
Overall		**0.54**	**2.5**	**A**	**-**

As shown in **Table 13**, by 2027 the Mer-Bleue / Renaud intersection is projected to operate with an overall LOS 'C' during the weekday morning peak hour. The southbound movement is identified as the most critical, operating at a LOS of 'B'. The entrance to the proposed site was included in the analysis and is projected to operate with an LOS of 'A', indicating excellent performance for site-generated traffic. By 2032, as shown in **Table 14**, Mer-Bleue / Renaud the intersection is projected to operate with an overall LOS of 'B' during the weekday morning peak hour. The entrance to the proposed site continues to operate with an LOS of 'A' in the2032 horizon year.

Location and Design of Access

Access to the site will be provided via a two-way driveway connecting to Mer-Bleue Road. Additionally, a bus-exclusive access lane is proposed at the southern end of the site. This entrance will feature a two-way driveway leading to a bus loop, specifically designed to support safe and efficient student drop-off and pick-up operations. All proposed site driveways comply with Section 25 of By-law No. 2003-447 (City's Private Approach By-law), which states that "No private approach intended for two-way vehicular traffic shall exceed 9 meters in width at the street line, and at the curb line or roadway edge."

A left-turn lane warrant analysis was conducted for the school entrances following the methodology outlined in the MTO Design Supplement for the TAC Geometric Design Guide for Canadian Roads. The analysis was performed using Exhibit 9A for design speeds of 50 km/h and 60 km/h. Given the significant variation in left-turning volumes between the AM and PM peak hours, separate analyses were conducted for each period. Additionally, consideration was given to the previously mentioned improvements to the Mer-Bleue/Renaud intersection, as shown in **Figure 12**. These improvements include the expansion of the south leg of Mer-Bleue Road, incorporating two through lanes, one dedicated left-turn lane for the departure lane, and a widened receiving lane (two lanes). The preliminary design provided by the City also includes a concrete median terminating approximately 30 meters before the school bus-exclusive access lane. This median is an interim condition prior to the re-alignment of Mer Bleue Road and eliminates left turn in and out to the parking lot but allows it for the school-bus-access lane. As noted previously, aseparate left-turn warrant analysis was conducted for this inteim condition. In all scenarios analyzed, a left-turn lane was not warranted. The results of this analysis are provided in **Appendix H**.

New Street Networks

This module is exempt based on the latest City of Ottawa TIA Guidelines as the proposed development is a Site Plan and not a subdivision.

Intersection Control

The site driveways are currently proposed to be STOP-controlled on the minor approaches. Based on the intersection capacity analysis conducted earlier in this report and in alignment with the City's policies, goals, and objectives, no additional signalization or intersection control measures are warranted at this time. Following the Mer-Bleue Road realignment (expected after the 2032 horizon year), adjustments to the site entrances will be required to ensure safe and efficient access. The parking lot entrance will operate as a right-in/right-out access connected to the realigned Mer-Bleue Road. The school-bus-exclusive access will connect to the old section of Mer-Bleue Road (south of the site), which will serve as a cul-de-sac. This design will facilitate safe and efficient bus operations while minimizing conflicts with other vehicles.

Intersection Design

The design of the proposed site access intersection is discussed above. As the proposed access is unsignalized, it is not included in the MMLOS analysis.

5.0 Findings and Recommendations

As with any infill development, the introduction of a new land use will impact the surrounding transportation network. J.L. Richards and Associates Limited has completed an assessment of these impacts and summarized the findings in this Transportation Impact Assessment (TIA) Study, prepared in accordance with the City of Ottawa's TIA Guidelines. The following findings and conclusions are offered at this stage:

- Intersection Operations: The study area intersection is currently operating under good conditions based on the LOS analysis. With the implementation of the City's proposed projects, the LOS is expected to remain stable or improve further.

- Road Safety: Based on historical collision data, the Mer-Bleue Road / Renaud intersection has a low collision rate. In alignment with the City's Road Safety Action Plan and the goal of progressing toward zero fatalities and major injuries, the City may consider conducting an In-Service Road Safety Review (ISRSR) to maintain or further reduce this low collision rate.

- Modal Split: Given the local context, private automobiles are projected to remain the largest contributor to new vehicle trips. However, non-motorized modes (e.g., walking and cycling) and school bus trips are expected to account for the majority of person trips and will likely be the primary modes of travel to and from the site.

- Traffic Generation: The proposed development is projected to generate 216 two-way vehicle trips per hour during weekday morning peak hours.

- Active Modes: The proposed development is projected to generate approximately 190 two-way person trips per hour during weekday morning peak hours related to walking, cycling, and other active modes.

- Parking Supply: The proposed parking supply meets the minimum By-Law requirements for the subject development.

- Pedestrian and Cyclist Infrastructure: The current and projected MMLOS targets for pedestrians and cyclists are not met. However, several adjustments are proposed in the area, including the widening of Mer-Bleue Road from Decoeur to Renaud, the realignment of Mer-Bleue Road south of Renaud and the implementation of a new signalized intersection at Mer-Bleue / Renaud intersection, as well as the inclusion of a pedestrian connection on public ROW between the new signalized intersection at Renaud and the school property (and MUP on the school block) as a Capital project.

- Site Layout: The overall site layout is effective, meets applicable By-Law requirements, and is expected to operate acceptably.

- The Synchro files supporting the analysis in this report will be submitted as a separate digital file.

The proposed development fits well into the context of the surrounding area and is projected to have minimal impact on the surrounding transportation network. The design and location of the proposed development align with the City of Ottawa's policies, goals, and objectives.

Based on the foregoing, the proposed development located at 2405 & 2419 Mer-Bleue Road is recommended from a transportation perspective.

J.L. RICHARDS & ASSOCIATES LIMITED

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Senior Civil Engineer, Transportation

Appendix A

Guideline Screening Form

City of Ottawa 2017 Transportation Impact Assessment (TIA) Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	2405 chemin Mer Bleue Rd, Orléans
Description of Location	Currently vacant land
Land Use Classification	Minor Institutional Zone (I1A/R3Z) – Elementary School
Development Size (units)	713 students
Development Size (m^2)	8,822
Number of Accesses and Locations	1
Phase of Development	Single Phase
Buildout Year	2030

If available, please attach a sketch of the development or site plan to this form.

2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Table notes:

1.Table 2, Table 3 & Table 4 TRANS Trip Generation Manual
2.Institute of Transportation Engineers (ITE) Trip Generation Manual 11.1 Ed.

Land Use Type	Minimum Development Size
Single-family homes	60 units
Multi-Use Family (Low-Rise)[1]	90 units
Multi-Use Family (High-Rise)[1]	150 units
Office[2]	1,400 m^2
Industrial[2]	7,000 m^2
Fast-food restaurant or coffee shop[2]	110 m^2
Destination retail[2]	1,800 m^2
Gas station or convenience market[2]	90 m^2

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

[1] Hubs are identified in Schedules B1 to B8 of the City of Ottawa Official Plan. PMTSAs are identified in ScheduleC1 of the Official Plan. DPAs are identified in Schedule C7A and C7B of the Official. See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA.

The subject site is 8,822 sq. m and generates more than 60 person trips during weekday peak hours, therefore the trip generation trigger is satisfied.

