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39 Years

Hillside Commons Residential Apartments 3277 St. Joseph Boulevard Ottawa, Ontario

Transportation Impact Assessment

Hillside Commons Residential Apartments
3277 St. Joseph Boulevard

Transportation Impact Assessment

Prepared By:

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

December 2021

Novatech File: 120237
Ref: R-2021-075

NOVATECH
Engineers, Planners & Landscape Architects

December 15, 2021

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

Attention: **Ms. Neeti Paudel**
Project Manager, Infrastructure Approvals

Dear Ms. Paudel:

Reference: **3277 St. Joseph Boulevard**
Transportation Impact Assessment
Novatech File No. 120237

We are pleased to submit the following Transportation Impact Assessment (TIA), in support of a Site Plan Control application at 3277 St. Joseph Boulevard, for your review and signoff. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

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

Yours truly,

NOVATECH

Joshua Audia, B.Sc.
E.I.T. | Transportation/Traffic

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 __15th__ day of _____December_____, 2021.

Name: _____Jennifer Luong, P.Eng._____
(Please Print)

Professional Title: _____Senior Project Manager, Transportation/Traffic_____

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 3277 St. Joseph Boulevard, in support of a Site Plan Control application. The subject site is approximately 1.2 acres in area, and is currently vacant.

The subject site is surrounded by the following:

- Residential uses, followed by Eric Czapnik Way and Ottawa Road 174 to the north,
- St. Joseph Boulevard, followed by residential uses to the south,
- Tenth Line Road, followed by an Ottawa Police Station to the east, and
- Residential uses, followed by Vieux-Silo Street to the west.

On Schedule B of the City of Ottawa's Official Plan, the subject site is designated as 'Mixed Use Centre.' The subject site is also located within the Orléans Town Centre Secondary Plan area. The implemented zoning for the property is the Residential Fifth-Density, Subzone Z (R5Z[1363] and R5Z[1415]), which permits the proposed land uses.

The proposed development will consist of two apartment buildings of nine-storeys each. The easterly building (referred to as 'Building A') will step down to five storeys at the north end to comply with the zoning requirements. It will include 172 dwellings, and the westerly building (referred to as 'Building B') will include 102 dwellings. In total, the proposed development will therefore include 274 dwellings, as well as 184 vehicle parking spaces within a multi-level parking garage.

Access to the proposed development will be provided via one driveway to St. Joseph Boulevard and one driveway to Lionel-Rhéo Private. Vehicles entering the site via one driveway will be able to exit via the other driveway, as the parking garages below Buildings A and B will connect. The proposed development is anticipated to be completed in a single phase, with a buildout year of 2024.

The study area for this report includes the boundary roadways St. Joseph Boulevard, Tenth Line Road, and Lionel-Rhéo Private, as well as the following intersections:

Signalized Intersections
- St. Joseph Boulevard/Tenth Line Road
- St. Joseph Boulevard/Old Tenth Line Road/ Ottawa Road 174 EB Off-Ramp

Unsignalized Intersections
- St. Joseph Boulevard/Vieux-Silo Street
- St. Joseph Boulevard/Eric Czapnik Way

The selected time periods for the analysis are the weekday AM and PM peak hours, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. Analysis will be completed for the 2024 build-out year and the 2029 horizon year.

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

Forecasting
- The proposed development is estimated to generate 111 person trips (including 58 vehicle trips) during the AM peak hour and 112 person trips (including 60 vehicle trips) during the PM peak hour.

Development Design

- New pedestrian walkways will connect the main and secondary entrances of Buildings A and B to the existing sidewalk on St. Joseph Boulevard. The main entrance of Building A is located at the southeastern corner of the subject site and the main entrance of Building B is located east of the proposed RIRO access, while the secondary entrances to both buildings will be accessed in the service easement between the two buildings, and are located approximately 35m north of St. Joseph Boulevard. New pedestrian walkways will also connect the main entrance of Building A and the northern end of the subject site to the existing sidewalk on Tenth Line Road.

- Bicycle parking will be provided on the upper parking garage level within Building B.

- Measuring from the main entrance, the bus stops within 400m are stops #1794, #6763, #7843, #7846, #8596, and #8761, which are served by OC Routes 33, 236, and 302.

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

- Pick-ups and drop-offs will be facilitated in a designated loop at the northwest corner of Building A, which will be accessed via Lionel-Rhéo Private. Access to the underground parking garage via Building A will be located directly adjacent to this pick-up/drop-off loop.

- Garbage collection and loading/deliveries will take place at the service entries to Buildings A and B, via the access along the service easement between the buildings. The fire route for the proposed development will be located curbside on St. Joseph Boulevard.

Parking

- The proposed number of vehicle parking spaces meets the minimum requirements, as outlined in the City's ZBL. The proposed number of bicycle parking spaces also meets the minimum requirements.

Boundary Streets

- The results of the segment multi-modal level of service (MMLOS) analysis can be summarized as follows:
    - Both St. Joseph Boulevard and Tenth Line Road do not meet the target pedestrian level of service (PLOS) C;
    - Both St. Joseph Boulevard and Tenth Line Road do not meet the target bicycle level of service (BLOS) C;
    - Tenth Line Road achieves the target transit level of service (TLOS) D;
    - Both St. Joseph Boulevard and Tenth Line Road meet the target truck level of service (TkLOS) D.

- Based on Exhibit 4 of the *MMLOS Guidelines*, the best possible PLOS for roadways with curb lane volumes greater than 3,000 vehicles per day and an operating speed greater than 60 km/h is a PLOS D. This can be achieved by providing sidewalks with a minimum width of 2.0m and a minimum boulevard width greater than 2.0m. This applies to both sides of St. Joseph Boulevard and the east side of Tenth Line Road, and is identified for the City's consideration. For the west side of Tenth Line Road, the target PLOS C can be achieved by providing a sidewalk with a minimum width of 2.0m and a minimum boulevard width of 0.5m. This is identified for the City's consideration.

- Based on Exhibit 11 of the *MMLOS Guidelines*, a physically separated bikeway (such as cycle tracks or multi-use pathways) are required to achieve the target BLOS A for St. Joseph Boulevard or BLOS C for Tenth Line Road, given the current operating speed of both roadways. This is identified for the City's consideration.

Access Design

- The proposed access to St. Joseph Boulevard meets all required provisions of the *Private Approach By-Law* (PABL), except for Section 25(u). Measuring from the property line, the grade of the access is approximately 2% (descending toward the roadway) for the first 4m inside the property line, and 6% (descending toward the parking garage) for the next 5m. By limiting the maximum grade to 6% within the first 9m of the property line, it is anticipated that drivers exiting the parking garage will have adequate sightlines to pedestrians walking along St. Joseph Boulevard. Therefore, it is requested that the requirement of Section 25(u) of the PABL be waived.

- The proposed access to St. Joseph Boulevard does not meet the Transportation Association of Canada (TAC)'s clear throat length requirement of 40m, as the underground parking garage door is located within this distance. However, the potential for queueing back onto St. Joseph Boulevard is mitigated by the access being restricted to right-in/right-out, and there is another approximately 40m of clear throat before the first parking spaces within the parking garage. Queueing onto St. Joseph Boulevard is not anticipated.

- TAC's *Geometric Design Guide* identifies a minimum corner clearance requirement of 70m for arterial roadways, measuring between the private approach and the nearest edge of the roadway. While it is acknowledged that the proposed access to St. Joseph Boulevard does not meet this requirement, it is located as far from the intersection at St. Joseph Boulevard/ Tenth Line Road as possible.

Transportation Demand Management

- The proponent has committed to providing the following TDM measures:
    - 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 cost from monthly rent.

Neighbourhood Traffic Management

- Eric Czapnik Way exceeds the City's threshold for considering neighbourhood traffic management measures. Eric Czapnik Way is not anticipated to operate at or near capacity in the 2029 total traffic conditions. Further, the function of Eric Czapnik Way as a local roadway is not anticipated to change as a result of the proposed development, and no neighbourhood traffic management measures are required.

Transit

- The proposed development is projected to generate 30 transit trips during the AM peak hour and 29 transit trips during the PM peak hour. No capacity issues are anticipated for OC Transpo Routes 33, 236, or 302, based on the above transit trip estimates.

Intersection MMLOS

- The results of the intersection MMLOS analysis can be summarized as follows:
    - Neither signalized intersection meets the target PLOS;
    - Neither signalized intersection meets the target BLOS;
    - St. Joseph Boulevard/Tenth Line Road does not meet the target TLOS;
    - Both signalized intersections meet the target TkLOS.

- All approaches of St. Joseph Boulevard/Tenth Line Road have a divided cross-section with a width equivalent to ten lanes crossed or more. There is limited opportunity in improving the PLOS at each approach without reducing the number of travel lanes or restricting turning movements. No approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

- All approaches of St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp have a divided cross-section with a width equivalent to eight to ten lanes crossed or more. There is limited opportunity in improving the PLOS at each approach without reducing the number of travel lanes or restricting turning movements further. No approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

- All approaches of St. Joseph Boulevard/Tenth Line Road do not meet the target BLOS, based on both left and right turn characteristics. Achieving the target BLOS A would require physically-separated bikeways (such as cycle tracks or multi-use pathways) and off-road facilities for cyclists to turn left. Therefore, the implementation of a protected intersection would be required to meet the target BLOS A, and would involve the removal of all right turn channels. This is identified for the City's consideration.

- The south and east approaches of St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp do not meet the target BLOS based on left turn characteristics, and the south approach does not meet the target based on right turn characteristics. Achieving the BLOS C would require two-stage left-turn bike boxes for northbound and westbound cyclists. Implementing bike boxes at the north approach would not require right turn on red (RTOR) restrictions, and is therefore identified for the City's consideration. There is no through phase for northbound cyclists to get to a left-turn bike box, and northbound cyclists could use Tenth Line Road to turn left onto St. Joseph Boulevard instead. The south approach can achieve the BLOS C based on right turn characteristics by implementing a pocket bike lane across the channelized northbound right turn lane. This is identified for the City's consideration.

- The south and east approaches of St. Joseph Boulevard/Tenth Line Road do not meet the target TLOS D. The east approach does not have a target TLOS, but the approach delays of approximately 35 seconds during the AM peak hour is noted. The City's RTTP Affordable Network includes transit priority signals and queue jump lanes on Tenth Line Road, and would be expected to improve the delays for transit vehicles to the target TLOS D or better.

Existing Intersection Operations

- All study area intersections currently operate at an Auto LOS C or better during the AM and PM peak hours. For all auxiliary lanes at the study area intersections, the Synchro analysis does not identify any 50th-percentile or 95th-percentile queue lengths that exceed the storage lengths provided. Similarly, Synchro does not identify any queues that result in blocking at an upstream intersection (i.e. on St. Joseph Boulevard, westbound queues at Tenth Line Road and eastbound queues at Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp do not extend through the intersection at Eric Czapnik Way).

Background Intersection Operations

- All study area intersections in the 2029 background conditions are projected to operate at an Auto LOS D or better during the AM and PM peak hours. The Synchro analysis identifies that, in the AM peak hour, the 95th-percentile northbound queue length at St. Joseph Boulevard/Tenth Line Road is approximately 190m, which extends past the auxiliary northbound left turn lane. For all auxiliary lanes within the study area, Synchro does not identify any 50th-percentile or 95th-percentile queue lengths that exceed the storage lengths provided. Similarly, Synchro does not identify any queues that result in blocking at an upstream intersection.

Total Intersection Operations

- The addition of site-generated traffic is anticipated to have little impact on the operations of the study area intersections. The proposed RIRO access to St. Joseph Boulevard is anticipated to operate at an Auto LOS A during the peak hours.

- 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 3277 St. Joseph Boulevard, in support of a Site Plan Control application. The subject site is approximately 1.2 acres in area, and is currently vacant.

The subject site is surrounded by the following:

- Residential uses, followed by Eric Czapnik Way and Ottawa Road 174 to the north,
- St. Joseph Boulevard, followed by residential uses to the south,
- Tenth Line Road, followed by an Ottawa Police Station to the east, and
- Residential uses, followed by Vieux-Silo Street to the west.

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

Figure 1: Site Location

Note: The above aerial does not show the recent construction of Vieux-Silo Street, Récolte Private, or Lionel-Rhéo Private. An approximate alignment of these roadways have been added to the figure.

1.2 Proposed Development

On Schedule B of the City of Ottawa's Official Plan, the subject site is designated as 'Mixed Use Centre.' The subject site is also located within the Orléans Town Centre Secondary Plan area. The implemented zoning for the property is the Residential Fifth-Density, Subzone Z (R5Z[1363] and R5Z[1415]), which permits the proposed land uses.

The proposed development will consist of two apartment buildings of nine-storeys each. The easterly building (referred to as 'Building A') will step down to five storeys at the north end to comply with the zoning requirements. It will include 172 dwellings, and the westerly building (referred to as 'Building B') will include 102 dwellings. In total, the proposed development will therefore include 274 dwellings, as well as 184 vehicle parking spaces within a multi-level parking garage.

Access to the proposed development will be provided via one driveway to St. Joseph Boulevard and one driveway to Lionel-Rhéo Private. Vehicles entering the site via one driveway will be able to exit via the other driveway, as the parking garages below Buildings A and B will connect. The proposed development is anticipated to be completed in a single phase, with a buildout year of 2024.

A copy of the proposed 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 expected to generate over 60 person trips/peak hour; further assessment **is required** based on this trigger.

- Location Triggers – The development proposes new driveways to a Spine Cycling Route (St. Joseph Boulevard) and is located in a Design Priority Area (Orléans Town Centre); further assessment **is required** based on this trigger.

- Safety Triggers – A proposed driveway within 150m of a signalized intersection, and there is a documented history of traffic operations/safety concerns on the boundary streets within 500m of the development; further assessment **is required** based on this trigger.

2.0 SCOPING

2.1 Existing Conditions

2.1.1 Roadways

All roadways within the study area fall under the jurisdiction of the City of Ottawa.

St. Joseph Boulevard is an arterial roadway that generally runs on an east-west alignment between Ottawa Road 174 and Trim Road. West of Ottawa Road 174, the roadway continues as Montreal Road, Rideau Street, and Wellington Street. East of Trim Road, the roadway continues as Old Montreal Road. Within the study area, St. Joseph Boulevard has a four-lane divided urban cross-section, asphalt sidewalks on both sides, and a posted speed limit of 60 km/h. St. Joseph Boulevard

is classified as a truck route, allowing full loads. On-street parking is not permitted. The City's Official Plan identifies a right-of-way (ROW) protection of 37.5m between 130m west of Duford Drive/Place d'Orléans Drive and Trim Road. A widening is not anticipated as part of this application.

Tenth Line Road is an arterial roadway that runs on a north-south alignment between Jeanne d'Arc Boulevard North and Smith Road. The roadway has a four-lane divided urban cross-section, concrete sidewalks on both sides, and a posted speed limit of 60 km/h. Tenth Line Road is classified as a truck route, allowing full loads. On-street parking is not permitted. The City's Official Plan does not identify a ROW protection on Tenth Line Road north of Tompkins Avenue. Therefore, a widening is not required as part of this application.

Old Tenth Line Road is an arterial roadway that generally runs on a north-south alignment between St. Joseph Boulevard and Tenth Line Road. The roadway has a three-lane undivided urban cross-section, concrete sidewalks on both sides, and a posted speed limit of 60 km/h. Old Tenth Line Road is not classified as a truck route. On-street parking is not permitted.

Ottawa Road 174 is a City-owned freeway that generally runs on an east-west alignment between Highway 417 and 600m east of Trim Road, and continues as an arterial roadway from 600m east of Trim Road to Canaan Road. The roadway then continues as Highway 17 east of Canaan Road. Within the study area, the roadway has a four- or six-lane divided rural cross-section, no sidewalks, and a posted speed limit of 100 km/h. Ottawa Road 174 is classified as a truck route, allowing full loads. On-street parking is not permitted.

Vieux-Silo Street is a local roadway that runs on a north-south alignment between St. Joseph Boulevard and Eric Czapnik Way. The roadway has a two-lane undivided urban cross-section, a concrete sidewalk on the west side, and a regulatory speed limit of 50 km/h per the Highway Traffic Act. Vieux-Silo Street is not classified as a truck route.

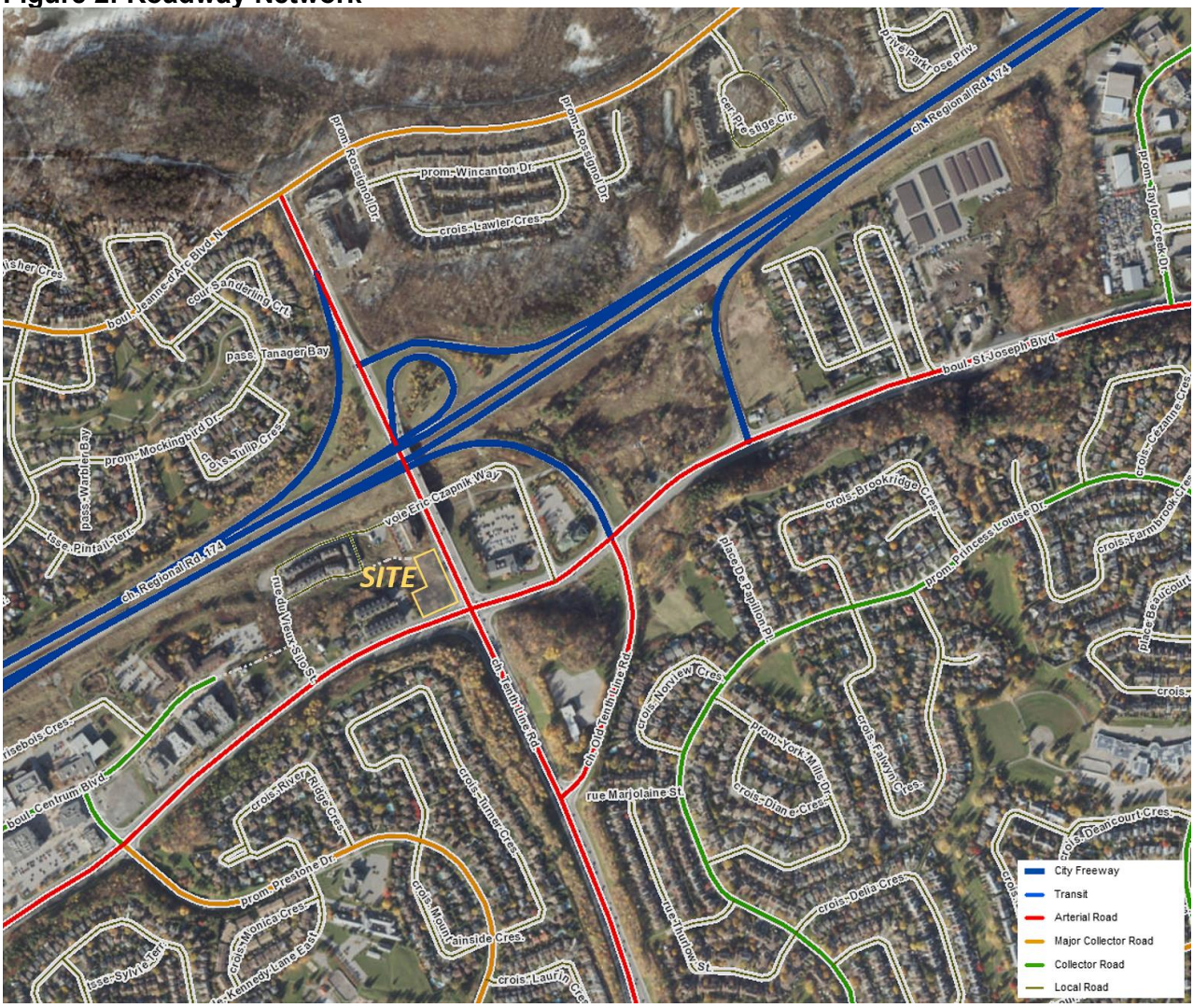
Eric Czapnik Way is a local roadway that generally runs on an east-west alignment starting at Vieux-Silo Street before curving to a north-south alignment and terminating at St. Joseph Boulevard between Tenth Line Road and Old Tenth Line Road. The roadway has a two-lane undivided urban cross-section, concrete sidewalks on the south side between Vieux-Silo Street and 205 Eric Czapnik Way and on the east side along the entire frontage of 3363 St. Joseph Boulevard, and an unposted speed limit of 50 km/h. Eric Czapnik Way is not classified as a truck route. On-street parking is permitted.

Récolte Private is a local roadway that generally runs on an east-west alignment starting at Vieux-Silo Street before curving to a north-south alignment and terminating at Eric Czapnik Way. The roadway has a two-lane undivided urban cross-section, concrete sidewalks on the south side of the roadway between Vieux-Silo Street and Lionel-Rhéo Private, and a regulatory speed limit of 50 km/h. Récolte Private is not classified as a truck route. On-street parking is permitted.

Lionel-Rhéo Private is a private roadway that runs on an east-west alignment for approximately 80m east of Récolte Private. The roadway has a two-lane undivided urban cross-section, and asphalt sidewalks on the south side. Lionel-Rhéo Private is not classified as a truck route. Perpendicular parking is provided on the north side of the roadway.

The roadway network of the greater area surrounding the subject site is illustrated in **Figure 2**.

