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- Commercial & Institutional
- Environmental Restoration

3459 & 3479 St. Joseph Boulevard

Transportation Impact Assessment

Proposed Mid-Rise Apartment Buildings
3459 & 3479 St Joseph Blvd

Transportation Impact Assessment

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

Dated: July 2024

Novatech File: 113020
Ref: R-2023-105

NOVATECH
Engineers, Planners & Landscape Architects

July 19, 2024

City of Ottawa
Planning and Growth Management Department
110 Laurier Ave. W., 4th Floor,
Ottawa, Ontario K1P 1J1

Attention: **Ms. Cass Sclauzero**
Planner

Dear Ms. Cass Sclauzero

Reference: **3459 & 3479 St Joseph Blvd**
Transportation Impact Assessment
Novatech File No. 113020

We are pleased to submit the following Transportation Impact Assessment (TIA), in support of a Site Plan application at 3459 & 3479 St. Joseph Boulevard, for your review and signoff. As the TIA Scoping Report was submitted and approved by the City prior to the City's 2023 TIA Guideline Update, the scoping sections of this report have been reformatted based on updated guideline.

If you have any questions or comments regarding this report, please feel free to contact Brad Byvelds, or the undersigned.

Yours truly,

NOVATECH

Trevor Van Wiechen, M.Eng.
E.I.T. | Transportation

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

TIA Plan Reports

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

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

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

CERTIFICATION

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

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

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Dated at Ottawa (City) this 19 day of July, 2024 .

Name: Brad Byvelds
(Please Print)

Professional Title: P. Eng. - Project Manager

B. Byvelds

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

Office Contact Information (Please Print)	
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EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared for the property located at 3459 & 3479 St Joseph Boulevard, in support of a Site Plan application. The subject site is currently occupied by one single-family home and a RV storage parking lot and is currently served by two driveways to St Joseph Boulevard.

The subject site is surrounded by the following:

- Existing residential development in the east;
- Ottawa Regional Road 174 (OR174, Queensway) and its on-ramp in the north and west; and,
- St. Joseph Boulevard and residential development in the south.

The proposed development is consistent with the previously proposed development and will contain 326 apartment units. There are two proposed driveways, one to St. Joseph Boulevard and one to the OR174 eastbound on-ramp. The connection to the on-ramp will be right-in, right-out, left-out, while the connection to St. Joseph Boulevard will be full movement. Modifications will be required to the OR 174 Eastbound On-Ramp to accommodate two-way traffic from the site driveway connection to St. Joseph Boulevard. Construction of the proposed development is anticipated in 2024.

The City of Ottawa's Official Plan locates the subject site within the Suburban (east) Transect, with a 'Neighbourhood' designation on Schedule B8. The subject site is also located within the Orléans Corridor Secondary Plan.

The conclusions and recommendations of this TIA can be summarized as follows:

Forecasting

- The proposed development is anticipated to generate 128 person trips during the AM peak hour (including 81 vehicle trips) and 131 person trips during the PM peak hour (including 84 vehicle trips) using the *2020 TRANS Trip Generation Manual*. This is 88 person trips less during the AM peak hour and 144 person trips less during the PM peak hour than what was estimated in the 2022 TIA.

Access Design

- The proposed accesses adhere to all provisions of the City's Private Approach By-law.
- The proposed accesses meet the intersection sight distance (ISD) and stopping sight distance (SSD) requirements set by the Transportation Association of Canada (TAC).
- Approximately 40m of clear throat are provided at the St. Joseph Boulevard and the OR174 EB on-ramp, meeting the TAC requirement.
- Based on 2027 total volumes an eastbound left turn lane or a westbound right turn lane is not required at the St. Joseph Boulevard access.

Development Design

- New pedestrian sidewalks will be provided on-site, connecting the main building entrances to parking areas as well as to existing sidewalks on St. Joseph Boulevard. A new sidewalk

will be provided on the east side of the OR174 on-ramp between the access and St. Joseph Boulevard. A new 3m Multi-Use Pathway (MUP) will also be provided on the south side of the east-west drive aisle. The main north-south drive aisle east of Building D will function as a shared vehicle/bicycle connection to St. Joseph Boulevard. Sidewalks will be continuous across the St. Joseph Boulevard access in accordance with City standards. As pedestrians are not permitted north of the OR174 access, the sidewalk will not be continuous through the access.

- Bicycle parking for the development will be in accordance with the City's *Zoning By-Law* (ZBL). A total of 86 bicycle parking spaces will be provided in the underground parking garage, 18 exterior spaces will be provided between buildings A and B, 19 will be provided within the island south of Building A, 17 will be provided north of Building C, and 26 will be provided to the east of Building D.

- All bus stops are within the vicinity of the subject site. These stops are served by Routes 33, 39, 236, and 639.

- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.

- The fire route for Building C is provided along the east-west drive aisle within the site and the fire route for Building D is provided along the north-south drive aisle within the site. The fire route for Buildings A and B is provided in the loop to the north of the east-west drive aisle.

- Five garbage rooms are provided throughout both levels of the underground parking garage to gather garbage. Additionally, in-ground earth bins located to the north of Building C. Garbage collection activities will occur along the main drive aisles on-site.

Parking

- The proposed number of vehicle parking spaces (441) and bicycle parking spaces (166) meet the minimum requirements outlined in the City's *Zoning By-Law*.

Boundary Streets

- St. Joseph Boulevard meets the target TkLOS but does not meet the target PLOS and BLOS.

- The OR 174 Eastbound On-Ramp meets the target TkLOS but does not meet the target PLOS and BLOS.

- There are no sidewalks currently provided along the OR 174 Eastbound On-Ramp. As part of the roadway modifications to convert the ramp to two-way traffic between St. Joseph Boulevard and the proposed access, a 2.0m sidewalk and 2.0m boulevard will be provided on the east side of the roadway. The proposed sidewalk will achieve a PLOS B.

- There are currently no cycling facilities provided along the OR 174 Eastbound On-Ramp. As cycling is not permitted on the ramp currently, and the site proposes a direct shared vehicle/cyclist connection to St. Joseph Boulevard, no cycling facility is proposed on the OR 174 Eastbound On-Ramp.

Transportation Demand Management

- The proponent has agreed to implement the following Transportation Demand Management measures within the proposed development:

    - Display local area maps with walking/cycling access routes and key destinations at major entrances;
    - Display relevant transit schedules and route maps at entrances;
    - Unbundle parking from monthly rent; and
    - Provide multimodal travel information package to new residents.

Based on the foregoing, the proposed development is recommended from a transportation perspective.

1.0 SCREENING

1.1 Introduction

This Transportation Impact Assessment (TIA) has been prepared for the property located at 3459 & 3479 St Joseph Boulevard, in support of a Site Plan application. The subject site is currently occupied by one single-family home and a RV storage parking lot and is currently served by two driveways to St Joseph Boulevard.

The subject site is surrounded by the following:

- Existing residential development in the east;
- Ottawa Regional Road 174 (OR174, Queensway) and its on-ramp in the north and west; and,
- St. Joseph Boulevard and residential development in the south.

An aerial of the vicinity around the subject site is provided in **Figure 1**.

Figure 1: View of the Subject Site

1.2 Proposed Development

A TIA dated July 2022 was prepared in support of a Zoning By-law Amendment application for the subject property. This application proposed 326 apartment units with access on both St. Joseph Boulevard and the OR174 eastbound on-ramp.

The proposed development is consistent with the previously proposed development and will contain 326 apartment units. There are two proposed driveways, one to St. Joseph Boulevard and one to the OR174 eastbound on-ramp. The connection to the on-ramp will be right-in, right-out, left-out, while the connection to St. Joseph Boulevard will be full movement. Modifications will be required to the OR 174 Eastbound On-Ramp to accommodate two-way traffic from the site driveway connection to St. Joseph Boulevard. The proposed site plan is included in **Appendix A**. Construction of the proposed development is anticipated in 2024.

The City of Ottawa's Official Plan locates the subject site within the Suburban (east) Transect, with a 'Neighbourhood' designation on Schedule B8. The subject site is also located within the Orléans Corridor Secondary Plan.

A copy of the site plan is included in **Appendix A**.

1.3 Screening Form

The City's *2017 TIA Guidelines* identify three triggers for completing a TIA report, including trip generation, location, and safety. The criteria for each trigger are outlined in the City's TIA Screening Form, which is included in **Appendix B**. The trigger results are as follows:

- Trip Generation Trigger – The development is not expected to generate a net additional 60 peak hour person trips compared to previously completed TIA; further assessment is **not required** based on this trigger.
- Location Triggers – The development proposes a connection to St. Joseph Boulevard which is in the City's Cross-Town Bikeway; further assessment **is required** based on this trigger.
- Safety Triggers – The proposed driveway to St. Joseph Boulevard is within the right turning lane for the OR174 eastbound on-ramp intersection and uses the existing median break on St. Joseph Boulevard; further assessment **is required** based on this trigger.

2.0 SCOPING

2.1 Existing Conditions

2.1.1 Roadways

Ottawa Regional Road 174 (OR174, Queensway) is a four-lane divided City freeway and is classified as a truck route, allowing full loads. It runs east-west and has a posted speed limit of 100km/h in the vicinity of the subject site. The westbound on-ramps and off-ramp connect to Tenth Line Road and the eastbound on-ramp and off-ramp connect to St. Joseph Boulevard to the west of the site. The OR174 EB on-ramp immediately to the west of the site has an advisory speed of 50km/h. A speed study was recently conducted along the ramp at the location of the proposed access. Results showed a mean speed of 58km/h and an 85th percentile speed of 67km/h, approximately 14% of drivers were in compliance with the 50km/h advisory speed limit. Results from the speed survey can be found in **Appendix C**.

St. Joseph Boulevard is a four-lane divided arterial roadway and is classified as a truck route, allowing full loads. It runs east-west and has a posted speed limit of 60km/h in the vicinity of the site. In this area it has a ROW protection of 37.5m. Based on the existing ROW widening is not required. A speed study was recently conducted along St. Joseph Boulevard along the subject site's frontage to St. Joseph Boulevard. Results showed a mean speed of 65km/h and an 85th percentile speed of 71km/h, approximately 25% of drivers were in compliance with the 60km/h posted speed limit. Results from the speed survey can be found in **Appendix C**.

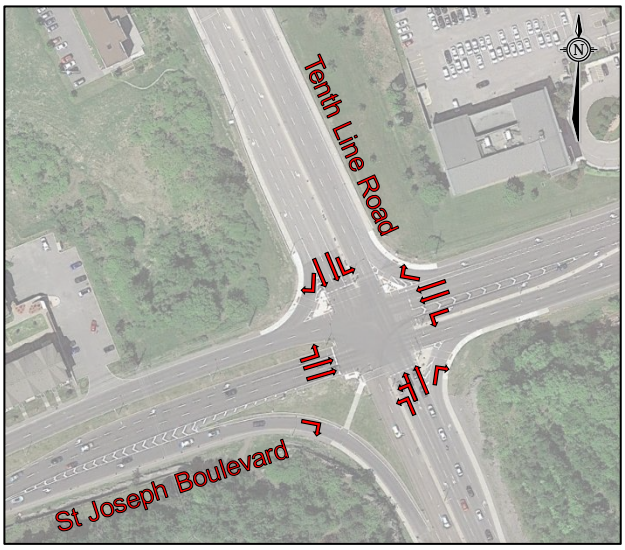
Tenth Line Road is a four-lane divided arterial roadway and is classified as a truck route, allowing full loads. It runs north-south and has a posted speed limit of 60km/h in this area.

Old Tenth Line Road is a three-lane (2 southbound, 1 northbound) arterial roadway and is classified as a truck route, allowing full loads. It runs north-south and has a posted speed limit of 60km/h in this area.

2.1.2 Intersections

St. Joseph Boulevard at Tenth Line Road

- Signalized four-legged intersection.
- Northbound: One left turn lane, one shared left/through lane, one through lane, and one right turn channelized lane.
- Southbound: One left turn lane, two through lanes, and one right turn channelized lane.
- Eastbound: One left turn lane, two through lanes, and one right turn channelized lane.
- Westbound: One left turn lane, two through lanes, and one right turn channelized lane.
- Marked crosswalks at all four approaches.

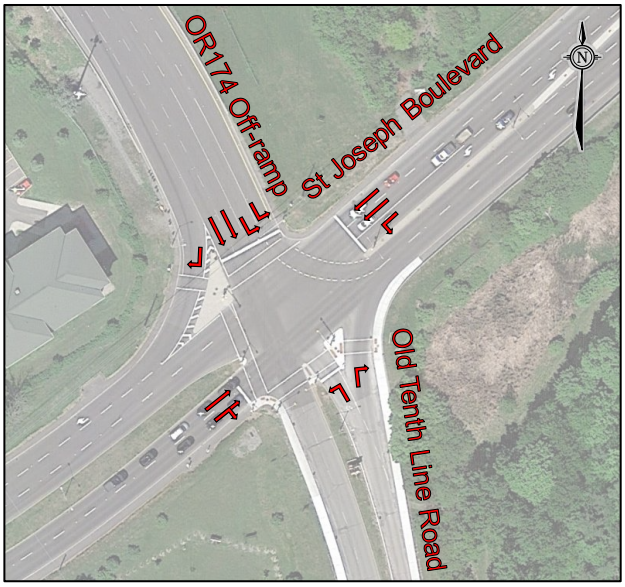


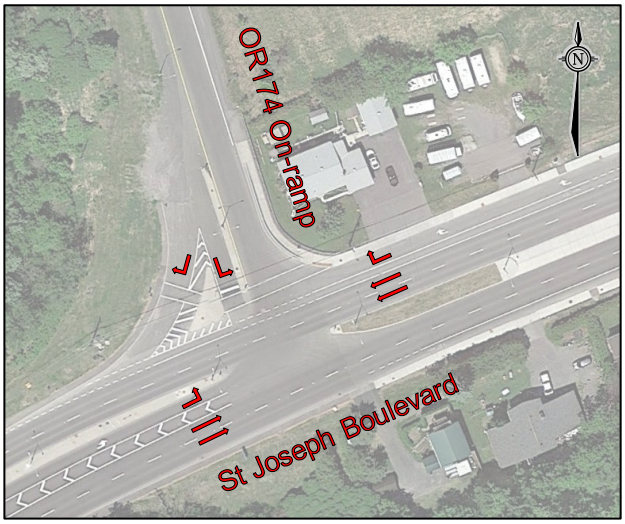
St. Joseph Boulevard at Old Tenth Line Road / OR174 EB Off-ramp

- Signalized four-legged intersection. The north approach is one-way southbound.
- Northbound: One left turn lane and one channelized right turn taper.
- Southbound: Two left turn lanes, two through lanes, and one channelized right turn lane.
- Eastbound: One through lane and one through/right shared lane.
- Westbound: One left turn lane and two through lanes.
- Marked crosswalks at the north, west, and south approaches.

St. Joseph Boulevard at OR174 EB On-ramp

- Unsignalized three-legged intersection (STOP control on the OR174 EB On-ramp).
- Southbound: One left turn lane and one channelized right turn taper.
- Eastbound: One left turn lane and two through lanes.
- Westbound: Two through lanes, one bicycle lane, and one right turn lane.
- Marked crosswalk at the north approach.





2.1.3 Driveways

There is one existing driveway on the west side of the OR174 EB on-ramp for civic #3453. A review of adjacent driveways along St. Joseph Boulevard in this area is provided as follows:

St. Joseph Boulevard, North Side:

- One looped residential driveway for civic #3403
- One residential and one commercial driveway for civic #3459 (site)
- Two residential driveways for civic #3483
- One residential driveway for civic #3489
- Two residential driveways for civic #3513
- Two driveways to Terra-Nova Estates, civic #3535

St. Joseph Boulevard, South Side:

- One residential driveway for civic #3460
- One residential driveway for civic #3464
- One residential driveway for civic #3472
- One residential driveway for civic #3474

2.1.4 Pedestrian and Cycling Facilities

Concrete sidewalks and on-street bicycle lanes are provided along both sides of St. Joseph Boulevard in this area running east of the OR174 EB on-ramp intersection. Asphalt sidewalks on both sides and no dedicated cycling facilities are provided on St. Joseph Boulevard west of the on-ramp intersection.

In the City's Transportation Master Plan Crosstown Bikeway Network, St. Joseph Boulevard is listed as a crosstown bikeway between Trim Road and Jeanne D'Arc Boulevard.

Pedestrians and bicyclists are prohibited along the OR174 EB on-ramp.

2.1.5 Transit

The closest OC Transpo bus stops in the vicinity of the subject site are described in **Table 1** and all bus stops within the vicinity of the study area are shown in **Figure 2**. A summary of various routes which serve the study area is included in **Table 2**. Detailed route information is included in **Appendix D**.

Table 1: OC Transpo Transit Stops

Stop	Location	Routes Serviced
#8761	North side of St. Joseph Boulevard between OR174EB off-ramp and Eric Czapnik Way	33, 236
#8596	Northeast corner of St. Joseph Boulevard and Tenth Line Road	33, 236
#1688	South side of St. Joseph Boulevard east of Taylor Creek Drive	39, 639

Table 2: OC Transpo Route Information

Route	From ↔ To	Frequency
33	Blair ↔ Portobello	15 to 30-minute headways, all-day service with select evening service, Monday to Friday
39	Millennium ↔ Blair/La Cité	30-minute headways, all-day service with select evening service, 7-days per week
236	Esprit ↔ Blair	30-minute headways, peak periods only, Monday to Friday
639	Gisèle ↔ Place d'Orléans	School bus route

Detailed route information is included in **Appendix D**.

Figure 2: OC Transpo Bus Stop Locations

2.1.6 Area Traffic Management

There are no Area Traffic Management (ATM) studies within the study area that have been completed or are currently in progress.

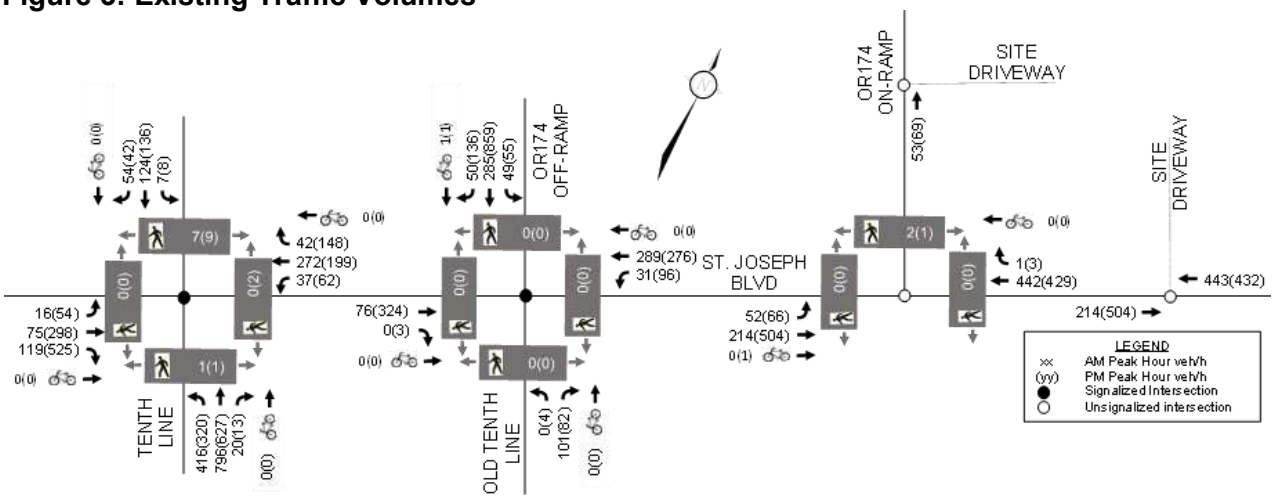
2.1.7 Existing Traffic Volumes

Weekday traffic counts completed by the City of Ottawa were used to determine the existing pedestrian, cyclist, and vehicular traffic volumes at the study area intersections. These counts were completed on the dates listed below:

• St. Joseph Blvd at Tenth Line Rd	March 20, 2018	City of Ottawa
• St. Joseph Blvd at Old Tenth Line Rd	January 25, 2018	City of Ottawa
• St. Joseph Blvd at OR174 EB on-ramp	November 26, 2019	City of Ottawa

Peak hour summary sheets of the traffic counts are included in **Appendix E**. Observed peak hour traffic volumes are shown in **Figure 3.**

Figure 3: Existing Traffic Volumes



2.1.8 Collision Records

Historical collision data from the last five years was obtained from the City's Public Works and Service Department for the study area intersections and road segments between intersections. Copies of the collision summary reports are included in **Appendix F**.

The collision data has been evaluated to determine if there are any identifiable collision patterns, defined in the *2017 TIA Guidelines* as 'more than six collisions in five years' for any one movement. The number of collisions at each intersection from January 1, 2017 to December 31, 2021 is summarized in **Table 3**.