Revision Date: December 2023

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?		X
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)?[1]		X

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street 80 km/hr or greater?		X
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		X
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?		X
Is the proposed driveway within auxiliary lanes of an intersection?		X
Does the proposed driveway make use of an existing median break that serves an existing site?		X
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		X
Does the development include a drive-thru facility?		X

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?	X	
Does the development satisfy the Location Trigger?		X
Does the development satisfy the Safety Trigger?		X

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

Appendix B

Existing Traffic Counts

Name: Bomo Dambo Date: 2024-10-10 Road Conditions: Dry

Intersection: Mer Bleue/Renaud Weather: 6 degrees celsius

15 Minute Interval	Road: Mer Bleue				Road: Renaud								
	Movement												
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
7:00 - 7:15	8	19			20	49	22		1				EBL: 1 ped SBR: 1 ped
7:15 - 7:30	15	41			17	65	31		4				
7:30 - 7:45	26	41			20	111	58		7				SBR: 3 peds, 4 cyclists EBL: 1 ped
7:45 - 8:00	27	34			18	119	58		10				SBR:2 peds, 1 cyclist
8:00 - 8:15	12	26			22	48	58		6				EBL: 1 ped
8:15 - 8:30	5	47			15	43	51		5				
8:30 - 8:45	4	47			16	50	47		3				SBR: 2 peds, 1 cyclist
8:45 - 9:00	7	43			31	37	44		4				SBT: 2 cyclists EBL: 1 ped
Total:	104	298	0	0	159	522	369	0	40	0	0	0	

15 Minute Interval	Road: Mer Bleue				Road: Renaud								
	Movement												
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
3:00 - 3:15	9	42			54	36	67		9				SBR: 1 ped EBL: 1 cyclist
3:15 - 3:30	4	45			54	35	96		6				SBR: 1 ped EBL: 1 ped NBT: 1 cyclist
3:30 - 3:45	4	43			48	38	97		4				
3:45 - 4:00	7	39			44	40	93		9				
4:00 - 4:15	5	35			59	37	92		12				EBL: 1 ped, 1 cyclist SBT: 1 cyclist
4:15 - 4:30	4	22			45	34	106		12				NBT: 1 cyclist
4:30 - 4:45	7	43			51	34	112		4				
4:45 - 5:00	5	42			47	32	127		6				EBL: 1 cyclist
Total:	45	311	0	0	402	286	790	0	62	0	0	0	

Field Notes:
Most heavy vehicles were school buses
At 3:28 PM, a queue was observed at the middle of the intersection for EBL turning vehicles from Renaud to Mer-Bleue as the north approach had a queue.

Appendix C

Collision Data

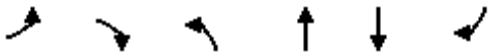
OBJECTID	DATE	ANOM_ID	YEAR	TIME	LOCATION	GEO_ID	ACCIDENT_LOCATION	CLASS_OF_ACCIDENT	IMPACT_TYPE	ENVIRONMENT	LIGHT	ROAD_SURFACE_CONDITION	TRAFFIC_CONTROL	TRAFFIC_CONTROL_CONDITION	NO_OF_PEDESTRIANS	X	Y	LONGITUDE	LATITUDE	No. of Vehicles	NO_BICYCLES	No. of Motorcycles	DISTANCE
1825	2017-02-03	11944	2017	4:33:00 PM	RENAUD RD @ MER BLEUE RD		03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign			383,448.77	5,033,734.55	-75.495	45.439	2			159.41 Meters (approximate)
2342	2017-03-02	11945	2017	4:06:00 PM	RENAUD RD @ MER BLEUE RD	12893	03 - At intersection	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign			383,448.77	5,033,734.55	-75.495	45.439	2			164.73 Meters (approximate)
68750	2022-05-17		2022	11:50:00 AM	RENAUD RD @ MER BLEUE RD (0012893)	12893	03 - At intersection	03 - P.D. only	02 - Angle	02 - Wet	01 - Daylight	02 - Wet	02 - Stop sign		0	383,448.77	5,033,734.55	45.439	-75.495	2	0	0	
62668	2021-11-24		2021	11:08:00 AM	RENAUD RD @ MER BLEUE RD (0012893)	12893	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign			383,448.86	5,033,734.71	45.439	-75.495	2	0	0	
62250	2021-11-18		2021	12:04:00 AM	RENAUD RD @ MER BLEUE RD (0012893)	12893	03 - At intersection	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign			383,448.77	5,033,734.55	45.439	-75.495	2	0	0	
52449	2020-10-17		2020	5:04:00 PM	RENAUD RD @ MER BLEUE RD (0012893)	12893	03 - At intersection	02 - Non-fatal injury	07 - SMV other	01 - Clear	07 - Dark	01 - Dry	02 - Stop sign			383,448.77	5,033,734.55	45.439	-75.495	1			

Total Area

Classification of Accident	*01 - Approaching*	*02 - Angle*	*03 - Rear end*	*04 - Sideswipe*	*05 - Turning movement*	*06 - SMV unattended vehicle*	*07 - SMV other*	*99 - Other*	*Total*	
04 - Non-reportable	0	0	0	0	0	0	0	0	0	0%
03 - P.D. only	0	4	1	0	0	0	0	0	5	83%
02 - Non-fatal injury	0	0	0	0	0	0	1	0	1	17%
01 - Fatal injury	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**4**	**1**	**0**	**0**	**0**	**1**	**0**	**6**	100%
	#4 or 0%	#1 or 67%	#2 or 17%	#4 or 0%	#4 or 0%	#4 or 0%	#2 or 17%	#4 or 0%		

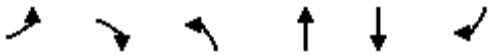
Appendix D

Synchro Analysis Output
Existing Conditions



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	205	27	80	142	77	343
Future Volume (vph)	205	27	80	142	77	343
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	25%	10%	8%	9%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	252	0	0	241	457	0
Sign Control	Stop			Stop	Stop	

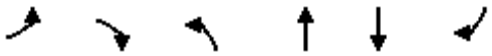
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	205	27	80	142	77	343
Future Volume (vph)	205	27	80	142	77	343
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	223	29	87	154	84	373

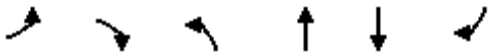
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	252	241	457
Volume Left (vph)	223	87	0
Volume Right (vph)	29	0	373
Hadj (s)	0.22	0.22	-0.39
Departure Headway (s)	5.8	5.5	4.7
Degree Utilization, x	0.41	0.37	0.59
Capacity (veh/h)	573	621	744
Control Delay (s)	12.8	11.7	14.2
Approach Delay (s)	12.8	11.7	14.2
Approach LOS	B	B	B

Intersection Summary			
Delay	13.2		
Level of Service	B		
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	244	37	109	194	105	343
Future Volume (vph)	244	37	109	194	105	343
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	25%	10%	8%	9%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	305	0	0	329	487	0
Sign Control	Stop			Stop	Stop	

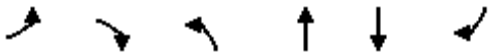
Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 68.6%		ICU Level of Service C	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	244	37	109	194	105	343
Future Volume (vph)	244	37	109	194	105	343
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	265	40	118	211	114	373

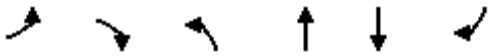
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	305	329	487
Volume Left (vph)	265	118	0
Volume Right (vph)	40	0	373
Hadj (s)	0.21	0.22	-0.36
Departure Headway (s)	6.2	5.9	5.1
Degree Utilization, x	0.53	0.54	0.69
Capacity (veh/h)	533	578	682
Control Delay (s)	16.0	15.5	18.9
Approach Delay (s)	16.0	15.5	18.9
Approach LOS	C	C	C