Figure 2: Roadway Network



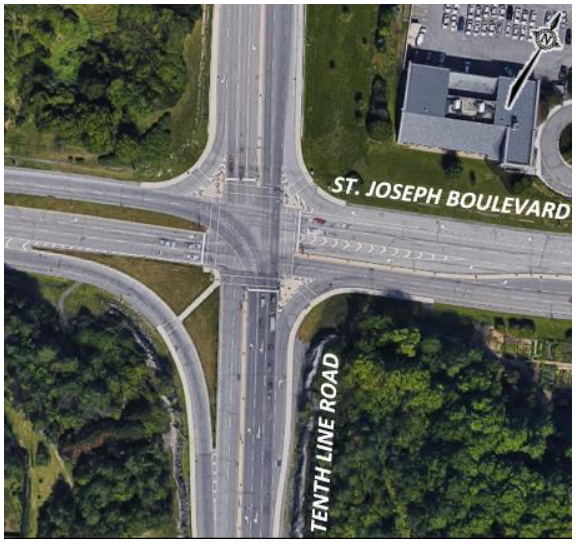
2.1.2 Intersections

St. Joseph Boulevard/Vieux-Silo Street

- Unsignalized three-legged intersection
- Southbound Approach (Vieux-Silo Street): one shared left turn/right turn lane
- Eastbound Approach (St. Joseph Boulevard): one left turn lane and two through lanes
- Westbound Approach (St. Joseph Boulevard): one through lane and one shared through/right turn lane
- Standard crosswalk is provided at southbound approach

St. Joseph Boulevard/Tenth Line Road

- Signalized four-legged intersection
- Northbound Approach (Tenth Line Road): one left turn lane, one shared left turn/through lane, one through lane, and one channelized right turn lane
- Southbound Approach (Tenth Line Road): one left turn lane, two through lanes, and one channelized right turn lane
- Eastbound Approach (St. Joseph Boulevard): one left turn lane, two through lanes, and one channelized right turn lane
- Westbound Approach (St. Joseph Boulevard): one left turn lane, two through lanes, and one channelized right turn lane
- Standard crosswalks are provided on all approaches
- Pocket bike lane provided at westbound approach



St. Joseph Boulevard/Eric Czapnik Way

- Unsignalized three-legged intersection
- Southbound Approach (Eric Czapnik Way): one shared left turn/right turn lane
- Eastbound Approach (St. Joseph Boulevard): one left turn lane and two through lanes
- Westbound Approach (St. Joseph Boulevard): two through lanes and one shared through/right turn lane

St. Joseph Boulevard/Old Tenth Line Road/ Ottawa Road 174 EB Off-Ramp

- Signalized four-legged intersection
- Northbound Approach (Old Tenth Line Road): one left turn lane and one channelized right turn lane
- Southbound Approach (OR 174 Off-Ramp): two left turn lanes, two through lanes, and one channelized right turn lane
- Eastbound Approach (St. Joseph Boulevard): one through lane and one shared through/right turn lane
- Westbound Approach (St. Joseph Boulevard): one left turn lane and two through lanes
- Standard crosswalks are provided at northbound, southbound, and eastbound approaches

2.1.3 Driveways

The City's *2017 TIA Guidelines* requires a review of existing driveways on the boundary streets within 200m of any proposed accesses. This can be summarized as follows:

St. Joseph Boulevard, North Side

- Four driveways to residences at 3245, 3251, 3259, and 3265 St. Joseph Boulevard

St. Joseph Boulevard, South Side

- No driveways

Récolte Private, North Side

- Eighteen driveways to residences at 524-558 Récolte Private

Récolte Private, West Side

- Eight driveways to residences at 500-514 Récolte Private

2.1.4 Pedestrian and Cycling Facilities

Sidewalks are provided on both sides of St. Joseph Boulevard, Tenth Line Road, and Old Tenth Line Road, and on one side of Vieux-Silo Street, Eric Czapnik Way, Récolte Private, and Lionel-Rhéo Private in select locations.

In the City of Ottawa's primary cycling network, St. Joseph Boulevard and Tenth Line Road north of St. Joseph Boulevard are classified as Spine Cycling Routes, and Tenth Line Road south of St. Joseph Boulevard is classified as a Major Pathway. Crosstown Bikeway Route #9 runs through the study area, and includes St. Joseph Boulevard between Notre Dame Street and Tenth Line Road, and Tenth Line Road between St. Joseph Boulevard and Innes Road. A pocket bike lane is provided on westbound St. Joseph Boulevard between Tenth Line Road and Eric Czapnik Way.

2.1.5 Area Traffic Management

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

2.1.6 Transit

The nearest transit stops to the subject site are as follows:

St. Joseph/Ad. 3227
- Stop #7846 – for routes 33 and 302
  (located on south side of St. Joseph Boulevard, approximately opposite Vieux-Silo Street)

St. Joseph/Ad. 3245
- Stop #1794 – for routes 33 and 302
  (located at northeast corner of St. Joseph Boulevard/Vieux-Silo Street)

St. Joseph/Tenth Line Road
- Stop #6763 – for routes 33, 233, 235, 236, and 302
  (located on west side of Tenth Line Road, approximately 125m south of St. Joseph Boulevard)
- Stop #7843 – for routes 33 and 302
  (located on north side of St. Joseph Boulevard, approximately 75m west of Tenth Line Road)
- Stop #8596 – for routes 33, 233, 235, and 236
  (located on east side of Tenth Line Road, approximately 50m north of St. Joseph Boulevard)
- Stop #8761 – for routes 33, 233, 235, and 236
  (located on north side of St. Joseph Boulevard, approximately 200m east of Tenth Line Road)

OC Transpo Route 33 is a local route, travelling between Blair LRT Station and Portobello/Summer Sky. The route operates every 15 to 30 minutes from 5:30am to 7:00pm, with select trips after 7:00pm. Route 33 operates on weekdays only.

OC Transpo Route 233 is a connexion route, travelling between Blair LRT Station and Portobello/ Summer Sky. The route operates in the peak direction every 20 to 30 minutes from 6:30am to 7:30am, and every 30 to 40 minutes from 4:30pm to 5:30pm. Route 233 operates on weekdays only. As of June 20, 2021, Route 233 has been suspended, as other routes serve the study area.

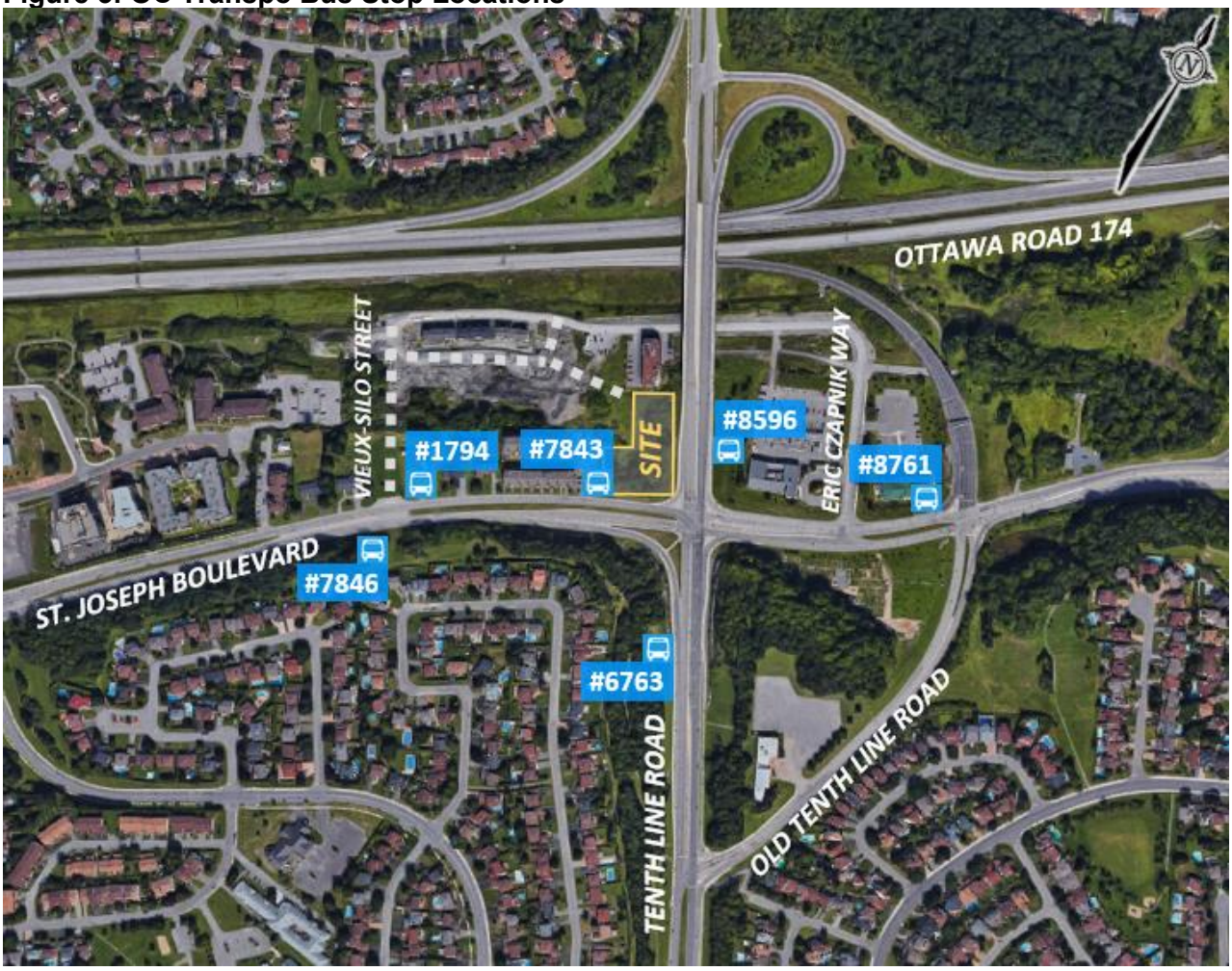
OC Transpo Route 235 is a connexion route, travelling between Blair LRT Station and Gardenway/ Portobello. The route operates in the peak direction every 15 minutes from 6:00am to 9:00am, and 15 minutes from 3:30pm to 6:30pm. Route 235 operates on weekdays only. As of June 20, 2021, Route 235 has been suspended, as other routes serve the study area.

OC Transpo Route 236 is a connexion route, travelling between Blair LRT Station and Lakeridge/ Vista Park. The route operates in the peak direction every 15 minutes from 5:30am to 9:00am, and every 15 minutes from 3:30pm to 6:30pm. Route 236 operates on weekdays only.

OC Transpo Route 302 is a free shopping route for residents of rural communities, travelling between St. Laurent LRT Station and the communities of Cumberland, Sarsfield, and Navan. The route is scheduled to arrive in the study area at 9:41am (toward St. Laurent and Gloucester Shopping Centres) and 2:49pm (toward the communities). Route 302 operates on Tuesdays only.

Locations of the transit stops described above are shown in **Figure 3**. OC Transpo maps for the routes outlined above and a copy of the system map is included in **Appendix C**.

Figure 3: OC Transpo Bus Stop Locations



2.1.7 Existing Traffic Volumes

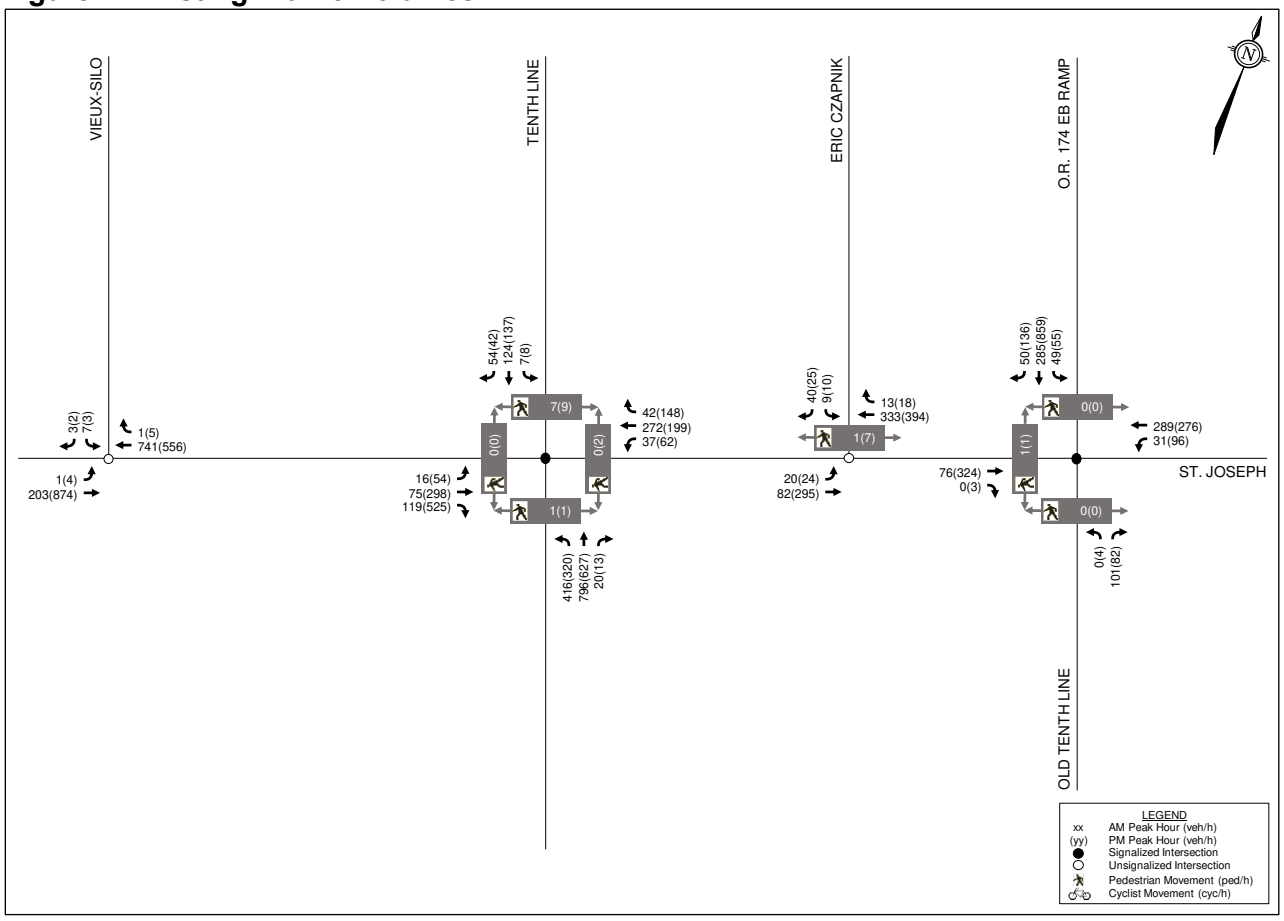
Weekday traffic counts completed by the City of Ottawa were used to determine the existing pedestrian, cyclist, and vehicular traffic volumes at study area intersections where data is available. These counts were completed on the dates listed below:

- St. Joseph Boulevard/Tenth Line Road Mar 20, 2018
- St. Joseph Boulevard/Eric Czapnik Way Apr 23, 2015
- St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp Jan 25, 2018

Eastbound/westbound through volumes at St. Joseph Boulevard/Vieux-Silo Street and St. Joseph Boulevard/Eric Czapnik Way have been carried from the observed eastbound/westbound volumes at St. Joseph Boulevard/Tenth Line Road. Turning movement volumes onto or from Vieux-Silo Street have been estimated using projections from the previously completed Hillside Vista traffic studies, which are referenced in Section 2.2.2. Turning movement volumes onto or from Eric Czapnik Way have been estimated by adding the observed 2015 volumes and projections from the previously completed Hillside Vista traffic studies.

Weekday AM and PM peak hour traffic volumes at the study area intersections are shown in **Figure 4**. Peak hour summary sheets of the above traffic counts are included in **Appendix D**.

Figure 4: Existing Traffic Volumes



2.1.8 Collision Records

Historical collision data from the last five years were 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 E**.

The collision data have been evaluated to identify 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, 2015 to December 31, 2019 is summarized in **Table 1**. During the five-year period, there were no reported fatal collisions in the analyzed area.

Table 1: Reported Collisions

Intersection/ Street Segment	Impact Types					Total
	Angle	Rear End	Sideswipe	SMV(1)/ Other	Turning Movement	
St. Joseph Boulevard/ Tenth Line Road	10	64	12	7	4	**97**
St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp	10	5	1	6	1	**23**
St. Joseph Boulevard between Prestone Drive and Tenth Line Road	-	-	3	3	-	**6**
St. Joseph Boulevard between Tenth Line Road and Old Tenth Line Road	-	-	-	3	-	**3**

1. SMV = Single Motor Vehicle

St. Joseph Boulevard/Tenth Line Road

A total of 97 collisions were reported at this intersection over the last five years, of which there were ten angle impacts, 64 rear-end impacts, 12 sideswipe impacts, seven single vehicle/other impacts, and four turning movement impacts. Seventeen collisions resulted in injuries. Thirty-nine of the 97 collisions occurred in poor driving conditions.

Of the ten angle impacts, one involved a northbound vehicle and an eastbound vehicle, five involved a northbound vehicle and a westbound vehicle, and four involved a southbound vehicle and an eastbound vehicle.

Of the 64 rear-end impacts, 50 involved northbound vehicles, one involved southbound vehicles, ten involved eastbound vehicles, and three involved westbound vehicles. For the northbound and eastbound approaches, high traffic volumes and downhill grades may play a factor in these collisions. It should be noted that a red light camera is installed for eastbound vehicles on St. Joseph Boulevard at this intersection.

Of the 12 sideswipe impacts, seven involved northbound vehicles, three involved southbound vehicles, one involved eastbound vehicles, and one involved westbound vehicles. High traffic volumes are likely a factor in these collisions.

Of the seven single vehicle/other impacts, three involved a northbound vehicle, one involved a southbound vehicle, and three involved an eastbound vehicle.

St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp

A total of 23 collisions were reported at this intersection over the last five years, of which there were ten angle impacts, five rear-end impacts, one sideswipe impact, six single vehicle/other impacts, and one turning movement impact. Seven collisions resulted in injuries. Twelve of the 23 collisions occurred in poor driving conditions.

Of the ten angle impacts, one involved a northbound vehicle and an eastbound vehicle, seven involved a southbound vehicle and an eastbound vehicle, and two involved a southbound vehicle and a westbound vehicle. High traffic volumes exiting Ottawa Road 174 are likely a factor in these collisions, which typically involved one driver failing to observe the traffic signal. Additionally, a red light camera has been installed for eastbound vehicles on St. Joseph Boulevard at this intersection.

St. Joseph Boulevard between Prestone Drive and Tenth Line Road
In this road segment overall, a total of six collisions have been identified in the last five years, consisting of three sideswipe impacts and three single vehicle impacts. One of the six collisions resulted in injuries. Two of the six collisions occurred in poor driving conditions.

St. Joseph Boulevard between Tenth Line Road and Old Tenth Line Road
No collisions were identified at St. Joseph Boulevard/Eric Czapnik Way, which is located midblock between Tenth Line Road and Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp. In this road segment overall, a total of three collisions have been identified in the last five years, all involving a single vehicle. No collisions resulted in injuries, and one collision occurred in poor driving conditions.

2.2 Planned Conditions

2.2.1 Planned Transportation Projects

The City's 2013 Transportation Master Plan (TMP) identifies multiple Rapid Transit or Transit Priority (RTTP) projects in proximity of the subject site. Consistent with the 2031 Network Concept, extension of the Confederation Line LRT from Blair Station to Trim Station is currently under construction, and revenue service is planned for 2024. Additionally, the 2031 Affordable Network and 2031 Network Concept identifies transit signal priority and queue jump lanes on Tenth Line Road between Ottawa Road 174 and Charlemagne Boulevard.

The City's 2013 TMP does not identify any roadway projects within the study area in its Affordable Road Network. The 2013 TMP identifies a widening of Ottawa Road 174 in its 2031 Network Concept, which would include widening the roadway from four lanes to six lanes between Highway 417 and Trim Road, and widening the roadway from two lanes to four lanes between Trim Road and the urban boundary.

The City's 2013 Pedestrian Plan does not identify any new pedestrian infrastructure projects within the study area.

The City's 2013 Cycling Plan includes the implementation of a multi-use pathway on Tenth Line Road between St. Joseph Boulevard and Innes Road, as a Phase 3 (2026-2031) project.

2.2.2 Other Area Developments

In proximity of the proposed development, there are multiple other developments that are approved or are in the approval process, and are listed below. Relevant excerpts of the traffic studies in support of these developments are included in **Appendix F**.

Hillside Vista
The Hillside Vista developments consist of multiple phases, some of which have been completed. The subject site is adjacent to the Hillside Vista developments. A total of 44 townhome dwellings have been built (considered 'Phase 1A'), and a total of 90 walk-up condominium dwellings are proposed as part of 'Phase 1B.' It is assumed that buildout of Phase 1B will be completed by the time the subject site is complete (i.e. the buildout year of 2024). Phase 1B is approved and now under construction.

211 Centrum Boulevard
This development is planned to include 17-storey and 9-storey buildings, consisting of a total of 397 retirement home units. The anticipated buildout year for this development is 2024. At the time of writing, the Official Plan Amendment, Zoning By-Law Amendment, and Site Plan Control applications associated with this development are in the review process.

3030 St. Joseph Boulevard
This development is planned to include a 16-storey building, consisting of 165 residential units and 426 m^2 of ground floor retail space. The development is anticipated to be built out by 2024. At the time of writing, the Zoning By-Law Amendment application associated with this development has been recommended for approval.

Petrie's Landing (8466, 8600, 8700, and 8900 Jeanne d'Arc Boulevard)
This development is divided into three phases, and can be summarized as follows:

- Petrie's Landing I: 806 dwellings and 1,500 m^2 of commercial space;
- Petrie's Landing II: 113 dwellings;
- Petrie's Landing III: 790 dwellings, 23,000 ft^2 of retail space, and 370,000 ft^2 of office space.

The first two phases are anticipated to be built out by 2024, and the third phase is assumed to be 50% built out in 2024, and fully built out by 2027. At the time of writing, the Site Plan Control and Zoning By-Law Amendment applications associated with the second phase of the development are in the review process.

2.3 Study Area and Time Periods

The study area for this report includes the boundary roadways St. Joseph Boulevard, Tenth Line Road, and Lionel-Rhéo Private, as well as the following intersections:

Signalized Intersections
- St. Joseph Boulevard/Tenth Line Road
- St. Joseph Boulevard/Old Tenth Line Road/ Ottawa Road 174 EB Off-Ramp

Unsignalized Intersections
- St. Joseph Boulevard/Vieux-Silo Street
- St. Joseph Boulevard/Eric Czapnik Way

Per discussions with City staff, the intersection at St. Joseph Boulevard/Place d'Orléans Drive/ Duford Drive has not been considered in the study area, as the number of site-generated trips that would travel through this intersection to access Ottawa Road 174 is anticipated to be minimal during the peak hours. Further discussion of the trip distribution and assignment assumptions are included in Sections 3.1.2 and 3.1.3.

The selected time periods for the analysis are the weekday AM and PM peak hours, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. Analysis will be completed for the 2024 build-out year and the 2029 horizon year.

2.4 Exemptions Review

This module reviews possible exemptions from the final Transportation Impact Assessment, as outlined in the *2017 TIA Guidelines*. The applicable exemptions for this site are shown in **Table 2**.

Table 2: TIA Exemptions

Module	Element	Exemption Criteria	Status
Design Review Component			
4.1 Development Design	*4.1.2* Circulation and Access	• Only required for site plans	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 plans	Not Exempt
	4.2.2 Spillover Parking	• Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 Transportation Demand Management	*All elements*	• Not required for non-residential site plans expected to have fewer than 60 employees and/or students on location at any given time	Not Exempt
4.6 Neighbourhood Traffic Management	*4.6.1* Adjacent Neighbourhoods	• Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Not 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

Based on the foregoing, the following modules will be included in the TIA report:

Design Review Component
- Module 4.1: Development Design
- Module 4.2: Parking
- Module 4.3: Boundary Streets
- Module 4.4: Access Design

Network Impact Component
- Module 4.5: Transportation Demand Management
- Module 4.6: Neighbourhood Traffic Management
- Module 4.7: Transit
- Module 4.9: Intersection Design

3.0 FORECASTING

3.1 Development-Generated Travel Demand

3.1.1 Trip Generation

The proposed development will include a total of 274 mid-rise apartment dwellings. The *TRANS Trip Generation Manual Summary Report*, prepared in October 2020 by WSP, includes data to estimate the trip generation and mode shares for residential uses, divided into single-family detached housing, low-rise multifamily housing (one or two storeys), and high-rise multifamily housing (three or more storeys). Relevant excerpts of the *TRANS Trip Generation Manual* are included in **Appendix G**.