Table 3: Reported Collisions

Location	Impact Types						Total
	Approach	Angle	Rear End	Sideswipe	Turning Mvmt	SMV[1]/ Other	
Old Tenth Line Road/OR174 Off-Ramp/St. Joseph Boulevard	-	10	6	1	4	9	**30**
St. Joseph Boulevard/Tenth Line Road	1	10	40	11	4	4	**70**
St. Joseph Boulevard/OR174 On-Ramp	-	-	-	-	-	-	**0**

1. SMV = Single Motor Vehicle

Old Tenth Line Road/OR174 Off-Ramp/St. Joseph Boulevard

A total of 30 collisions were reported at this intersection over the last five years, of which there was ten angle impacts, six rear-end impacts, one sideswipe impacts, four turning movement impacts, and nine single vehicle/other impacts. Five collisions resulted in injuries, but none caused fatalities. None of the collisions involved cyclists or pedestrians.

Of the 30 collisions at this location, two of them occurred during rain conditions, 11 of them occurred during snow conditions, and one occurred during freezing rain conditions, for all other collisions weather was not a factor. Additionally, of the 30 collisions, 21 of them occurred during daylight hours.

Of the ten angle collisions, six involved southbound and eastbound vehicles, two involved northbound and eastbound vehicles, and two involved westbound and southbound vehicles. Angle collisions at this location could be due to the high number of travel lanes and the intersecting roads not meeting at a 90-degree perpendicular angle.

Of the six rear end collisions, two involved southbound vehicles, two involved eastbound vehicles, and two involved westbound vehicles.

Of the nine single motor vehicle or other collisions, three involved northbound vehicles, four involved southbound vehicles, and two involved eastbound vehicles.

Calculations of the intersection collision rate per Million Entering Vehicles (MEV) for all collision types across the five-year study period showed an intersection collision rate of 0.99/MEV. Based on this analysis, Old Tenth Line Road/OR174 Off-Ramp/St. Joseph Boulevard does not experience an abnormally high rate of collisions.

St. Joseph Boulevard/Tenth Line Road

A total of 70 collisions were reported at this intersection over the last five years, of which there was ten angle impacts, 40 rear-end impacts, eleven sideswipe impacts, four turning movement collisions and four single vehicle/other impacts. Eleven collisions resulted in injuries, but none caused fatalities. None of the collisions involved cyclists or pedestrians.

Of the 70 collisions at this location, ten of them occurred during rain conditions, 11 of them occurred during snow conditions, and one occurred during freezing rain conditions, for all other collisions weather was not a factor. Additionally, of the 70 collisions, 46 of them occurred during daylight hours.

Of the ten angle collisions, five involved eastbound and southbound vehicles, two involved eastbound and northbound vehicles, and three involved westbound and northbound vehicles.

Of the 40 rear end collisions, 29 involved northbound vehicles, seven involved eastbound vehicles, and four involved westbound vehicles. Northbound rear end collision patterns at this intersection are anticipated to be attributable to high traffic volumes and the downgrade towards the intersection.

Of the 11 sideswipe impacts, seven involved northbound vehicles, two involved southbound vehicles, one involved eastbound vehicles, and one involved westbound vehicles. Sideswipe collision patterns at this intersection are anticipated to be attributable to the shift from two to four lanes nearing the intersection.

Calculations of the intersection collision rate per Million Entering Vehicles (MEV) for all collision types across the five-year study period showed an intersection collision rate of 1.36/MEV. Based on this analysis, St. Joseph Boulevard/Tenth Line Road does not experience an abnormally high rate of collisions.

St. Joseph Boulevard/OR174 On-Ramp

No collisions were reported at this intersection according to data from the past five years.

2.2 Planned Conditions

2.2.1 Planned Roadway and Transit Projects

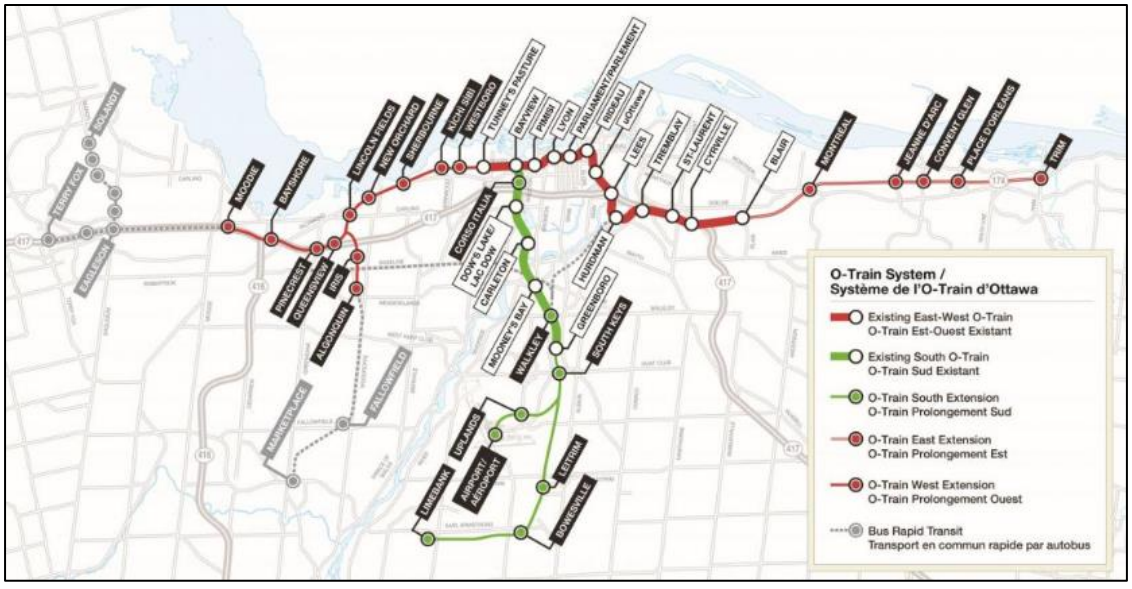
Construction of Phase 2 of the Ottawa LRT has begun, which will extend the LRT further east to the Trim Transit Station, west to the Moodie and Algonquin Transit Stations, and south to Limebank Road and the Macdonald-Cartier International Airport (See **Figure 4**). A new station is proposed about 300m east of Tenth Line Road.

The City's 2013 TMP Rapid Transit and Transit Priority Network identifies transit signal priority and queue jump lanes for Tenth Line Road between Charlemagne Boulevard and OR174 (Affordable and Network Concept).

The City's 2013 TMP identifies Ottawa Road 174 between Highway 417 and Trim Road for road widening (four lanes to six) as well as widening of OR174 between Trim and the City boundary from two lanes to four. The widening is part of the City's 2031 Network Concept and will not be implemented until after 2031.

The City's Orléans Corridor Secondary Plan (passed by City Council in September 2022) includes improvements to the St. Joseph Boulevard corridor. Through the St. Joseph Boulevard Concept Plan area west of Tenth Line Road on Schedule C, the Secondary Plan provides interim and ultimate cross sections which will remove one vehicle travel lane in each direction to provide improved pedestrian and cycling facilities. Schedule C also identifies the implementation of separated cycling facilities along St. Joseph Boulevard between Tenth Line Road and Trim Road.

Figure 4: LRT Phase 2



2.2.2 Other Area Developments

In proximity of the proposed development, there are multiple developments that are approved, or in the approval process. Other developments in the area include:

- Phase 1B of the Orléans Town Centre – A Transportation Brief was prepared (Novatech 2017) that considered the impact of 90 walk-up condominium units within the subdivision.
- 280 Eric Czapnik Way – Two 36-unit apartment buildings (72 units total); no TIA was prepared as the development did not meet the triggers for a TIA.
- 3277 St. Joseph Boulevard - A TIA was prepared (Novatech 2023) that considers the impact of 273 apartment dwelling units.

2.3 Study Area and Time Periods

The study area for this report includes the boundary roadway St. Joseph Boulevard, as well as the following intersections:

- St. Joseph Boulevard at Tenth Line Road;
- St. Joseph Boulevard at Old Tenth Line Road/OR174 EB off-ramp; and
- St. Joseph Boulevard at OR174 EB on-ramp;

Analysis will be completed for the weekday AM and PM peak hours, as this represents the worst-case combination of site generated traffic and adjacent street traffic.

2.4 Development-Generated Traffic

The proposed development includes a total of 326 dwelling units within four six-storey buildings. As the previously completed TIA for the zoning application used trip generation rates from the *2009 TRANS Trip Generation Study* a comparison of the trips generated using the *2009 TRANS Trip Generation Study* and the currently accepted *2020 TRANS Trip Generation Manual* was completed.

2009 TRANS Trip Generation Study
The trips estimated by the previously competed TIA as part of the Zoning application are shown in **Table 4**.

Table 4: Residential Peak Hour Person Trips by Mode

Travel Mode	AM Peak (pph)[1]			PM Peak (pph)[1]		
	IN	OUT	TOT	IN	OUT	TOT
TOTAL	**52**	**164**	***216***	**168**	**107**	***275***
Auto Driver	28	91	119	93	60	153
Auto Passenger	10	31	*41*	32	20	52
Transit	11	34	*45*	35	22	*57*
Active Modes	3	8	11	8	5	13

1. pph: person trips per hour

2020 TRANS Trip Generation Manual
Trips generated by the proposed residential development have been estimated using the *2020 TRANS Trip Generation Manual*. The trip generation rates for the residential portion of the development are taken from Table 3 and correspond to Multi-Unit (High Rise). The directional split between inbound and outbound trips are based on the blended splits presented in Table 9 of the report. The estimated trip generation are summarized in **Table 5**.

Table 5: Residential Person Trip Generation

Land Use	Trip Rate	Units/GFA	AM Peak (ppp)[1]			PM Peak (ppp)[1]		
			IN	OUT	TOT	IN	OUT	TOT
High-Rise Residential, Orleans	AM: 0.80 PM: 0.90	326	81	180	*261*	170	123	*293*

1. ppp: person trips per period

The *2020 TRANS Trip Generation Manual* provides modal shares for residential developments within the Orleans Area. The AM and PM modal shares identified in Table 8 of the report have been averaged and rounded to the nearest 5%. A summary of the 2020 TRANS modal shares and the previously proposed modal shares as part of the July 2022 TIA is provided in the following table.

Table 6: 2020 TRANS and July 2022 TIA Modal Share Comparison

Travel Mode	2020 TRANS	July 2022 TIA
Auto Driver	60%	65%
Auto Passenger	10%	20%
Transit	25%	10%
Cyclist	0%	5%
Pedestrian	5%	

Considering the distance to existing transit stops, the previous July 2022 TIA applied a reduction in transit modal share (and associated increase in driver modal share). For the purposes of this study, the modal shares assumed in the previous TIA were carried forward and the 5% shown as active modes in the July 2022 TIA was assigned to pedestrians in order to be consistent with the TRANS Trip Generation Manual.

A breakdown of the projected person trips by modal share is shown in **Table 7**.

Table 7: Residential Peak Period Person Trips by Mode

Travel Mode	Mode Share	AM Peak (ppp)[1]			PM Peak (ppp)[1]		
		IN	OUT	TOT	IN	OUT	TOT
TOTAL		**81**	**180**	**261**	**170**	**123**	**293**
Auto Driver	65%	53	117	*170*	110	80	*190*
Auto Passenger	20%	16	36	*52*	34	25	*59*
Transit	10%	8	18	*26*	17	12	*29*
Cyclist	0%	0	0	*0*	0	0	*0*
Pedestrian	5%	4	9	*13*	9	6	*15*

1. ppp: person trips per period

Table 4 of the *2020 TRANS Trip Generation Manual* includes adjustment factors to convert the estimated number of trips generated for each mode from peak period to peak hour. A breakdown of the peak hour trips by mode is shown in **Table 8**.

Table 8: Residential Peak Hour Person Trips by Mode

Travel Mode	Adjustment Factor		AM Peak (pph)[1]			PM Peak (pph)[1]		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
TOTAL			**40**	**88**	**128**	**76**	**55**	**131**
Auto Driver	0.48	0.44	25	56	81	49	35	84
Auto Passenger	0.48	0.44	8	17	25	15	11	26
Transit	0.55	0.47	5	10	15	8	6	14
Cyclist	0.58	0.48	0	0	0	0	0	0
Pedestrian	0.58	0.52	2	5	7	4	3	7

1. pph: person trips per hour

Trip Generation Comparison

A comparison of the net person trips calculated using the two trip generation methods by modal share is shown in **Table 9**.

Table 9: Person Trip Generation Comparison

Travel Mode	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
2009 TRANS Trip Generation Study						
Auto Driver	28	91	*119*	93	60	*153*
Auto Passenger	10	31	*41*	32	20	*52*
Transit	11	34	*45*	35	22	*57*
Active Modes	3	8	*11*	8	5	*13*
Total	**52**	**164**	***216***	**168**	**107**	***275***
2020 TRANS Trip Generation Manual						
Auto Driver	25	56	*81*	49	35	*84*
Auto Passenger	8	17	*25*	15	11	*26*
Transit	5	10	*15*	8	6	*14*
Active Modes	2	5	*7*	4	3	*7*
Total	**40**	**88**	***128***	**76**	**55**	***131***
Difference in Trips						
Auto Driver	-3	-35	*-38*	-44	-25	*-69*
Auto Passenger	-2	-14	*-16*	-17	-9	*-26*
Transit	-6	-24	*-30*	-27	-16	*-43*
Active Modes	-1	-3	*-4*	-4	-2	*-6*
Total	**-12**	**-76**	***-88***	**-92**	**-52**	***-144***

From the previous table, the 2020 TRANS Trip Generation methodology results in a reduction of 88 person trips (38 vehicle trips during the AM peak hour and 144 person trips (69 vehicle trips) during the PM peak hour compared to the 2009 TRANS Trip Generation methodology. As described in Section 1.3 the development proposes no additional units and current trip generation methods show no increase in generated trips so the Trip Generation Trigger is not met. The analysis presented in the July 2022 TIA is considered a conservative representation of intersection operations following the development.

2.5 Trip Distribution

As described in the July 2022 TIA, the overall distribution of trips generated by the development has been estimated (see below) based on the observed volumes along the study area roadways, the major road network, and logical routing assumptions:

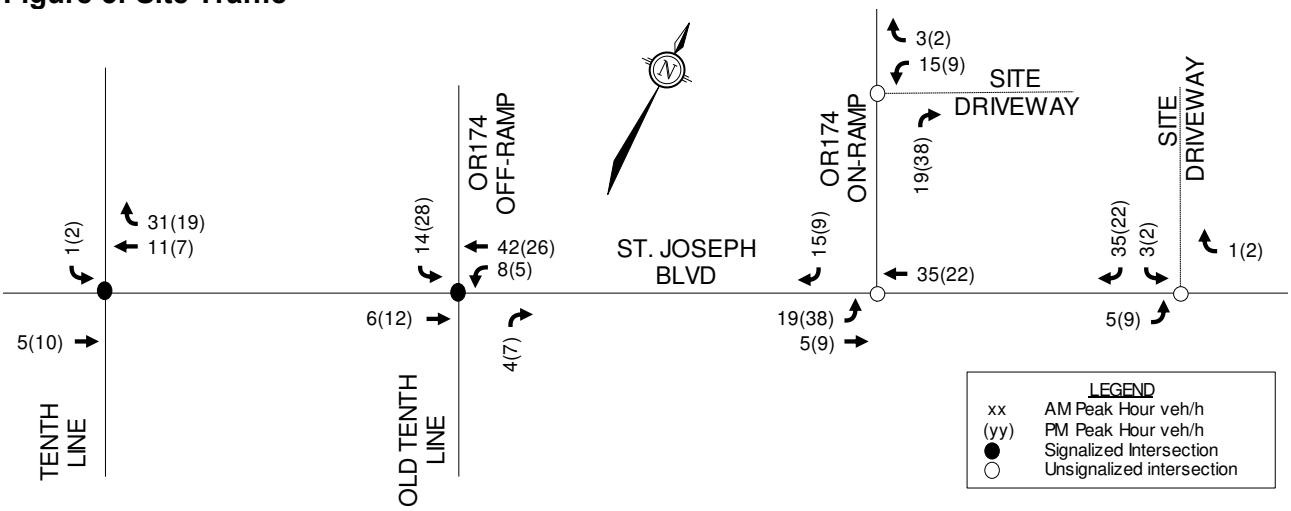
- 55% to/from the west via OR174
- 20% to/from the west via St. Joseph Boulevard
- 15% to/from the south via Old Tenth Line Road
- 5% to/from the east via OR174
- 5% to/from the east via St. Joseph Boulevard

The assignment of site generated trips has applied the following assumptions:

- 80% of the inbound trips from the west or south will use the on-ramp driveway with the remainder using the St Joseph driveway; and,
- 30% of the outbound trips to the west or south will use the on-ramp driveway with the remainder using the St Joseph driveway.

Traffic generated by the site based on the 2020 TRANS Trip Generation methodology is summarized in **Figure 5**.

Figure 5: Site Traffic



2.6 Access Design

The site will be served by two connections, one to St. Joseph Boulevard and one to the OR174 EB on-ramp. The connection to the on-ramp will be right-in, right-out, left-out, while the connection to St. Joseph Boulevard will be full movement. Modifications will be required to the OR174 EB on-ramp to accommodate two-way traffic from the site driveway connection to St. Joseph Boulevard.

A functional design of the proposed roadway modifications is provided in **Appendix G**. A Roadway Modification Approval letter will be provided under a separate cover.

The access configurations with respect to design guidelines and requirements of the City's Private Approach By-law are summarized below:

- Section 25 (c) of the *Private Approach By-Law* identifies that no private approach intended for two-way vehicular traffic shall exceed 9m in width measured at the property line. The St. Joseph Boulevard access measures 7.4m at the property line and the OR 174 Eastbound On-Ramp access measure 6.7m at the property line.

- Section 25 (m) of the *Private Approach By-Law* identifies spacing between driveways and streets for properties abutting arterial and major collector roads. For residential sites with over 300 parking spaces, this spacing is 60m.
    - The connection to St. Joseph Boulevard is about 85m from the OR174 EB on-ramp, meeting this requirement.
    - The connection to the OR174 EB on-ramp is about 100m from St. Joseph Boulevard, meeting this requirement.

- Section 25 (p) of the PABL identifies a minimum separation requirement of 3.0m between the edge of any private approach and the nearest property line, as measured at the street line. This requirement is met by all proposed accesses.

- Section 25 (u) of the PABL identifies a requirement that any private approach serving parking area with more than 50 parking spaces shall not have a grade exceeding 2% for the first 9m inside the property line. The grading of all proposed accesses conform to this requirement.

- The Transportation Association of Canada (TAC) outlines minimum clear throat lengths for driveways based on the land use, development size, and type of roadway. For this site, the clear throat requirement for a two-way driveway to an arterial is 40m. Approximately 40m of clear throat are provided at the St. Joseph Boulevard and the OR174 EB on-ramp, meeting the requirement.

- Available sight distance along St. Joseph Boulevard is as follows:
    - The Stopping Sight Distance (SSD) requirement along a 70 km/h design speed roadway is 105m. Available SSD is greater than 200m at the site connection to St. Joseph Boulevard.
    - The Intersection Sight Distance (ISD) requirements on roadways with design speeds of 70km/h for a right turning and left turning vehicle from STOP is 130m and 150m, respectively. As St. Joseph Boulevard does not have any vertical or horizontal curves in proximity of the proposed access, the required turning sight distance is achieved.

- Available sight distance along the OR174 EB on-ramp is as follows:
    - The SSD along a 60 km/h design speed roadway is 85m. Available SSD along the OR174 EB on-ramp meets the SSD requirements.
    - The ISD requirement on roadways with design speeds of 60km/h for a right turning vehicle from STOP is 110m. The available ISD looking left is over 110m and meets the ISD requirement. No traffic is approaching from the north and left turning sight distance (looking right) does not apply.

- Left turn lane warrants were prepared (See **Appendix H**) for the projected 2027 AM and PM peak hourly volumes with added site generated trips at the intersection of St. Joseph Boulevard and the site driveway. Warrants indicate that an eastbound left turn lane along St. Joseph Boulevard for traffic turning into the site is not warranted.

From the TAC Geometric Design Guide a right-turn taper with auxiliary lane is required when the volume of decelerating or accelerating vehicles compared with the through traffic volume causes undue hazard. Generally, a right turn lane should be considered if the volumes of right turning vehicles exceed 60vph or if the right turn volumes are larger than 10% of the adjacent through

volumes. Based on the 2027 total traffic projections, approximately two vehicles in the AM peak and five vehicles in the PM peak are anticipated to turn westbound right into the St. Joseph Boulevard access. This equates to less than 1% of the adjacent through traffic during peak hours. Due to the low volume of right turning vehicles, extension of the existing right turn lane is not recommended.

2.7 Exemptions Review

This module reviews possible exemptions from the final Transportation Impact Assessment, as outlined in the *2023 TIA Guidelines*. The applicable exemptions for this site are shown in **Table 10**.