Intersection Summary			
Delay	17.1		
Level of Service	C		
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	327	62	184	327	177	343
Future Volume (vph)	327	62	184	327	177	343
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	25%	10%	8%	9%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	422	0	0	555	565	0
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 75.2%		ICU Level of Service D	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	327	62	184	327	177	343
Future Volume (vph)	327	62	184	327	177	343
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	355	67	200	355	192	373

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total (vph)	422	555	128	437
Volume Left (vph)	355	200	0	0
Volume Right (vph)	67	0	0	373
Hadj (s)	0.20	0.22	0.15	-0.50
Departure Headway (s)	7.0	6.9	7.3	6.6
Degree Utilization, x	0.82	1.06	0.26	0.81
Capacity (veh/h)	505	531	485	533
Control Delay (s)	34.4	82.8	11.6	30.4
Approach Delay (s)	34.4	82.8	26.2	
Approach LOS	D	F	D	

Intersection Summary			
Delay	48.8		
Level of Service	E		
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

Appendix E

TDM – Supportive Development Design and Infrastructure

Introduction

The City of Ottawa's *Transportation Impact Assessment (TIA) Guidelines* (specifically Module 4.1—Development Design) requires proponents of qualifying developments to use the City's **TDM-Supportive Development Design and Infrastructure Checklist** to assess the opportunity to implement design elements that are supportive of sustainable modes. The goal of this assessment is to ensure that the development provides safe and efficient access for all users, while creating an environment that encourages walking, cycling and transit use.

The remaining sections of this document are:

- Using the Checklist
- Glossary
- TDM-Supportive Development Design and Infrastructure Checklist: Non-Residential Developments
- TDM-Supportive Development Design and Infrastructure Checklist: Residential Developments

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

Using the Checklist

This **TDM-Supportive Development Design and Infrastructure Checklist** document includes two actual checklists, one for non-residential developments (office, institutional, retail or industrial) and one for residential developments (multi-family or condominium only; subdivisions are exempt). Readers may download the applicable checklist in electronic format and complete it electronically, or print it out and complete it by hand. As an alternative, they may create a freestanding document that lists the design and infrastructure measures being proposed and provides additional detail on them.

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

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

Glossary

This glossary defines and describes the following measures that are identified in the **TDM-Supportive Development Design and Infrastructure Checklist**:

Walking & cycling: Routes
- Building location & access points
- Facilities for walking & cycling
- Amenities for walking & cycling

Walking & cycling: End-of-trip facilities
- Bicycle parking
- Secure bicycle parking
- Shower & change facilities
- Bicycle repair station

Transit
- Walking routes to transit
- Customer amenities

Ridesharing
- Pick-up & drop-off facilities
- Carpool parking

Carsharing & bikesharing
- Carshare parking spaces
- Bikeshare station location

Parking
- Number of parking spaces
- Separate long-term & short-term parking areas

Other
- On-site amenities to minimize off-site trips

In addition to specific references made in this glossary, readers should consult the City of Ottawa's design and planning guidelines for a variety of different land uses and contexts, available on the City's website at www.ottawa.ca. Readers may also find the following resources to be helpful:

- *Promoting Sustainable Transportation through Site Design*, Institute of Transportation Engineers, 2004 (www.cite7.org/wpdm-package/iterp-promoting-sustainable-transportation)
- *Bicycle End-of-Trip Facilities: A Guide for Canadian Municipalities and Employers*, Transport Canada, 2010 (www.fcm.ca/Documents/tools/GMF/Transport_Canada/BikeEndofTrip_EN.pdf)

▶ *Walking & cycling: Routes*

Building location & access points. Correctly positioning buildings and their entrances can help make walking convenient, comfortable and safe. Minimizing travel distances and maximizing visibility are key.

Facilities for walking & cycling. The Official Plan gives clear direction on the provision and design of walking and cycling facilities for both access and circulation. On larger, busier sites (e.g. multi-building campuses) the inclusion of sidewalks, pathways, marked crossings, stop signs and traffic calming features can create a safer and more supportive environment for active transportation.

Amenities for walking & cycling. Lighting, landscaping, benches and wayfinding can make walking and cycling safer and more secure, comfortable and accessible.

▶ *Walking & cycling: End-of-trip facilities*

Bicycle parking. The Official Plan and Zoning By-law both address the need for adequate bicycle parking at developments. Weather protection and theft prevention are major concerns for commuters who spend hundreds or thousands of dollars on a quality bicycle. Bicycle racks should have a design that enables secure locking while preventing damage to wheels. They should be located within sight of busy areas such as main building entrances or staffed parking kiosks.

Secure bicycle parking. Ottawa's Zoning By-law requires a secure area for bicycles at office or residential developments having more than 50 bicycle parking spaces. Lockable outdoor bike cages or indoor storage rooms that limit access to registered users are ideal.

Shower & change facilities. Longer-distance cyclists, joggers and even pedestrians can need a place to shower and change at work; the lack of such facilities is a major barrier to active commuting. Lockers and drying racks provide a place to store gear away from workspaces, and showers and grooming stations allow commuters to make themselves presentable for the office.

Bicycle repair station. Cycling commuters can experience maintenance issues that make the homeward trip difficult or impossible. A small supply of tools (e.g. air pump, Allen keys, wrenches) and supplies (e.g. inner tube patches, chain lubricant) in the workplace can help.

▶ *Transit*

Customer amenities. Larger developments that feature an on-site transit stop can make transit use more attractive by providing shelters, lighting and benches. Even better, they could integrate the passenger waiting area into a building entrance.

▶ *Ridesharing*

Pick-up & drop-off facilities. Having a safe place to load or unload passengers (for carpools as well as taxis and ride-hailing services) without obstructing pedestrians, cyclists or other vehicles can help make carpooling work.

Carpool parking. At destinations with large parking lots (or lots that regularly fill to capacity), signed priority carpool parking spaces can be an effective ridesharing incentive. Priority spaces are frequently abused by non-carpoolers, so a system to provide registered users with vehicle identification tags is recommended.

▶ *Carsharing & bikesharing*

Carshare parking spaces. For developments where carsharing could be an attractive option for employees, visitors or residents, ensuring an attractive location for future carshare parking spaces can avoid challenges associated with future retrofits.

Bikeshare station location. For developments where bikesharing could be an attractive option for employees, visitor or residents, ensuring an attractive location for a future bikeshare station can avoid challenges associated with future retrofits.

▶ *Parking*

Number of parking spaces. Parking capacity is an important variable in development design, as it can either support or subvert the mode share targets set during the transportation impact analysis (TIA). While the Zoning By-law establishes any minimum and/or maximum requirements for parking capacity, it also allows a reduction in any minimum to reflect the existence of on-site shower, change and locker rooms provided for cyclists.

Separate long-term & short-term parking areas. Because access to unused parking spaces can be a powerful incentive to drive, developments can better manage their parking supply and travel behaviours by separating long-term from short-term parking through the use of landscaping, gated controls or signs. Doing so makes it difficult for long-term parkers (e.g. commuters) to park in short-term areas (e.g. for visitors) as long as enforcement occurs; it also protects long-term parking capacity for its intended users.

▶ *Other*

On-site amenities to minimize off-site trips. Developments that offer facilities to limit employees' need for a car during their commute (e.g. to drop off children at daycare) or during their workday (e.g. to hit the gym) can free employees to make the commuting decision that otherwise works best for them.