The *TRANS Trip Generation Manual* identifies the subject site as being located within the Orléans district, which has the following observed mode shares during the peak hours:

AM Peak Hour
- Auto Driver: 54%
- Auto Passenger: 7%
- Transit: 29%
- Cyclist: 0%
- Pedestrian: 10%

PM Peak Hour
- Auto Driver: 60%
- Auto Passenger: 13%
- Transit: 21%
- Cyclist: 0%
- Pedestrian: 6%

For the proposed development, one set of mode shares have been assumed for both peak hours, based on the above shares (i.e. 55% driver, 10% passenger, 25% transit, 10% pedestrian).

For the High-Rise Multifamily Housing land use, the process of converting the trip generation estimates from peak period to peak hour is shown in the following tables. The estimated number of person trips generated by the proposed dwellings for the AM and PM peak periods are shown in **Table 3**. A breakdown of these trips by modal share is shown in **Table 4**.

Table 3: Proposed Residential – Peak Period Trip Generation

Land Use	TRANS Rate	Units	AM Peak Period (ppp[1])			PM Peak Period (ppp)		
			IN	OUT	TOT	IN	OUT	TOT
High-Rise Multifamily Housing	AM: 0.80 PM: 0.90	274	68	151	*219*	143	104	*247*

1. ppp: Person Trips per Peak Period

Table 4: Proposed Residential – Peak Period Trips by Mode Share

Travel Mode	Mode Share	AM Peak Period			PM Peak Period		
		IN	OUT	TOT	IN	OUT	TOT
Peak Period Person Trips		**68**	**151**	***219***	**143**	**104**	***247***
Auto Driver	55%	37	83	*120*	79	57	*136*
Auto Passenger	10%	7	15	*22*	14	11	*25*
Transit	25%	17	38	*55*	36	26	*62*
Cyclist	0%	0	0	*0*	0	0	*0*
Pedestrian	10%	7	15	*22*	14	10	*24*

Table 4 of the *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 5**.

Table 5: Proposed Residential – Peak Hour Trips by Mode Share

Travel Mode	Adj. Factor		AM Peak Hour			PM Peak Hour		
	AM	PM	IN	OUT	TOT	IN	OUT	TOT
Auto Driver	0.48	0.44	18	40	*58*	35	25	*60*
Auto Passenger	0.48	0.44	3	7	*10*	6	5	*11*
Transit	0.55	0.47	9	21	*30*	17	12	*29*
Cyclist	0.58	0.48	0	0	*0*	0	0	*0*
Pedestrian	0.58	0.52	4	9	*13*	7	5	*12*
Peak Hour Person Trips			**34**	**77**	***111***	**65**	**47**	***112***

From the previous table, the proposed high-rise dwellings are estimated to generate 111 person trips (including 58 vehicle trips) during the AM peak hour and 112 person trips (including 60 vehicle trips) during the PM peak hour.

3.1.2 Trip Distribution

The assumed distribution of trips generated by the proposed development have been derived from the initial trip distribution assumptions of the *Orléans Town Centre (OTC) West Transportation Impact Study*, prepared by Novatech in July 2007, and existing traffic patterns. The assumed distribution of site-generated trips can be described as follows:

- 5% to/from the north via Tenth Line Road;
- 25% to/from the south via Tenth Line Road;
- 10% to/from the east via St. Joseph Boulevard;
- 15% to/from the west via St. Joseph Boulevard;
- 45% to/from the west via Ottawa Road 174.

Trips arriving from the west are anticipated to enter the study area via St. Joseph Boulevard or the Ottawa Road 174 EB Off-Ramp. All trips departing to the west via Ottawa Road 174 have been equally distributed to the on-ramps at Tenth Line Road and Champlain Street (via Place d'Orléans Drive, west of the study area). Relative to the study area, this adds another 22.5% of outbound trips to the north via Tenth Line Road and 22.5% of outbound trips to the west via St. Joseph Boulevard.

3.1.3 Trip Assignment

It is anticipated that, based on the layout of the proposed development, trips to/from the subject site may utilize the proposed right-in/right-out (RIRO) access to St. Joseph Boulevard when arriving and the Lionel-Rhéo Private access when departing, or vice versa. The assumed assignment of site-generated trips can be described as follows:

St. Joseph Boulevard RIRO Access

- 100% of trips arriving from the north via Tenth Line Road;
- 100% of trips arriving from the south via Tenth Line Road;
- 25% of trips arriving from the east via St. Joseph Boulevard;
- 25% of trips arriving from the west via Ottawa Road 174;
- 50% of trips departing to the west via St. Joseph Boulevard;
- 50% of trips departing to the west via Ottawa Road 174.

Lionel-Rhéo Private Access via Vieux-Silo Street

- 100% of trips arriving from the west via St. Joseph Boulevard;
- 100% of trips departing to the south via Tenth Line Road;
- 50% of trips departing to the west via St. Joseph Boulevard.

Lionel-Rhéo Private Access via Eric Czapnik Way

- 75% of trips arriving from the east via St. Joseph Boulevard;
- 75% of trips arriving from the west via Ottawa Road 174;
- 100% of trips departing to the north via Tenth Line Road;
- 100% of trips departing to the east via St. Joseph Boulevard;
- 50% of trips departing to the west via Ottawa Road 174.

3.2 Background Traffic

3.2.1 Other Area Developments

As first discussed in Section 2.2.2, traffic generated by the following developments in proximity of the subject site have been considered in the 2024 and 2029 background volumes. Relevant excerpts of the traffic studies in support of these developments are included in **Appendix F**.

Hillside Vista
A total of 44 townhome dwellings have been built (considered 'Phase 1A'), and a total of 90 walk-up condominium dwellings are proposed as part of 'Phase 1B.' A Transportation Brief was prepared by Novatech in December 2017 in support of Phase 1B, and traffic volumes generated by this phase have been added to the 2024 and 2029 background traffic volumes.

211 Centrum Boulevard
This development is planned to include 17-storey and 9-storey buildings, consisting of a total of 397 retirement home units. A TIA was prepared by CGH in April 2021 in support of this development, and traffic volumes generated by this development have been added to the 2024 and 2029 background traffic volumes.

3030 St. Joseph Boulevard
This development is planned to include a 16-storey building, consisting of 165 residential units and 426 m^2 of ground floor retail space. A Transportation Brief was prepared by Parsons in September 2017 in support of this development, and traffic volumes generated by this development have been added to the 2024 and 2029 background traffic volumes.

Petrie's Landing (8466, 8600, 8700, and 8900 Jeanne d'Arc Boulevard)
This development is divided into three phases, and can be summarized as follows:

- Petrie's Landing I: 806 dwellings and 1,500 m^2 of commercial space;
- Petrie's Landing II: 113 dwellings;
- Petrie's Landing III: 790 dwellings, 23,000 ft^2 of retail space, and 370,000 ft^2 of office space.

A TIA was prepared by Parsons in February 2021 in support of Phase 2, and identified that the first two phases are anticipated to be built out by 2024, while the third phase is assumed to be 50% built out in 2024 and fully built out by 2027. Therefore, traffic volumes generated by 100% of Phase 1, 100% of Phase 2, and 50% of Phase 3 have been added to the 2024 background traffic volumes, and traffic volumes generated by 100% of all phases have been added to the 2029 background traffic volumes.

3.2.2 General Background Growth Rate

A review of snapshots of the City's *Strategic Long-Range Model* and *Intersection Traffic Growth Rates (2000-2016)* has been conducted. Both resources are included in **Appendix H**. Comparing snapshots of the 2011 and 2031 AM peak hour traffic volumes, the *Strategic Long-Range Model* generally suggests positive growth on the arterial roadways, ranging from approximately 0.5% on Tenth Line Road and approximately 4% on St. Joseph Boulevard. The *Intersection Traffic Growth Rates* figures, which determine growth rates based on total vehicular volumes entering the intersection, identify the following growth rates at St. Joseph Boulevard/Tenth Line Road between 2000 and 2016.

- AM Peak Hour: positive growth between +4.0% and +8.0% per annum;
- PM Peak Hour: positive growth between +2.0% and +4.0% per annum.

In addition to the above resources, Exhibit 2.10 of the City's 2013 TMP projects population and employment growth rates of approximately 1.6% to 3.0% per year, respectively. Therefore, an annual background growth rate of 3% has been assumed for traffic volumes on St. Joseph Boulevard, Tenth Line Road, Old Tenth Line Road/Ottawa Road 174.

3.3 Future Traffic Conditions

The figures below present the following future traffic conditions:

- Proposed site-generated traffic volumes are shown in **Figure 5**;
- Other area development-generated traffic volumes in 2024 are shown in **Figure 6**;
- Other area development-generated traffic volumes in 2029 are shown in **Figure 7**;
- Background traffic volumes in 2024 are shown in **Figure 8**;
- Background traffic volumes in 2029 are shown in **Figure 9**;
- Total traffic volumes in 2024 are shown in **Figure 10**;
- Total traffic volumes in 2029 are shown in **Figure 11**.