Table 10: TIA Exemptions

Module	Element	Exemption Criteria	Status
4.1 Development Design	*4.1.2* Circulation and Access	• Only required for Site Plan and Zoning By-law Applications	Not Exempt
	4.1.3 New Street Networks	• Only required for plans of subdivision	Exempt
4.2 Parking	*4.2.1 Parking Supply*	• Only required for Site Plan and Zoning By-law Applications	Not Exempt
4.6 Neighbourhood Traffic Management	*4.6.1 Adjacent Neighbourhoods*	• If the development meets all of the following criteria along the route(s) site generated traffic is expected to utilize between arterial road and the site's access: 1. Access to a Collector or Local; 2. "Significant sensitive land use presence" exists where there is at least two of the following adjacent to the subject street segment (school, Park, Retirement/Older Adult Facility, Licensed Child Care Centre, Community Centre, or 50% or greater of the property is occupied by residential land uses) 3. Application is for Zoning By-Law Amendment or Draft Plan of Subdivision 4. At least 75 site generated auto trips 5. Site trip infiltration is expected	Exempt
4.7 Transit	*4.7.1* Transit Route Capacity	• Greater than 75 site transit trips	Exempt
	4.7.2 Transit Priority Requirements	• Greater than 75 site auto trips	Exempt
4.8 Network Concept	*All elements*	• Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by the established zoning	Exempt

Module	Element	Exemption Criteria	Status
4.9 Intersection Design	*4.9.1* Intersection Controls	• Greater than 75 site auto trips	Exempt
	4.9.2 Intersection Design	• Greater than 75 site auto trips	Exempt

The following modules will be included in the TIA report:

- Module 4.1: Development Design
- Module 4.2: Parking
- Module 4.3: Boundary Streets
- Module 4.5: Transportation Demand Management

3.0 FORECASTING

3.1 Background Traffic

3.1.1 Other Area Developments

A review of other area development traffic has been conducted, per the developments listed in Section 2.2.2. Traffic generated by these developments have been considered in this analysis and added to the future background traffic volumes, as the development was completed after the most recent available traffic data. Relevant excerpts of the traffic study associated with the development below are included in **Appendix I**.

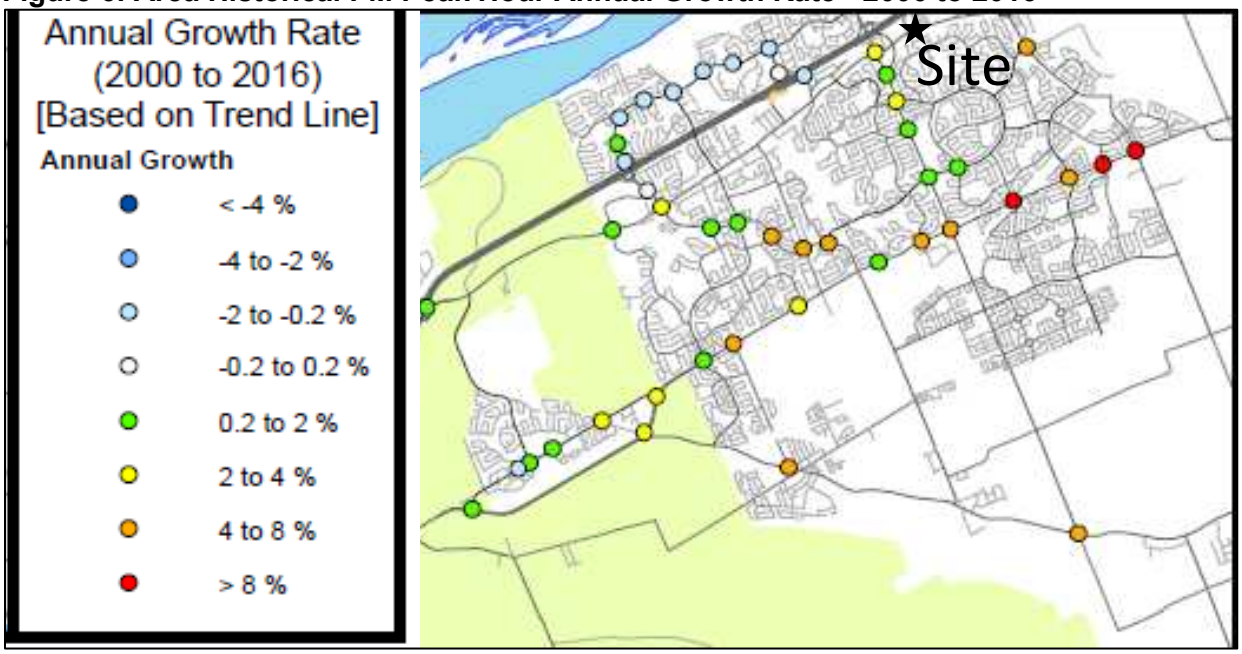
Phase 1B of the Orléans Town Centre
The residential development is expected to generate 35 and 41 vehicle trips during the AM and PM peak hours, respectively. Full build out is expected to be 2024.

3277 St. Joseph Boulevard
The residential development is expected to generate 58 and 60 vehicle trips during the AM and PM peak hours, respectively. Full build out is expected to be 2024.

3.1.2 General Background Growth Rate

The previously completed TIA established a rate of background growth through a review of the City of Ottawa's 2013 TMP and historical growth (2000 to 2016). For the 'Orléans' area of Ottawa, Exhibit 2.10 of the 2013 TMP projects population and employment growth rates of approximately 1.6% and 3.0% per year, respectively. A 3% annual background growth rate has been applied to non-site traffic in this area and is in line with the annual historical (2000 to 2016) growth rate for this area (2% to 4%) identified by the City of Ottawa (See **Figure 6**).

Figure 6: Area Historical PM Peak Hour Annual Growth Rate - 2000 to 2016



3.2 Volume Figures

The volume figures below have been taken from the July 2022 TIA and are considered a conservative representation of traffic within the study area.

- 2022 and 2027 Future Background Traffic are shown in **Figures 7** and **8**.
- 2022 and 2027 Total Traffic are shown in **Figures 9** and **10**.

Figure 7: 2022 Future Background Traffic Volumes

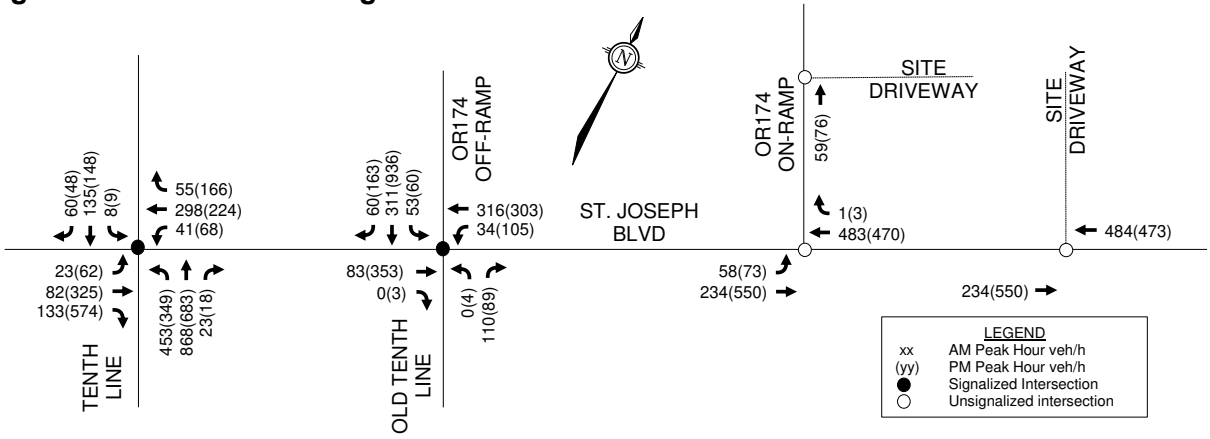


Figure 8: 2027 Future Background Traffic Volumes

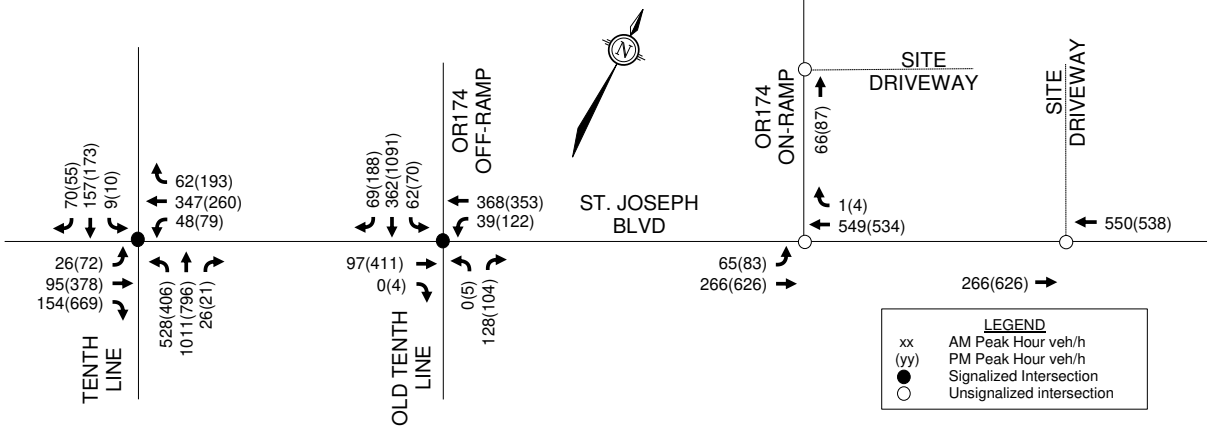


Figure 9: 2022 Total Traffic Volumes

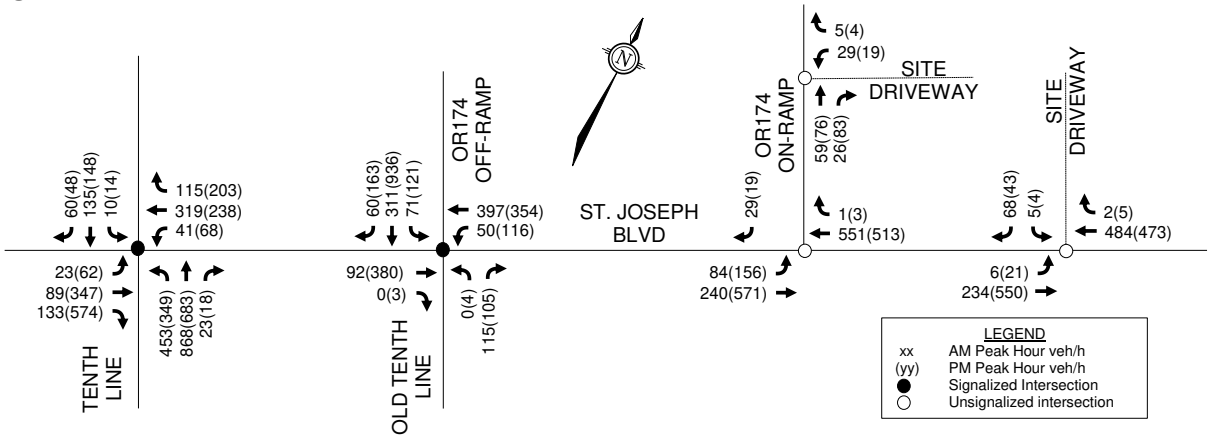
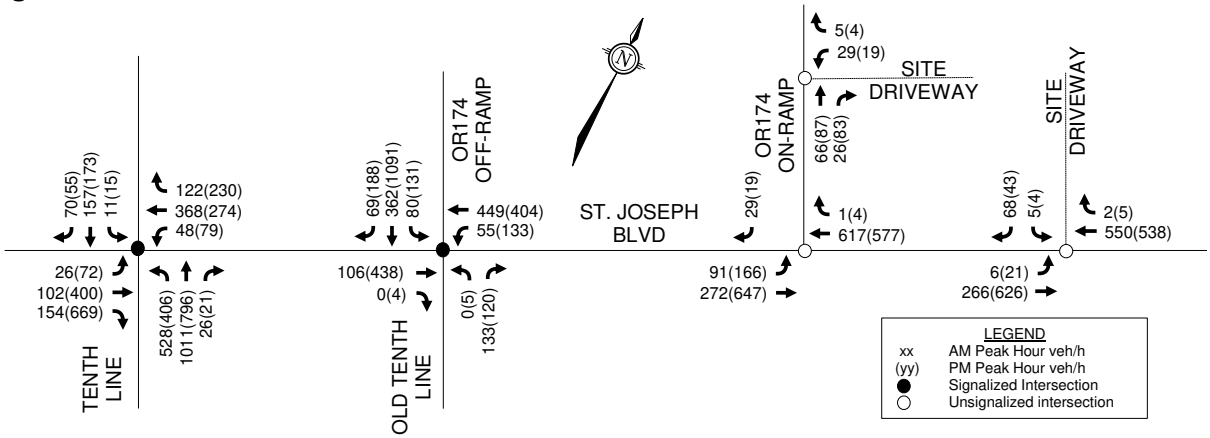


Figure 10: 2027 Total Traffic Volumes



3.3 Demand Rationalization

As the trip generation trigger is not met, a detailed review of intersection operations within the study area is not required. The analysis presented in the July 2022 TIA is considered a conservative representation of intersection operations following the development.

4.0 ANALYSIS

4.1 Development Design

4.1.1 Design for Sustainable Modes

New pedestrian sidewalks will be provided on-site, connecting the main building entrances to parking areas as well as to existing sidewalks on St. Joseph Boulevard. A new sidewalk will be provided on the east side of the OR174 on-ramp between the access and St. Joseph Boulevard. A new 3m Multi-Use Pathway (MUP) will also be provided on the south side of the east-west drive aisle. The main north-south drive aisle east of Building D will function as a shared vehicle/bicycle connection to St. Joseph Boulevard. Sidewalks will be continuous across the St. Joseph Boulevard access in accordance with City standards. As pedestrians are not permitted north of the OR174 access, the sidewalk will not be continuous through the access.

Bicycle parking for the development will be in accordance with the City's *Zoning By-Law* (ZBL). A total of 86 bicycle parking spaces will be provided in the underground parking garage, 18 exterior spaces will be provided between buildings A and B, 19 will be provided within the island south of Building A, 17 will be provided north of Building C, and 26 will be provided to the east of Building D.

All bus stops discussed in Section 2.1.5 (and shown in **Figure 3**) are within the vicinity of the subject site. These stops are served by Routes 33, 39, 236, and 639.

A review of the City's *Transportation Demand Management (TDM)-Supportive Development Design and Infrastructure Checklist* has been conducted. All required TDM-supportive design and infrastructure measures in the TDM checklist are met. A copy of this checklist is included in **Appendix J**.

In order to encourage the use of sustainable modes, the following 'basic' and 'better' design measures from the City's TDM Infrastructure Checklist will be implemented for the proposed redevelopment:

- Building D will be located near the street and have no parking areas between the street and building entrances;
- Building entrances will be located in a way that minimizes walking distances to sidewalks and transit stops/stations;
- Walking routes from the development to nearby transit stops will be safe, direct, and attractive; and
- Walking routes from the development to nearby transit stops will be secure, visible, lighted, shaded, and wind protected whenever possible.

4.1.2 Circulation and Access

The fire route for Building C is provided along the east-west drive aisle within the site and the fire route for Building D is provided along the north-south drive aisle within the site. The fire route for Buildings A and B is provided in the loop to the north of the east-west drive aisle.

Five garbage rooms are provided throughout both levels of the underground parking garage to gather garbage. Additionally, in-ground earth bins will be located to the north of Building C. Garbage collection activities will occur along the main drive aisles on-site.

4.2 Parking

The subject site is located in Area C of Schedule 1 and Schedule 1A of the City's ZBL. Per Section 101(6)(c) where all parking spaces provided or required for a permitted land use are located below grade in the same building as the land use, the parking required may be reduced by the lesser of 10% or 20 parking spaces.

An evaluation of the proposed parking versus the requirements are summarized in **Table 11**.

Table 11: Parking Requirements

Land Use	Rate	Units/GFA	Required	Proposed
Minimum Vehicle Parking Requirements				
Mid-High Rise Apartment	1.2 per dwelling unit for each unit	326	371[1]	371
Mid-High Rise Apartment (visitor parking)	0.2 per dwelling unit for each unit		65	70
		Total	**436[1]**	**441**
Minimum Bicycle Parking Requirements				
Mid-High Rise Apartment	0.5 per dwelling unit	326	163	166
		Total	**163**	**166**

1. required parking spaces reduced by 20 based on ZBL Section 101(6)(c)

Based on the previous table, the proposed number of vehicle and bicycle parking spaces meet the minimum requirements.

4.3 Boundary Street Design

This section provides a review of the boundary streets St. Joseph Boulevard and OR174 EB on-ramp using complete streets principles. The Multi-Modal Level of Service (MMLOS) Guidelines, produced by IBI Group in October 2015, were used to evaluate the levels of service for each alternative mode of transportation on the boundary streets. The subject site is located within a General Urban Area (per Schedule B of the City's previous Official Plan, which is referenced by the MMLOS Guidelines).

A detailed segment MMLOS review of the boundary streets is included in **Appendix K**. A summary of the segment MMLOS analysis is provided below in **Table 12**.

Table 12: Segment MMLOS Summary

Segment	PLOS		BLOS		TLOS		TkLOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target
St. Joseph Boulevard	**D**	C	**E**	C	D	N/A	A	D
OR174 EB on-ramp	F	N/A[1]	F	N/A[1]	-	N/A	B	D

1. Pedestrians and bicyclists are prohibited along the OR174 EB on-ramp.

St. Joseph Boulevard

St. Joseph Boulevard meets the target TkLOS but does not meet the target PLOS and BLOS.

The existing sidewalks along St. Joseph Boulevard achieve a PLOS D. Based on the current traffic volumes (>3000 vehicles AADT) and operating speed of 70km/h, a maximum PLOS D can be achieved. As such, no modifications are recommended.

The existing bike lanes along St. Joseph Boulevard achieve a BLOS E.

Due to the high operating speed, a physically separated bikeway is required to meet the target BLOS. This is consistent with the recommendations of the Orleans Corridor Secondary Plan, which recommends separated cycling facilities along St. Joseph Boulevard between Tenth Line Road and Trim Road. This is identified for the City's consideration.

OR174 EB On-Ramp
The OR 174 Eastbound On-Ramp meets the target TkLOS but does not meet the target PLOS and BLOS.

There are no sidewalks currently provided along the OR 174 Eastbound On-Ramp. As part of the roadway modifications to convert the ramp to two-way traffic between St. Joseph Boulevard and the proposed access, a 2.0m sidewalk and 2.0m boulevard will be provided on the east side of the roadway. The proposed sidewalk will achieve a PLOS B.

There are currently no cycling facilities provided along the OR 174 Eastbound On-Ramp. As cycling is not permitted on the ramp currently, and the site proposes a direct shared vehicle/cyclist connection to St. Joseph Boulevard, no cycling facility is proposed on the OR 174 Eastbound On-Ramp.

4.4 Transportation Demand Management

4.4.1 Context for TDM

The proposed development consists of a total of 326 residential units. The development breakdown is summarized as follows:

- One Bedroom: 172 units
- Two Bedroom: 154 units

4.4.2 Need and Opportunity

The assumed modal shares for the development are generally consistent with the existing modal shares associated with high-rise (3+ storey) residential developments in the Orléans Area district. Due to the distance to existing transit stops, the transit modal share was decreased by and auto modal share was increased. Based on this, the proposed development is anticipated to meet the assumed modal shares.

4.4.3 TDM Program

The proposed development conforms to the City's TDM initiatives by providing easy access to local pedestrian, bicycle, and transit systems as outlined in Section 4.1. A review of the TDM - Measures Checklist has been conducted and is included in **Appendix J**. The following measures will be implemented within the proposed development:

- Display local area maps with walking/cycling access routes and key destinations at major entrances;
- Display relevant transit schedules and route maps at entrances;
- Unbundle parking from monthly rent; and
- Provide multimodal travel information package to new residents.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing, the conclusions and recommendations of this TIA can be summarized as follows:

Forecasting

- The proposed development is anticipated to generate 128 person trips during the AM peak hour (including 81 vehicle trips) and 131 person trips during the PM peak hour (including 84 vehicle trips) using the *2020 TRANS Trip Generation Manual*. This is 88 person trips less during the AM peak hour and 144 person trips less during the PM peak hour than what was estimated in the 2022 TIA.

Access Design

- The proposed accesses adhere to all provisions of the City's Private Approach By-law.
- The proposed accesses meet the intersection sight distance (ISD) and stopping sight distance (SSD) requirements set by the Transportation Association of Canada (TAC).
- Approximately 40m of clear throat are provided at the St. Joseph Boulevard and the OR174 EB on-ramp, meeting the TAC requirement.
- Based on 2027 total volumes an eastbound left turn lane or a westbound right turn lane is not required at the St. Joseph Boulevard access.