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

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

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

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

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐ N/A
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐ N/A
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐ N/A
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☑
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☐
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐

Appendix F

Multi-Modal Level of Service (MMLOS) analysis

Multi-Modal Level of Service - Segments Form

Consultant	**J.L. Richards and Associates Ltd.**	**Project**	**33322-003 Orleans ESP**
Scenario	**Existing Conditions**	**Date**	
Comments			

SEGMENTS		**Mer-Bleue**	Proposed 1	Proposed 2	Section 3	Section 4	Section 5	Section 6	Section 7	Section 8	Section 9
Pedestrian	Sidewalk Width Boulevard Width	-	no sidewalk n/a								
	Avg Daily Curb Lane Traffic Volume		≤ 3000								
	Operating Speed On-Street Parking		> 30 to 50 km/h no								
	Exposure to Traffic PLoS		**F**	-	-	-	-	-	-	-	-
	Effective Sidewalk Width										
	Pedestrian Volume		250 ped/hr								
	Crowding PLoS		-	-	-	-	-	-	-	-	-
	Level of Service		-	-	-	-	-	-	-	-	-
Bicycle	Type of Cycling Facility	-	Mixed Traffic								
	Number of Travel Lanes		2-3 lanes total								
	Operating Speed		≥ 50 to 60 km/h								
	# of Lanes & Operating Speed LoS		**E**	-	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width										
	Bike Lane Width LoS		-	-	-	-	-	-	-	-	-
	Bike Lane Blockages										
	Blockage LoS		-	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)										
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes								
	Sidestreet Operating Speed		>40 to 50 km/h								
	Unsignalized Crossing - Lowest LoS		-	-	-	-	-	-	-	-	-
	Level of Service		-	-	-	-	-	-	-	-	-
Transit	Facility Type	-									
	Friction or Ratio Transit:Posted Speed										
	Level of Service		-	-	-	-	-	-	-	-	-
Truck	Truck Lane Width	-									
	Travel Lanes per Direction										
	Level of Service		-	-	-	-	-	-	-	-	-

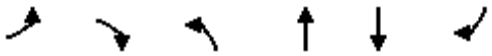
Multi-Modal Level of Service - Segments Form

Consultant	**J.L. Richards and Associates Ltd.**	**Project**	**33322-003 Orleans ESP**
Scenario	**Proposed Conditions**	**Date**	
Comments			

SEGMENTS		**Mer-Bleue**	Proposed	Modified to Comply LOS	Section	Section	Section	Section	Section	Section	Section
			1	2	3	4	5	6	7	8	9
Pedestrian	Sidewalk Width Boulevard Width	**B**	≥ 2 m > 2 m	≥ 2 m > 2 m							
	Avg Daily Curb Lane Traffic Volume		≤ 3000	≤ 3000							
	Operating Speed On-Street Parking		> 30 to 50 km/h no	> 30 to 50 km/h no							
	Exposure to Traffic PLoS		**A**	**A**	-	-	-	-	-	-	-
	Effective Sidewalk Width		2.0 m	3.0 m							
	Pedestrian Volume		1000 ped/hr	250 ped/hr							
	Crowding PLoS		**B**	**A**	-	-	-	-	-	-	-
	Level of Service		**B**	**A**	-	-	-	-	-	-	-
Bicycle	Type of Cycling Facility	**A**	Mixed Traffic	Physically Separated							
	Number of Travel Lanes		2-3 lanes total	~~4-5 lanes total~~							
	Operating Speed		≥ 50 to 60 km/h	~~≥ 50 to 60 km/h~~							
	# of Lanes & Operating Speed LoS		**E**	**~~A~~**	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width										
	Bike Lane Width LoS		-	-	-	-	-	-	-	-	-
	Bike Lane Blockages										
	Blockage LoS		-	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)										
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes								
	Sidestreet Operating Speed		>40 to 50 km/h								
	Unsignalized Crossing - Lowest LoS		-	**~~A~~**	-	-	-	-	-	-	-
	Level of Service		-	**A**	-	-	-	-	-	-	-
Transit	Facility Type	-									
	Friction or Ratio Transit:Posted Speed										
	Level of Service		-	-	-	-	-	-	-	-	-
Truck	Truck Lane Width	-									
	Travel Lanes per Direction										
	Level of Service		-	-	-	-	-	-	-	-	-

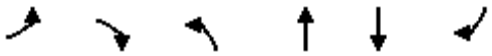
Appendix G

Synchro Analysis Output
Future Conditions



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	211	62	102	189	126	353
Future Volume (vph)	211	62	102	189	126	353
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	25%	10%	8%	9%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	273	0	0	291	479	0
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	211	62	102	189	126	353
Future Volume (vph)	211	62	102	189	126	353
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	211	62	102	189	126	353

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	273	291	479
Volume Left (vph)	211	102	0
Volume Right (vph)	62	0	353
Hadj (s)	0.17	0.22	-0.34
Departure Headway (s)	6.0	5.7	4.9
Degree Utilization, x	0.46	0.46	0.65
Capacity (veh/h)	556	597	710
Control Delay (s)	13.9	13.4	16.7
Approach Delay (s)	13.9	13.4	16.7
Approach LOS	B	B	C

Intersection Summary			
Delay	15.0		
Level of Service	C		
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

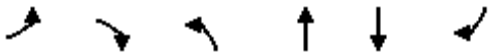
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	40	40	251	69	69	120
Future Volume (vph)	40	40	251	69	69	120
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	0	320	0	0	189
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 47.8%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	40	40	251	69	69	120
Future Volume (Veh/h)	40	40	251	69	69	120
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	40	40	251	69	69	120
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	544	286			320	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	544	286			320	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	95			94	
cM capacity (veh/h)	473	754			1240	

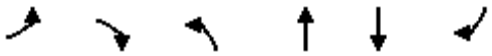
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	80	320	189
Volume Left	40	0	69
Volume Right	40	69	0
cSH	581	1700	1240
Volume to Capacity	0.14	0.19	0.06
Queue Length 95th (m)	3.8	0.0	1.4
Control Delay (s)	12.2	0.0	3.3
Lane LOS	B		A
Approach Delay (s)	12.2	0.0	3.3
Approach LOS	B		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	222	63	107	246	157	371
Future Volume (vph)	222	63	107	246	157	371
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	25%	10%	8%	9%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	285	0	0	353	528	0
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 70.2%		ICU Level of Service C	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	222	63	107	246	157	371
Future Volume (vph)	222	63	107	246	157	371
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	222	63	107	246	157	371

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total (vph)	285	353	105	423
Volume Left (vph)	222	107	0	0
Volume Right (vph)	63	0	0	371
Hadj (s)	0.17	0.21	0.15	-0.52
Departure Headway (s)	6.2	5.9	6.1	5.5
Degree Utilization, x	0.49	0.58	0.18	0.64
Capacity (veh/h)	531	583	566	634
Control Delay (s)	15.2	16.7	9.3	16.5
Approach Delay (s)	15.2	16.7	15.1	
Approach LOS	C	C	C	

Intersection Summary			
Delay	15.6		
Level of Service	C		
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	40	40	313	69	69	152
Future Volume (vph)	40	40	313	69	69	152
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	0	382	0	0	221
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 53.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	40	40	313	69	69	152
Future Volume (Veh/h)	40	40	313	69	69	152
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	40	40	313	69	69	152
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	638	348			382	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	638	348			382	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	94			94	
cM capacity (veh/h)	415	696			1176	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	80	382	221
Volume Left	40	0	69
Volume Right	40	69	0
cSH	520	1700	1176
Volume to Capacity	0.15	0.22	0.06
Queue Length 95th (m)	4.3	0.0	1.5
Control Delay (s)	13.2	0.0	2.9
Lane LOS	B		A
Approach Delay (s)	13.2	0.0	2.9
Approach LOS	B		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix H