Figure 5: Site-Generated Traffic Volumes

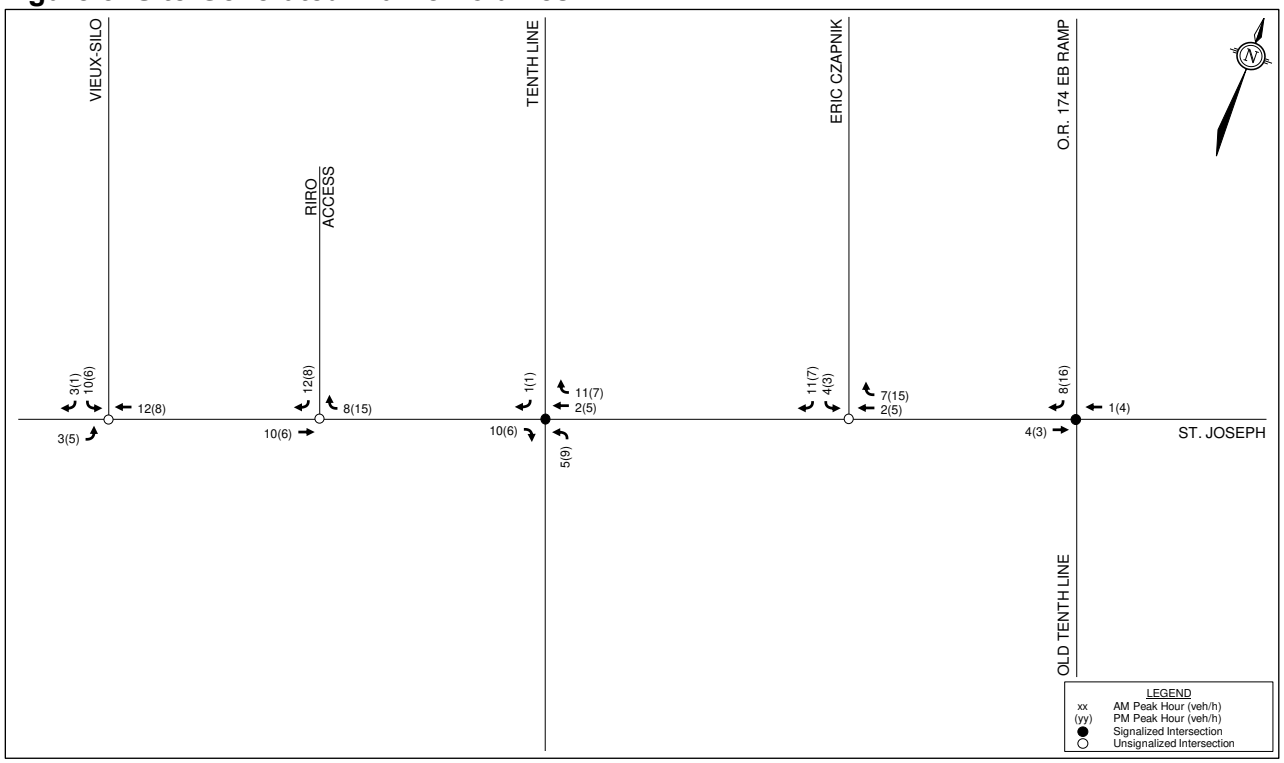


Figure 6: 2024 Other Area Development-Generated Traffic Volumes

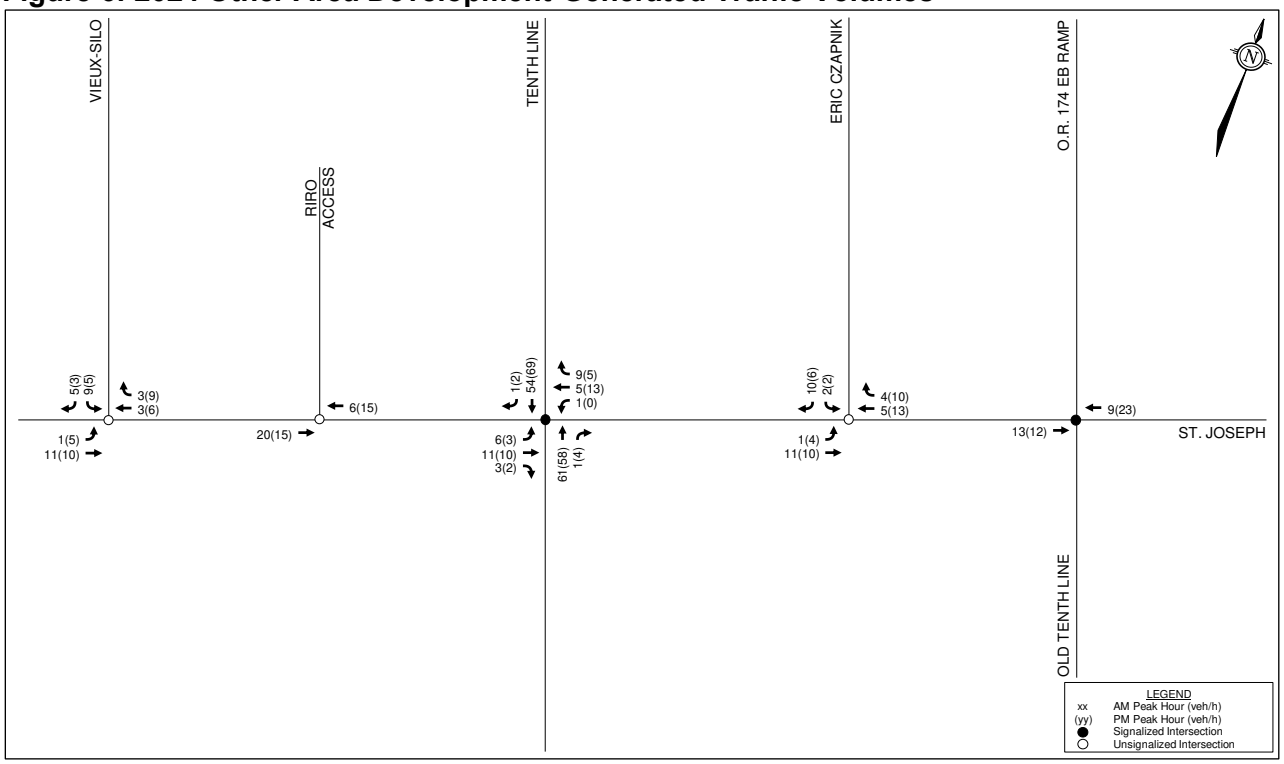


Figure 7: 2029 Other Area Development-Generated Traffic Volumes

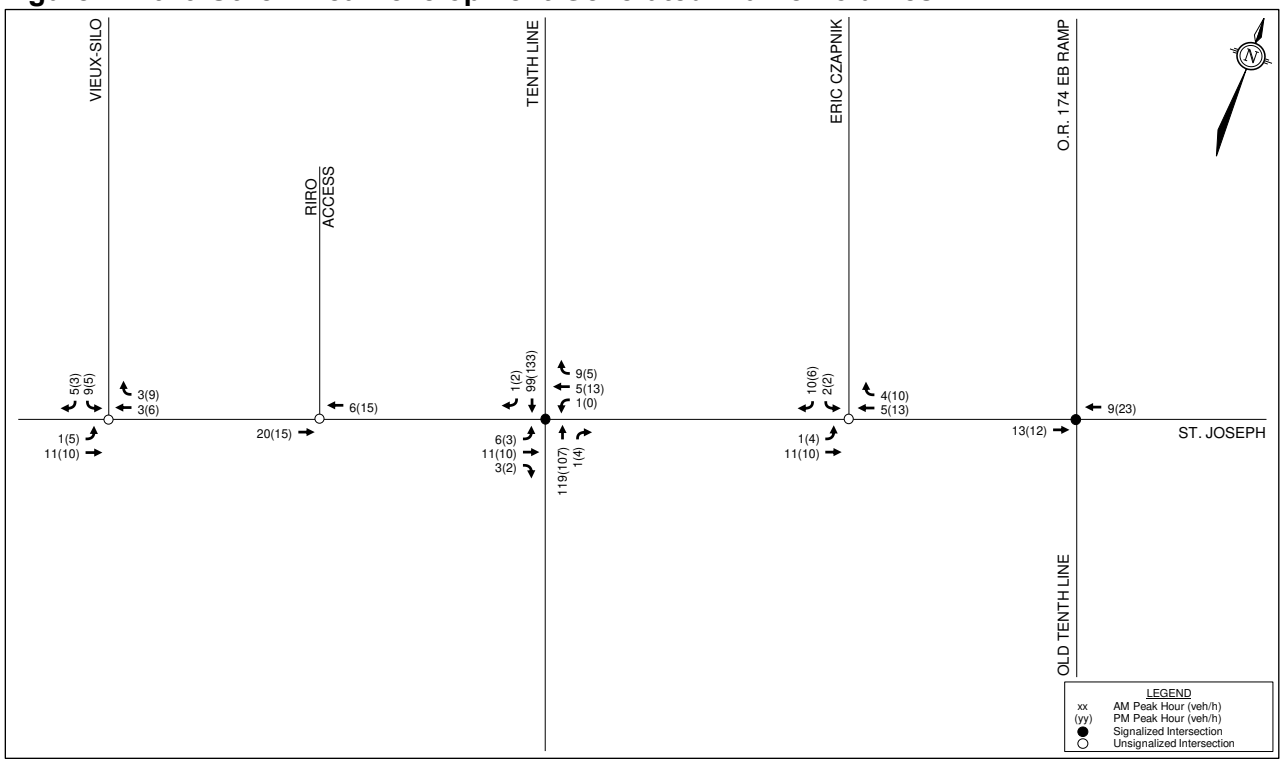


Figure 8: 2024 Background Traffic Volumes

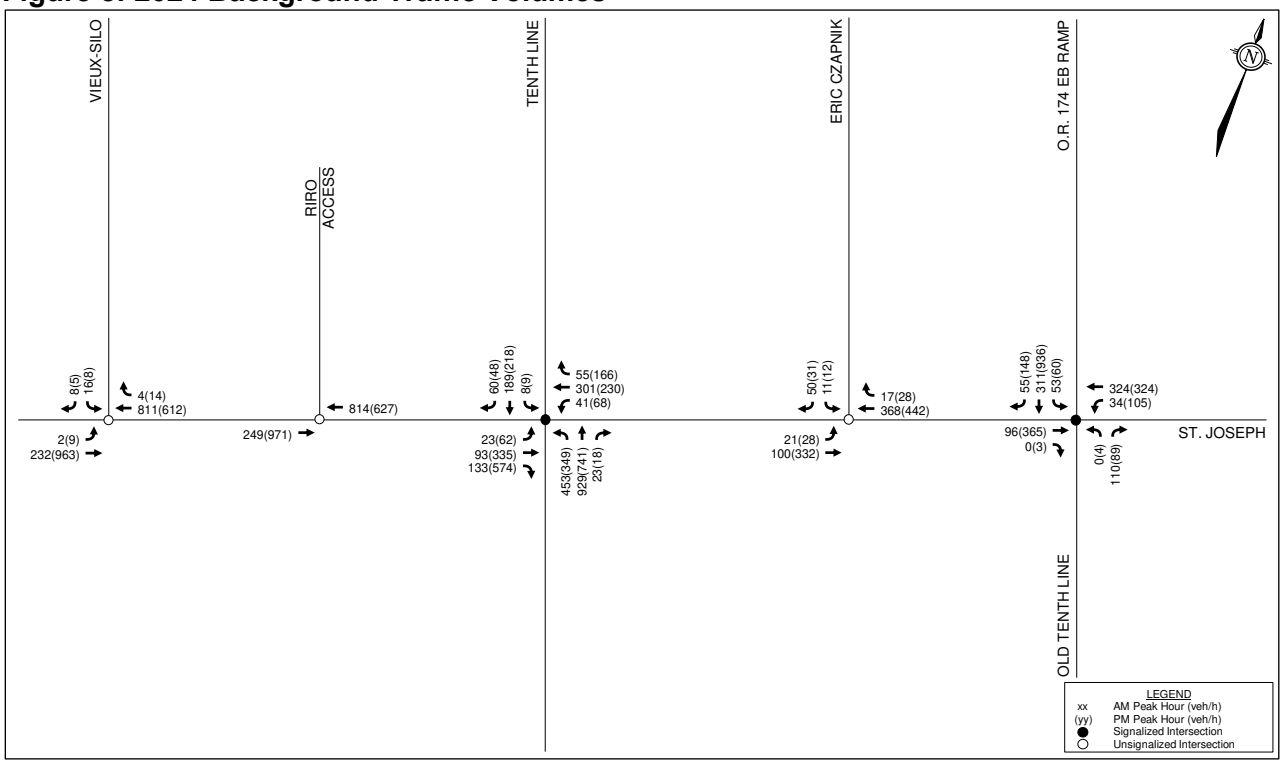


Figure 9: 2029 Background Traffic Volumes

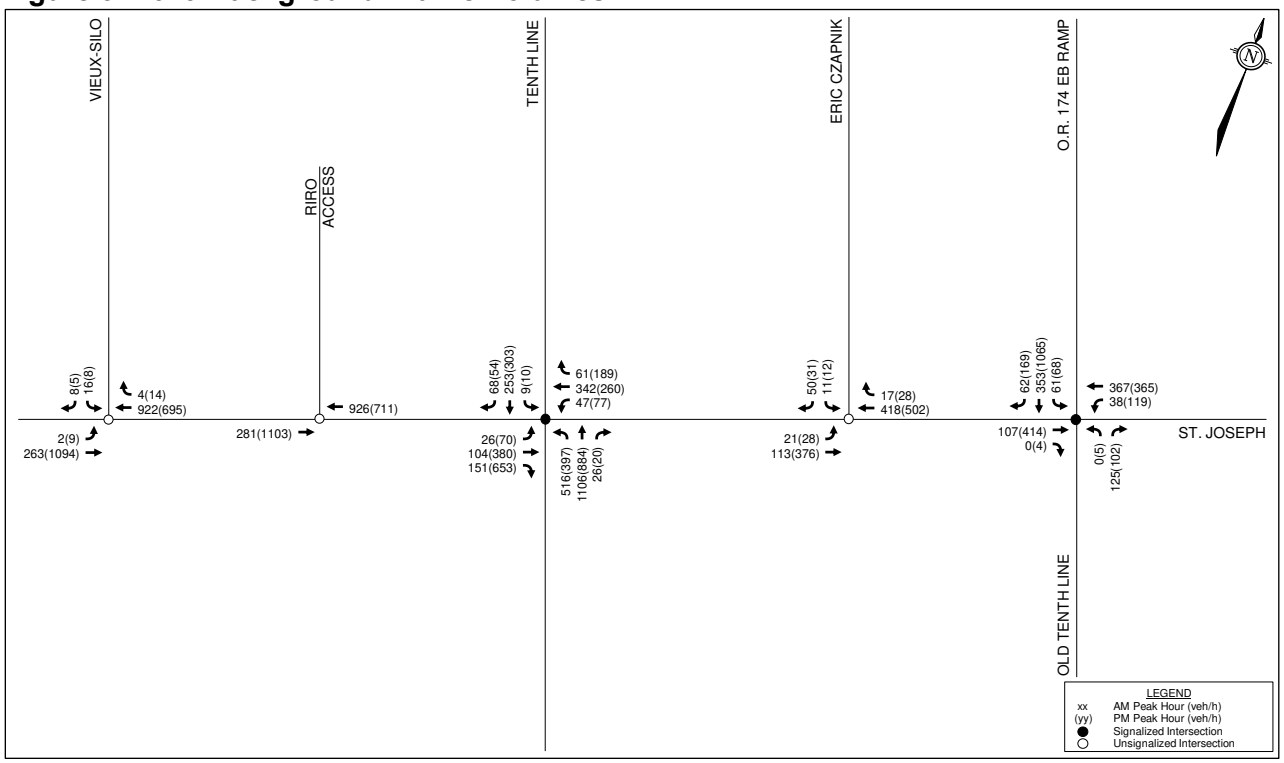


Figure 10: 2024 Total Traffic Volumes

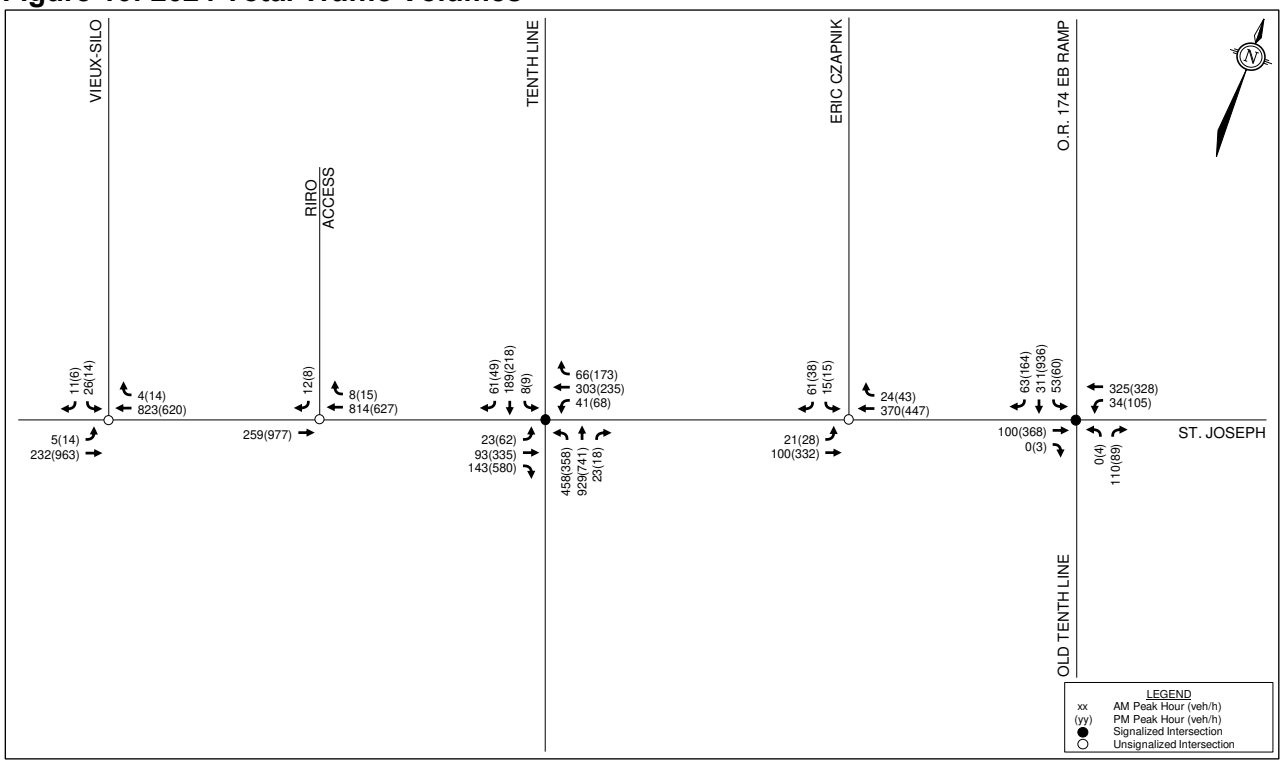
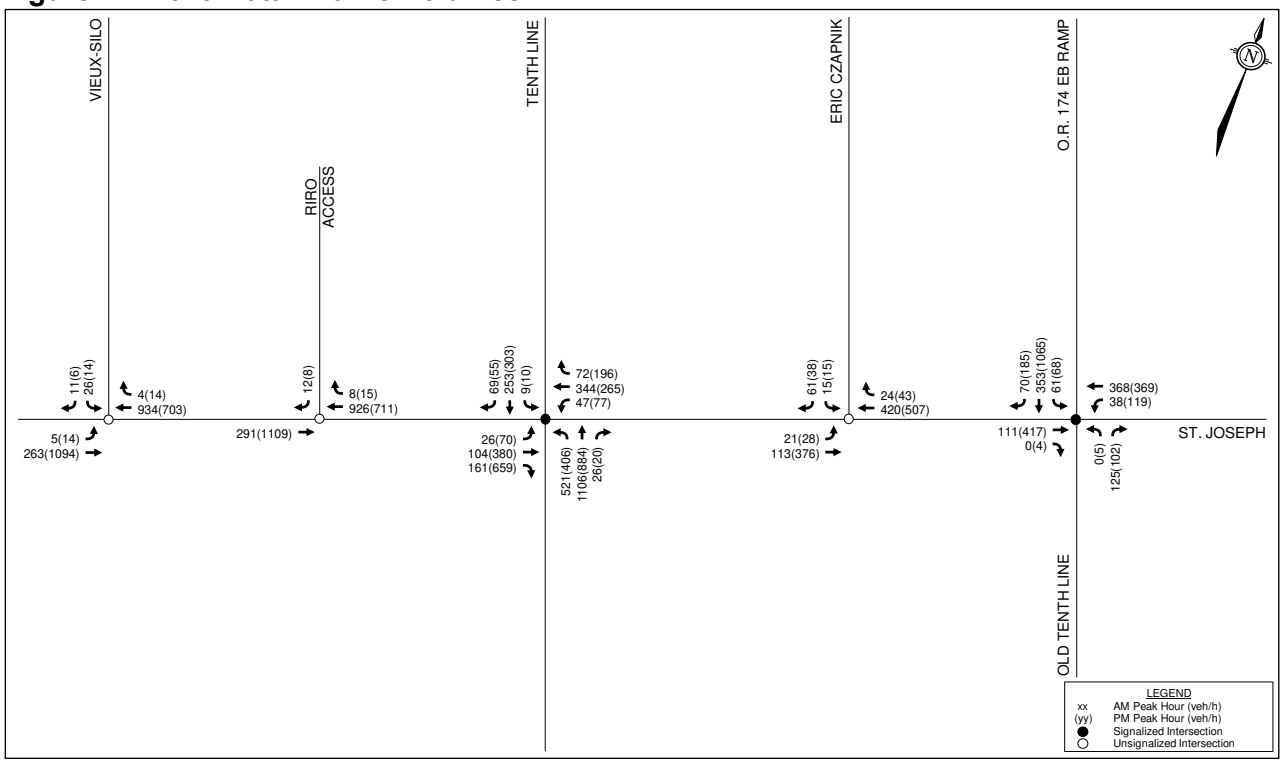


Figure 11: 2029 Total Traffic Volumes



3.4 Demand Rationalization

A review of the existing and background intersection operations has been conducted to determine if and when traffic volumes exceed capacity within the study area. The intersection parameters used in the analysis are consistent with the *2017 TIA Guidelines* (Saturated Flow Rate: 1,800 vphpl, Peak Hour Factor: 0.9 in existing conditions and 1.0 in future conditions).

Per Exhibit 22 of the *Multi-Modal Level of Service (MMLOS) Guidelines*, the target vehicular level of service (Auto LOS) at all study area intersections is an Auto LOS D, which equates to a vehicle-to-capacity (v/c) ratio of 0.90 at signalized intersections, and a maximum delay of 35 seconds at unsignalized intersections. Signal timing plans were obtained from the City, and are included in **Appendix I**.

3.4.1 Existing Intersection Operations

Intersection capacity analysis has been conducted for the existing traffic conditions. The results of the analysis are summarized in **Table 6** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix J**.

Table 6: Existing Traffic Operations

Intersection	AM Peak			PM Peak		
	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
St. Joseph Boulevard/ Vieux-Silo Street(1)	16 sec	C	SBL/R	18 sec	C	SBL/R
St. Joseph Boulevard/ Tenth Line Road(2)	0.73	C	NBT	0.79	C	EBR
St. Joseph Boulevard/ Eric Czapnik Way(1)	10 sec	A	SBL/R	11 sec	B	SBL/R
St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp(2)	0.37	A	WBT	0.66	B	SBT

1. Unsignalized intersection
2. Signalized intersection

From the previous table, all study area intersections currently operate at an Auto LOS C or better during the AM and PM peak hours.

For all auxiliary lanes at the study area intersections, the Synchro analysis does not identify any 50th-percentile or 95th-percentile queue lengths that exceed the storage lengths provided. Similarly, Synchro does not identify any queues that result in blocking at an upstream intersection (i.e. on St. Joseph Boulevard, westbound queues at Tenth Line Road and eastbound queues at Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp do not extend through the intersection at Eric Czapnik Way).

3.4.2 2024 Background Intersection Operations

Intersection capacity analysis has been conducted for the 2024 background traffic conditions. The results of the analysis are summarized in **Table 7** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix K**.

Table 7: 2024 Background Traffic Operations

Intersection	AM Peak			PM Peak		
	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
St. Joseph Boulevard/ Vieux-Silo Street(1)	16 sec	C	SBL/R	18 sec	C	SBL/R
St. Joseph Boulevard/ Tenth Line Road(2)	0.74	C	NBT	0.79	C	EBR
St. Joseph Boulevard/ Eric Czapnik Way(1)	10 sec	A	SBL/R	11 sec	B	SBL/R
St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp(2)	0.35	A	WBT	0.66	B	SBT

1. Unsignalized intersection
2. Signalized intersection

From the previous table, all study area intersections in the 2024 background conditions are projected to continue operating at an Auto LOS C or better during the AM and PM peak hours. The max v/c ratios and delays at some intersections appear to improve when compared to the existing conditions, due to differences in the Peak Hour Factor parameter (0.9 in existing conditions versus 1.0 in future conditions).

For all auxiliary lanes at the study area intersections, the Synchro analysis does not identify any 50th-percentile or 95th-percentile queue lengths that exceed the storage lengths provided. Similarly, Synchro does not identify any queues that result in blocking at an upstream intersection.

3.4.3 2029 Background Intersection Operations

Intersection capacity analysis has been conducted for the 2029 background traffic conditions. The results of the analysis are summarized in **Table 8** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix K**.

Table 8: 2029 Background Traffic Operations

Intersection	AM Peak			PM Peak		
	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
St. Joseph Boulevard/ Vieux-Silo Street(1)	17 sec	C	SBL/R	21 sec	C	SBL/R
St. Joseph Boulevard/ Tenth Line Road(2)	0.84	D	NBT	0.82	D	EBR
St. Joseph Boulevard/ Eric Czapnik Way(1)	10 sec	A	SBL/R	11 sec	B	SBL/R
St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp(2)	0.40	A	WBT	0.71	C	SBT

1. Unsignalized intersection
2. Signalized intersection

From the previous table, all study area intersections in the 2029 background conditions are projected to operate at an Auto LOS D or better during the AM and PM peak hours. Compared to the 2024 background conditions, the max v/c ratios and delays at the study area intersections increase due to background traffic growth.

The Synchro analysis identifies that, in the AM peak hour, the 95th-percentile northbound queue length at St. Joseph Boulevard/Tenth Line Road is approximately 190m, which extends past the auxiliary northbound left turn lane. For all auxiliary lanes within the study area, Synchro does not identify any 50th-percentile or 95th-percentile queue lengths that exceed the storage lengths provided. Similarly, Synchro does not identify any queues that result in blocking at an upstream intersection.

4.0 ANALYSIS

4.1 Development Design

4.1.1 Design for Sustainable Modes

New pedestrian walkways will connect the main and secondary entrances of Buildings A and B to the existing sidewalk on St. Joseph Boulevard. The main entrance of Building A is located at the southeastern corner of the subject site and the main entrance of Building B is located east of the proposed RIRO access, while the secondary entrances to both buildings will be accessed in the service easement between the two buildings, and are located approximately 35m north of St. Joseph Boulevard. New pedestrian walkways will also connect the main entrance of Building A and the northern end of the subject site to the existing sidewalk on Tenth Line Road.

bicycle parking will be provided in the upper parking garage level within Building B. The number of bicycle parking spaces, as well as the minimum bicycle parking requirements per the City's *Zoning By-Law* (ZBL), are reviewed further in Section 4.2.

The nearest bus stops to the subject site are shown in Section 2.1.6 and **Figure 3**. OC Transpo's service guideline for peak period services is to provide service within a five-minute (400m) walk of home, work, or school for 95% of urban residents. Measuring from the main entrance, the bus stops within 400m are stops #1794, #6763, #7843, #7846, #8596, and #8761, which are served by OC Routes 33, 236, and 302.

A review of the *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 the checklist is included in **Appendix L**. In addition to the required measures, the proposed development also meets the following 'basic' or 'better' measures as defined in the *TDM-Supportive Development Design and Infrastructure Checklist*:

- Locate building close to the street, and do not locate parking areas between the street and building entrances;
- Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations;
- Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort;
- Provide safe, direct and attractive walking routes from building entrances to nearby transit stops.

4.1.2 Circulation and Access

Pick-ups and drop-offs will be facilitated in a designated loop at the northwest corner of Building A, which will be accessed via Lionel-Rhéo Private. Access to the underground parking garage via Building A will be located directly adjacent to this pick-up/drop-off loop. Garbage collection and loading/deliveries will take place at the service entries to Buildings A and B, via the access along the service easement between the buildings. The fire route for the proposed development will be located curbside on St. Joseph Boulevard.

Turning movement figures have been prepared for a Medium Single Unit (MSU) design vehicle, which represents garbage or delivery trucks, and is anticipated to be the largest vehicle to traverse the site. These figures are included in **Figure 12** and **Figure 13**.

4.2 Parking

The subject site is located in Area C of Schedule 1 and Area Z of Schedule 1A of the City's ZBL. Minimum vehicle parking rates, and minimum bicycle parking rates for the proposed development are identified in Sections 101, 102, and 111 of the ZBL, and are summarized in **Table 9**.

Table 9: Required and Proposed Parking

Land Use	Rate	Units	Required	Provided
Minimum Vehicle Parking				
Dwelling, Mid-Rise	No minimum rate for resident parking; 0.1 spaces per unit for visitors after the first 12 units	274 units	26	157 (resident) 27 (visitor)
Minimum Bicycle Parking				
Dwelling, Mid-Rise	0.5 spaces per dwelling	274 units	137	137

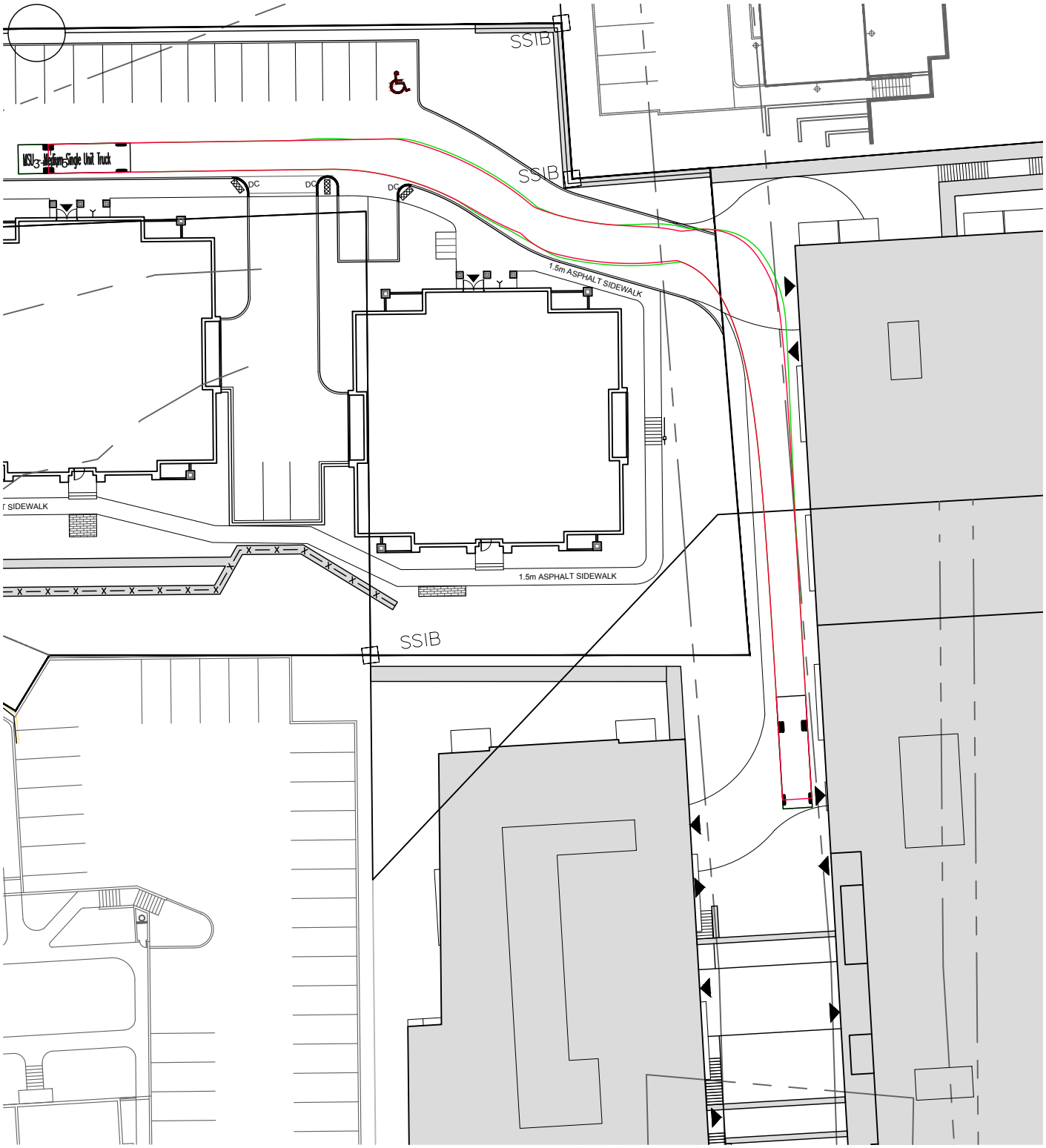
Based on the previous table, the proposed number of vehicle parking spaces meets both of the minimum requirements, as outlined in the City's ZBL. Of the 184 proposed parking spaces, three will be allocated as accessible parking spaces.

Section 111(12) of the ZBL identifies that, where the number of bicycle parking spaces required for a single residential building exceeds 50 spaces, a minimum of 25% of the required total must be located within a building or structure, a secure area, or bicycle lockers. All bicycle parking will be provided in the upper parking garage level within Building B. Therefore, this requirement is met.

4.3 Boundary Streets

This section provides a review of the boundary streets St. Joseph Boulevard and Tenth Line Road. The *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 roadways have been evaluated against the MMLOS targets associated with the 'Mixed Use Centre' land use designation, and are based on existing conditions.

A detailed segment MMLOS review of the boundary streets is included in **Appendix M**. A summary of the segment MMLOS analysis are provided in **Table 10**.



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HILLSIDE

TURNING MOVEMENTS - S-LOT (MSU)

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE NOV 2021 | JOB 120237 | FIGURE FIGURE-12

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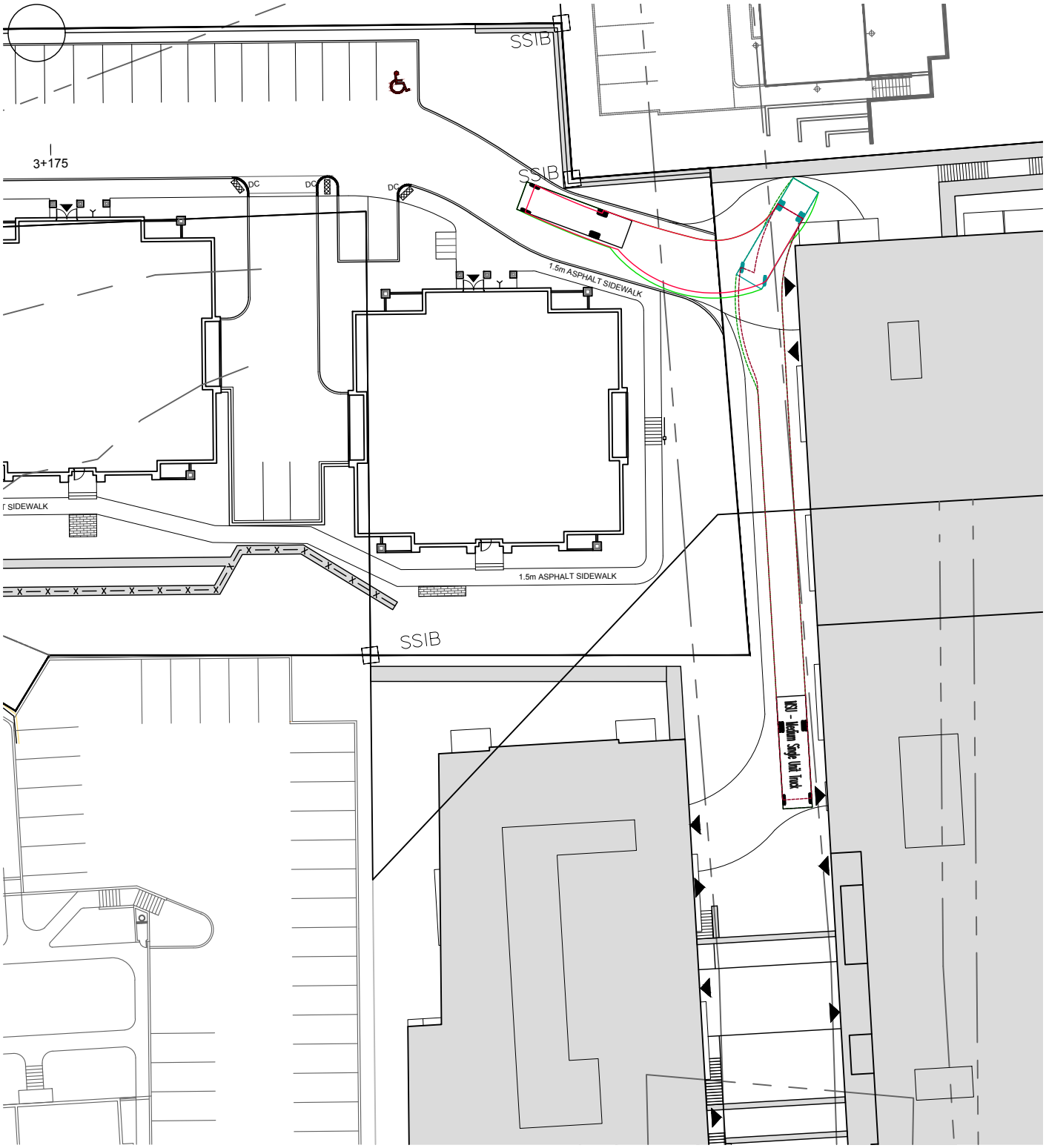

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TURNING MOVEMENTS - S-LOT (MSU)

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE NOV 2021 | JOB 120237 | FIGURE FIGURE-13

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Table 10: Segment MMLOS Summary

Segment	PLOS		BLOS		TLOS		TkLOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target
St. Joseph Boulevard	**F**	C	**F**	A	D	-	A	D
Tenth Line Road	**F**	C	**F**	C	D	D	A	D

The results of the segment MMLOS analysis can be summarized as follows:

- Both St. Joseph Boulevard and Tenth Line Road do not meet the target pedestrian level of service (PLOS) C;
- Both St. Joseph Boulevard and Tenth Line Road do not meet the target bicycle level of service (BLOS) A or C;
- Tenth Line Road achieves the target transit level of service (TLOS) D;
- Both St. Joseph Boulevard and Tenth Line Road meet the target truck level of service (TkLOS) D.