Development Design

- New pedestrian sidewalks will be provided on-site, connecting the main building entrances to parking areas as well as to existing sidewalks on St. Joseph Boulevard. A new sidewalk will be provided on the east side of the OR174 on-ramp between the access and St. Joseph Boulevard. A new 3m Multi-Use Pathway (MUP) will also be provided on the south side of the east-west drive aisle. The main north-south drive aisle east of Building D will function as a shared vehicle/bicycle connection to St. Joseph Boulevard. Sidewalks will be continuous across the St. Joseph Boulevard access in accordance with City standards. As pedestrians are not permitted north of the OR174 access, the sidewalk will not be continuous through the access.
- Bicycle parking for the development will be in accordance with the City's *Zoning By-Law* (ZBL). A total of 86 bicycle parking spaces will be provided in the underground parking garage, 18 exterior spaces will be provided between buildings A and B, 19 will be provided within the island south of Building A, 17 will be provided north of Building C, and 26 will be provided to the east of Building D.
- All bus stops are within the vicinity of the subject site. These stops are served by Routes 33, 39, 236, and 639.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- The fire route for Building C is provided along the east-west drive aisle within the site and the fire route for Building D is provided along the north-south drive aisle within the site. The

fire route for Buildings A and B is provided in the loop to the north of the east-west drive aisle.

- Five garbage rooms are provided throughout both levels of the underground parking garage to gather garbage. Additionally, in-ground earth bins located to the north of Building C. Garbage collection activities will occur along the main drive aisles on-site.

Parking

- The proposed number of vehicle parking spaces (441) and bicycle parking spaces (166) meet the minimum requirements outlined in the City's *Zoning By-Law*.

Boundary Streets

- St. Joseph Boulevard meets the target TkLOS but does not meet the target PLOS and BLOS.

- The OR 174 Eastbound On-Ramp meets the target TkLOS but does not meet the target PLOS and BLOS.

- There are no sidewalks currently provided along the OR 174 Eastbound On-Ramp. As part of the roadway modifications to convert the ramp to two-way traffic between St. Joseph Boulevard and the proposed access, a 2.0m sidewalk and 2.0m boulevard will be provided on the east side of the roadway. The proposed sidewalk will achieve a PLOS B.

- There are currently no cycling facilities provided along the OR 174 Eastbound On-Ramp. As cycling is not permitted on the ramp currently, and the site proposes a direct shared vehicle/cyclist connection to St. Joseph Boulevard, no cycling facility is proposed on the OR 174 Eastbound On-Ramp.

Transportation Demand Management

- The proponent has agreed to implement the following Transportation Demand Management measures within the proposed development:

    - Display local area maps with walking/cycling access routes and key destinations at major entrances;
    - Display relevant transit schedules and route maps at entrances;
    - Unbundle parking from monthly rent; and
    - Provide multimodal travel information package to new residents.

Based on the foregoing, the proposed development is recommended from a transportation perspective.

NOVATECH

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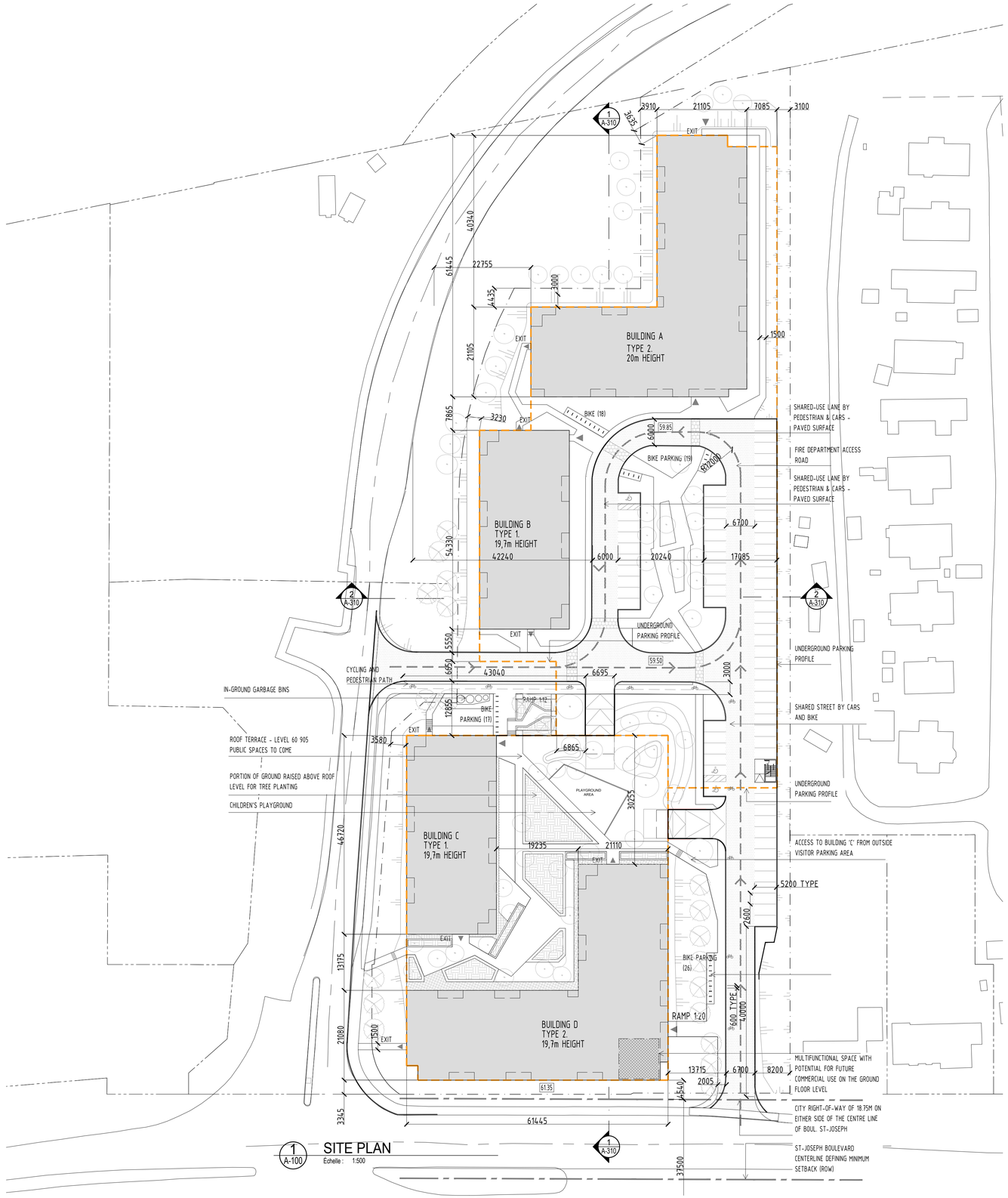
Reviewed by:

Brad Byvelds, P.Eng.
Project Manager | Transportation

APPENDIX A

Site Plan



LÉGEND

- LOT BOUNDARY
- GREEN AREA
- RAISED GREEN AREA
- PARKING PROFILE
- PROPOSED BUILDING
- PAVED GROUND AREA
- MID-BOULEVARD LINE AND PROTECTION ROW
- MID-ACCESS ROAD MEDIAN FIRE SERVICE ACCESS

PROJECT'S STATISTICS

NUMBER OF UNITS

BUILDING A:	103 UNITS
BUILDING B:	60 UNITS
BUILDING C:	60 UNITS
BUILDING D:	103 UNITS
TOTAL:	326 UNITS

UNIT TYPES

1 BEDROOM:	172 UNITS
2 BEDROOMS:	154 UNITS

LOT AREA

% OF GREEN AREA ON SITE:	36.6% (6 533 M2 / 17 813 M2)
% OF BUILT-UP AREA:	32.45% (5 782.8 / 17 813 M2)
GROSS FLOOR AREA :	23 082.35 M2

AMENITY AREAS

OUTDOOR AREA:	920 M2
BALCONY:	1 025.5 M2
INDOOR COMMON AREA (GROUND FLOOR OF BUILDINGS A & D)	178.5 M2
TOTAL:	2 124 M2 (1 956 M2 REQUIRED)

WASTE MANAGEMENT

TRASH ROOMS IN BASEMENT:	110.5 M2
CONTAINER VOLUMES	
GARBAGE: 4 M3 BIN	
PAPER: 4 M3 BIN	
GLASS, METAL, PLASTIC: 3 M3 BINS	
ORGANIC MATTER: 240-LITRE CARTS	

PARKING SPACES

UNDERGROUND SPACES:	371 SPACES (391 REQUIRED - 20 SPACES)
NUMBER OF OUTDOOR SPACES:	70 SPACES (65 REQUIRED)
TOTAL:	441 SPACES

BIKE PARKING

NUMBER OF OUTDOOR SPACES:	80 SPACES
NUMBER OF BASEMENT SPACES:	86 SPACES
TOTAL:	166 SPACES (163 REQUIRED)

APPLICABLE REGULATIONS

ZONING PROVISIONS: GM13(434)H(20)

MINIMUM AREA:	NO MINIMUM
MINIMUM LOT WIDTH:	NO MINIMUM
FRONT YARD SETBACK:	MINIMUM 3 M
INTERIOR SIDE YARD SETBACK:	MINIMUM 3 M
REAR YARD SETBACK:	7.5 M / NO MINIMUM
MINIMUM NUMBER OF STOREYS:	2
MAXIMUM BUILDING HEIGHT:	20 M
MINIMUM LANDSCAPE SPACE WIDTH:	MINIMUM 3 M
RESIDENTIAL PARKING:	1.2 SPACES PER UNIT REQUIRED (AREA C) REDUCED BY 10% OR 20 SPACES, WHICHEVER IS LESS, IF ALL SPACES ARE UNDERGROUND.
VISITOR PARKING: REQUIRED (AREA C)	0.2 SPACES PER UNIT
MIN. DIMENSIONS OF PARKING SPACES:	2.6 M X 5.2 M 2.6 M X 6.7 M (PARALLEL SPACES)
DRIVEWAY FOR UNDERGROUND PARKING:	MAX. 6.7 M / MIN. 6 M
MIN. NUMBER OF BICYCLE PARKING:	0.5 PER DWELLING UNIT
RECREATION AREA:	6 M2 PER DWELLING UNIT

ADDITIONAL PROVISIONS FOR PLANNED UNIT DEVELOPMENT

MIN. PRIVATE ROAD WIDTH:	6 M
MIN. DISTANCE BETWEEN BUILDING AND ROAD:	1.8 M
MIN. SEPARATION BETWEEN BUILDINGS:	3 M

PARKING:
IN ADDITION TO PROVIDING PARKING IN ACCORDANCE WITH ARTICLE 100 OF THIS REGULATION, PARKING IN A PLANNED UNIT DEVELOPMENT MAY BE LOCATED ANYWHERE WITHIN THE DEVELOPMENT, WHETHER THE DEVELOPMENT PARCELS WITHIN THE PLANNED UNIT DEVELOPMENT ARE SEPARATED OR NOT.

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PROJECT
MULTI HOUSING - ORLÉANS
3479 ST. JOSEPH BOULEVARD
OTTAWA, QC

CLIENT
ISABEL CHARBONNEAU
PAUL-ANDRÉ CHARBONNEAU

CONSULTAN

SITE PLAN

SCALE :

REVISIONS

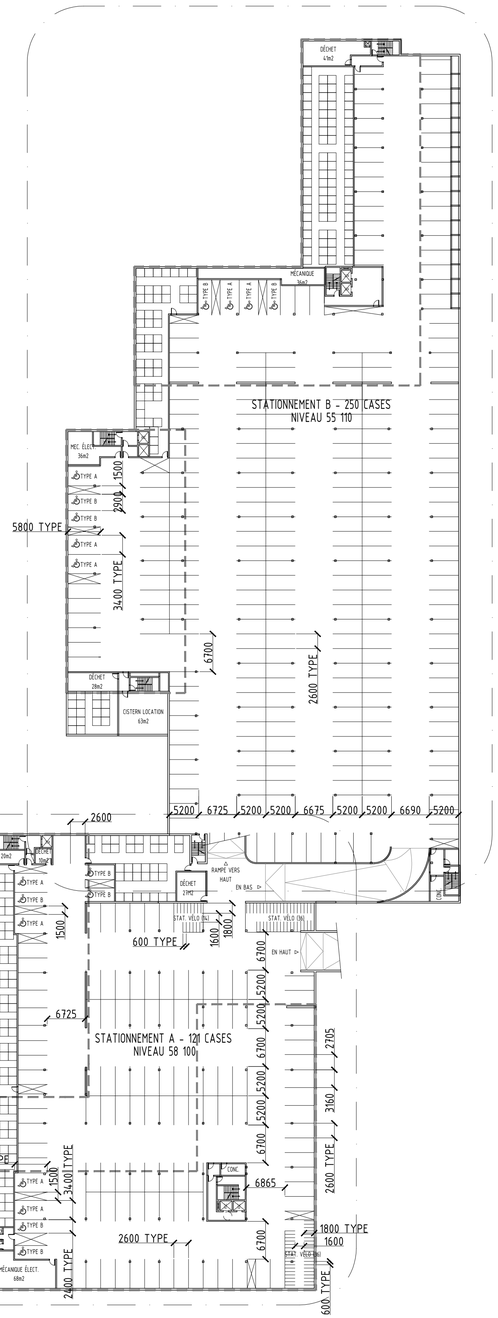
No	DATE	DESCRIPTION
1	2020-05-10	ÉMIS POUR COORDINATION
2	2020-05-26	ÉMIS POUR INFORMATION
3	2020-06-25	ÉMIS POUR INFORMATION
4	2020-06-30	ÉMIS POUR INFORMATION
5	2020-08-16	ÉMIS POUR INFORMATION
6	2022-04-05	ÉMIS POUR INFORMATION
7	**2022-08-26**	**ÉMIS POUR INFORMATION**
8	2022-04-20	ÉMIS POUR INFORMATION
9	2022-07-05	ÉMIS POUR INFORMATION
10	2023-07-06	ÉMIS POUR COORDINATION
11	2023-07-14	ÉMIS POUR COORDINATION
12	2023-12-06	ÉMIS POUR COORDINATION
13	2024-06-26	ÉMIS POUR INFORMATION

SEAL

NOTES
IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL MEASUREMENTS AND DIMENSIONS ON SITE PRIOR TO PROCEEDING WITH THIS WORK.

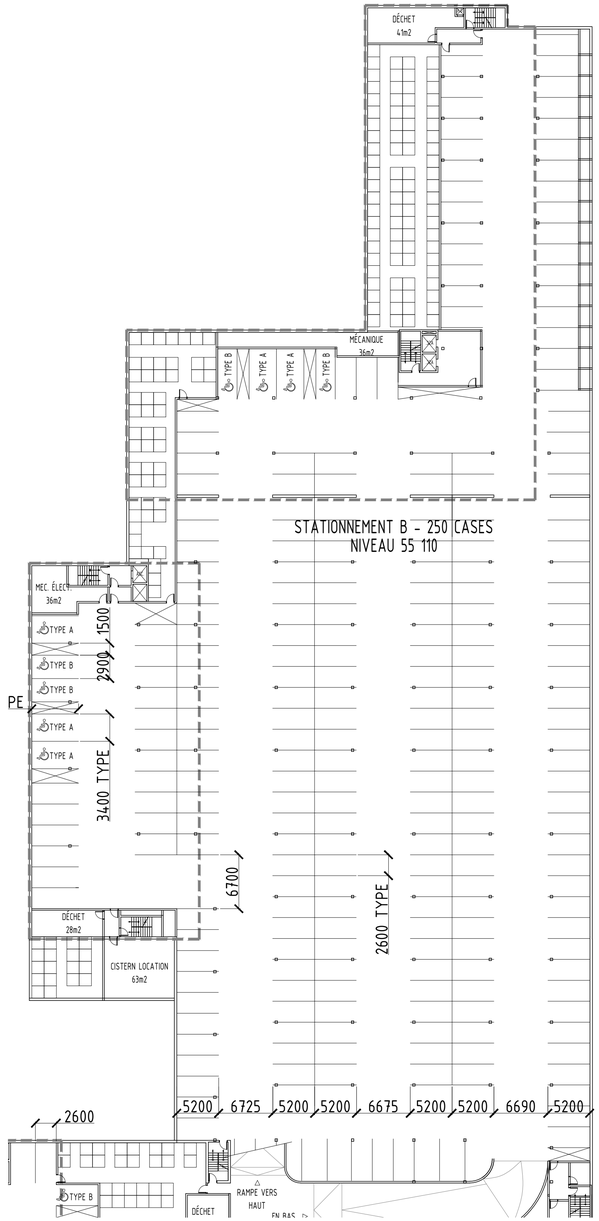
FOLDER 109821B

PAGE A-100



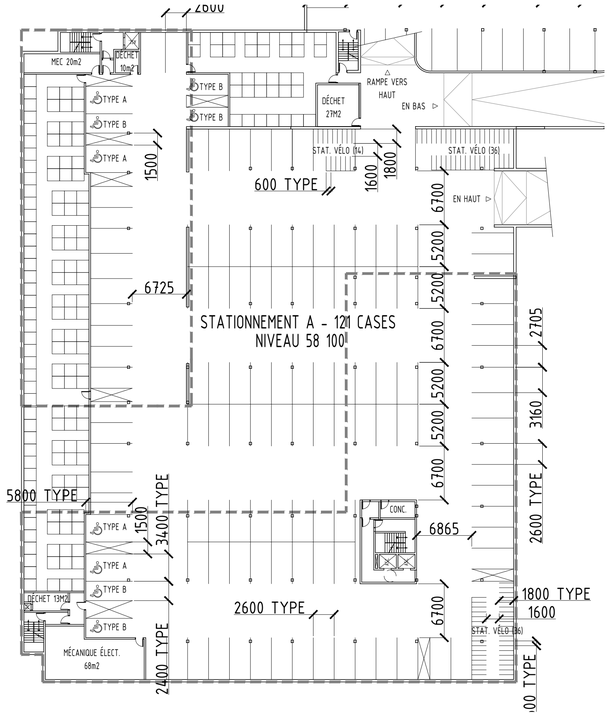
1 A-101 PLAN STATIONNEMENT SOUTERRAIN

Échelle : 1:500



2 A-101 PLAN STATIONNEMENT NORD

Échelle : 1:350



3 A-101 PLAN STATIONNEMENT SUD

Échelle : 1:350

LemayMichaud
111, rue Saint-Pierre, Québec QC G1K 4A6

PROJECT
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3479 ST. JOSEPH BOULEVARD
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CONSULTAN

UNDERGROUND PARKING

SCALE :

REVISIONS

No	DATE	DESCRIPTION
1	2020-05-10	ÉMIS POUR COORDINATION
2	2020-05-26	ÉMIS POUR INFORMATION
3	2020-06-25	ÉMIS POUR INFORMATION
4	2020-06-30	ÉMIS POUR INFORMATION
5	2020-08-16	ÉMIS POUR INFORMATION
6	2022-04-05	ÉMIS POUR INFORMATION
7	2024-06-26	ÉMIS POUR INFORMATION

SEAL

NOTES

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FOLDER NO 109821B

PAGE NO A-101

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines TIA Screening

1. Description of Proposed Development

Municipal Address	3459 & 3479 St. Joseph Boulevard
Description of Location	Northeast of St. Joseph / 174 On-ramp intersection
Land Use Classification	Residential
Development Size (units)	326 Apartment Units
Development Size square metre (m^2)	
Number of Accesses and Locations	1 connection to St. Joseph Blvd and 1 connection to 174 on-ramp
Phase of Development	
Buildout Year	

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 equal to or greater than the sizes identified above, the Trip Generation Trigger is satisfied.

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?	☑	☐
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)?[2]	☐	☑

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 are 80 kilometers per hour (km/h) or greater?	☐	☑
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	☐	☑
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 metre [m] of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	☐	☑
Is the proposed driveway within auxiliary lanes of an intersection?	☑	☐
Does the proposed driveway make use of an existing median break that serves an existing site?	☑	☐

[2] Hubs are identified in Schedules B1 to B8 of the City of Ottawa Official Plan. PMTSAs are identified in Schedule C1 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.