Signal and Left-turn Lane Warrant Analysis

2027 Peak Hour Signal Warrant

Mer-Bleue/Renaud - (2027 peak hour signal warrant)

Signal Warrant		Description		Minimum Requirement for Two-Lane Roadways	Compliance			
				Restricted Flow - Operating Speed Less Than 70 km/h	Numerical	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	499	69%	69%	**69% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	181	71%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	318	44%	44%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	165	220%		

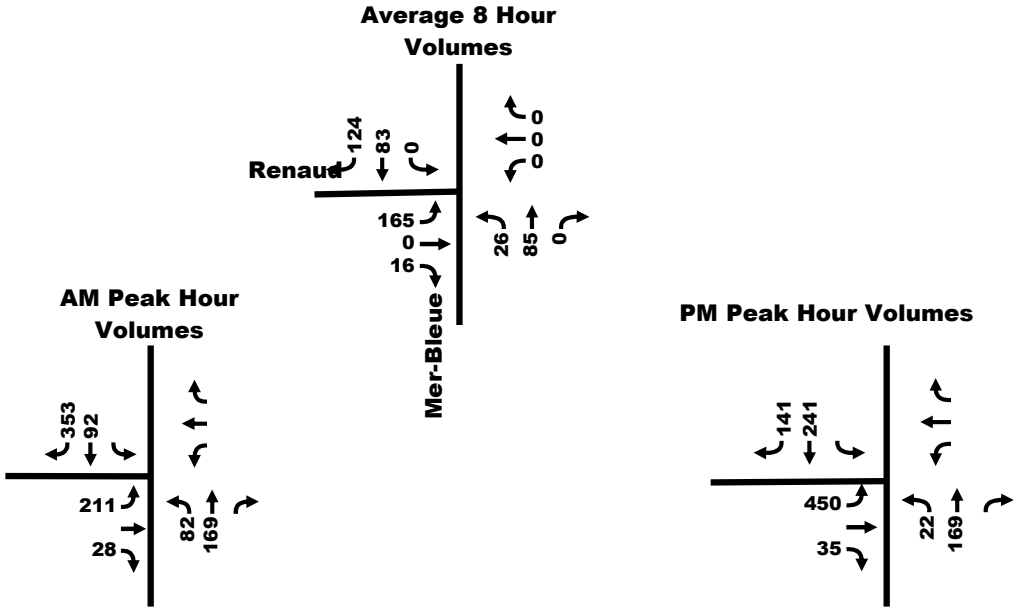
Notes

1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* — **No**

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

3 *The Lowest Sectional Percentage Governs the Entire Warrant*

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



2032 Peak Hour Signal Warrant

Mer-Bleue/Renaud - (2032 peak hour signal warrant)

Signal Warrant		Description		Minimum Requirement for Two-Lane Roadways	Compliance			
				Restricted Flow - Operating Speed Less Than 70 km/h	Numerical	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	719	100%	100%	**100% Yes**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	304	119%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	415	58%	58%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	187	249%		

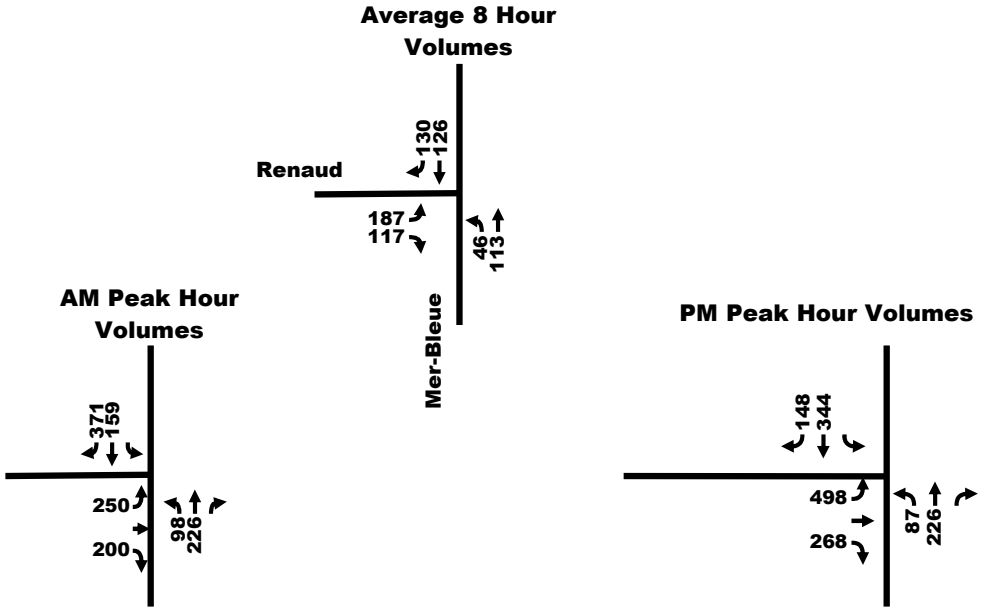
Notes

1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* — **No**

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

3 *The Lowest Sectional Percentage Governs the Entire Warrant*

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



2027 Peak Hour Signal Warrant

Mer-Bleue/Renaud - (2027 peak hour signal warrant)

Signal Warrant		Description		Minimum Requirement for Two-Lane Roadways	Compliance			
				Restricted Flow - Operating Speed Less Than 70 km/h	Numerical	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	864	499	58%	58%	**58% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	306	181	59%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	864	318	37%	37%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	90	165	183%		

Notes

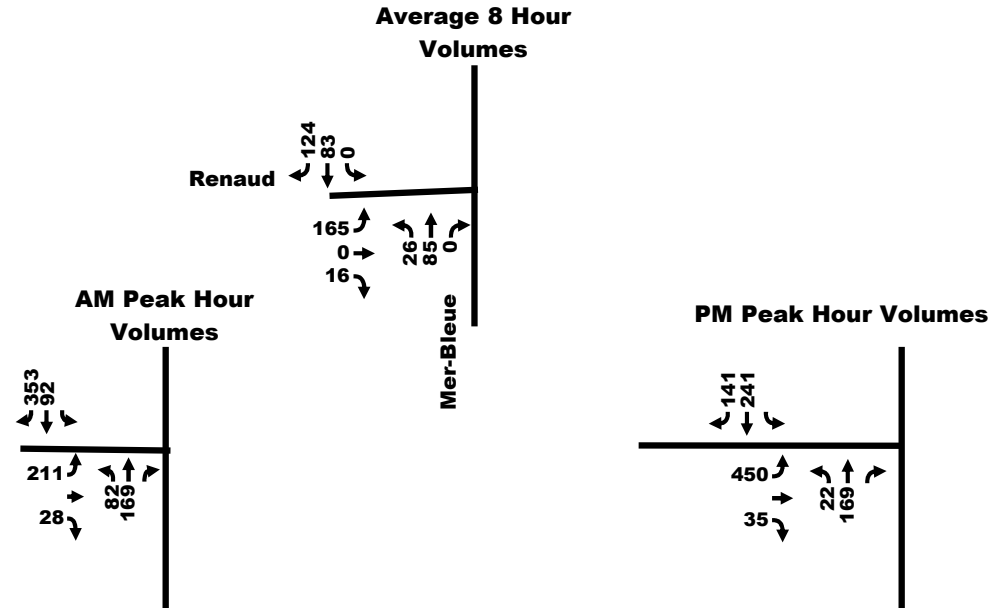
1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* **No**