Based on Exhibit 4 of the *MMLOS Guidelines*, the best possible PLOS for roadways with curb lane volumes greater than 3,000 vehicles per day and an operating speed greater than 60 km/h is a PLOS D. This can be achieved by providing sidewalks with a minimum width of 2.0m and a minimum boulevard width greater than 2.0m. This applies to both sides of St. Joseph Boulevard and the east side of Tenth Line Road, and is identified for the City's consideration. For the west side of Tenth Line Road, the target PLOS C can be achieved by providing a sidewalk with a minimum width of 2.0m and a minimum boulevard width of 0.5m. This is identified for the City's consideration.

Based on Exhibit 11 of the *MMLOS Guidelines*, a physically separated bikeway (such as cycle tracks or multi-use pathways) are required to achieve the target BLOS A for St. Joseph Boulevard or BLOS C for Tenth Line Road, given the current operating speed of both roadways. The *Ontario Traffic Manual (OTM) – Book 18* includes a desirable cycling facility pre-selection tool, based on the operating speed and AADT of a roadway. For roadways with an operating speed of 70 km/h and AADT volumes of 11,000 to 16,000 vehicles per day, OTM Book 18 identifies that separated facilities are appropriate. This is identified for the City's consideration. The pre-selection tool is included in **Figure 14**.

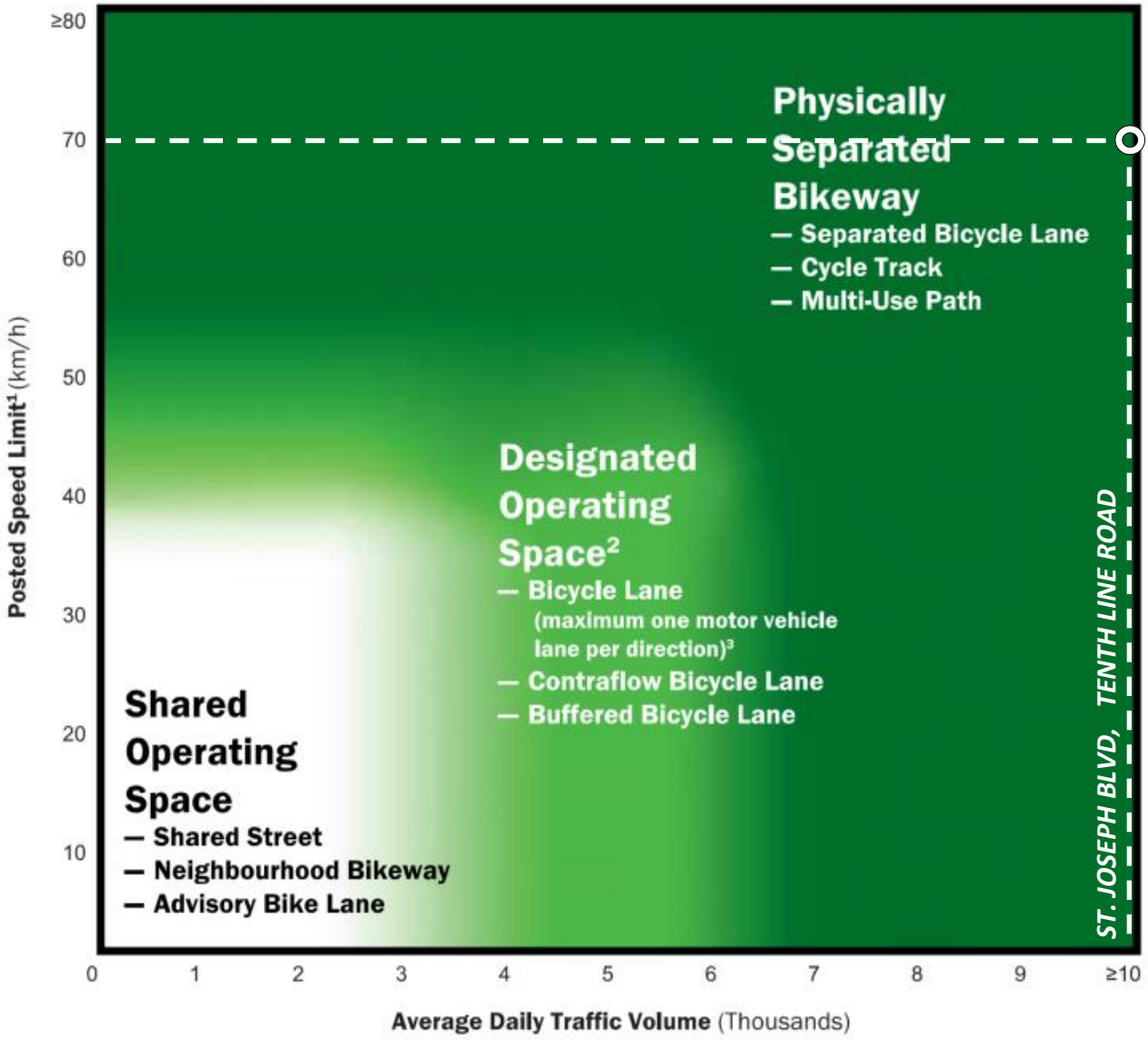
4.4 Access Design

The proposed connection to Lionel-Rhéo Private will be approximately 6.0m in width. Per Section 107(1)(a) of the City's ZBL, any driveway providing access to a parking lot or garage must have a minimum width of 6.0m for a double traffic lane. Per Section 107(1)(aa) of the ZBL, the maximum permitted width for a double traffic lane leading to 20 or more parking spaces is 6.7m. The proposed connection to Lionel-Rhéo Private meets both of these provisions.

The design of the proposed RIRO access to St. Joseph Boulevard has been evaluated based on the relevant provisions of the City's ZBL and *Private Approach By-Law* (PABL), and the Transportation Association of Canada (TAC)'s *Geometric Design Guide for Canadian Roads*.

Section 25(a) of the PABL identifies that, for sites with 45m to 150m of frontage on a roadway, a maximum of two two-way private approaches to that roadway are permitted. As only one access to St. Joseph Boulevard is proposed, this requirement is met.

Figure 14: Desirable Cycling Facility Pre-Selection Nomograph



1 Operating speeds are assumed to be similar to posted speeds. If evidence suggests this is not the case, practitioners may consider using 85th percentile speeds or implementing measures to reduce operating speeds.
2 Physically separated bikeways may always be considered in the designated operating space area of the nomograph.
3 On roadways with two or more lanes per direction (including multi-lane one-way roadways), a buffered bicycle lane should be considered the minimum with a typical facility being a physically separated bikeway.

Section 25(c) of the PABL identifies a maximum width requirement of 9.0m for any two-way private approach, as measured at the street line. Since the proposed RIRO access is approximately 6.1m in width at the street line, this requirement is met. Section 107(1)(a) and 107(1)(aa) of the City's ZBL identify that any driveway providing access to a parking lot or garage must have a minimum width of 6.0m and a maximum width of 6.7m, for double traffic lanes leading to 20 or more parking spaces. The proposed RIRO access also meets both of these provisions.

Section 25(m)(ii) of the PABL identifies that, for a property that abuts or is within 46m of an arterial roadway, there is a minimum distance requirement between a private approach and the nearest intersecting street line, based on the land use and the number of parking space provided. For apartment buildings with 100 to 199 parking spaces, a minimum distance of 30m is required. Measuring along the street line, the nearest edge of the proposed RIRO access is approximately 57m to the extension of the Tenth Line Road ROW, and therefore this requirement is met.

Section 25(p) of the PABL identifies a minimum separation requirement of 3m between a private approach and the nearest property line, as measured at the street line. The western edge of the proposed RIRO access is approximately 5m from the westerly property line, and therefore this requirement is met.

Section 25(u) of the PABL identifies a requirement that any private approach serving a parking area with more than 50 parking spaces shall not have a grade exceeding 2% for the first 9m inside the property line. Measuring from the property line, the grade of the access is approximately 2% (descending toward the roadway) for the first 4m inside the property line, and 6% (descending toward the parking garage) for the next 5m. By limiting the maximum grade to 6% within the first 9m of the property line, it is anticipated that drivers exiting the parking garage will have adequate sightlines to pedestrians walking along St. Joseph Boulevard. Therefore, it is requested that the requirement of Section 25(u) of the PABL be waived.

TAC's *Geometric Design Guide* identifies minimum clear throat length requirements for accesses based on land use, development size, and class of roadway. For apartment developments with more than 200 dwellings accessing arterial roadways, a minimum clear throat length of 40m is required. The proposed RIRO access has approximately 13.7m of clear throat before the garage door. While the clear throat length is not met, queueing back onto St. Joseph Boulevard is mitigated by the access being restricted to right-in/right-out. Approximately 15 inbound vehicles per hour are anticipated for the PM peak hour, which is expected to result in queueing of less than one vehicle. There is another approximately 40m of clear throat before the first parking spaces within the parking garage. Therefore, queueing onto St. Joseph Boulevard is not anticipated.

TAC's *Geometric Design Guide* identifies a minimum corner clearance requirement of 70m for arterial roadways, measuring between the private approach and the edge of the roadway. The proposed RIRO access to St. Joseph Boulevard is approximately 65m from the curbline of Tenth Line Road, and does not meet this requirement. However, it is located as far from the intersection at St. Joseph Boulevard/Tenth Line Road as possible.

Dedicated right turn lanes are typically considered when the peak hour turning volumes meet or exceed 60 vehicles per hour, or 10% of the adjacent through volume. As shown in the total traffic volume figures (**Figures 10** and **11**), these thresholds are not met by the westbound right turn movements into the proposed RIRO access to St. Joseph Boulevard. Therefore, no auxiliary westbound right turn lane at the RIRO access is recommended or required.

4.5 Transportation Demand Management

4.5.1 Context for TDM

Broken down by dwelling type, the proposed development will include nine studio units, 111 one-bedroom units, 83 one-bedroom plus den units, 69 two-bedroom units, and two three-bedroom units.

4.5.2 Need and Opportunity

The subject site is designated as 'Mixed Use Centre' on Schedule B of the City's Official Plan. The implemented zoning for the property is 'Residential Fifth-Density, Subzone Z' (R5Z). As first discussed in Section 3.1.1, the mode shares for the proposed development are assumed to be generally consistent with the surveyed mode shares of the Orléans district, as outlined in the *TRANS Trip Generation Manual*.

As discussed in Section 2.2.1, the Confederation Line LRT will be extended to Trim Road along Ottawa Road 174, and isolated transit priority measures are proposed on Tenth Line Road between Ottawa Road 174 and Charlemagne Boulevard. These measures are anticipated to improve the transit share of the proposed development and the Orléans district, and therefore failure to meet the assumed driver share target of 55% during the peak hours is not anticipated.

4.5.3 TDM Program

A review of the City's *TDM Measures Checklist* has been conducted by the proponent, who has committed to providing the following TDM measures.

- 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 cost from monthly rent.

A copy of the checklist is included in **Appendix L**.

4.6 Neighbourhood Traffic Management

The *2017 TIA Guidelines* identify two-way peak hour traffic volume thresholds for considering when a Neighbourhood Traffic Management (NTM) plan should be developed, when the site relies on local or collector roadways for access. The NTM two-way volume thresholds (in vehicles per hour, or vph) are as follows:

- 120 vph for local roadways;
- 300 vph for collector roadways;
- 600 vph for major collector roadways.

The proposed development can be accessed via the local roadways Vieux-Silo Street or Eric Czapnik Way, as well as the private roadways Récolte Private and Lionel-Rhéo Private. As shown in **Figure 11**, only Eric Czapnik Way is anticipated to exceed the NTM volume threshold of 120 vph (by less than 5 vph), and therefore only Eric Czapnik Way is reviewed below.

The typical lane capacities shown in the City's TRANS Long-Range Transportation Model have been used to estimate the directional capacity of this roadway, based on roadway classification and general characteristics (for example, suburban with limited access, urban with on-street parking, etc.). To compare the directional capacity with the NTM thresholds, the two-way NTM thresholds have been halved to represent a one-way volume threshold. The assumed directional capacities (in vehicles per hour per lane, or vphpl) and NTM one-way volume thresholds (in vph) for Eric Czapnik Way can be summarized as follows.

- Directional capacity: 400 vphpl capacity in each direction;
- NTM threshold: 60 vph threshold in each direction (15% of capacity).

It should be noted that any roadway operating at 60% capacity or less (i.e. a v/c ratio of 0.60 or better) is considered to be operating at the best possible Auto LOS A. Therefore, the NTM thresholds are considered to be extremely low.

The 2029 total traffic peak hour volumes and corresponding v/c ratios for Eric Czapnik Way are summarized as follows:

AM Peak Hour
- Northbound: 45 vph (v/c: 0.11)
- Southbound: 76 vph (v/c: 0.19)

PM Peak Hour
- Northbound: 71 vph (v/c: 0.18)
- Southbound: 53 vph (v/c: 0.13)

From the above, Eric Czapnik Way is not anticipated to operate at or near capacity in the 2029 total traffic conditions. Detailed intersection analysis for total traffic conditions is included in Sections 4.8.2 and 4.8.3, and identify no operational concerns on Eric Czapnik Way. Further, the function of Eric Czapnik Way as a local roadway is not anticipated to change as a result of the proposed development, and no neighbourhood traffic management measures are required.

4.7 Transit

Based on the trip generation estimates presented in Section 3.1.1, the proposed development is projected to generate the following number of transit trips:

- 30 transit trips (9 inbound trips and 21 outbound trips) during the AM peak hour;
- 29 transit trips (17 inbound trips and 12 outbound trips) during the PM peak hour.

All site-generated transit trips are anticipated to board and alight buses at the stops listed in Section 2.1.6, which includes stops on St. Joseph Boulevard and Tenth Line Road. No capacity issues are anticipated for OC Transpo Routes 33, 236, or 302, based on the above transit trip estimates.

4.8 Intersection Design

4.8.1 Intersection MMLOS Review

This section provides a review of the signalized study area intersections using complete streets principles. The signalized intersections within the study area have been evaluated for PLOS, BLOS, TLOS, and TkLOS.

Based on Schedule B of the City's Official Plan, the MMLOS targets associated with the 'Mixed Use Centre' designation have been used to evaluate St. Joseph Boulevard/Vieux-Silo Street and St. Joseph Boulevard/Tenth Line Road, and the targets associated with the 'General Urban Area' designation have been used to evaluate St. Joseph Boulevard/Eric Czapnik Way and St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp.

The full intersection MMLOS analysis is included in **Appendix M**. A summary of the results is shown in **Table 11**.

Table 11: Intersection MMLOS Summary

Intersection	PLOS		BLOS		TLOS		TkLOS	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target
St. Joseph Boulevard/ Tenth Line Road	**F**	C	**F**	A	**E**	D	A	D
St. Joseph Boulevard/Old Tenth Line Road/OR 174 EB Off-Ramp	**F**	C	**F**	C	C	-	D	D

The results of the intersection MMLOS analysis can be summarized as follows:

- Neither signalized intersection meets the target PLOS;
- Neither signalized intersection meets the target BLOS;
- St. Joseph Boulevard/Tenth Line Road does not meet the target TLOS;
- Both signalized intersections meet the target TkLOS.

A discussion of St. Joseph Boulevard/Tenth Line Road and St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp in further detail is included below.

St. Joseph Boulevard/Tenth Line Road
The intersection does not meet the target PLOS C, BLOS A, or TLOS E.

All approaches have a divided cross-section with a width equivalent to ten lanes crossed or more (assuming a lane width equals 3.5m, per the *MMLOS Guidelines*). There is limited opportunity in improving the PLOS at each approach without reducing the number of travel lanes or restricting turning movements. No approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

All approaches do not meet the target BLOS, based on both left and right turn characteristics. Based on Exhibit 12 of the *MMLOS Guidelines*, achieving the target BLOS A would require physically-separated bikeways (such as cycle tracks or multi-use pathways) and off-road facilities for cyclists to turn left. Therefore, the implementation of a protected intersection would be required to meet the target BLOS A, and would involve the removal of all right turn channels. This is identified for the City's consideration.

The south and east approaches do not meet the target TLOS D. The east approach does not have a target TLOS, but the approach delays of approximately 35 seconds during the AM peak hour is noted. The City's RTTP Affordable Network includes transit priority signals and queue jump lanes on Tenth Line Road, and would be expected to improve the delays for transit vehicles to the target TLOS D or better.

St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp
The intersection does not meet the target PLOS C or BLOS C.

All approaches have a divided cross-section with a width equivalent to eight to ten lanes crossed or more. There is limited opportunity in improving the PLOS at each approach without reducing the number of travel lanes or restricting turning movements further. No approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

The south and east approaches do not meet the target BLOS based on left turn characteristics, and the south approach does not meet the target based on right turn characteristics. Per Exhibit 12 of the *MMLOS Guidelines*, achieving the BLOS C would require two-stage left-turn bike boxes for northbound and westbound cyclists. Implementing bike boxes at the north approach would not require right turn on red (RTOR) restrictions, and is therefore identified for the City's consideration. There is no through phase for northbound cyclists to get to a left-turn bike box, and northbound cyclists could use Tenth Line Road to turn left onto St. Joseph Boulevard instead. Exhibit 12 of the *MMLOS Guidelines* identifies that the south approach can achieve the BLOS C based on right turn characteristics by implementing a pocket bike lane across the channelized northbound right turn lane. This is identified for the City's consideration.

4.8.2 2024 Total Intersection Operations

Intersection capacity analysis has been conducted for the 2024 total traffic conditions. The results of the analysis are summarized in **Table 12** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix N**.

Table 12: 2024 Total Traffic Operations

Intersection	AM Peak			PM Peak		
	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
St. Joseph Boulevard/ Vieux-Silo Street(1)	17 sec	C	SBL/R	20 sec	C	SBL/R
St. Joseph Boulevard/ Tenth Line Road(2)	0.74	C	NBT	0.79	C	EBR
St. Joseph Boulevard/ Eric Czapnik Way(1)	10 sec	A	SBL/R	11 sec	B	SBL/R
St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp(2)	0.36	A	WBT	0.66	B	SBT
St. Joseph Boulevard/ RIRO Site Access(1)	10 sec	A	SBR	10 sec	A	SBR

1. Unsignalized intersection
2. Signalized intersection

Comparing the previous table and the 2024 background conditions, the addition of site-generated traffic is anticipated to have little impact on the operations of the study area intersections.

4.8.3 2029 Total Intersection Operations

Intersection capacity analysis has been conducted for the 2029 total traffic conditions. The results of the analysis are summarized in **Table 13** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix N**.

Table 13: 2029 Total Traffic Operations

Intersection	AM Peak			PM Peak		
	Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
St. Joseph Boulevard/ Vieux-Silo Street(1)	19 sec	C	SBL/R	24 sec	C	SBL/R
St. Joseph Boulevard/ Tenth Line Road(2)	0.84	D	NBT	0.82	D	EBR
St. Joseph Boulevard/ Eric Czapnik Way(1)	10 sec	A	SBL/R	11 sec	B	SBL/R
St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp(2)	0.40	A	WBT	0.71	C	SBT
St. Joseph Boulevard/ RIRO Site Access(1)	10 sec	A	SBR	10 sec	A	SBR

1. Unsignalized intersection
2. Signalized intersection

Comparing the previous table and the 2029 background conditions, the addition of site-generated traffic is anticipated to have little impact on the operations of the study area intersections.

5.0 CONCLUSIONS AND RECOMMENDATIONS

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

Forecasting

- The proposed development is estimated to generate 111 person trips (including 58 vehicle trips) during the AM peak hour and 112 person trips (including 60 vehicle trips) during the PM peak hour.

Development Design

- New pedestrian walkways will connect the main and secondary entrances of Buildings A and B to the existing sidewalk on St. Joseph Boulevard. The main entrance of Building A is located at the southeastern corner of the subject site and the main entrance of Building B is located east of the proposed RIRO access, while the secondary entrances to both buildings will be accessed in the service easement between the two buildings, and are located approximately 35m north of St. Joseph Boulevard. New pedestrian walkways will also connect the main entrance of Building A and the northern end of the subject site to the existing sidewalk on Tenth Line Road.

- Bicycle parking will be provided on the upper parking garage level within Building B.

- Measuring from the main entrance, the bus stops within 400m are stops #1794, #6763, #7843, #7846, #8596, and #8761, which are served by OC Routes 33, 236, and 302.

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

- Pick-ups and drop-offs will be facilitated in a designated loop at the northwest corner of Building A, which will be accessed via Lionel-Rhéo Private. Access to the underground parking garage via Building A will be located directly adjacent to this pick-up/drop-off loop.

- Garbage collection and loading/deliveries will take place at the service entries to Buildings A and B, via the access along the service easement between the buildings. The fire route for the proposed development will be located curbside on St. Joseph Boulevard.

Parking

- The proposed number of vehicle parking spaces meets the minimum requirements, as outlined in the City's ZBL. The proposed number of bicycle parking spaces also meets the minimum requirements.