	Yes	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	☐	☑
Does the development include a drive-thru facility?	☐	☑

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

5. Summary

Results of Screening	Yes	No
Does the development satisfy the Trip Generation Trigger?	☐	☑
Does the development satisfy the Location Trigger?	☑	☐
Does the development satisfy the Safety Trigger?	☑	☐

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 C

Speed Study

Spot Speed Survey Histogram

Glossary of Relevant Spot Speed Survey Terms

OR 174 Eastbound on Ramp between St. Joseph Boulevard & OR 174 E/B Lanes

At access to # 3453

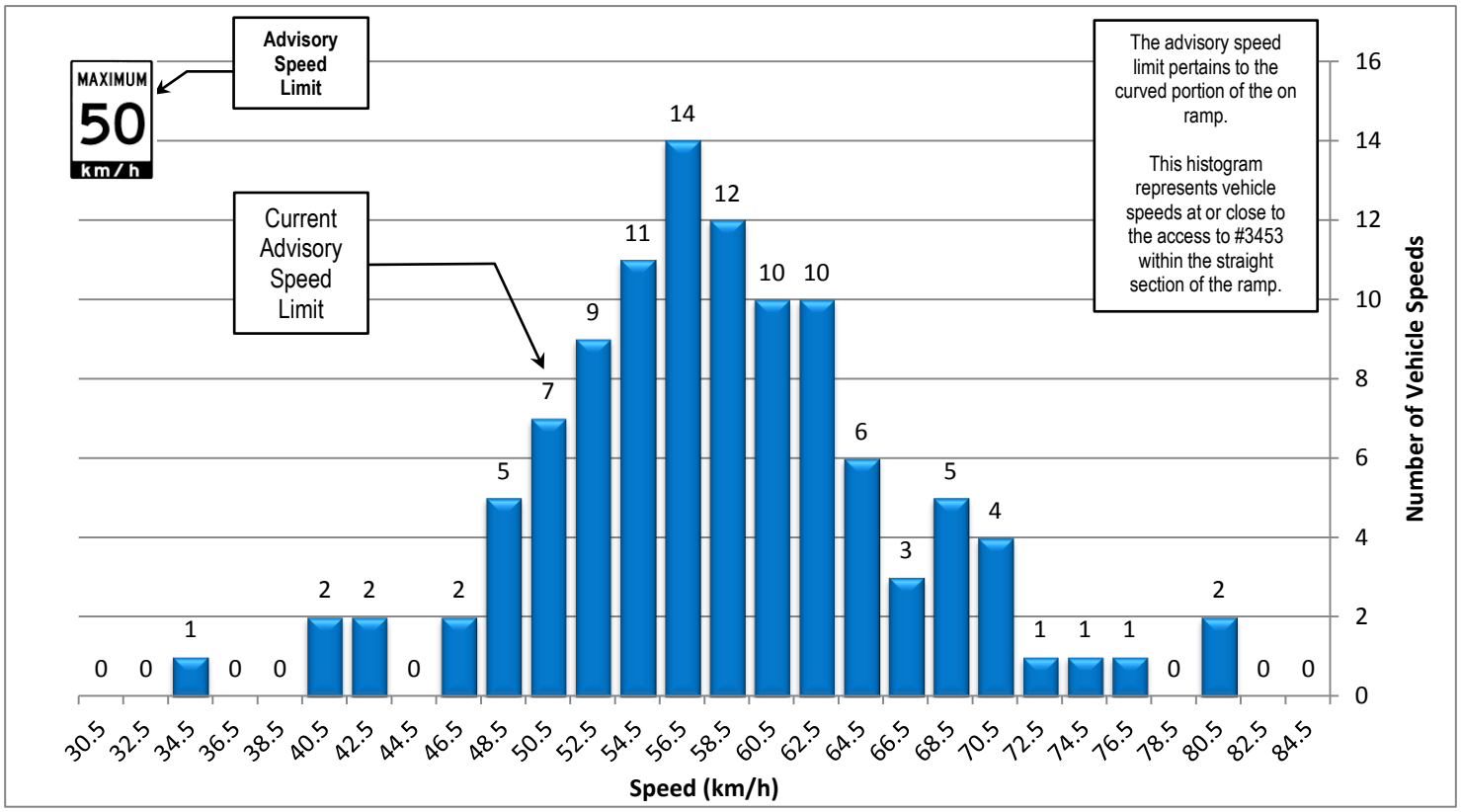
Orléans, ON **Ward: 1** **Orléans, ON**

Friday 26 May 2023 **Road Surface:** Asphalt **Road Condition:** Dry

Weather: Clear and Sunny **Survey Hours:** 0750 - 0920

Notes: The 50 km/h speed limit is the advisory speed for the curved portion of the on ramp.

Spot Speed Survey Histogram - All Vehicles - Combined Directions



Glossary of Relevant Spot Speed Survey Terms

Mean Speed: The average speed, calculated as the sum of all speeds divided by the number of speed observations.

Median Speed The speed that equally divides the distribution of spot speeds; 50 % of observed speeds are higher than the median; 50 % of the observed speeds are lower than the median.

Mode: The number that occurs most frequently in a series of numbers.

Pace Speed: The 16 km/h (typically, 15 km/h) increment in speeds that encompass the highest portion of observed speeds; often, the pace speed range is the mean speed plus/minus 8 km/h.

85th percentile Speed: The speed at or below which 85 % of a sample of free-flowing vehicles is travelling (based on the results of a spot speed survey). The 85th percentile speed is typically used as a baseline for establishing the speed limit.

ACCURATE TRUSTED TRAFFIC DATA

Spot Speed Survey Summary

Including Estimated Driver Compliance and Recommended Speed Limits

OR 174 Eastbound on Ramp between St. Joseph Boulevard & OR 174 E/B Lanes

At access to # 3453

Orléans, ON **Ward: 1** **Orléans, ON**

Friday 26 May 2023 **Road Surface:** Asphalt **Road Condition:** Dry

Weather: Clear and Sunny **Survey Hours:** 0750 - 0920

Notes: The 50 km/h speed limit is the advisory speed for the curved portion of the on ramp.

Spot Speed Survey Summaries for All Vehicle Types

Northbound	
Total Number of All Vehicles	108
Average (Mean) Speed	58 km/h
85th Percentile Speed	67 km/h
95th Percentile Speed	71 km/h
Upper Limit Pace Speed Range	64 km/h
Driver Compliance with Speed Limit	14 %

Speed Limit

50

km/h

N/A	
Total Number of All Vehicles	N/A
Average (Mean) Speed	N/A km/h
85th Percentile Speed	N/A km/h
95th Percentile Speed	N/A km/h
Upper Limit Pace Speed Range	N/A km/h
Driver Compliance with Speed Limit	N/A %

Spot Speed Summary - Combined Both Directions	
Total Number of All Vehicles	108
Average (Mean) Speed	58 km/h
85th Percentile Speed	67 km/h
95th Percentile Speed	71 km/h
Upper Limit Pace Speed Range	64 km/h
Driver Compliance with Speed Limit	14%

Additional Survey Details	
Highest vehicle speed in summary	80 km/h
Slowest vehicle speed in summary	34 km/h
Speed Differential	46 km/h
Fastest Outlier Speed Observed *	80 km/h

* The **FASTEST Outlier** speed observed is **NOT** included in the summary if it is > than the **HIGHEST** vehicle speed in the summary. It is included for information only.

Expressway On or Off Ramp

Heavy Vehicle Spot Speed Survey Summary

Total Number of Heavy Vehicles *	7
Average (Mean) Speed	45 km/h
85th Percentile Speed	52 km/h
Driver Compliance with Speed Limit	71%

Trucks 6 

Buses 0 

School Buses 1 

* N/A if the total number of heavy vehicles < 6.

* If the total number of heavy vehicles is < 30, this value is insufficient for a valid statistical sample.

Estimated Driver Compliance

with an increase or decrease in the posted speed limit.

Current Speed Limit

Speed Limit	Compliance
30 km/h	0%
40 km/h	2%
50 km/h	14%
60 km/h	65%
70 km/h	94%
80 km/h	99%
90 km/h	100%
100 km/h	100%

City of Ottawa Speed Zoning Policy for Urban and Rural Roads (2009)

Based **exclusively** on the results of this spot speed survey and using the criteria set forth in the *City of Ottawa Speed Zoning Policy for Urban and Rural Roads (2009)*, the ideal speed limit for this roadway is:	70 km/h
The lowest speed limit appropriate for this roadway shall not differ from the 85th percentile speed by more than 13 km/h. In this case, the lowest speed limit must not be lower than:	60 km/h

Spot Speed Survey Histogram

Glossary of Relevant Spot Speed Survey Terms

St. Joseph Boulevard between OR 174 Eastbound On Ramp & Second Avenue

At a point approximately 40 m east of OR 174 eastbound on ramp.

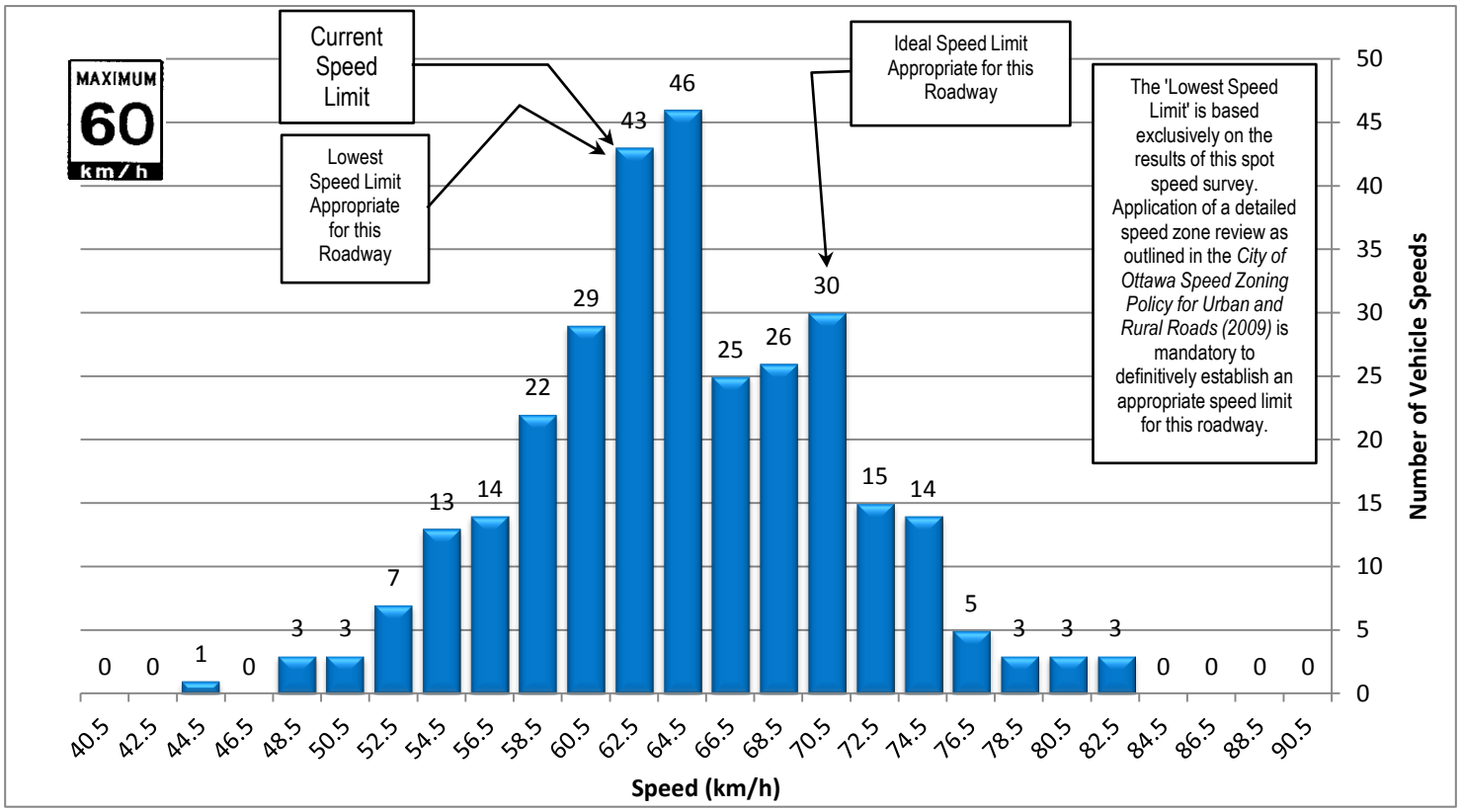
Orléans, ON **Ward: 1** **Orléans, ON**

Monday 15 May 2023 **Road Surface:** Asphalt **Road Condition:** Dry

Weather: Cloudy **Survey Hours:** 0915 - 1015

Notes: St. Joseph Boulevard is a divided roadway.

Spot Speed Survey Histogram - All Vehicles - Combined Directions



Glossary of Relevant Spot Speed Survey Terms

Mean Speed: The average speed, calculated as the sum of all speeds divided by the number of speed observations.

Median Speed The speed that equally divides the distribution of spot speeds; 50 % of observed speeds are higher than the median; 50 % of the observed speeds are lower than the median.

Mode: The number that occurs most frequently in a series of numbers.

Pace Speed: The 16 km/h (typically, 15 km/h) increment in speeds that encompass the highest portion of observed speeds; often, the pace speed range is the mean speed plus/minus 8 km/h.

85th percentile Speed: The speed at or below which 85 % of a sample of free-flowing vehicles is travelling (based on the results of a spot speed survey). The 85th percentile speed is typically used as a baseline for establishing the speed limit.

ACCURATE TRUSTED TRAFFIC DATA

Spot Speed Survey Summary

Including Estimated Driver Compliance and Recommended Speed Limits

St. Joseph Boulevard between OR 174 Eastbound On Ramp & Second Avenue

At a point approximately 40 m east of OR 174 eastbound on ramp.

Orléans, ON **Ward: 1** **Orléans, ON**

Monday 15 May 2023 **Road Surface:** Asphalt **Road Condition:** Dry

Weather: Cloudy **Survey Hours:** 0915 - 1015

Notes: St. Joseph Boulevard is a divided roadway.

Spot Speed Survey Summaries for All Vehicle Types

Eastbound	
Total Number of All Vehicles	101
Average (Mean) Speed	66 km/h
85th Percentile Speed	74 km/h
95th Percentile Speed	78 km/h
Upper Limit Pace Speed Range	74 km/h
Driver Compliance with Speed Limit	20 %

Speed Limit 60 km/h

Westbound	
Total Number of All Vehicles	204
Average (Mean) Speed	64 km/h
85th Percentile Speed	70 km/h
95th Percentile Speed	74 km/h
Upper Limit Pace Speed Range	72 km/h
Driver Compliance with Speed Limit	28 %

Spot Speed Summary - Combined Both Directions	
Total Number of All Vehicles	305
Average (Mean) Speed	65 km/h
85th Percentile Speed	71 km/h
95th Percentile Speed	75 km/h
Upper Limit Pace Speed Range	74 km/h
Driver Compliance with Speed Limit	25%

Arterial Roadway

Additional Survey Details	
Highest vehicle speed in summary	82 km/h
Slowest vehicle speed in summary	44 km/h
Speed Differential	38 km/h
Fastest Outlier Speed Observed *	82 km/h

* The **FASTEST Outlier** speed observed is **NOT** included in the summary if it is > than the **HIGHEST** vehicle speed in the summary. It is included for information only.

Heavy Vehicle Spot Speed Survey Summary

Total Number of Heavy Vehicles *	28
Average (Mean) Speed	60 km/h
85th Percentile Speed	65 km/h
Driver Compliance with Speed Limit	64%

Trucks 28 

Buses 0 

School Buses 0 

* N/A if the total number of heavy vehicles < 6.

* If the total number of heavy vehicles is < 30, this value is insufficient for a valid statistical sample.

Estimated Driver Compliance

with an increase or decrease in the posted speed limit.

Current Speed Limit

Speed Limit	Compliance
30 km/h	0%
40 km/h	0%
50 km/h	2%
60 km/h	25%
70 km/h	81%
80 km/h	99%
90 km/h	100%
100 km/h	100%

City of Ottawa Speed Zoning Policy for Urban and Rural Roads (2009)

Based **exclusively** on the results of this spot speed survey and using the criteria set forth in the *City of Ottawa Speed Zoning Policy for Urban and Rural Roads (2009)*, the ideal speed limit for this roadway is:	70 km/h
The lowest speed limit appropriate for this roadway shall not differ from the 85th percentile speed by more than 13 km/h. In this case, the lowest speed limit must not be lower than:	60 km/h

APPENDIX D

OC Transpo Route Maps

33 Local

PORTOBELLO
BLAIR
PLACE D'ORLÉANS

Monday to Friday / Lundi au vendredi

All day – Selected trips in the evening
Toute la journée – Service limité en soirée

2021.06

- Station
- Weekday Peak trips only / Trajets de semaine en périodes de pointe seulement
- Park & Ride / Parc-o-bus
- Timepoint / Heures de passage

2021.06

Schedule / Horaire 613-560-1000
Text / Texto* 560560
plus your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres
*Standard message rates may apply / Les tarifs réguliers de messagerie texte peuvent s'appliquer

Customer Service
Service à la clientèle **613-560-5000**

Lost and Found / Objets perdus..... **613-563-4011**

Security / Sécurité **613-741-2478**

Effective June 20, 2021
En vigueur 20 juin 2021

OC Transpo
INFO 613-560-5000
octranspo.com

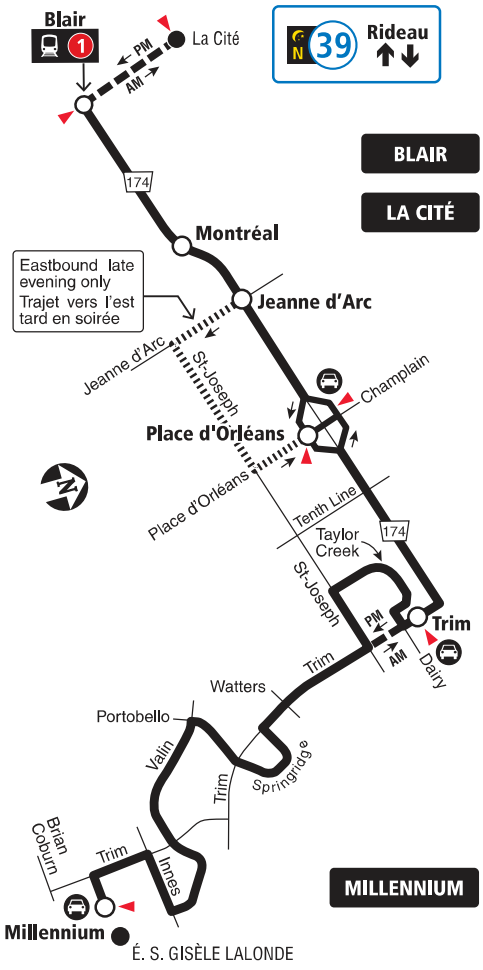
39 Rapide

MILLENNIUM

BLAIR
LA CITÉ

7 days a week / 7 jours par semaine

All day service and limited overnight
Service toute la journée et limité la nuit



Station
Peak periods / Périodes de pointe
Park & Ride / Parc-o-bus
Timepoint / Heures de passage

39

When O-Train Line 1 is not running overnight, Route 39 will be extended downtown to Rideau Station. / Lorsque la ligne 1 de l'O-Train ne circule pas la nuit, le circuit 39 sera prolongée au centre-ville jusqu'à la station Rideau.