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

3 *The Lowest Sectional Percentage Governs the Entire Warrant*

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

5 *Values Increased by 20% as indicated on Table 22 OTM Book 12 for Future Developments* **Yes**



2032 Peak Hour Signal Warrant

Mer-Bleue/Renaud - (2032 peak hour signal warrant)

Signal Warrant		Description		Minimum Requirement for Two-Lane Roadways	Compliance			
				Restricted Flow - Operating Speed Less Than 70 km/h	Numerical	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	719	100%	100%	**100% Yes**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	304	119%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	864	415	48%	48%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	90	187	208%		

Notes

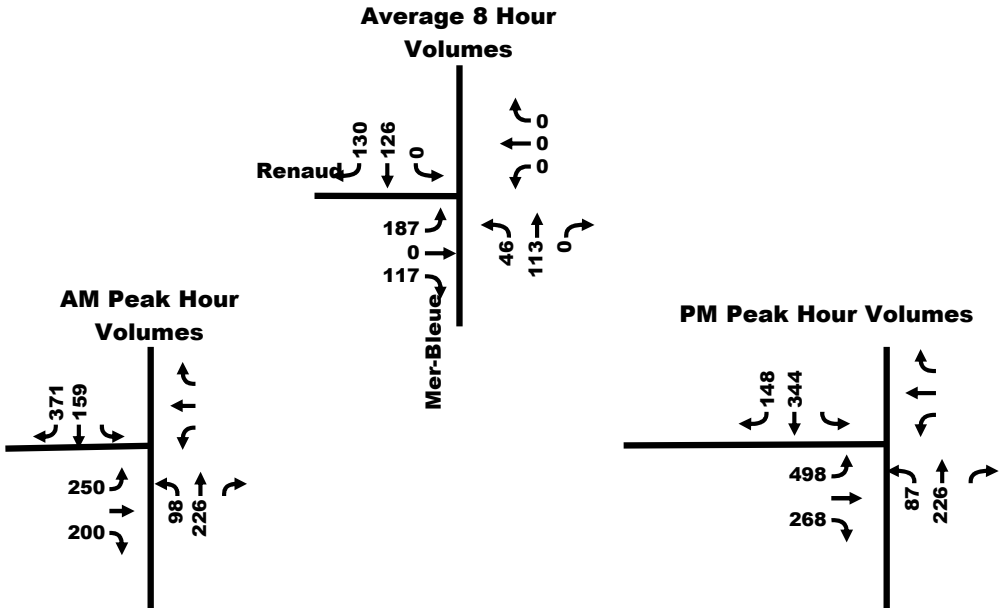
1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* — **No**

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

3 *The Lowest Sectional Percentage Governs the Entire Warrant*

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

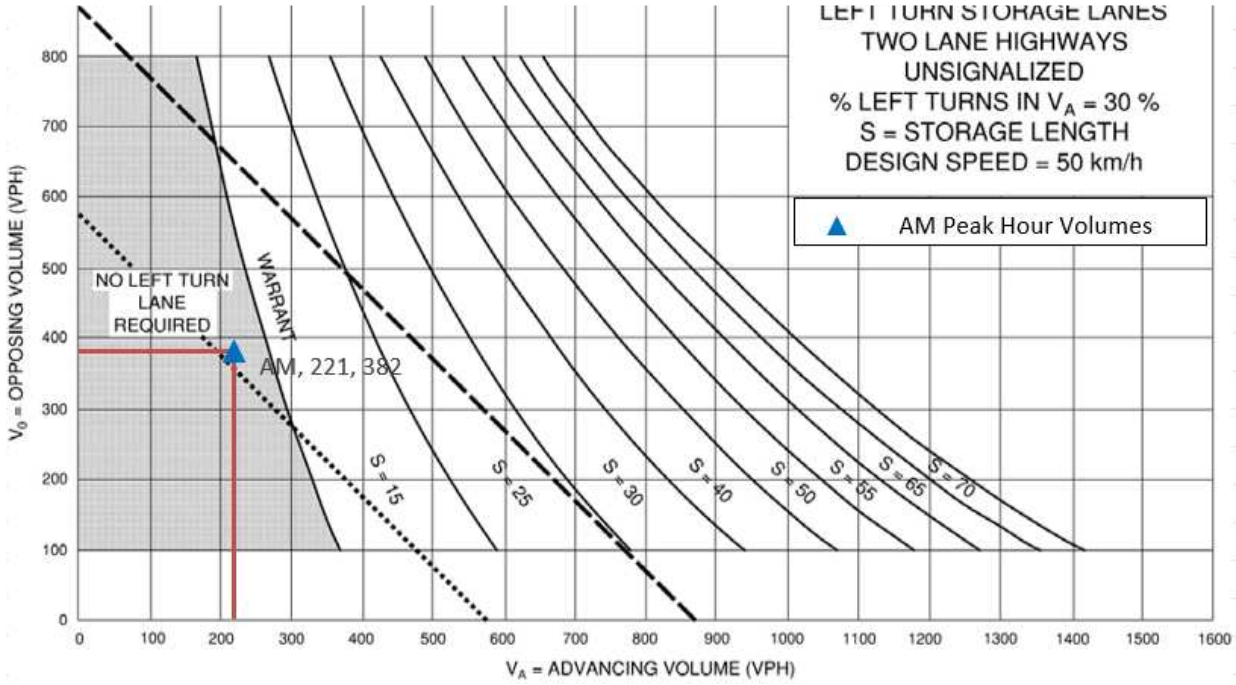
5 *Values Increased by 20% as indicated on Table 22 OTM Book 12 for Future Developments* — **Yes**