Boundary Streets

- The results of the segment multi-modal level of service (MMLOS) analysis can be summarized as follows:
    - Both St. Joseph Boulevard and Tenth Line Road do not meet the target pedestrian level of service (PLOS) C;
    - Both St. Joseph Boulevard and Tenth Line Road do not meet the target bicycle level of service (BLOS) C;
    - Tenth Line Road achieves the target transit level of service (TLOS) D;
    - Both St. Joseph Boulevard and Tenth Line Road meet the target truck level of service (TkLOS) D.

- Based on Exhibit 4 of the *MMLOS Guidelines*, the best possible PLOS for roadways with curb lane volumes greater than 3,000 vehicles per day and an operating speed greater than 60 km/h is a PLOS D. This can be achieved by providing sidewalks with a minimum width of 2.0m and a minimum boulevard width greater than 2.0m. This applies to both sides of St. Joseph Boulevard and the east side of Tenth Line Road, and is identified for the City's consideration. For the west side of Tenth Line Road, the target PLOS C can be achieved by providing a sidewalk with a minimum width of 2.0m and a minimum boulevard width of 0.5m. This is identified for the City's consideration.

- Based on Exhibit 11 of the *MMLOS Guidelines*, a physically separated bikeway (such as cycle tracks or multi-use pathways) are required to achieve the target BLOS A for St. Joseph Boulevard or BLOS C for Tenth Line Road, given the current operating speed of both roadways. This is identified for the City's consideration.

Access Design

- The proposed access to St. Joseph Boulevard meets all required provisions of the *Private Approach By-Law* (PABL), except for Section 25(u). Measuring from the property line, the grade of the access is approximately 2% (descending toward the roadway) for the first 4m inside the property line, and 6% (descending toward the parking garage) for the next 5m. By limiting the maximum grade to 6% within the first 9m of the property line, it is anticipated that drivers exiting the parking garage will have adequate sightlines to pedestrians walking along St. Joseph Boulevard. Therefore, it is requested that the requirement of Section 25(u) of the PABL be waived.

- The proposed access to St. Joseph Boulevard does not meet the Transportation Association of Canada (TAC)'s clear throat length requirement of 40m, as the underground parking garage door is located within this distance. However, the potential for queueing back onto St. Joseph Boulevard is mitigated by the access being restricted to right-in/right-out, and there is another approximately 40m of clear throat before the first parking spaces within the parking garage. Queueing onto St. Joseph Boulevard is not anticipated.

- TAC's *Geometric Design Guide* identifies a minimum corner clearance requirement of 70m for arterial roadways, measuring between the private approach and the nearest edge of the roadway. While it is acknowledged that the proposed access to St. Joseph Boulevard does not meet this requirement, it is located as far from the intersection at St. Joseph Boulevard/ Tenth Line Road as possible.

Transportation Demand Management

- The proponent has committed to providing the following TDM measures:
  - 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 cost from monthly rent.

Neighbourhood Traffic Management

- Eric Czapnik Way exceeds the City's threshold for considering neighbourhood traffic management measures. Eric Czapnik Way is not anticipated to operate at or near capacity in the 2029 total traffic conditions. Further, the function of Eric Czapnik Way as a local roadway is not anticipated to change as a result of the proposed development, and no neighbourhood traffic management measures are required.

Transit

- The proposed development is projected to generate 30 transit trips during the AM peak hour and 29 transit trips during the PM peak hour. No capacity issues are anticipated for OC Transpo Routes 33, 236, or 302, based on the above transit trip estimates.

Intersection MMLOS

- The results of the intersection MMLOS analysis can be summarized as follows:
  - Neither signalized intersection meets the target PLOS;
  - Neither signalized intersection meets the target BLOS;
  - St. Joseph Boulevard/Tenth Line Road does not meet the target TLOS;
  - Both signalized intersections meet the target TkLOS.

- All approaches of St. Joseph Boulevard/Tenth Line Road have a divided cross-section with a width equivalent to ten lanes crossed or more. There is limited opportunity in improving the PLOS at each approach without reducing the number of travel lanes or restricting turning movements. No approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

- All approaches of St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp have a divided cross-section with a width equivalent to eight to ten lanes crossed or more. There is limited opportunity in improving the PLOS at each approach without reducing the number of travel lanes or restricting turning movements further. No approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks. There is limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

- All approaches of St. Joseph Boulevard/Tenth Line Road do not meet the target BLOS, based on both left and right turn characteristics. Achieving the target BLOS A would require physically-separated bikeways (such as cycle tracks or multi-use pathways) and off-road facilities for cyclists to turn left. Therefore, the implementation of a protected intersection would be required to meet the target BLOS A, and would involve the removal of all right turn channels. This is identified for the City's consideration.

- The south and east approaches of St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp do not meet the target BLOS based on left turn characteristics, and the south approach does not meet the target based on right turn characteristics. Achieving the BLOS C would require two-stage left-turn bike boxes for northbound and westbound cyclists. Implementing bike boxes at the north approach would not require right turn on red (RTOR) restrictions, and is therefore identified for the City's consideration. There is no through phase for northbound cyclists to get to a left-turn bike box, and northbound cyclists could use Tenth Line Road to turn left onto St. Joseph Boulevard instead. The south approach can achieve the BLOS C based on right turn characteristics by implementing a pocket bike lane across the channelized northbound right turn lane. This is identified for the City's consideration.

- The south and east approaches of St. Joseph Boulevard/Tenth Line Road do not meet the target TLOS D. The east approach does not have a target TLOS, but the approach delays of approximately 35 seconds during the AM peak hour is noted. The City's RTTP Affordable Network includes transit priority signals and queue jump lanes on Tenth Line Road, and would be expected to improve the delays for transit vehicles to the target TLOS D or better.

Existing Intersection Operations

- All study area intersections currently operate at an Auto LOS C or better during the AM and PM peak hours. For all auxiliary lanes at the study area intersections, the Synchro analysis does not identify any 50th-percentile or 95th-percentile queue lengths that exceed the storage lengths provided. Similarly, Synchro does not identify any queues that result in blocking at an upstream intersection (i.e. on St. Joseph Boulevard, westbound queues at Tenth Line Road and eastbound queues at Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp do not extend through the intersection at Eric Czapnik Way).

Background Intersection Operations

- All study area intersections in the 2029 background conditions are projected to operate at an Auto LOS D or better during the AM and PM peak hours. The Synchro analysis identifies that, in the AM peak hour, the 95th-percentile northbound queue length at St. Joseph Boulevard/Tenth Line Road is approximately 190m, which extends past the auxiliary northbound left turn lane. For all auxiliary lanes within the study area, Synchro does not identify any 50th-percentile or 95th-percentile queue lengths that exceed the storage lengths provided. Similarly, Synchro does not identify any queues that result in blocking at an upstream intersection.

Total Intersection Operations

- The addition of site-generated traffic is anticipated to have little impact on the operations of the study area intersections. The proposed RIRO access to St. Joseph Boulevard is anticipated to operate at an Auto LOS A during the peak hours.

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

NOVATECH

Prepared by:

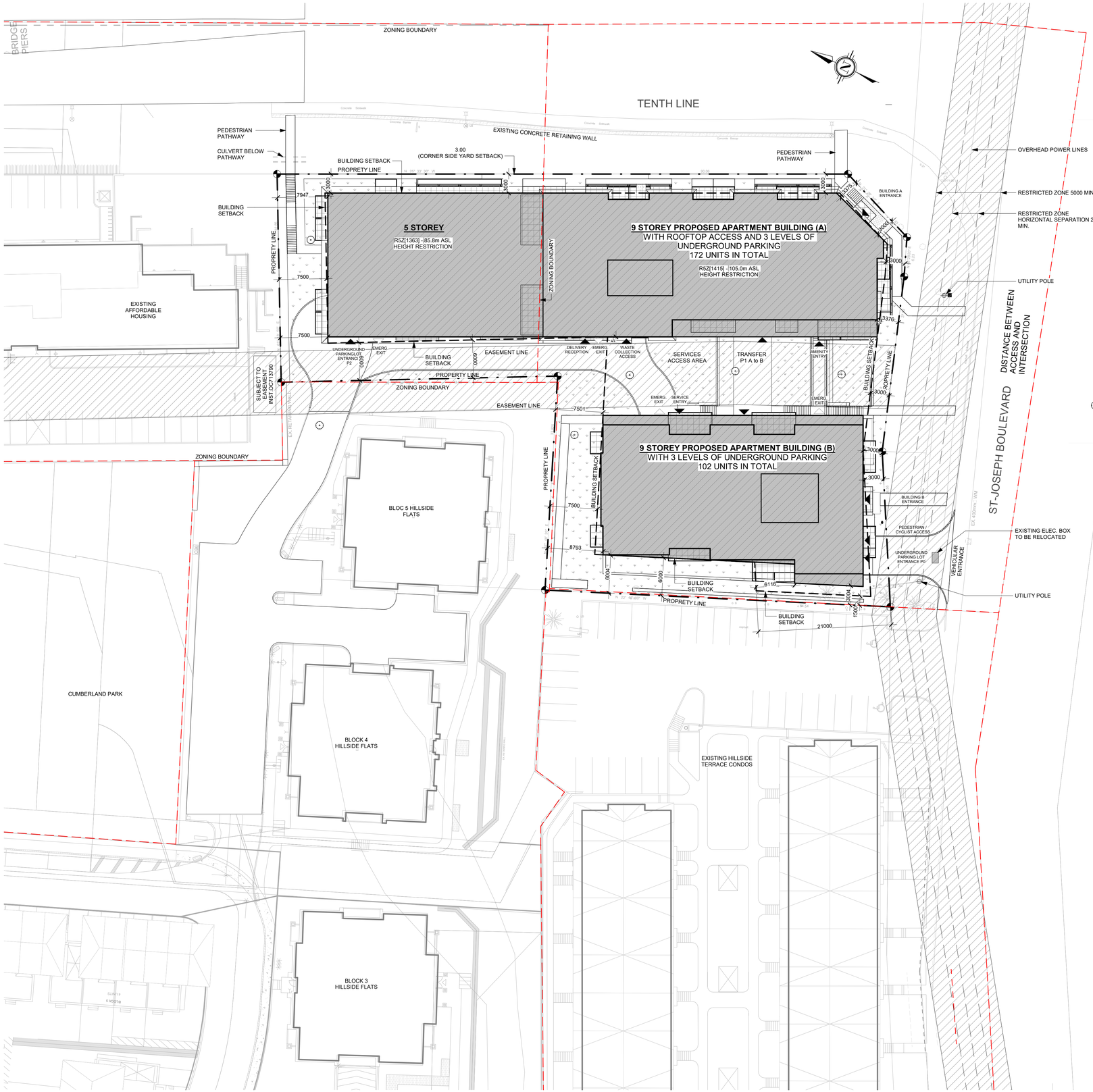
Joshua Audia, B.Sc.
E.I.T.,
Transportation/Traffic

Reviewed by:

Jennifer Luong, P.Eng.
Senior Project Manager,
Transportation/Traffic

APPENDIX A

Proposed Site Plan



SITE PLAN LEGEND

- NEW CONSTRUCTION - BUILDING
- NEW CONSTRUCTION - RETAINING WALL
- GRASS
- INTERLOCK PATHWAY
- CONCRETE PATHWAY
- BUILDING ACCESS / EXIT
- PROPRETY LINE
- SETBACK LINE
- ZONING LINE
- TREE/BUSH

GENERAL NOTES

NOTE A: NO PERMANENT BUILDING OR STRUCTURE SHALL BE PLACED WITHIN 5000MMEASURED RADIALLY FROM ANY PRIMARY VOLTAGE CONDUCTOR OR EQUIPMENT.MEASURED FROM THE CLOSEST PRIMAR CONDUCTOR (AT REST) TO THE CLOSEST POINT OF THE BUILDING OR STRUCTURE

NOTE B: ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS. ANY DISCEPANCIES BETWEEN DRAWINGS WILL BE REPORTED TO THE PROJECT LEAD IMMEDIATELY FOR CLARIFICATION PRIOR COMMENCE ANY CONSTRUCTION

NOTE C: ALL GENERAL SITE INFORMATION AND CONDITIONS HAVE BEEN COMPLIED FROM EXISTING PLANS AND SURVEY

NOTE D: CONTRACTOR IS RESPONSIBLE TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ALL ERRORS AND / OR OMISSIONS TO THE ARCHITECT.

NOTE E: ALL CONTRACTORS MUST COMPLY WITH ALL CURRENT APPLICABLE CODES, REGULATIONS AND BYLAWS

NOTE F: DO NOT SCALE DRAWINGS.

PROJECT INFORMATION STATISTICS

SITE SUMMARY

ADDRESS:	*3277 ST-JOSEPH-BOULEVARD*
ZONING:	*R5Z (1415), R5Z (1363), R5Z(2168)*
SITE AREA:	*4965.04 m2*
PROPOSED USE:	*RESIDENTIAL APARTMENTS (274 UNITS) 3 LEVELS OF UNDERGROUND PARKING*
BUILDING AREA:	*3045.07 m2*

ZONING SUMMARY

	REQUIRED	PROPOSED
MIN LOT AREA:	*1000 m²*	*4965.04 m²*
MIN LOT WIDTH:	*25 m*	*68.63 m*
BUILDING HEIGHT:	*10 storeys*	*9 storeys*
MIN YARD SETBACKS		
FRONT YARD:	*3 m*	*3m*
CORNER SIDE YARD:	*3 m*	*3m*
REAR YARD:	*7.5 m*	*7.5 m*
INTERIOR SIDE YARD:	*1.5-6 m*	*3-6m*
LANDSCAPE OPEN SPACE:	*-*	*TBD*
SOFT LANDSCAPING:	*-*	*TBD*
HARD LANDSCAPING:	*-*	*TBD*

VEHICULAR PARKING

	REQUIRED	PROPOSED
RESIDENTIAL APARTMENTS (274) UNITS EXEMPT UNDER ZONE 'Z' 0 SPACES PER DWELLING:	*0*	*157*
VISITOR PARKING (274-12)UNITS AS PER TABLE 102 0.1 SPACES PER DWELLING:	*27*	*27*
TOTAL VEHICULAR PARKING:	*27*	*184*
ACCESSIBLE PARKING: (INCLUDED IN TOTAL PARKING COUNT)	*1*	*3*

BICYCLE PARKING

	REQUIRED	PROPOSED
RESIDENTIAL APARTMENTS (274)UNITS AS PER TABLE 111A, 0.5 SPACES PER DWELLING :	*137*	*137*

WASTE MANAGEMENT CONTAINERS

BUILDING 'A' - 172 UNITS

	REQUIRED	AMOUNT
GARBAGE (172 X 0.11Y = 18.92Y³)	*4Y³*	*5*
RECYCLING (172 X 0.038Y = 6.54Y³)	*4Y³*	*2*
ORGANICS (240L per 50 UNITS = 4)	*240L*	*4*

BUILDING 'B' - 102 UNITS

	REQUIRED	AMOUNT
GARBAGE (102 X 0.11Y = 11.22Y³)	*4Y³*	*3*
RECYCLING (102 X 0.038Y = 3.88Y³)	*4Y³*	*2*
ORGANICS (240L per 50 UNITS = 3)	*240L*	*3*

BUILDING SUMMARY

	GROSS FLOOR AREA	UNIT COUNT
LEVEL P3 PARKING:	*1972.82 m2*	*47*
LEVEL P2 PARKING:	*2940.47 m2*	*55*
LEVEL P1 PARKING:	*2940.47 m2*	*64*
LEVEL P0 PARKING:	*1108.67 m2*	*18*
GROUND FLOOR :	*2952.45 m2*	*30*
LEVEL 2-9:	*18721.19 m2*	*244*
TOTAL (res units):	*21673.64 m2*	*274*

AMENITY SPACE

	REQUIRED	PROPOSED
6m² REQUIRED PER UNIT:	*1644m²*	*2134.1m²*
COMMUNAL AMENITIES (50%):	*822m²*	*933.58m²*
TOTAL	*1644m²*	*3067.68.m²*
BREAKDOWN:		
PRIVATE TERRACES / BALCONIES 'A'		*1483.5m²*
PRIVATE TERRACES / BALCONIES 'B		*650.6m²*
COMMUNAL ROOF TERRACE:		*602m²*
COMMUNAL GYM:		*86.86m²*
COMMUNAL GROUND FLOOR:		*113.81m²*
COMMUNAL EXTERIOR GRADE:		*130.91m²*

UNIT STATISTICS

	PROPOSED		
1BEDROOM STUDIO:	*9*	*units*	*(3.28%)*
1 BEDROOM:	*111*	*units*	*(40.51%)*
1 BEDROOM + DEN:	*83*	*units*	*(30.29%)*
2 BEDROOM:	*69*	*units*	*(25.18%)*
3 BEDROOM:	*2*	*units*	*(0.72%)*

ROSSMANN ARCHITECTURE

88 Saint-Joseph Boulevard, Gatineau QC J8Y 3W5
Tel : 819-600-1555

NOT FOR / PAS POUR CONSTRUCTION

KEY PLAN / PLAN CLÉ :

CLIENT :

PHOENIX HOMES
www.phoenixhomes.ca

revisions	description	date
1.4	ISSUED FOR SPCA	2021-12-22
1.3	FOR COORDINATION	2021-12-16
1.1	COORDINATION 33%	2021-11-10

PROJECT NAME / NOME DU PROJET :

PHOENIX HILLSIDE

DRAWING NAME / NOM DU DESSIN :

GENERAL SITE PLAN CONTROL

PROJECT NO. / NO. DE PROJET :	20030
DATE :	2021-10-27
DRAWN BY / DESSINÉ PAR :	IG
REVIEWED BY / VÉRIFIÉ PAR :	LaG
SCALE / ÉCHELLE :	As indicated
PROJECT PHASE / PHASE DU PROJET :	1

DWG NO. / NO. DESSIN :

A003

REVISION NO. / NO. DE RÉVISION : 1.4

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	**3277 St. Joseph Boulevard**
Description of Location	**Located at the northwest corner of St. Joseph Boulevard and Tenth Line Road**
Land Use Classification	**Mid-Rise Apartments**
Development Size (units)	**274 dwellings**
Development Size (m^2)	**-**
Number of Accesses and Locations	**One full-movement access to Lionel-Rhéo Private; One right-in/right-out access to St. Joseph Boulevard**
Phase of Development	**1**
Buildout Year	**2024**

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.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	***90 units***
Office	3,500 m^2
Industrial	5,000 m^2
Fast-food restaurant or coffee shop	100 m^2
Destination retail	1,000 m^2
Gas station or convenience market	75 m^2

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is 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 City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	✓	
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*	✓	

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

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 km/hr or greater?		✓
Are there any horizontal/vertical curvatures on a boundary street limiting 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 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?		✓
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

	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

OC Transpo Route Maps

33 PORTOBELLO / BLAIR

Local

Monday to Friday / Lundi au vendredi

Peak periods with selected trips midday and evening / Périodes de pointe et service limité en mi-journée et soirée