2019.07

1

Future route after O-Train Line 1 is open
Trajet du circuit après l'ouverture de la Ligne 1 de l'O-Train

Lost and Found / Objets perdus..... **613-563-4011**
Security / Sécurité..... **613-741-2478**

OC Transpo
INFO 613-741-4390
octranspo.com

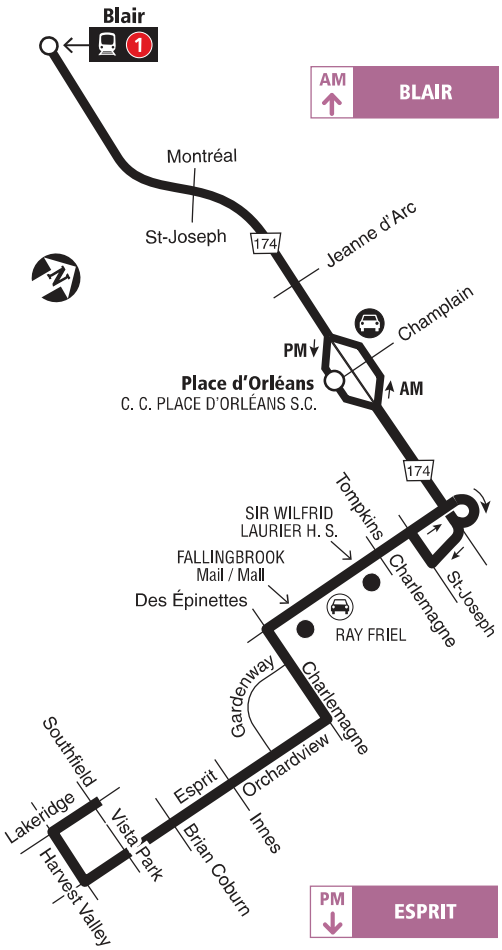
236 ESPRIT / BLAIR

Connexion

Monday to Friday / Lundi au vendredi

Peak periods only

Périodes de pointe seulement



Station

Park & Ride / Parc-o-bus

2019.07

1

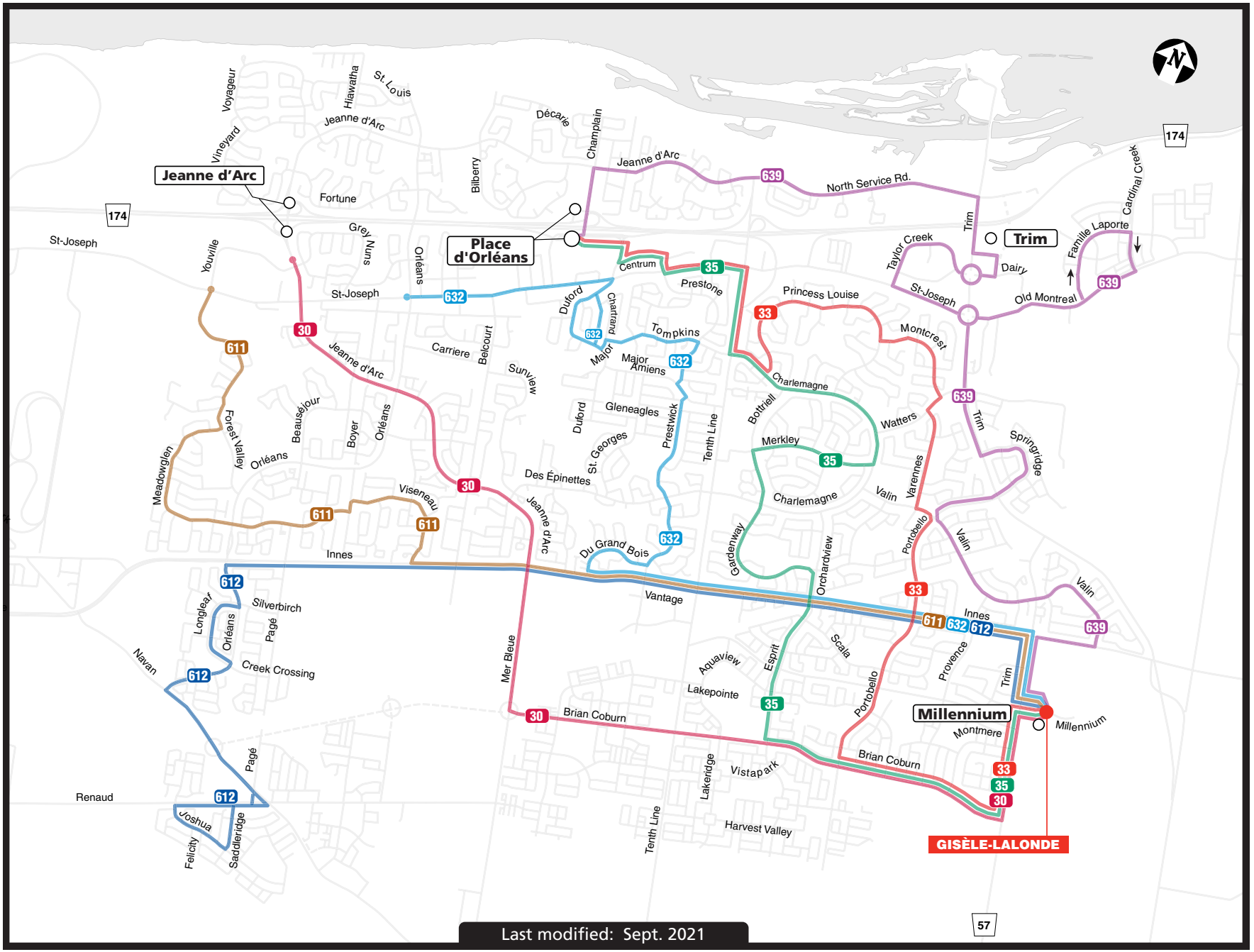
Future route after O-Train Line 1 is open
Trajet du circuit après l'ouverture de la Ligne 1 de l'O-Train

Lost and Found / Objets perdus..... **613-563-4011**

Security / Sécurité..... **613-741-2478**

OC Transpo

INFO 613-741-4390
octranspo.com


Jeanne d'Arc
Place d'Orléans
Trim
Millennium
GISÈLE-LALONDE
Last modified: Sept. 2021

APPENDIX E

Traffic Count Data

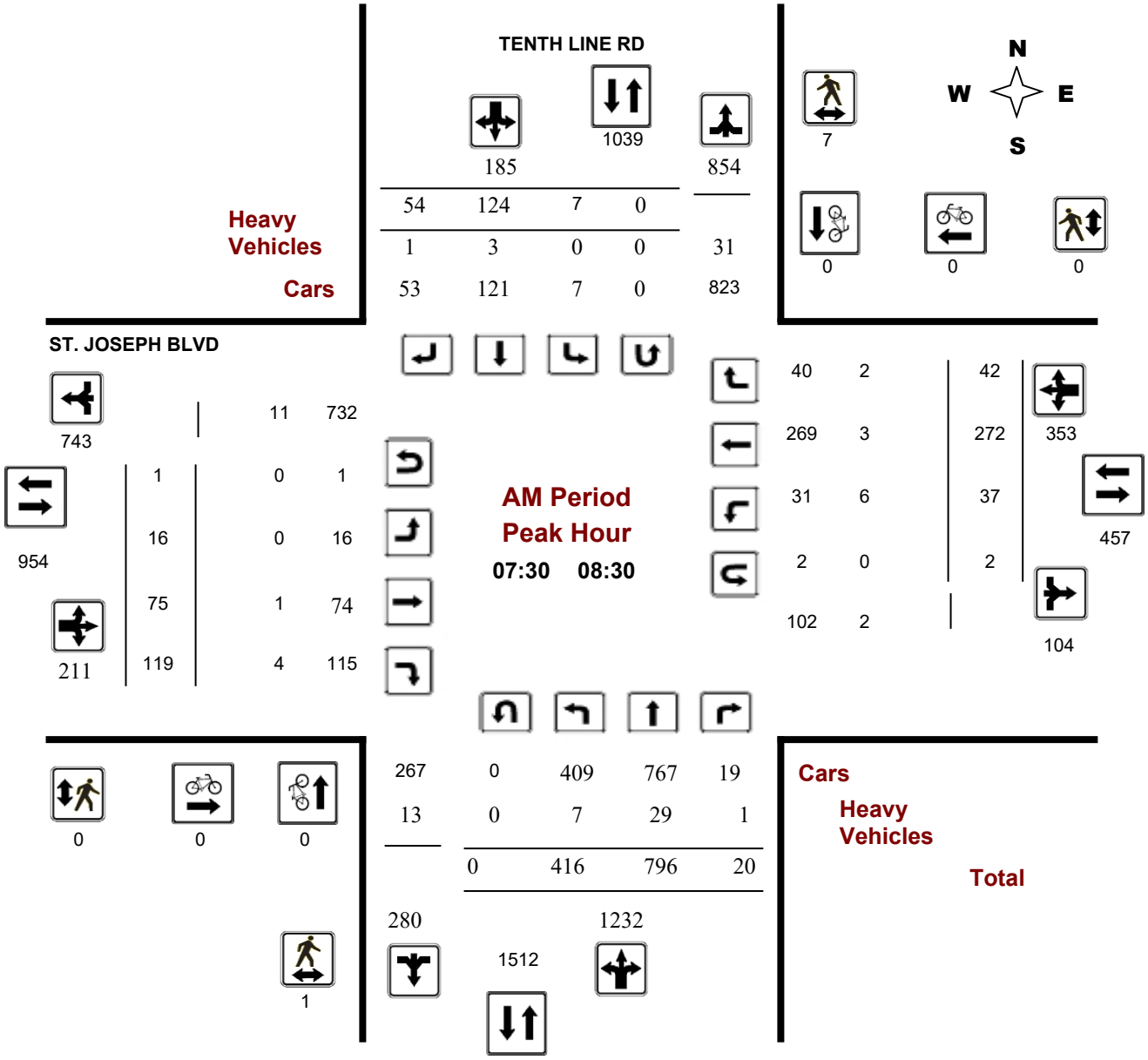
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ST. JOSEPH BLVD @ TENTH LINE RD

Survey Date: Tuesday, March 20, 2018 **WO No:** 37613

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



Comments

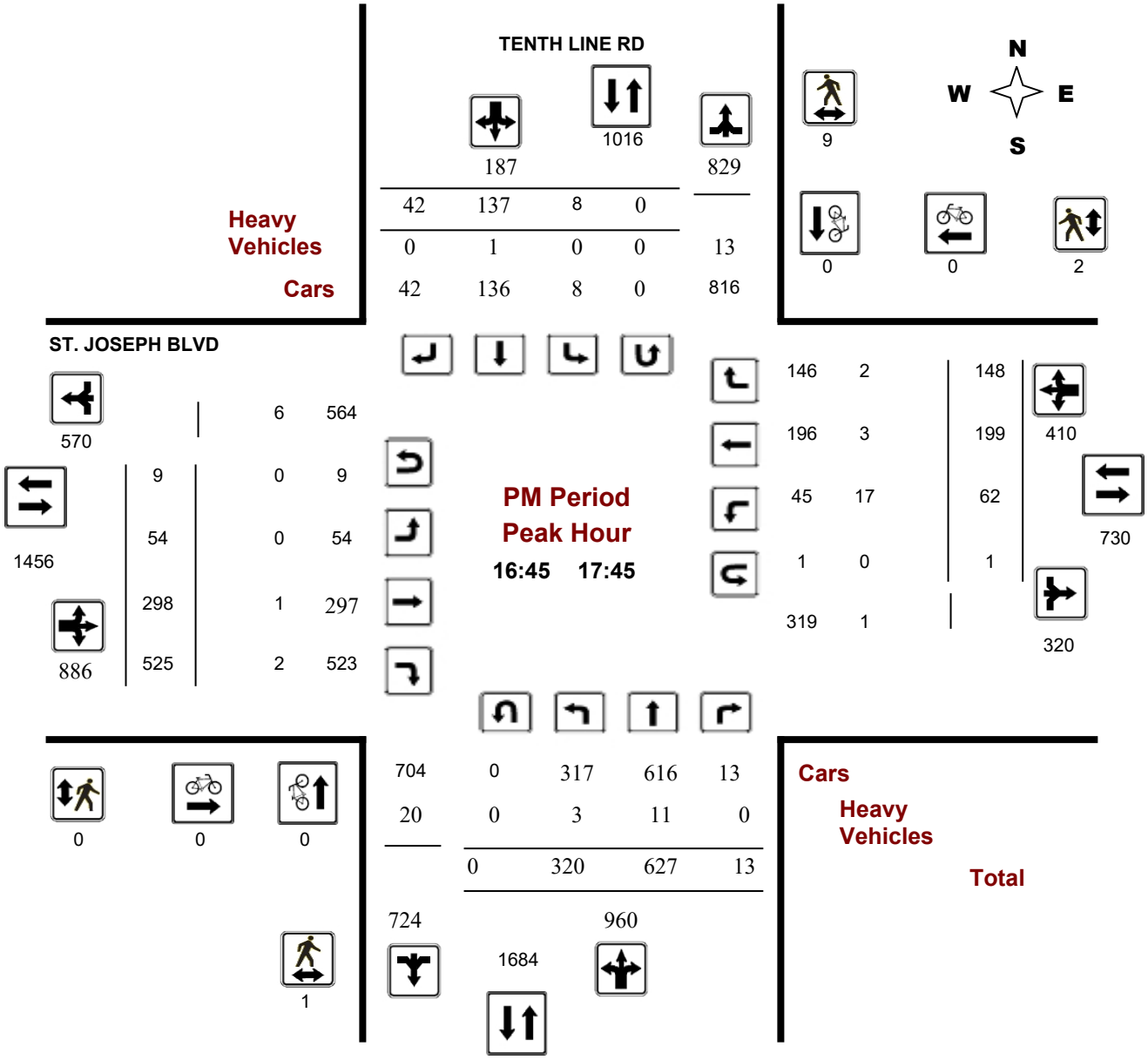
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ST. JOSEPH BLVD @ TENTH LINE RD

Survey Date: Tuesday, March 20, 2018 **WO No:** 37613

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



Comments

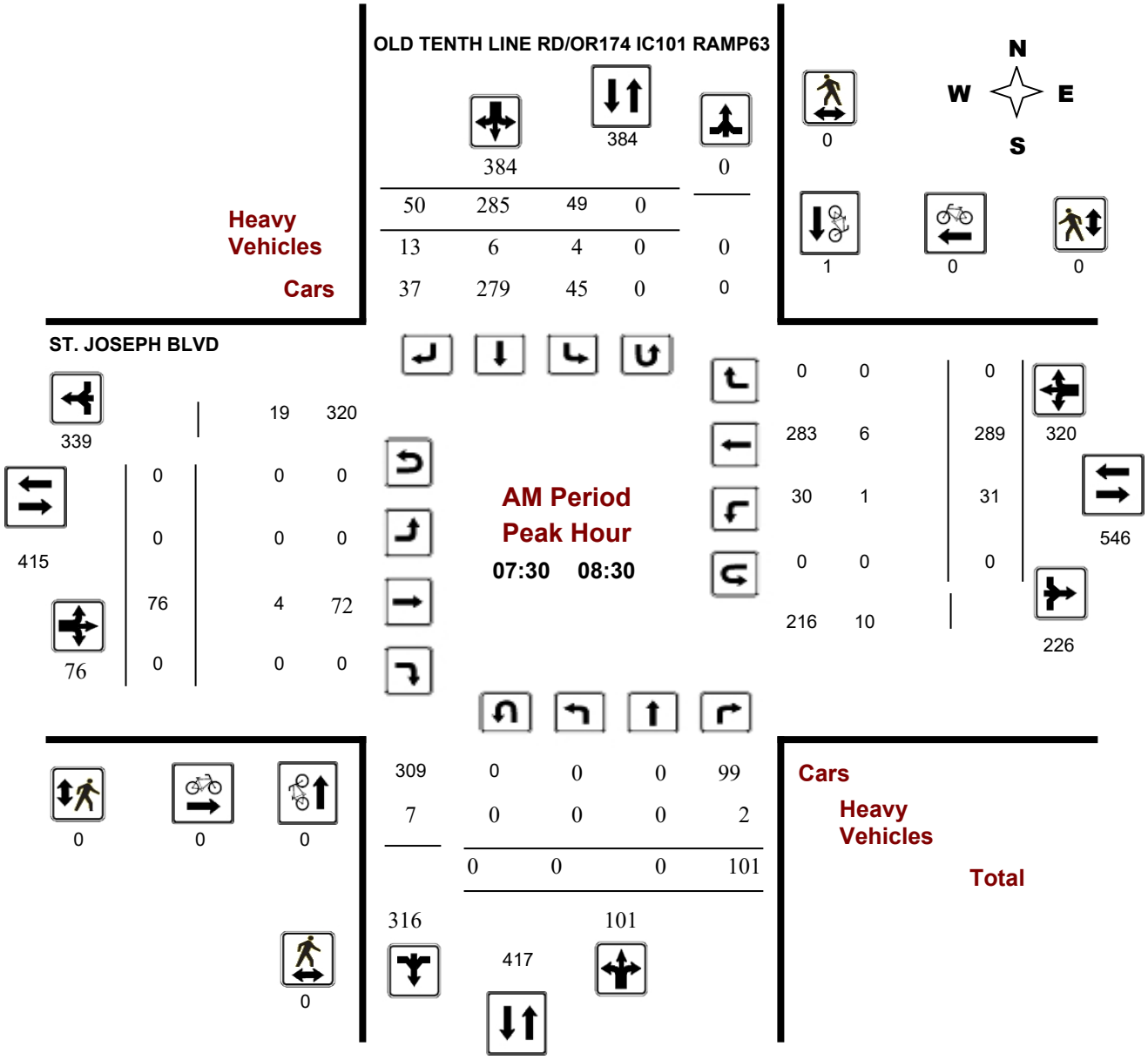
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

OLD TENTH LINE RD/OR174 IC101 RAMP63 @ ST. JOS

Survey Date: Thursday, January 25, 2018 **WO No:** 37452

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



Comments

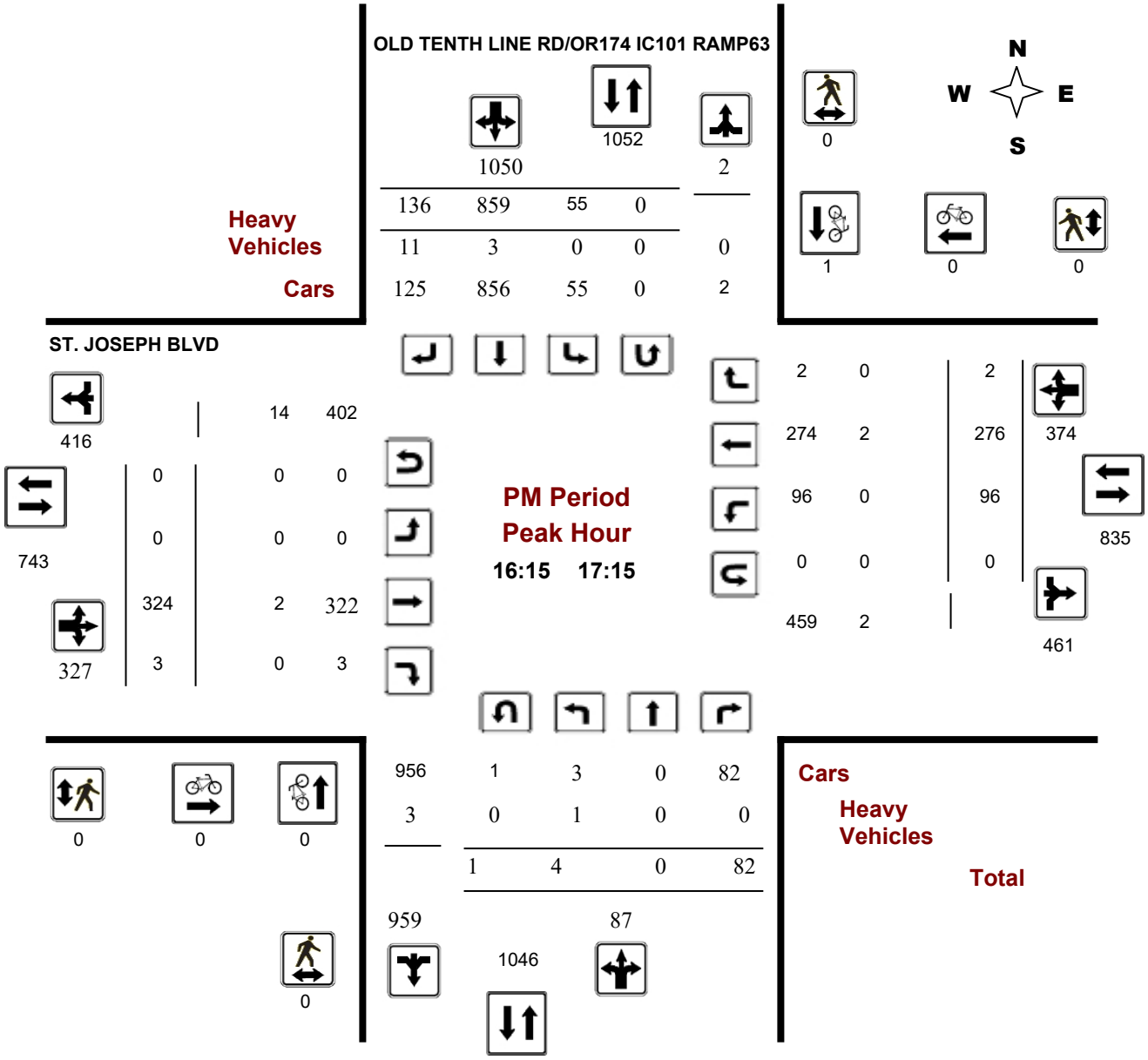
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