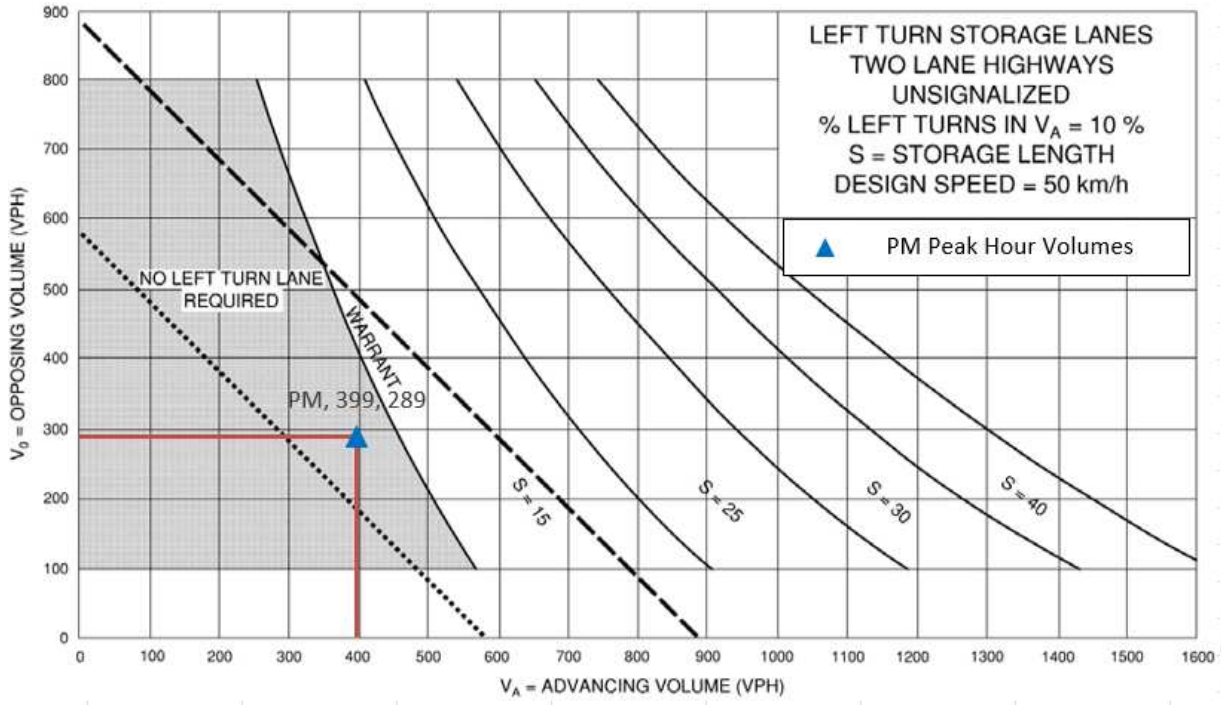


LEFT TURN WARRANT MTO DESIGN SUPPLEMENT

Intersection	Left-Turn Warrant	Advancing Traffic Volume (V_A)		Opposing Traffic Volume (V_O)		Left Turn Traffic Volume (V_L)		% of Left Turning Traffic		Warrant
		AM	PM	AM	PM	AM	PM	AM	PM	
Mer-Bleue-School Site entrances	SBL	221	399	382	289	69	40	31%	10%	No

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM		313	69	69	152					40		40
PM		249	40	40	359					69		69

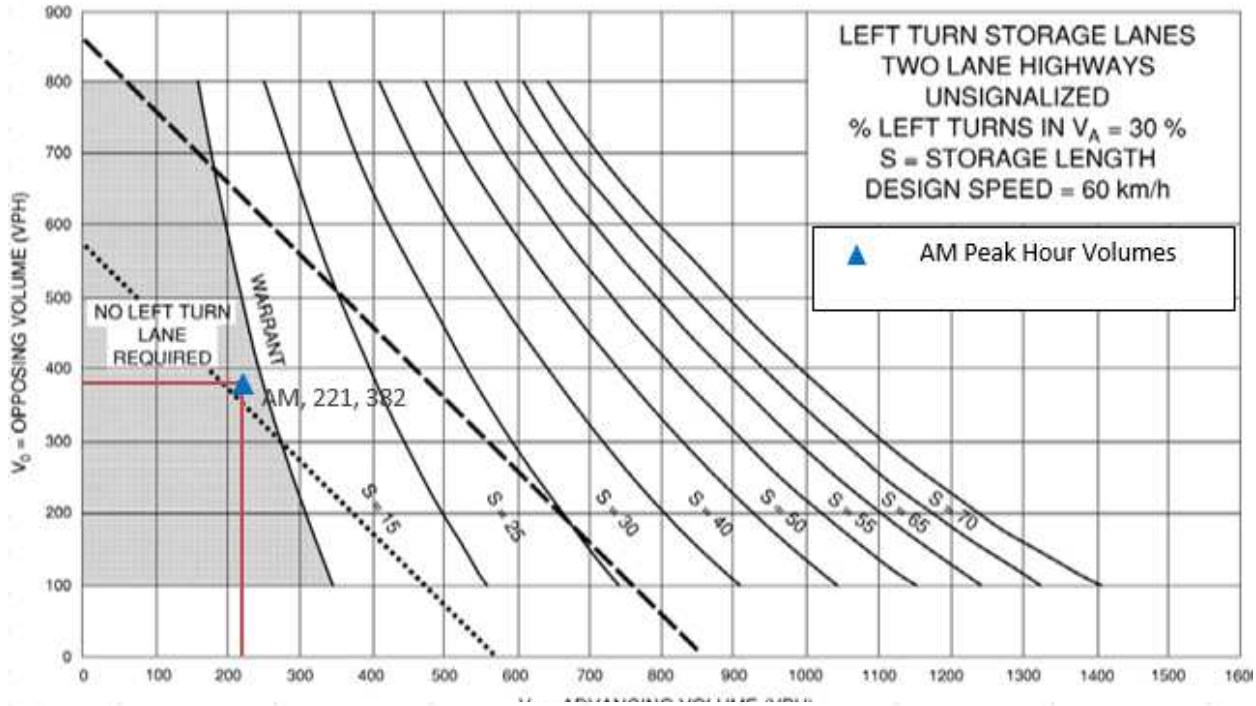


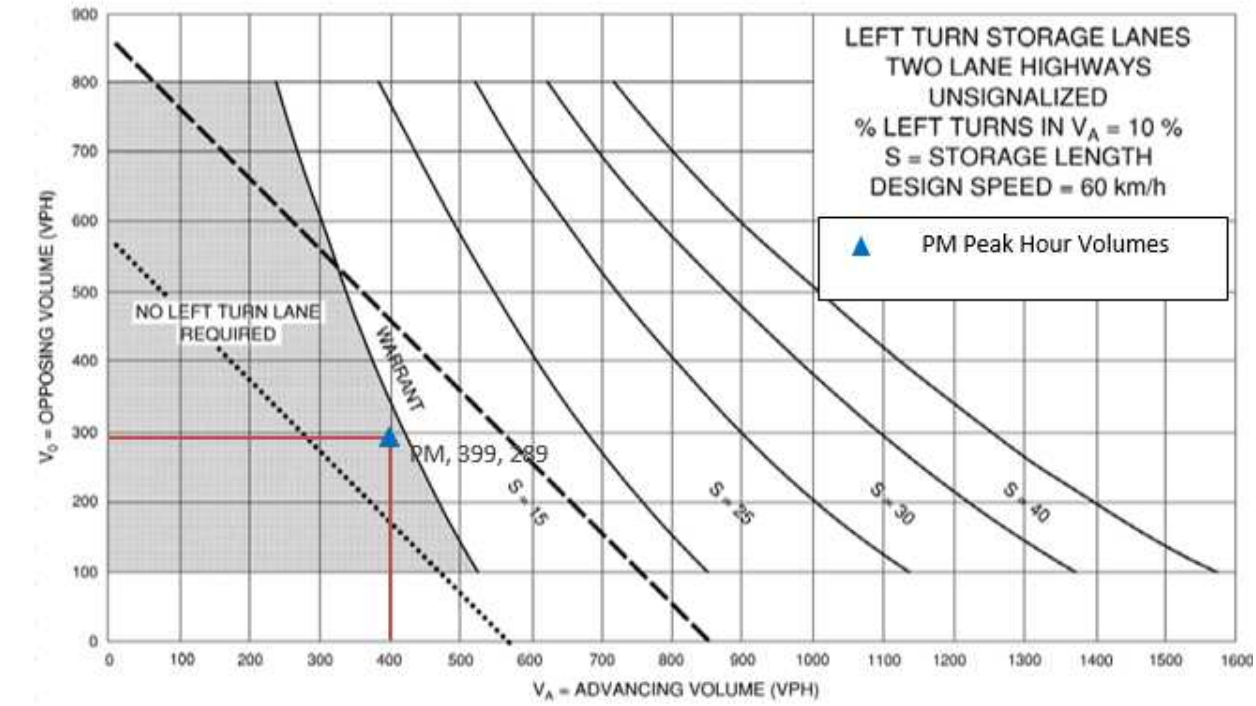


LEFT TURN WARRANT MTO DESIGN SUPPLEMENT

Intersection	Left-Turn Warrant	Advancing Traffic Volume (V_A)		Opposing Traffic Volume (V_O)		Left Turn Traffic Volume (V_L)		% of Left Turning Traffic		Warrant
		AM	PM	AM	PM	AM	PM	AM	PM	
Mer-Bleue-School Site entrances	SBL	221	399	382	289	69	40	31%	10%	No