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

2019.07

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

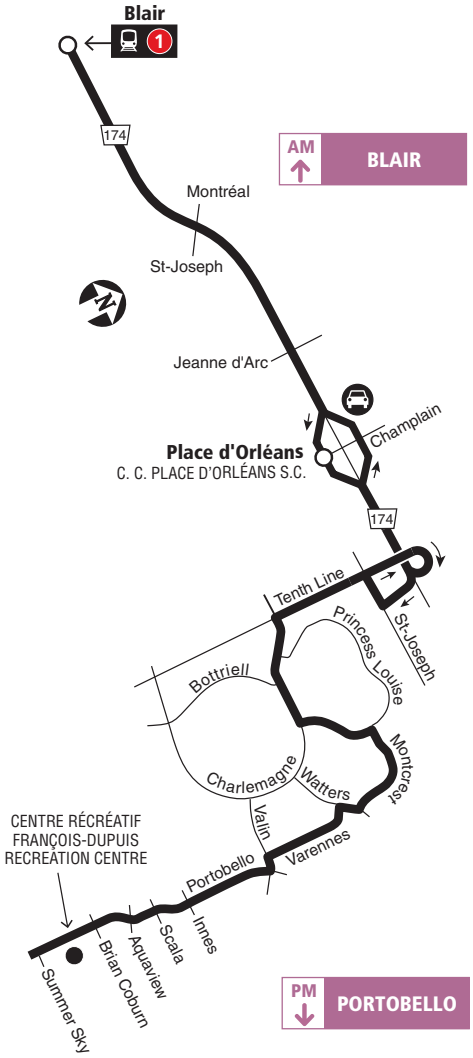
233 Connexion

PORTOBELLO
BLAIR

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

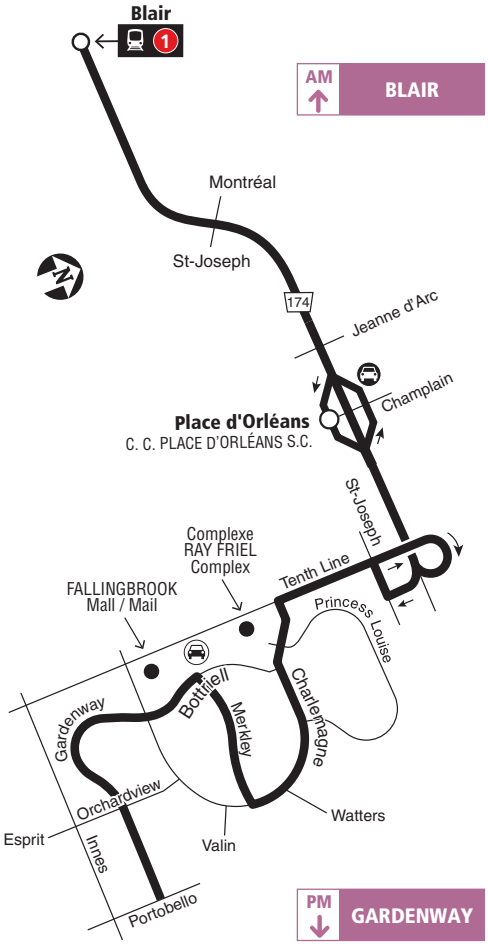
235 Connexion

GARDENWAY
BLAIR

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

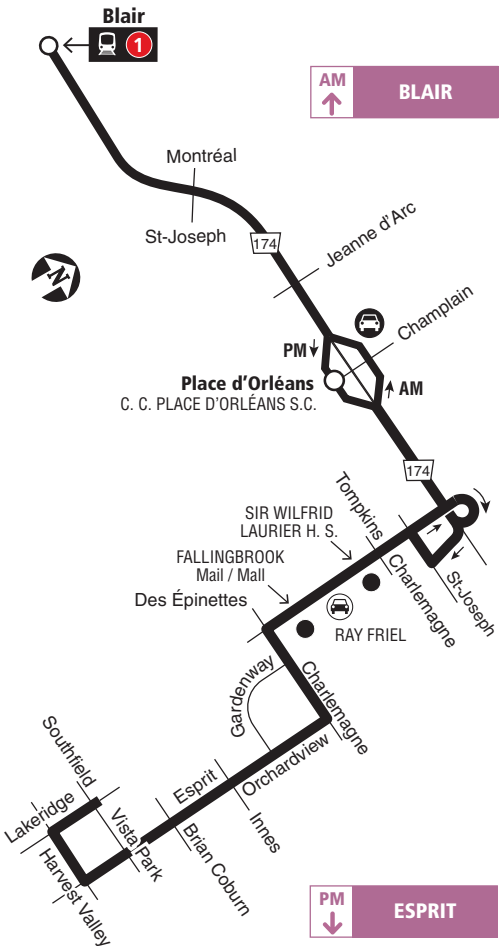
INFO 613-741-4390
octranspo.com

236 Connexion

ESPRIT
BLAIR

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

302 ST-LAURENT
CUMBERLAND, SARSFIELD, NAVAN

Local

Tuesday only / Mardi seulement

Selected time periods

Périodes sélectionnées

Station

Park & Ride / Parc-o-bus

2019.08

Schedule / Horaire.....613-560-1000

Text / Texto 560560

plus your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres

Customer Relations
Service à la clientèle **613-842-3600**

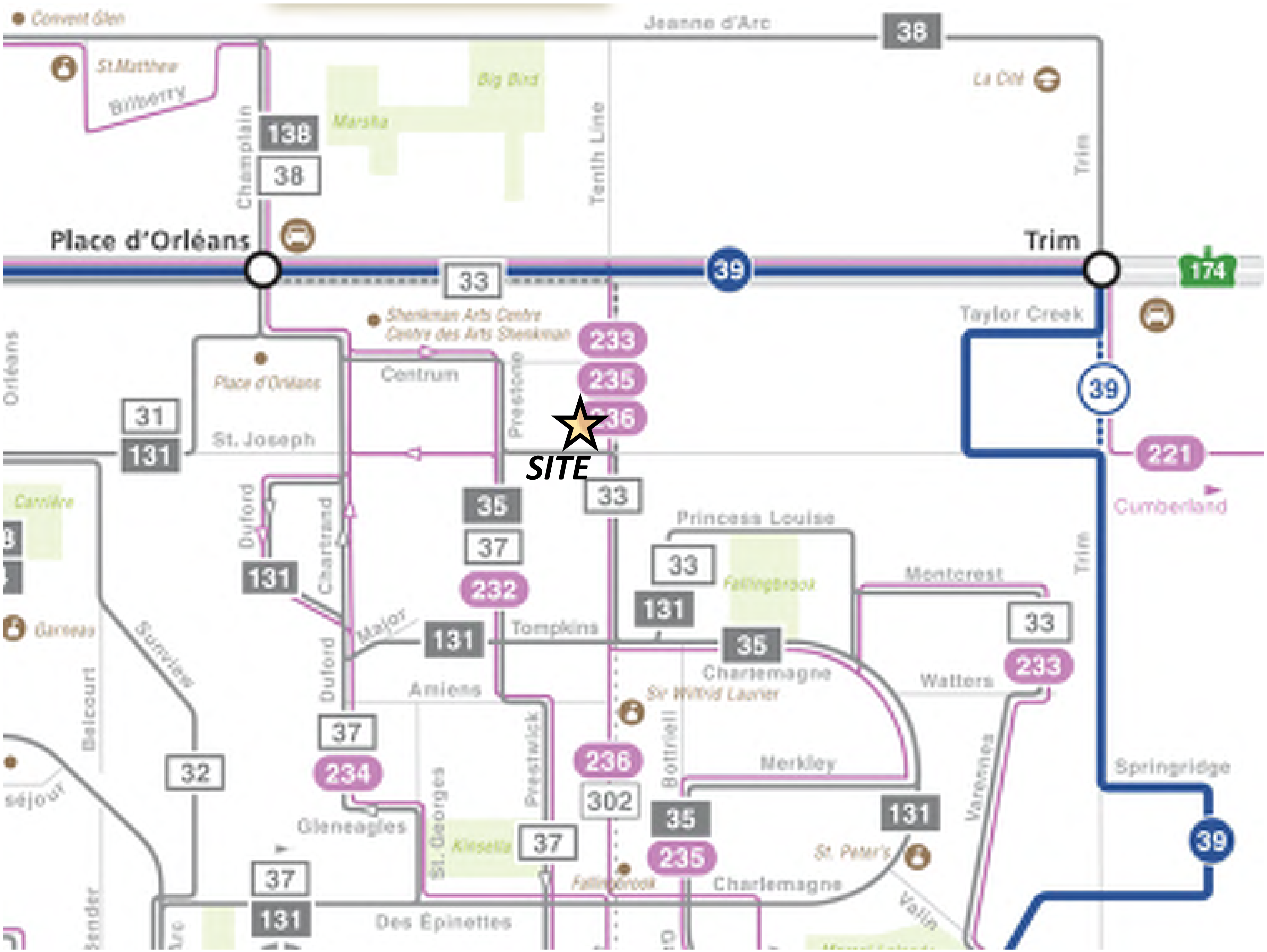
Lost and Found / Objets perdus..... **613-563-4011**

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

Effective December 25, 2016
En vigueur 25 décembre 2016

OC Transpo

INFO 613-741-4390
octranspo.com


Jeanne d'Arc
38
Place d'Orléans
Trim
Champlain
138
38
Tenth Line
33
39
174
Taylor Creek
Shenkman Arts Centre
Centre des Arts Shenkman
233
235
236
Centrum
Preston
Place d'Orléans
St. Joseph
31
131
39
221
Cumberland
SITE
33
35
37
232
Princess Louise
33
131
Montcrest
33
233
Dufford
Chartrand
131
Major
131
Tompkins
35
Charlemagne
Sir Wilfrid Laurier
Walters
Amiens
Surview
Belcourt
32
37
234
236
302
Bottriell
Merkley
35
235
131
Varennes
Springridge
39
Gleneagles
St. Georges
Prestwick
37
37
131
Des Épinettes
Charlemagne
St. Peter's
Valin
Orléans
Trim

APPENDIX D

Traffic Count Data

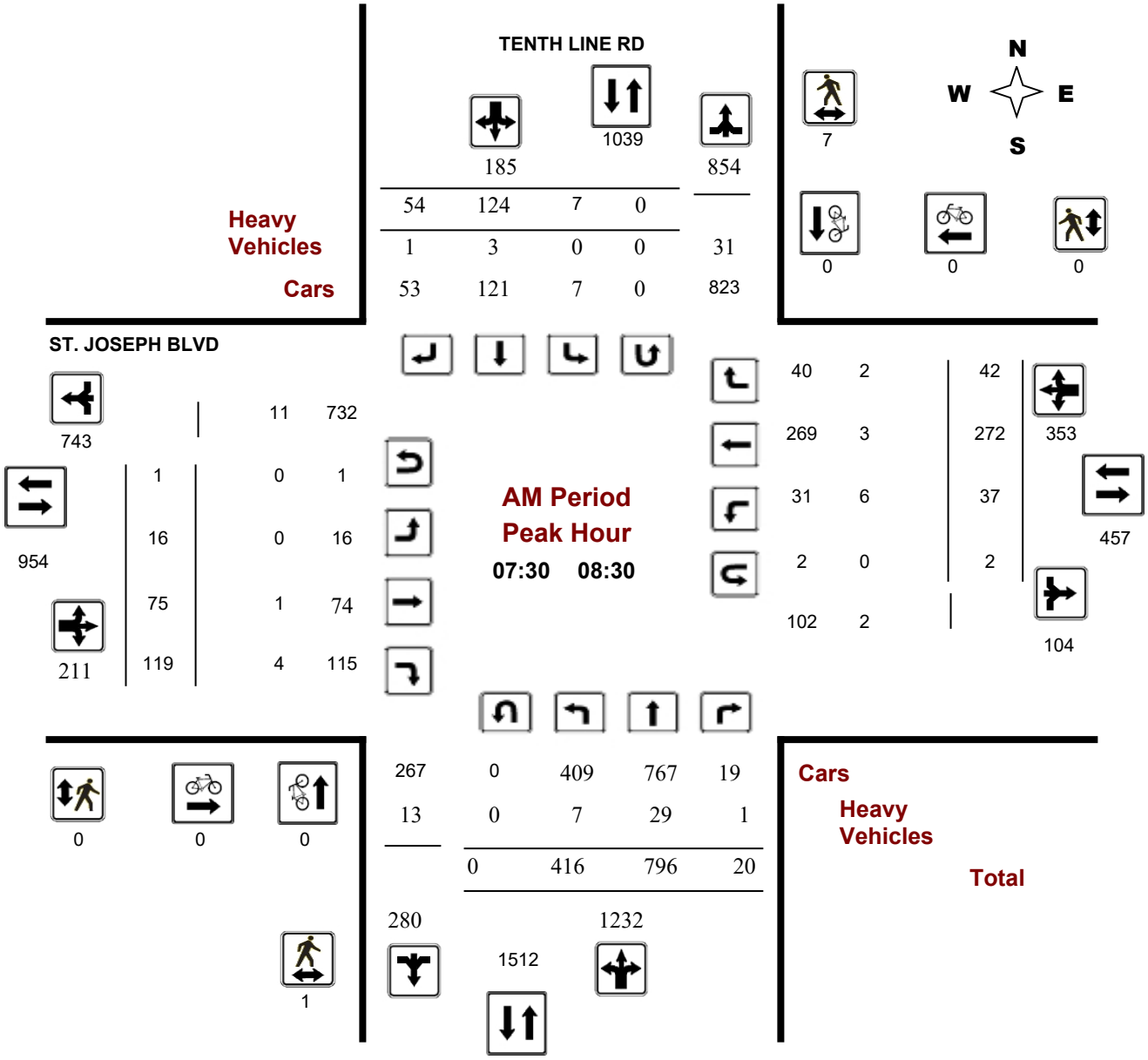
Transportation Services - Traffic Services

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

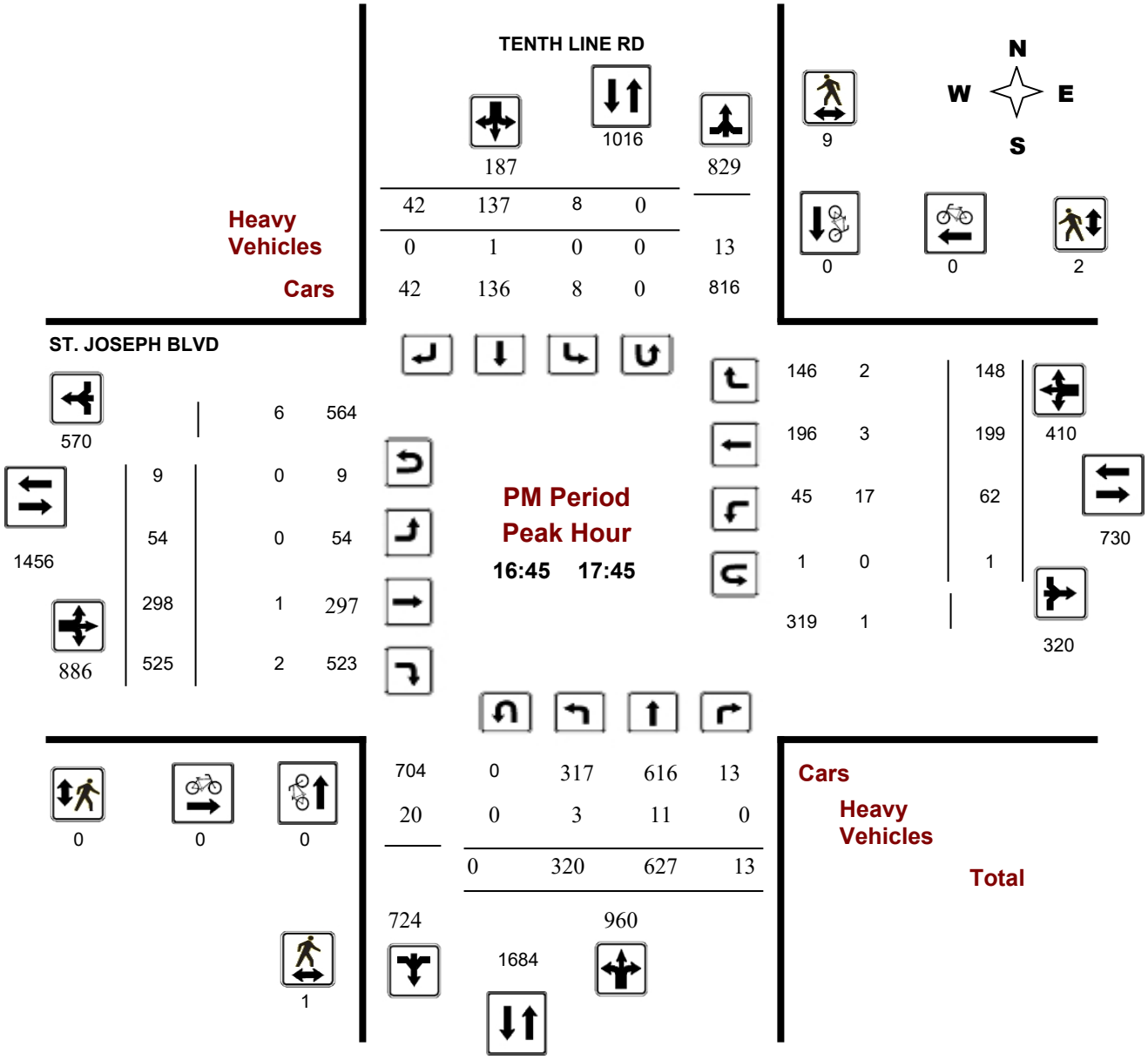
Transportation Services - Traffic Services

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 - Study Results

ST. JOSEPH BLVD @ TENTH LINE RD

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

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

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, March 20, 2018

Total Observed U-Turns

Northbound: 2 Southbound: 1

Eastbound: 24 Westbound: 5

AADT Factor

1.00

	TENTH LINE RD								ST. JOSEPH BLVD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	452	756	19	**1227**	9	104	33	**146**	**1373**	9	65	91	**165**	29	281	53	**363**	**528**	**1901**
08:00 09:00	378	772	16	**1166**	3	122	76	**201**	**1367**	17	78	135	**230**	28	233	52	**313**	**543**	**1910**
09:00 10:00	349	772	30	**1151**	12	125	35	**172**	**1323**	13	89	181	**283**	30	181	60	**271**	**554**	**1877**
11:30 12:30	328	571	28	**927**	6	121	26	**153**	**1080**	15	173	324	**512**	43	206	81	**330**	**842**	**1922**
12:30 13:30	372	534	33	**939**	11	103	38	**152**	**1091**	31	172	322	**525**	37	162	77	**276**	**801**	**1892**
15:00 16:00	307	580	27	**914**	8	120	33	**161**	**1075**	29	237	429	**695**	54	200	119	**373**	**1068**	**2143**
16:00 17:00	336	547	27	**910**	10	161	29	**200**	**1110**	46	315	518	**879**	54	162	131	**347**	**1226**	**2336**
17:00 18:00	332	614	17	**963**	7	135	45	**187**	**1150**	53	280	508	**841**	62	194	136	**392**	**1233**	**2383**
Sub Total	2854	5146	197	**8197**	66	991	315	**1372**	**9569**	213	1409	2508	**4130**	337	1619	709	**2665**	**6795**	**16364**
U Turns				**2**				**1**	**3**				**24**				**5**	**29**	**32**
Total	2854	5146	197	**8199**	66	991	315	**1373**	**9572**	213	1409	2508	**4154**	337	1619	709	**2670**	**6824**	**16396**
EQ 12Hr	3967	7153	274	**11397**	92	1377	438	**1908**	**13305**	296	1959	3486	**5774**	468	2250	986	**3711**	**9485**	**22790**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	3739	6741	258	**10741**	86	1298	413	**1799**	**13305**	279	1846	3285	**5442**	441	2121	929	**3498**	**9485**	**22790**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1**					
AVG 24Hr	4898	8831	338	**14070**	113	1701	541	**2356**	**16426**	366	2418	4304	**7129**	578	2778	1217	**4582**	**11711**	**28137**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

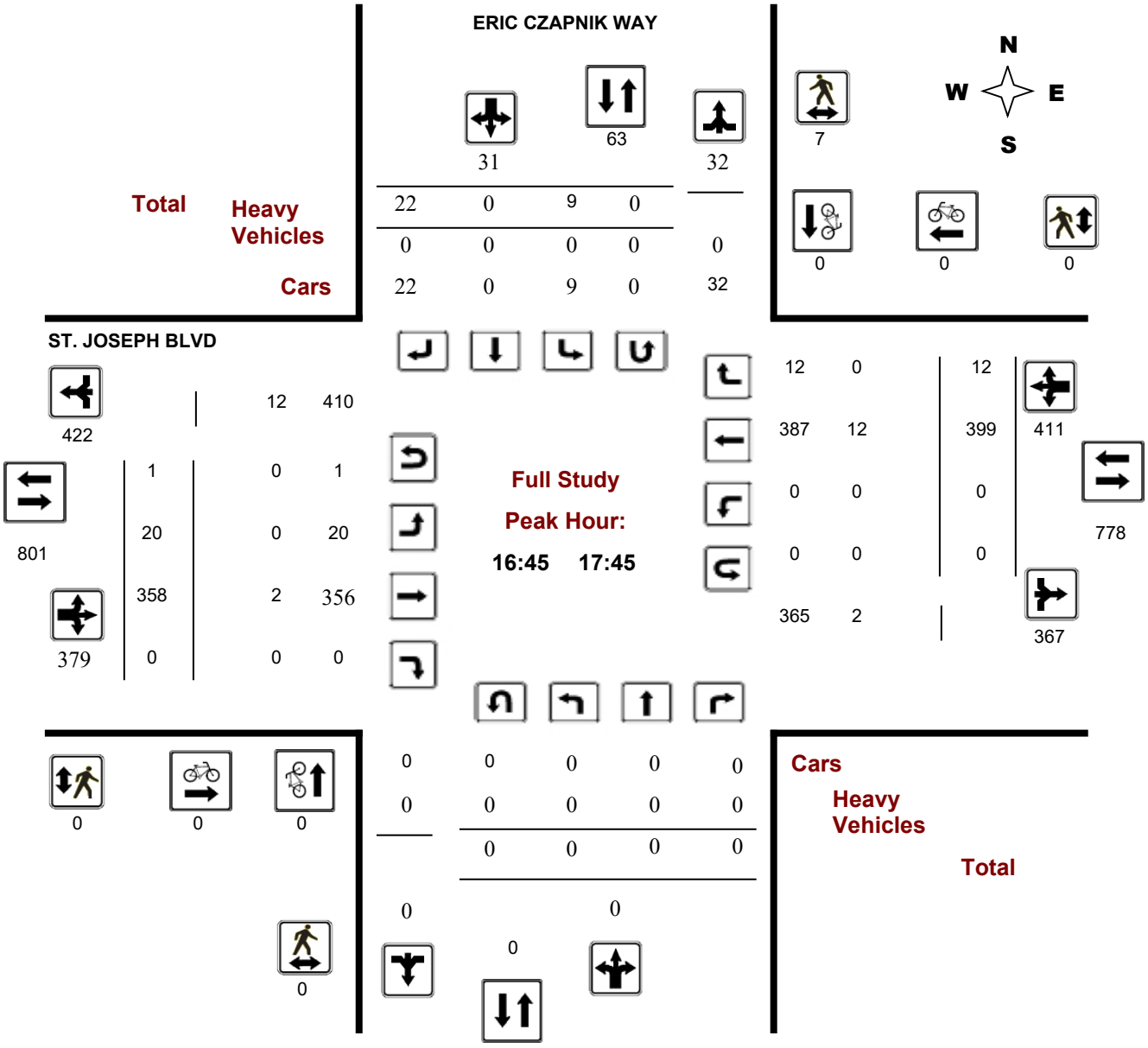
Transportation Services - Traffic Services

Turning Movement Count - Study Results

ERIC CZAPNIK WAY @ ST. JOSEPH BLVD

Survey Date: Thursday, April 23, 2015
Start Time: 07:00
WO No: 35086
Device: Miovision

Full Study Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ERIC CZAPNIK WAY @ ST. JOSEPH BLVD

Survey Date: Thursday, April 23, 2015 **WO No:** 35086

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

Full Study 15 Minute Increments

		ERIC CZAPNIK WAY									ST. JOSEPH BLVD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	0	5	0	13	18	**18**	1	5	0	6	0	86	8	94	**100**	**118**
07:15	07:30	0	0	0	0	1	0	11	12	**12**	7	28	0	35	0	90	6	96	**131**	**143**
07:30	07:45	0	0	0	0	2	0	5	7	**7**	3	21	0	24	0	85	2	87	**111**	**118**
07:45	08:00	0	0	0	0	2	0	5	7	**7**	5	23	0	28	0	83	0	83	**111**	**118**
08:00	08:15	0	0	0	0	2	0	12	14	**14**	4	28	0	32	0	79	3	82	**114**	**128**
08:15	08:30	0	0	0	0	1	0	4	5	**5**	3	23	0	26	0	82	0	82	**108**	**113**
08:30	08:45	0	0	0	0	2	0	3	5	**5**	1	28	0	29	0	65	5	70	**99**	**104**
08:45	09:00	0	0	0	0	3	0	8	11	**11**	4	40	0	44	0	58	3	61	**105**	**116**
09:00	09:15	0	0	0	0	1	0	4	5	**5**	2	38	0	40	0	80	2	82	**122**	**127**
09:15	09:30	0	0	0	0	1	0	6	7	**7**	5	35	0	40	0	71	5	76	**116**	**123**
09:30	09:45	0	0	0	0	0	0	5	5	**5**	2	42	0	44	0	51	4	55	**99**	**104**
09:45	10:00	0	0	0	0	2	0	6	8	**8**	6	46	0	52	0	72	5	77	**129**	**137**
10:00	10:15	0	0	0	0	1	0	6	7	**7**	3	55	0	58	0	68	4	72	**130**	**137**
10:15	10:30	0	0	0	0	2	0	4	6	**6**	5	41	0	46	0	57	2	59	**105**	**111**
10:30	10:45	0	0	0	0	4	0	1	5	**5**	3	48	0	51	0	56	1	57	**108**	**113**
10:45	11:00	0	0	0	0	1	0	4	5	**5**	6	68	0	74	0	76	6	82	**156**	**161**
11:00	11:15	0	0	0	0	1	0	3	4	**4**	7	36	0	43	0	79	5	84	**127**	**131**
11:15	11:30	0	0	0	0	2	0	9	11	**11**	5	47	0	52	0	72	4	76	**128**	**139**
11:30	11:45	0	0	0	0	2	0	11	13	**13**	4	46	0	50	0	92	4	96	**146**	**159**
11:45	12:00	0	0	0	0	2	0	13	15	**15**	5	48	0	53	1	77	5	83	**136**	**151**
12:00	12:15	0	0	0	0	1	0	6	7	**7**	4	43	0	47	0	66	3	69	**116**	**123**
12:15	12:30	0	0	0	0	3	0	2	5	**5**	3	55	0	58	0	74	4	78	**136**	**141**
12:30	12:45	0	0	0	0	0	0	8	8	**8**	4	47	0	51	0	91	1	92	**143**	**151**
12:45	13:00	0	0	0	0	1	0	7	8	**8**	8	52	0	60	0	78	4	82	**142**	**150**
13:00	13:15	0	0	0	0	1	0	8	9	**9**	3	60	0	63	0	79	5	84	**147**	**156**
13:15	13:30	0	0	0	0	0	0	5	5	**5**	2	47	0	49	0	68	5	73	**122**	**127**
13:30	13:45	0	0	0	0	1	0	5	6	**6**	4	73	0	77	0	68	3	71	**148**	**154**
13:45	14:00	0	0	0	0	0	0	5	5	**5**	4	55	0	59	0	79	7	86	**145**	**150**
14:00	14:15	0	0	0	0	2	0	5	7	**7**	4	61	0	65	0	56	6	62	**127**	**134**
14:15	14:30	0	0	0	0	0	0	5	5	**5**	5	47	0	52	0	76	0	76	**128**	**133**
14:30	14:45	0	0	0	0	3	0	5	8	**8**	4	61	0	65	0	77	4	81	**146**	**154**
14:45	15:00	0	0	0	0	2	0	10	12	**12**	5	48	0	53	0	90	3	93	**146**	**158**
15:00	15:15	0	0	0	0	0	0	5	5	**5**	4	66	0	70	0	86	2	88	**158**	**163**
15:15	15:30	0	0	0	0	3	0	11	14	**14**	3	66	0	69	0	71	4	75	**144**	**158**
15:30	15:45	0	0	0	0	4	0	6	10	**10**	5	59	0	64	0	74	9	83	**147**	**157**
15:45	16:00	0	0	0	0	1	0	8	9	**9**	6	92	0	98	0	85	4	89	**187**	**196**
16:00	16:15	0	0	0	0	5	0	12	17	**17**	4	70	0	74	0	119	8	127	**201**	**218**
16:15	16:30	0	0	0	0	4	0	13	17	**17**	8	71	0	79	0	100	5	105	**184**	**201**
16:30	16:45	0	0	0	0	7	0	7	14	**14**	3	72	0	75	0	92	2	94	**169**	**183**
16:45	17:00	0	0	0	0	4	0	4	8	**8**	3	87	0	90	0	107	3	110	**200**	**208**
17:00	17:15	0	0	0	0	3	0	9	12	**12**	5	99	0	104	0	98	3	101	**205**	**217**
17:15	17:30	0	0	0	0	1	0	4	5	**5**	7	100	0	107	0	89	4	93	**200**	**205**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ERIC CZAPNIK WAY @ ST. JOSEPH BLVD

Survey Date: Thursday, April 23, 2015 **WO No:** 35086

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

17:30	17:45	0	0	0	0	1	0	5	6	**6**	6	72	0	78	0	105	2	107	**185**	**191**
17:45	18:00	0	0	0	0	1	0	4	5	**5**	2	83	0	85	0	101	4	105	**190**	**195**
18:00	18:15	0	0	0	0	0	0	10	10	**10**	1	54	0	55	0	113	2	115	**170**	**180**
18:15	18:30	0	0	0	0	1	0	3	4	**4**	0	54	0	54	0	83	2	85	**139**	**143**
18:30	18:45	0	0	0	0	1	0	7	8	**8**	4	39	0	43	0	81	2	83	**126**	**134**
18:45	19:00	0	0	0	0	0	0	9	9	**9**	5	65	0	70	0	59	3	62	**132**	**141**
Total:		0	0	0	0	87	0	321	408	**408**	197	2544	0	2741	1	3844	178	4023	**408**	**7,172**

Note: U-Turns are included in Totals.