OLD TENTH LINE RD/OR174 IC101 RAMP63 @ ST. JOS

Survey Date: Thursday, January 25, 2018 **WO No:** 37452

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



Comments

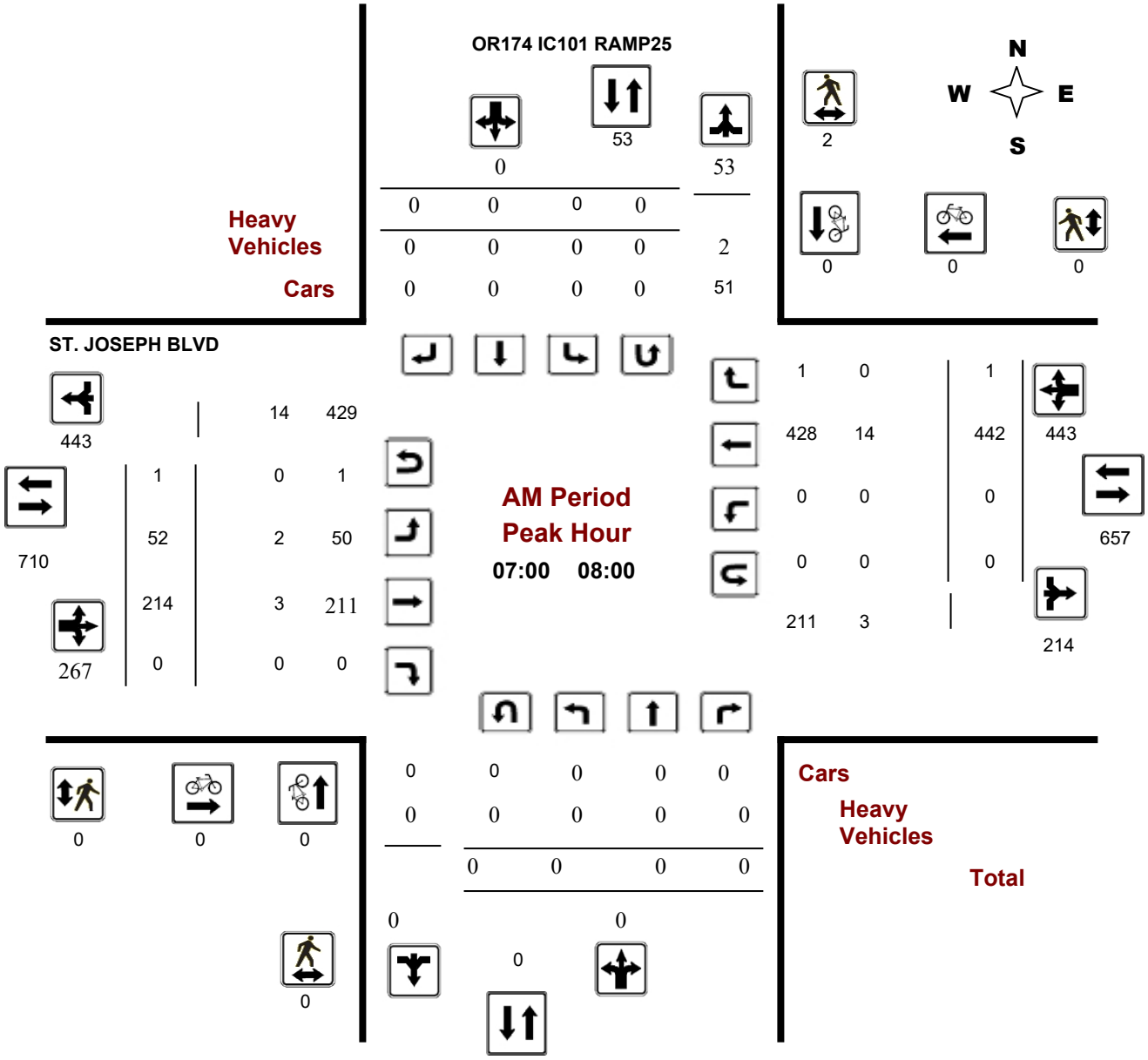
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ST. JOSEPH BLVD @ OR174 IC101 RAMP25

Survey Date: Tuesday, November 26, 2019 **WO No:** 39032

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



Comments

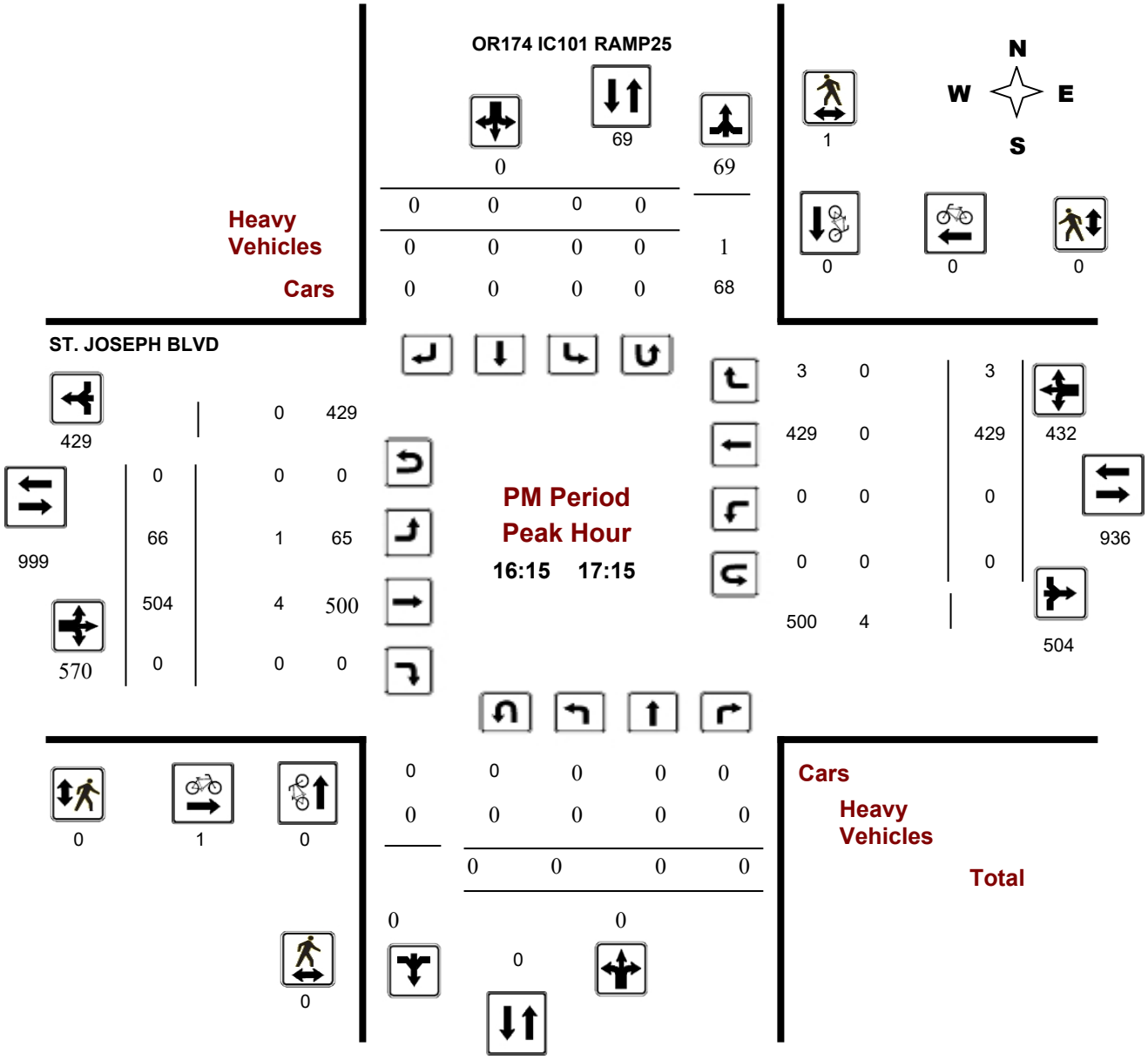
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ST. JOSEPH BLVD @ OR174 IC101 RAMP25

Survey Date: Tuesday, November 26, 2019 **WO No:** 39032

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



Comments

APPENDIX F

Collision Records

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2017 **To:** December 31, 2021

Location: OLD TENTH LINE RD/OR174 IC101 RAMP63 @ ST. JOS

Traffic Control: Traffic signal **Total Collisions:** 30

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Feb-12, Sun,16:23	Snow	Angle	P.D. only	Slush	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Apr-05, Wed,12:01	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2017-May-16, Tue,21:56	Clear	SMV other	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Ran off road	0
2017-May-28, Sun,20:30	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
2017-Jun-23, Fri,08:51	Rain	Angle	Non-fatal injury	Wet	East	Going ahead	Passenger van	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2017-Jun-30, Fri,08:30	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Sep-29, Fri,15:00	Clear	SMV other	P.D. only	Dry	East	Turning right	Automobile, station wagon	Debris falling off vehicle	0
2017-Oct-30, Mon,16:40	Clear	Angle	Non-fatal injury	Dry	South	Turning left	Passenger van	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2017-Nov-30, Thu,17:27	Snow	Turning movement	P.D. only	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2018-Jan-08, Mon,14:52	Snow	SMV other	P.D. only	Loose snow	South	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
2018-Jan-08, Mon,17:41	Snow	Angle	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jan-22, Mon,16:30	Snow	SMV other	P.D. only	Ice	South	Slowing or stopping	Automobile, station wagon	Pole (sign, parking meter)	0
2018-Feb-08, Thu,18:10	Clear	Rear end	P.D. only	Wet	East	Stopped	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Pick-up truck	Other motor vehicle	
2018-Nov-12, Mon,07:08	Snow	SMV other	P.D. only	Ice	North	Going ahead	Automobile, station wagon	Skidding/sliding	0
2018-Nov-12, Mon,07:08	Snow	SMV other	P.D. only	Ice	North	Going ahead	Automobile, station wagon	Skidding/sliding	0

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2017 **To:** December 31, 2021

Location: OLD TENTH LINE RD/OR174 IC101 RAMP63 @ ST. JOS

Traffic Control: Traffic signal **Total Collisions:** 30

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Nov-27, Tue,15:15	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Dec-14, Fri,14:17	Freezing Rain	Angle	Non-fatal injury	Ice	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2019-Feb-22, Fri,10:56	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Debris on road	0
2019-Apr-09, Tue,15:02	Snow	Rear end	P.D. only	Loose snow	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2020-Feb-27, Thu,07:52	Snow	Angle	P.D. only	Packed snow	North	Turning right	Automobile, station wagon	Skidding/sliding	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Aug-13, Thu,19:10	Clear	SMV other	P.D. only	Dry	South	Turning right	Pick-up truck	Pole (sign, parking meter)	0
2020-Aug-15, Sat,08:16	Clear	Turning movement	P.D. only	Dry	West	Turning left	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2020-Oct-04, Sun,12:57	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2020-Oct-07, Wed,13:40	Rain	Turning movement	P.D. only	Wet	West	Turning left	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2020-Nov-25, Wed,08:32	Snow	SMV other	P.D. only	Ice	North	Turning right	Passenger van	Pole (utility, power)	0
2021-Feb-19, Fri,17:36	Snow	Rear end	P.D. only	Loose snow	West	Unknown	Unknown	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2021-Aug-05, Thu,10:22	Clear	Rear end	P.D. only	Dry	West	Going ahead	Truck and trailer	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2021-Nov-07, Sun,11:20	Clear	Sideswipe	P.D. only	Dry	South	Turning left	Truck and trailer	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2017 **To:** December 31, 2021

Location: OLD TENTH LINE RD/OR174 IC101 RAMP63 @ ST. JOS

Traffic Control: Traffic signal **Total Collisions:** 30

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2021-Dec-01, Wed,12:00	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2021-Dec-04, Sat,10:49	Clear	Angle	P.D. only	Dry	North	Turning left	Unknown	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 70

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Jan-04, Wed,15:15	Snow	Sideswipe	P.D. only	Slush	North	Going ahead	Automobile, station wagon	Skidding/sliding	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Jan-16, Mon,11:41	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Passenger van	Other motor vehicle	
2017-Feb-10, Fri,10:33	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Mar-15, Wed,17:17	Clear	Angle	Non-fatal injury	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2017-Mar-17, Fri,14:18	Clear	Rear end	P.D. only	Dry	North	Changing lanes	Passenger van	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Apr-26, Wed,06:19	Rain	Rear end	P.D. only	Wet	North	Turning left	Pick-up truck	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2017-May-27, Sat,17:48	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2017 **To:** December 31, 2021

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 70

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-May-29, Mon,15:33	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Truck - dump	Other motor vehicle	0
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	
2017-Jun-23, Fri,17:40	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Pick-up truck	Skidding/sliding	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2017-Jun-25, Sun,13:20	Rain	Rear end	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2017-Jul-07, Fri,08:25	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2017-Jul-19, Wed,21:00	Clear	Sideswipe	P.D. only	Dry	East	Turning right	Unknown	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Aug-03, Thu,11:25	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Oct-12, Thu,19:35	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Dec-02, Sat,18:13	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Delivery van	Other motor vehicle	
2017-Dec-06, Wed,11:15	Clear	Rear end	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Pick-up truck	Other motor vehicle	
2017-Dec-14, Thu,21:44	Clear	Rear end	Non-fatal injury	Loose snow	North	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Dec-16, Sat,03:57	Snow	SMV other	P.D. only	Loose snow	South	Turning right	Automobile, station wagon	Skidding/sliding	0
2017-Dec-18, Mon,17:38	Snow	Rear end	Non-fatal injury	Loose snow	East	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2017 **To:** December 31, 2021

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 70

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Dec-23, Sat,15:55	Snow	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Truck - open	Skidding/sliding	0
					East	Stopped	Passenger van	Other motor vehicle	
2017-Dec-23, Sat,16:09	Snow	Rear end	P.D. only	Loose snow	West	Going ahead	Automobile, station wagon	Skidding/sliding	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Dec-26, Tue,18:45	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Dec-28, Thu,10:30	Clear	Rear end	P.D. only	Ice	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2017-Dec-28, Thu,11:27	Clear	Rear end	P.D. only	Ice	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-02, Tue,13:29	Snow	Rear end	P.D. only	Loose snow	East	Going ahead	Passenger van	Skidding/sliding	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2018-Jan-10, Wed,14:30	Clear	Rear end	P.D. only	Ice	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-12, Fri,17:12	Freezing Rain	Rear end	P.D. only	Packed snow	East	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-14, Sun,10:20	Clear	Rear end	P.D. only	Ice	North	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Mar-10, Sat,10:52	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Apr-15, Sun,12:35	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2017 **To:** December 31, 2021

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 70

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Jun-07, Thu,09:15	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-13, Wed,08:13	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-Jun-19, Tue,11:03	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Pick-up truck	Other motor vehicle	
2018-Jun-22, Fri,13:15	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Truck - closed	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-27, Wed,13:12	Clear	SMV other	Non-fatal injury	Dry	East	Slowing or stopping	Motorcycle	Other	0
2018-Jul-24, Tue,09:35	Rain	Rear end	P.D. only	Wet	North	Turning left	Passenger van	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Sep-06, Thu,20:22	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Sep-29, Sat,08:40	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Unknown	Pick-up truck	Other motor vehicle	
2018-Oct-11, Thu,18:40	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Oct-26, Fri,21:19	Clear	Turning movement	P.D. only	Dry	East	Turning left	Passenger van	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Dec-13, Thu,23:39	Clear	SMV other	P.D. only	Dry	East	Turning right	Automobile, station wagon	Curb	0

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2017 **To:** December 31, 2021

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 70

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Dec-20, Thu,13:55	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jan-20, Sun,22:00	Snow	SMV other	P.D. only	Packed snow	North	Turning right	Automobile, station wagon	Skidding/sliding	0
2019-Jan-29, Tue,08:20	Snow	Sideswipe	P.D. only	Slush	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Feb-27, Wed,08:24	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Mar-06, Wed,18:12	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Mar-22, Fri,07:45	Rain	Rear end	P.D. only	Wet	West	Going ahead	Delivery van	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-May-03, Fri,14:40	Rain	Rear end	Non-fatal injury	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jun-22, Sat,14:25	Clear	Rear end	P.D. only	Dry	North	Going ahead	Passenger van	Other motor vehicle	0
					North	Stopped	Passenger van	Other motor vehicle	
2019-Sep-20, Fri,06:24	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Sep-25, Wed,06:30	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Oct-06, Sun,14:20	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Unknown	Unknown	Other motor vehicle	
2019-Oct-25, Fri,18:32	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2017 **To:** December 31, 2021

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 70

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Nov-03, Sun,11:30	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Dec-04, Wed,09:38	Snow	Sideswipe	P.D. only	Wet	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Feb-15, Sat,11:46	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Passenger van	Other motor vehicle	
2020-Feb-19, Wed,17:16	Snow	Sideswipe	Non-fatal injury	Packed snow	North	Unknown	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Passenger van	Other motor vehicle	
2020-Apr-18, Sat,15:12	Clear	Angle	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	
2020-May-16, Sat,16:30	Clear	Rear end	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2020-Sep-04, Fri,14:03	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Jan-07, Thu,17:27	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2021-Jan-11, Mon,17:10	Clear	Rear end	P.D. only	Ice	North	Unknown	Unknown	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2021-May-27, Thu,14:00	Clear	Approaching	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2017 **To:** December 31, 2021

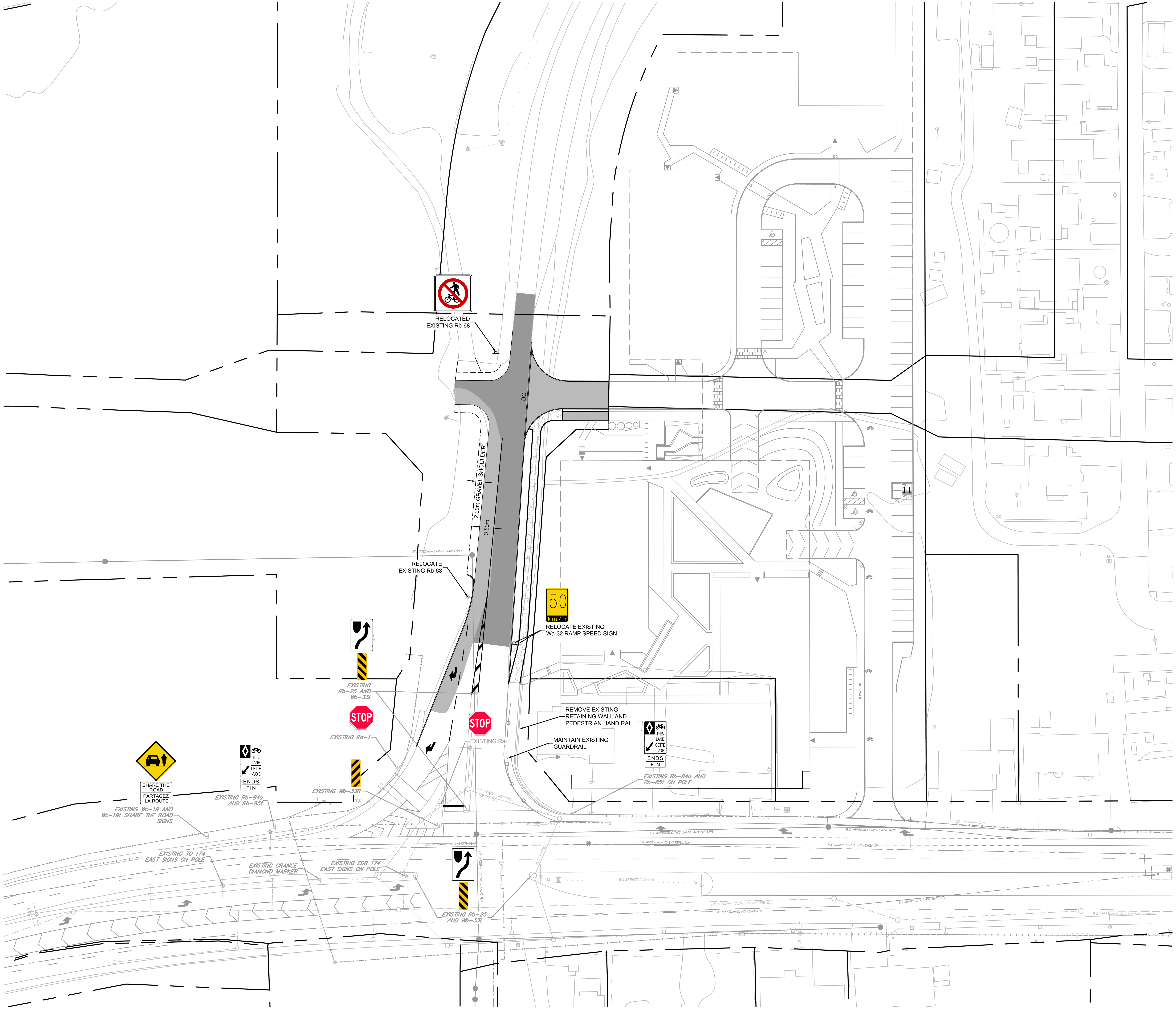
Location: ST. JOSEPH BLVD @ TENTH LINE RD

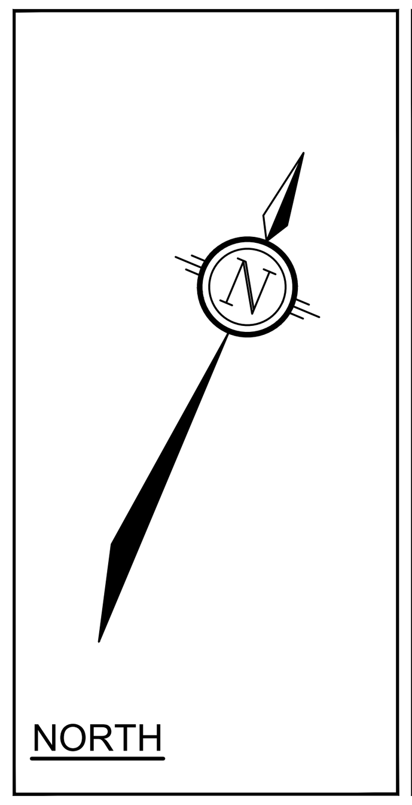
Traffic Control: Traffic signal **Total Collisions:** 70