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM		313	69	69	152					40		40
PM		249	40	**40**	359					69		69

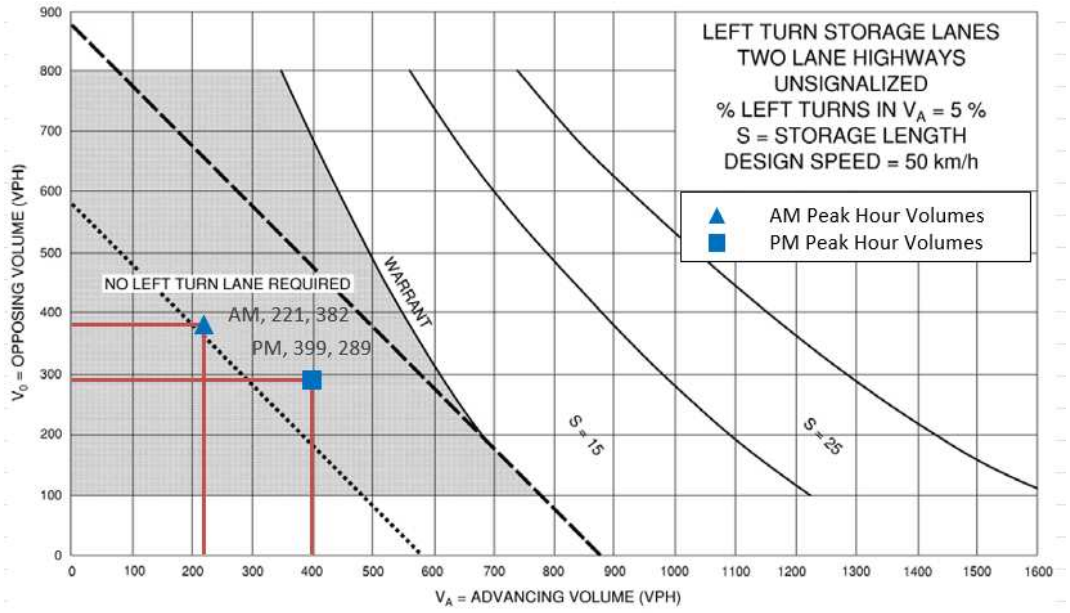


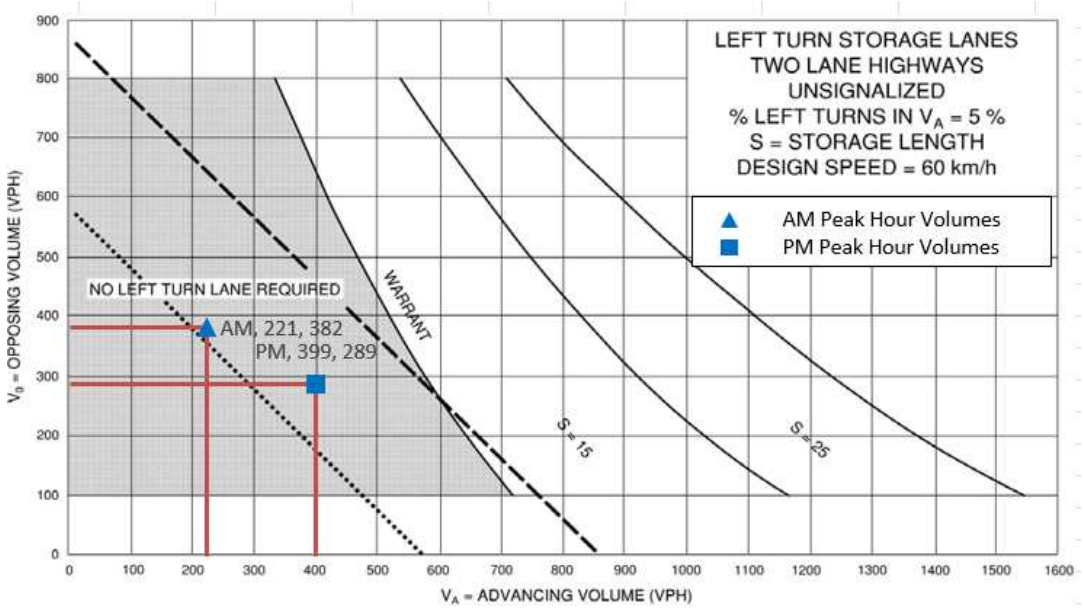


LEFT TURN WARRANT INTERIM SCHOOL-BUS-EXCLUSIVE MTO DESIGN SUPPLEMENT

Intersection	Left-Turn Warrant	Advancing Traffic Volume (V_A)		Opposing Traffic Volume (V_O)		Left Turn Traffic Volume (V_L)		% of Left Turning Traffic		Warrant
		AM	PM	AM	PM	AM	PM	AM	PM	
Mer-Bleue-School Bus Exclusive- Interim	SBL	221	399	382	289	11	11	5%	3%	No

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM		371	11	11	210							11
PM		278	11	11	388							11





Appendix I

City Data

MER BLEUE ROAD WIDENING
COPPERHEAD STREET / DECOEUR DRIVE TO RENAUD STREET

PROTECTED INTERSECTIONS GEOMETRY PLAN

Robinson Consultants

Contract No.	Dwg. No.
Sheet of	
Asset No.	
Asset Group	
Des. RG	Chk'd. ??
Dwn. RG	Chk'd. ??
Utility Circ. No.	Index No.
Const. Inspector	
Scale: HORIZONTAL 0m 5 10	

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

REVISIONS No.	Description	By	Date (dd/mm/yy)
0	ISSUED FOR INTERNAL REVIEW	R.G.	27.08.24
1	FUNCTIONAL DESIGN REV 01 - INTERNAL REVIEW	R.G.	25.10.24
2	FUNCTIONAL DESIGN FINAL	R.G.	5.11.24

Felipe Abello

From: Wei, Tim <Tim.Wei@ottawa.ca>
Sent: January 28, 2025 12:04 PM
To: Felipe Abello
Cc: Lee Jablonski; Gervais, Josiane; Ghile, Daniel; Michèle Gagnon; omar.ben@cepeo.on.ca
Subject: RE: 2405 Mer Bleue - TIS Growth rate
Attachments: 2022_Auto_Volumes_AM_PeakHour.pdf; 2046_Auto_Volumes_AM_PeakHour.pdf

Hi, Abello,

I have attached the TRANS model auto volume plots for both 2022 and 2046. Based on the modeled volumes, the annual growth rate is about 6% for the study area. Please note that our TRANS model has only been calibrated to the Screenline level. If you have any traffic counts, you may make any professional adjustments by comparing the counts with the base year modeled numbers.

Thanks,
Tim

TRANS Regional Model

Version 1.01 - Assigned December, 2024

AM Peak Hour Total Traffic Volume

Mer Bleue

2022 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: Jan, 2025
EMME Scenario: 22002

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

50 100150200250

TRANS Regional Model

Version 1.01 - Assigned December, 2024

AM Peak Hour Total Traffic Volume

Mer Bleue

2046 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: Jan, 2025
EMME Scenario: 46001

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

50 100150200250