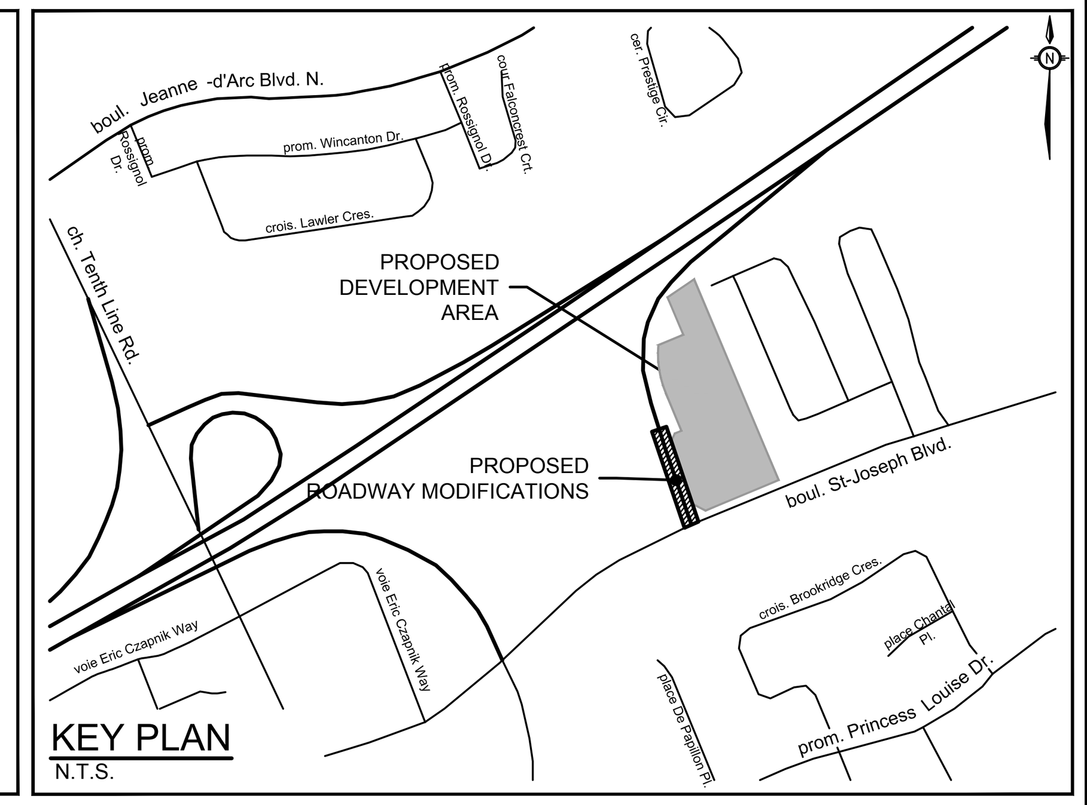
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2021-Jul-01, Thu,18:15	Clear	Sideswipe	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2021-Oct-16, Sat,21:36	Rain	Angle	P.D. only	Wet	East	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Nov-01, Mon,17:51	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Nov-15, Mon,14:26	Rain	Angle	P.D. only	Wet	East	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Unknown	Pick-up truck	Other motor vehicle	
2021-Nov-30, Tue,15:20	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2021-Dec-04, Sat,17:00	Snow	Turning movement	P.D. only	Wet	South	Turning left	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Unknown	Other motor vehicle	
2021-Dec-11, Sat,15:30	Rain	Sideswipe	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

APPENDIX G

Functional Design







LEGEND

PROPOSED ASPHALT WIDENING
PROPOSED ASPHALT REMOVAL AND REGRADING
PROPOSED CONCRETE
DC — PROPOSED DEPRESSED CURB
EXISTING LIGHT STANDARD
EXISTING SANITARY MANHOLE
EXISTING STORM MANHOLE
EXISTING TRAFFIC MANHOLE
EXISTING CATCHBASIN
EXISTING TREE
EXISTING HYDRO DUCT
EXISTING BELL DUCT
EXISTING ROGERS DUCT
EXISTING GAS MAIN
EXISTING WATERMAIN
EXISTING STREET LIGHT DUCT
EXISTING GUIDERAIL

REFER TO ___________ FOR ADDITIONAL NOTES

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
1.	ISSUED FOR REVIEW	JUL 12/24	BJB

SCALE 1:500

1:500 — 0 5 10 15 20

DESIGN	RCH
CHECKED	JRA
DRAWN	RCH
CHECKED	JRA
APPROVED	BJB

FOR REVIEW ONLY

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY of OTTAWA
NAME OF DEVELOPMENT

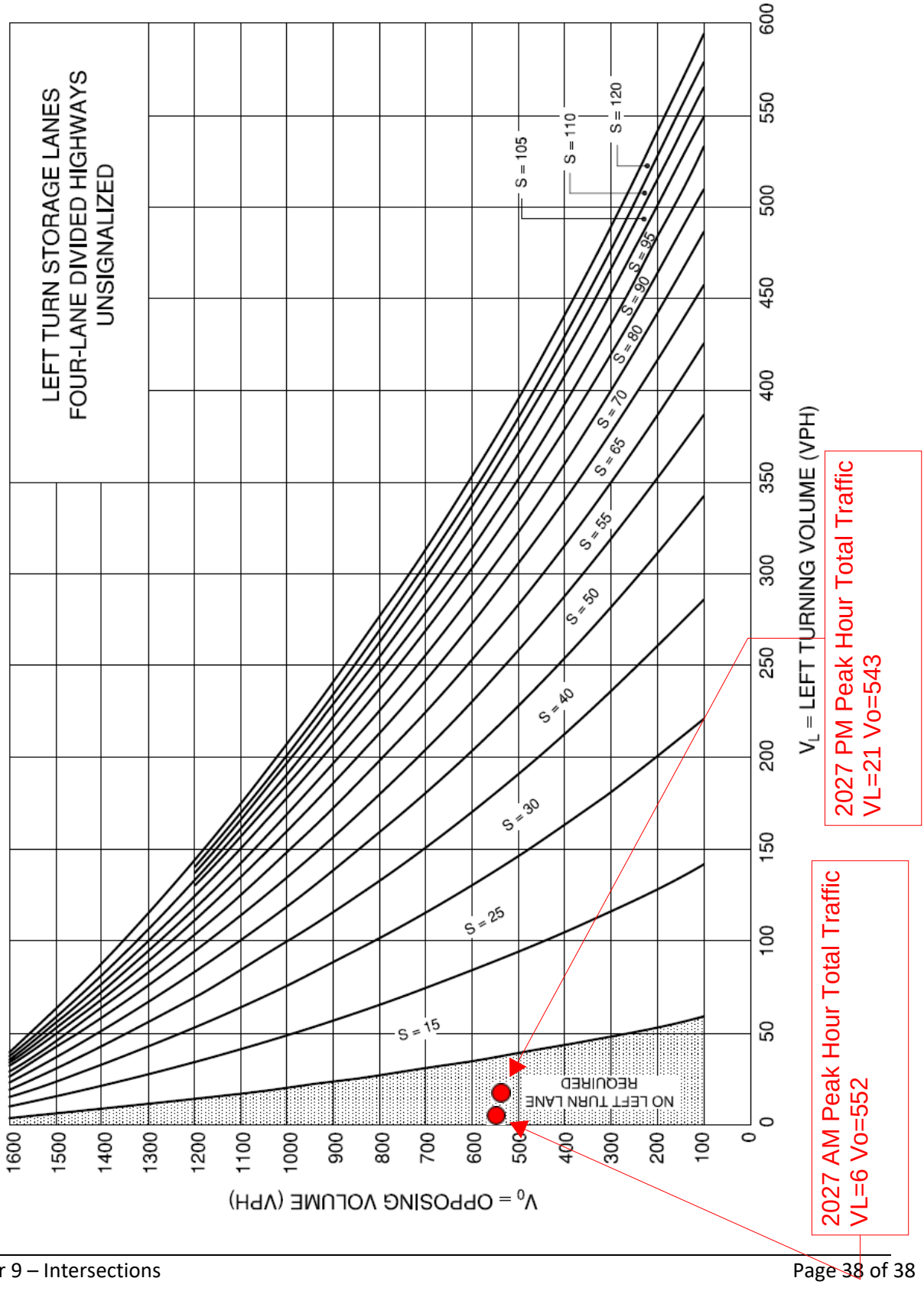
DRAWING NAME
FUNCTIONAL DESIGN

PROJECT No. 113020
REV: REV # 1
DRAWING No. 113020-FD

APPENDIX H

MTO Left Turn Lane Warrant

Exhibit 9A-32



APPENDIX I

Background Reports

Residential Development lands. This peak hour vehicle trip generation is based on rates obtained from the 9th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual (Land Use Code 230).

Table 2: Projected Site-Generated Vehicle Trips - ITE Rates

Land Use	Units	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Residential Condominium	90	9	38	47	35	20	55

Given ITE trip generation surveys only record vehicle trips and are typically conducted in highly suburban locations, adjustment factors appropriate to a more urban study area context were used to forecast site-generated trips in terms of "person" trips. Based on our review of available literature, a factor of 1.3 applied to ITE vehicle trip generation rates are considered to be a reasonable estimate of "person" trips, given typical auto occupancy in North America is approximately 1.15 and the typical modal share of non-auto person trips is approximately 10% (e.g. 70% Auto Driver, 10% Auto Passenger, 10% Transit, and 10% Non-motorized).

Based on the foregoing, the following **Table 3** summarizes the projected site-generated "person" traffic to/from the proposed development during the weekday morning and afternoon peak hours.

Table 3: Projected Site-Generated Person Trips

Land Use	Units	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Residential Condominium	90	13	49	62	46	26	72

Given the subject site's proximity to alternative non-auto modes and based on data obtained from the TRANS Committee's 2011 *NCR Household Origin-Destination Survey*, the following **Table 4** summarizes the modal share values (appropriate to the area of the subject site) and the resultant breakdown of projected person trips by mode.

Table 4: Projected Site-Generated Person Trips by Mode

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Auto Driver	55%	8	27	35	26	15	41
Auto Passenger	10%	2	5	7	5	3	8
Transit	30%	3	15	18	13	7	20
Non-motorized	5%	0	2	2	2	1	3
Total Person Trips	100%	13	49	62	46	26	72
Projected Auto Trips		**8**	**27**	**35**	**26**	**15**	**41**

As summarized in **Table 4**, Phase 1B is projected to generate a two-way total of approximately 35 and 40 veh/h during the weekday morning and afternoon peak hours, respectively. This equates to approximately one new vehicle every 1-2 minutes, on average.

3.3 Projected Site-Generated Traffic Distribution and Assignment

Consistent with the assumptions of the November 2013 TB, the following distribution of site-generated traffic to/from the subject site was assumed:

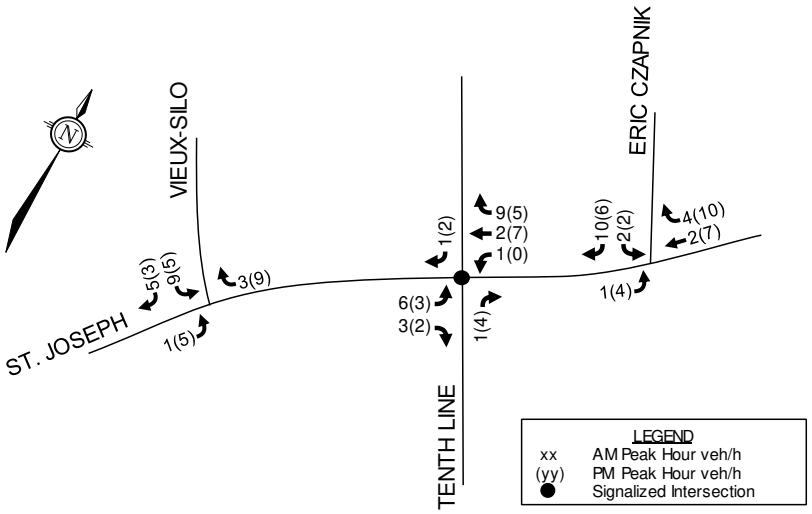
55%	to/from the west via OR174;
18%	to/from the west via St. Joseph Boulevard;
5%	to/from the east via St. Joseph Boulevard;
5%	to/from the east via OR174;
2%	to/from the north via Tenth Line Road; and
15%	to/from the south via Tenth Line Road.
100%	

Based on the foregoing assumed distribution, the following **Figure 6** depicts the projected additional site-generated traffic (i.e. traffic generated by the currently proposed Phase 1B, comprised of 90 condominium units) assigned to the study area network. It should be noted, it is assumed that approximately half the projected traffic generated by Phase 1B will take advantage of the existing full-movement connection to St. Joseph Boulevard (i.e. residents will use the existing St. Joseph/Eric Czapnik intersection), similar to the background traffic assumptions made Phase 1A.

A description of the trip assignment assumptions is provided as follows. The assumptions are based on the adjacent roadway pattern, existing operating conditions at the Tenth Line Road/St. Joseph Boulevard intersection, and the principles of logical trip routing.

- Trips to/from the north via Tenth Line Road or to/from the west via OR174 assigned equally between the Vieux Silo Street and Eric Czapnik Way,
- Trips to/from the west via St. Joseph Boulevard assigned to Vieux-Silo Street,
- Trips to/from the east via St. Joseph Boulevard assigned to Eric Czapnik Way,
- Trips to the east via OR174 assigned to Eric Czapnik Way; trips from the east via OR174 assigned to Vieux-Silo Street, and
- Trips to the south via Tenth Line Road assigned to 2/3 to Vieux-Silo Street and 1/3 to Eric Czapnik Way; trips from the south via Tenth Line Road assigned to Eric Czapnik Way.

Figure 6: Projected Site-Generated Traffic



APPENDIX J

Transportation Demand Management Checklists

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

Legend

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

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☒
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: *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: *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 resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☒
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
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	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☒
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	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

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

Legend

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

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

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

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

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

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

APPENDIX K

Boundary Street MMLOS

Segment Level of Service

Pedestrian Level of Service (PLOS)

Side	Sidewalk Width	Boulevard Width	Motor Vehicle Traffic Volume (AADT)	Presence of On-Street Parking	Operating Speed	Segment PLOS
St. Joseph Boulevard						
North	2m	2m	> 3,000 vpd	No	70 km/h	D
South	2m	2m	> 3,000 vpd	No	70 km/h	D
OR174 Onramp						
East	None	0	< 3,000 vpd	No	70 km/h	F
West	None	0	< 3,000 vpd	No	70 km/h	F

Bicycle Level of Service (BLOS)

Bike Route	Type of Bikeway	Travel Lanes	Centreline Markings	Operating Speed	Segment BLOS
St. Joseph Boulevard					
Spine	Bike Lane	4	Median	70 km/h	E
OR174 Onramp					
None	Mixed Traffic	2	Line	70 km/h	F

Transit Level of Service (TLOS)

Facility Type	Congestion, Friction, and Potential Incidents	Segment TLOS
St. Joseph Boulevard		
Mixed Traffic Limited parking/driveway friction	Congestion, Low Friction, Medium Incident Type	D

Truck Level of Service (TkLOS)

Curb Lane Width	Travel Lanes	Segment TkLOS
St. Joseph Boulevard		
≤3.5m	More than 2 travel lanes	A
OR174 Onramp		
>3.7m	One travel lane	B

Intersection MMLOS Pedestrian Level of Service

Criteria	North Approach		South Approach		East Approach		West Approach	
St. Joseph at Tenth Line								
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	-10	No	-10	No	-10	No	-10
Lanes Crossed (3.5m Lane Width)	10 +		10 +		10 +		10 +	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	Perm + Prot	-8	Perm + Prot	-8	Protected	0	Protected	0
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5	Permissive or Yield	-5
Right Turn on Red	N/A	0	N/A	0	N/A	0	N/A	0
Leading Pedestrian Interval	No	-2	No	-2	No	-2	No	-2
CORNER RADIUS								
Parallel Radius	> 15m to 25m	-8	> 25m	-9	> 15m to 25m	-8	> 15m to 25m	-8
Parallel Right Turn Channel	Conventional with Receiving	-3	Conventional with Receiving	-3	Conventional without Receiving	0	Conventional without Receiving	0
Perpendicular Radius	> 15m to 25m	-8	> 15m to 25m	-8	> 15m to 25m	-8	> 25m	-9
Perpendicular Right Turn Channel	Conventional without Receiving	0	Conventional without Receiving	0	Conventional with Receiving	-3	Conventional with Receiving	-3
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	Standard	-7	Standard	-7
PETSI SCORE		**-51**		**-52**		**-43**		**-44**
LOS		**F**		**F**		**F**		**F**
DELAY SCORE								
Cycle Length		129.7		129.7		129.7		129.7
Pedestrian Walk Time		6		6		34		3
DELAY SCORE		**59**		**59**		**35.3**		**61.9**
LOS		**E**		**E**		**D**		**F**
OVERALL		**F**		**F**		**F**		**F**

Criteria	North Approach		South Approach		East Approach		West Approach	
St. Joseph at Old Tenth Line / 174 Off-ramp								
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	6	No	23	N/A	N/A	No	-10
Lanes Crossed (3.5m Lane Width)	9		8		N/A		10 +	
SIGNAL PHASING AND TIMING								
Left Turn Conflict	No Left Turn/Prohibited	0	Permissive	-8	N/A	N/A	Protected	0
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	N/A	N/A	Permissive or Yield	-5
Right Turn on Red	N/A	0	N/A	0	N/A	N/A	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	N/A	N/A	No	-2
CORNER RADIUS								
Parallel Radius	No Right Turn	0	> 3m to 5m	-4	N/A	N/A	> 25m	-9
Parallel Right Turn Channel	No Right Turn	0	No Right Turn Channel	-4	N/A	N/A	Conventional with Receiving	-3
Perpendicular Radius	> 25m	-9	> 15m to 25m	-8	N/A	N/A	N/A	0
Perpendicular Right Turn Channel	Conventional with Receiving	-3	Smart Channel	2	N/A	N/A	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	N/A	N/A	Standard	-7
PETSI SCORE		**-20**		**-13**		**N/A**		**-39**
LOS		**F**		**F**		**N/A**		**F**
DELAY SCORE								
Cycle Length		77.9		77.9		81.9		81.9
Pedestrian Walk Time		8		8		N/A		11
DELAY SCORE		**31.4**		**31.4**		**N/A**		**30.7**
LOS		**D**		**D**		**N/A**		**D**
OVERALL		**F**		**F**		**N/A**		**F**

Bicycle Level of Service

Approach	Bikeway Facility Type	Criteria	Travel Lanes and/or Speed[1]	BLOS
St Joseph at 10th Line Road – F Overall				
North Approach	Mixed Traffic Approach	Right turn lane characteristics	Right turn lane ≤50m; turning speed ≤25km/h	**D**
		Left turn accommodation	2 or more lanes crossed; ≥ 50km/hr	**F**
South Approach	Mixed Traffic Approach	Right turn lane characteristics	Right turn lane ≤50m; turning speed ≤25km/h	**D**
		Left turn accommodation	Dual left turn lanes	**F**
East Approach	Pocket Bike Lane	Right turn lane characteristics	Right turn lane >50m; turning speed ≤30km/h	**D**
		Left turn accommodation	2 or more lanes crossed; ≥ 50km/hr	**F**
West Approach	Mixed Traffic Approach	Right turn lane characteristics	Right turn lane >50m	**F**
		Left turn accommodation	2 or more lanes crossed; ≥ 50km/hr	**F**
St Joseph at Old 10th Line Road / 174 Off-ramp – F Overall				
North Approach	N/A	Right turn lane characteristics	N/A	**-**
		Left turn accommodation	N/A	**-**
South Approach	Mixed Traffic Approach	Right turn lane characteristics	Right turn lane ≤50m; turning speed ≤25km/h	**D**
		Left turn accommodation	No lane crossed; ≥ 60km/hr	**D**
East Approach	Mixed Traffic Approach	Right turn lane characteristics	N/A	**-**
		Left turn accommodation	2 or more lanes crossed; ≥ 50km/hr	**F**
West Approach	Mixed Traffic Approach	Right turn lane characteristics	No Right Turn Lane	**-**
		Left turn accommodation	N/A	**-**

Transit Level of Service

Transit Movement	AM (PM) Delay	LOS
St Joseph at 10th Line Road – D Overall		
WB	32 (24)	**E**
NB	28 (30)	**D**
St Joseph at Old 10th Line Road / 174 Off-ramp – B Overall		
SB	14 (19)	**C**

Truck Level of Service

Approach	Effective Corner Radius (m)	Number of Receiving Lanes on Departure from Intersection	LOS
St Joseph at 10th Line Road – A Overall			
North Approach	> 15m	2+	A
South Approach	> 15m	2+	A
East Approach	> 15m	2+	A
West Approach	> 15m	2+	A
St Joseph at Old 10th Line Road / 174 Off-ramp – D Overall			
North Approach	> 15m	2+	A
South Approach	> 15m	2+	A
East Approach	N/A	-	-
West Approach	< 10m	2+	D