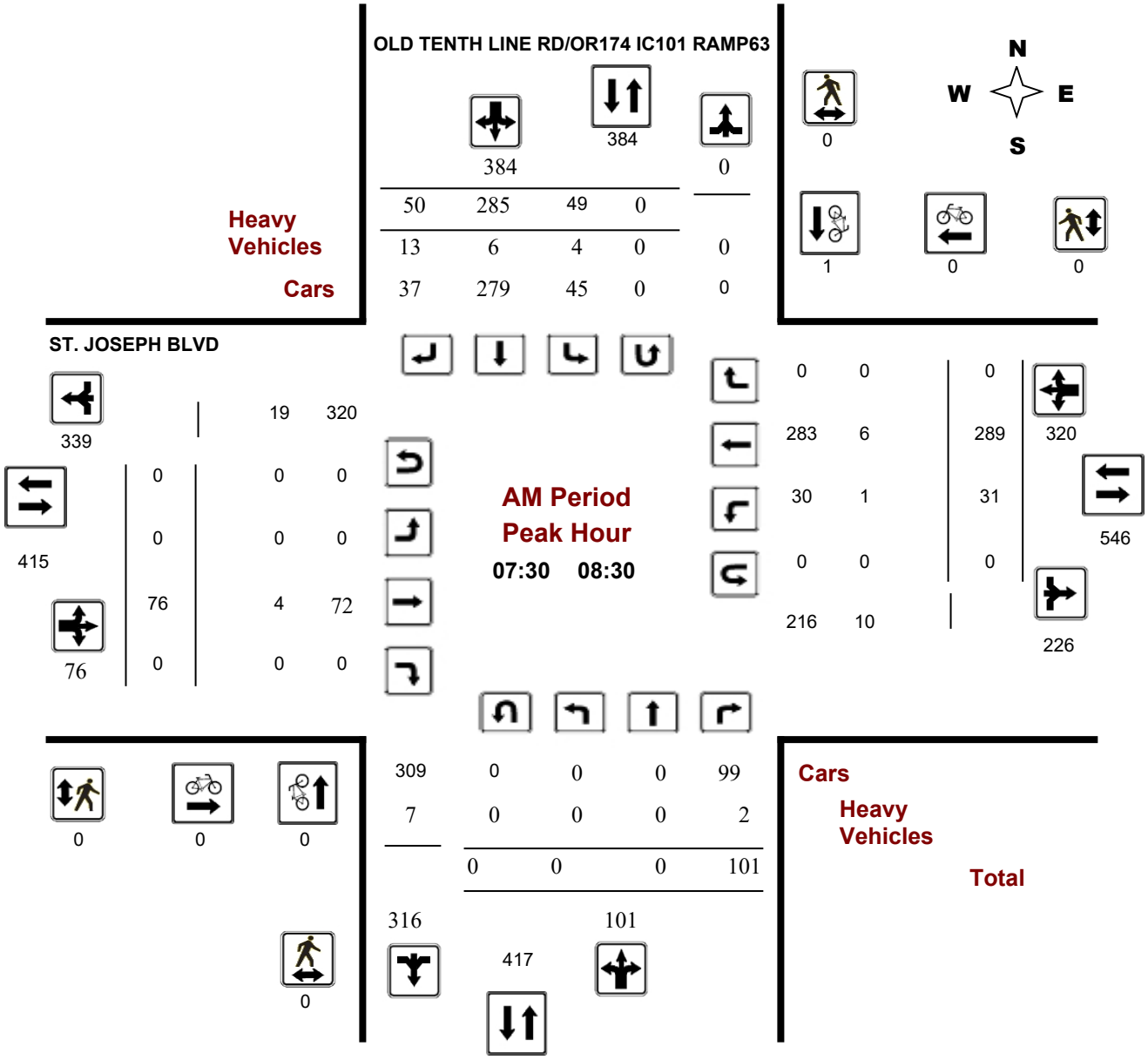
Transportation Services - Traffic Services

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

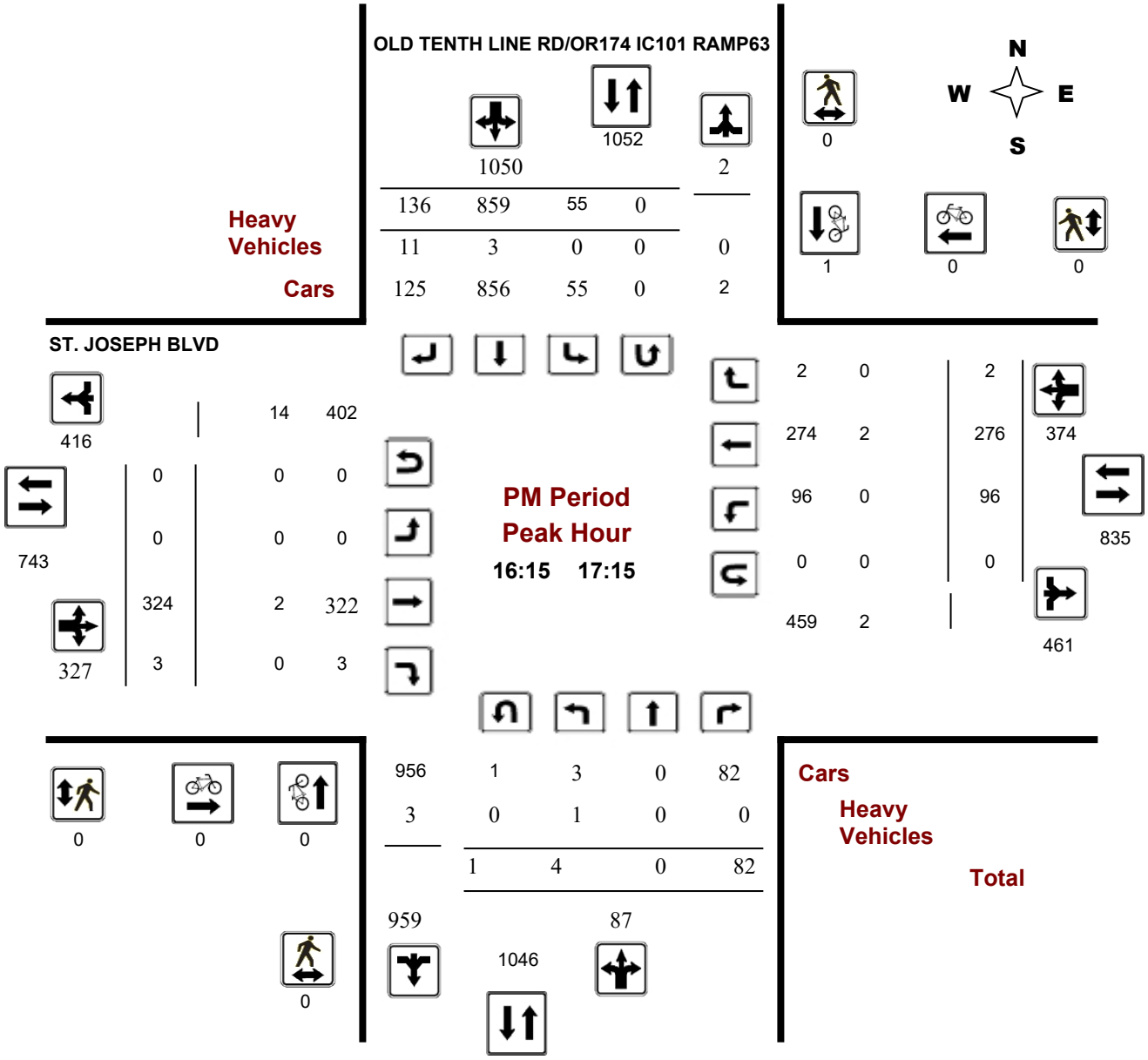
Transportation Services - Traffic Services

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

APPENDIX E

Collision Records

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

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

Traffic Control: Traffic signal **Total Collisions:** 23

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jan-05, Tue,13:58	Clear	Angle	Non-fatal injury	Packed snow	East	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Feb-18, Thu,08:03	Clear	Angle	P.D. only	Wet	East	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Aug-14, Sun,20:16	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Passenger van	Other motor vehicle	
2016-Oct-14, Fri,11:44	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Oct-14, Fri,22:18	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
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

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

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

Traffic Control: Traffic signal **Total Collisions:** 23

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
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-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	

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 97

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 97

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jan-14, Wed,17:27	Clear	Rear end	P.D. only	Ice	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2015-Jan-27, Tue,08:12	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Passenger van	Other motor vehicle	0
					North	Slowing or stopping	Passenger van	Other motor vehicle	
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2015-Feb-08, Sun,12:49	Snow	Angle	P.D. only	Ice	East	Unknown	Unknown	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2015-Feb-17, Tue,05:54	Clear	Rear end	P.D. only	Ice	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2015-Feb-17, Tue,06:37	Clear	Sideswipe	P.D. only	Ice	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2015-Feb-17, Tue,16:22	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	
2015-Feb-18, Wed,17:18	Clear	Rear end	Non-fatal injury	Wet	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Feb-24, Tue,08:25	Clear	SMV other	P.D. only	Ice	North	Slowing or stopping	Passenger van	Skidding/sliding	0
2015-Mar-01, Sun,13:55	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	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 97

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jun-28, Sun,14:47	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Aug-31, Mon,08:00	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	
2015-Sep-01, Tue,10:31	Clear	Rear end	Non-fatal injury	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2015-Sep-24, Thu,12:11	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Pick-up truck	Other motor vehicle	
2015-Oct-04, Sun,07:59	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	
2015-Oct-04, Sun,12:55	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Oct-09, Fri,11:05	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2015-Oct-15, Thu,06:52	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	
2015-Oct-30, Fri,06:37	Clear	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2015-Nov-27, Fri,10:50	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Passenger van	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2015-Nov-27, Fri,19:46	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2015-Dec-17, Thu,07:40	Rain	Rear end	P.D. only	Wet	North	Stopped	Pick-up truck	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 97

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Dec-23, Wed,18:41	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2015-Dec-24, Thu,20:13	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Jan-20, Wed,17:04	Clear	Angle	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Passenger van	Other motor vehicle	
2016-Jan-31, Sun,10:19	Clear	Rear end	P.D. only	Wet	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Feb-05, Fri,09:50	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	
2016-Feb-12, Fri,14:55	Clear	Rear end	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Pick-up truck	Other motor vehicle	
2016-Feb-20, Sat,15:30	Rain	Rear end	P.D. only	Slush	South	Going ahead	Police vehicle	Other motor vehicle	0
					South	Slowing or stopping	Passenger van	Other motor vehicle	
2016-Feb-25, Thu,19:00	Snow	SMV other	P.D. only	Ice	East	Turning right	Pick-up truck	Skidding/sliding	0
2016-Mar-07, Mon,17:53	Clear	Rear end	Non-fatal injury	Wet	North	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
2016-Mar-10, Thu,13:25	Clear	SMV other	Non-fatal injury	Wet	North	Slowing or stopping	Delivery van	Other	0
2016-Mar-12, Sat,15:20	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 97

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Apr-22, Fri,15:26	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	
2016-May-07, Sat,11:56	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2016-Jun-30, Thu,12:34	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Truck - open	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Jul-09, Sat,11:02	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2016-Jul-11, Mon,15:47	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	
2016-Aug-26, Fri,12:28	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Delivery van	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
					North	Turning right	Pick-up truck	Other motor vehicle	
2016-Sep-10, Sat,11:03	Clear	Rear end	Non-fatal injury	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Sep-28, Wed,17:50	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2016-Oct-05, Wed,09:17	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Dec-31, Sat,21:19	Snow	Angle	P.D. only	Loose snow	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 97

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	
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	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 97

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
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	
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	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 97

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
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	
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	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 97

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
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
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	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: ST. JOSEPH BLVD @ TENTH LINE RD

Traffic Control: Traffic signal **Total Collisions:** 97

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
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	
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	

Location: ST. JOSEPH BLVD btwn PRESTONE DR & TENTH LINE RD

Traffic Control: No control **Total Collisions:** 6

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2015 **To:** December 31, 2019

Location: ST. JOSEPH BLVD btwn PRESTONE DR & TENTH LINE RD

Traffic Control: No control **Total Collisions:** 6

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Feb-15, Mon,07:17	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Jun-11, Sat,09:47	Rain	SMV other	Non-fatal injury	Wet	West	Slowing or stopping	Motorcycle	Curb	0
2017-Oct-17, Tue,14:20	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jan-06, Sat,17:00	Clear	SMV other	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Snowbank/drift	0
2018-Apr-10, Tue,19:03	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Unknown	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jun-05, Wed,07:36	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Ran off road	0

Location: ST. JOSEPH BLVD btwn TENTH LINE RD & OR174 IC101 RAMP63

Traffic Control: No control **Total Collisions:** 3

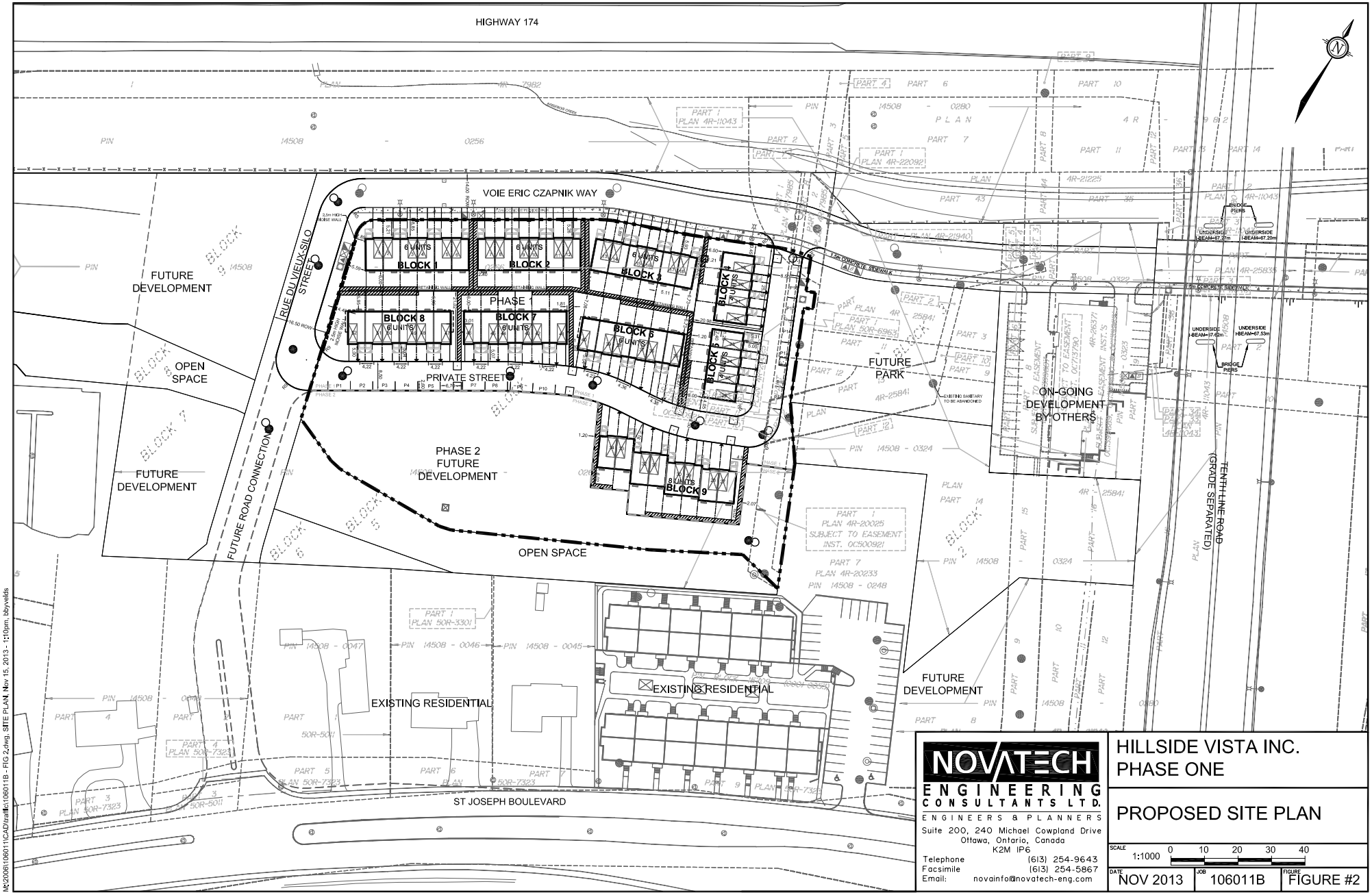
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Feb-11, Wed,09:50	Clear	SMV other	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Ditch	0
2015-Jun-26, Fri,14:45	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Ran off road	0
2017-Aug-28, Mon,17:16	Clear	SMV other	P.D. only	Dry	East	Going ahead	Truck - dump	Pole (utility, power)	0

APPENDIX F

Other Area Developments

OTHER AREA DEVELOPMENTS

Hillside Vista – Phase One



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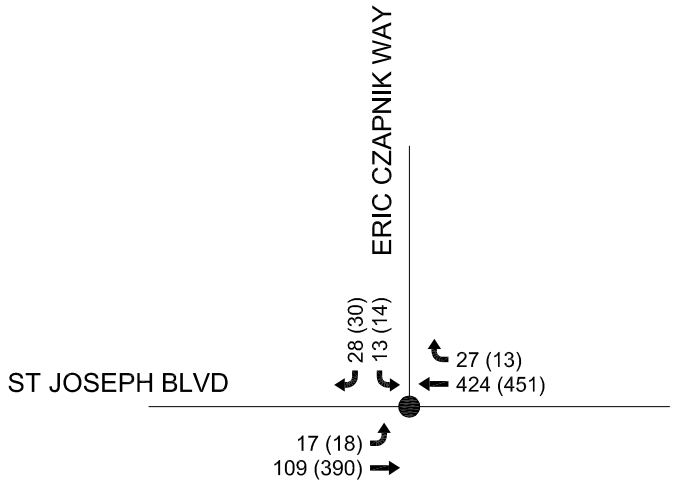
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

HILLSIDE VISTA INC. PHASE ONE

PROPOSED SITE PLAN

SCALE 1:1000 (0 10 20 30 40)
DATE NOV 2013
JOB 106011B
FIGURE FIGURE #2

M:\2006\106011\CAD\draft\c106011B - FIG 2.dwg, SITE PLAN, Nov 15, 2013 - 1:10pm, bbyvelds



LEGEND

- Unsignalized Intersection
- xx VPH AM Peak Hour
- (xx) VPH PM Peak Hour

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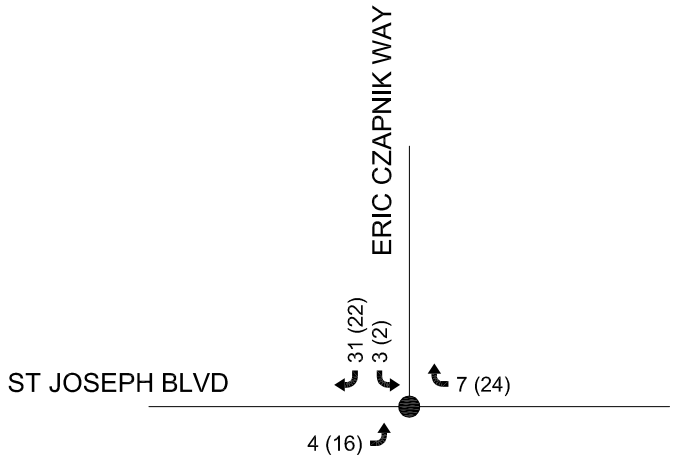
HILLSIDE VISTA INC. PHASE 1

2015 BACKGROUND TRAFFIC VOLUMES

NOV 2013 106011B FIGURE #5



LEGEND

- Unsignalized Intersection
- xx VPH AM Peak Hour
- (xx) VPH PM Peak Hour

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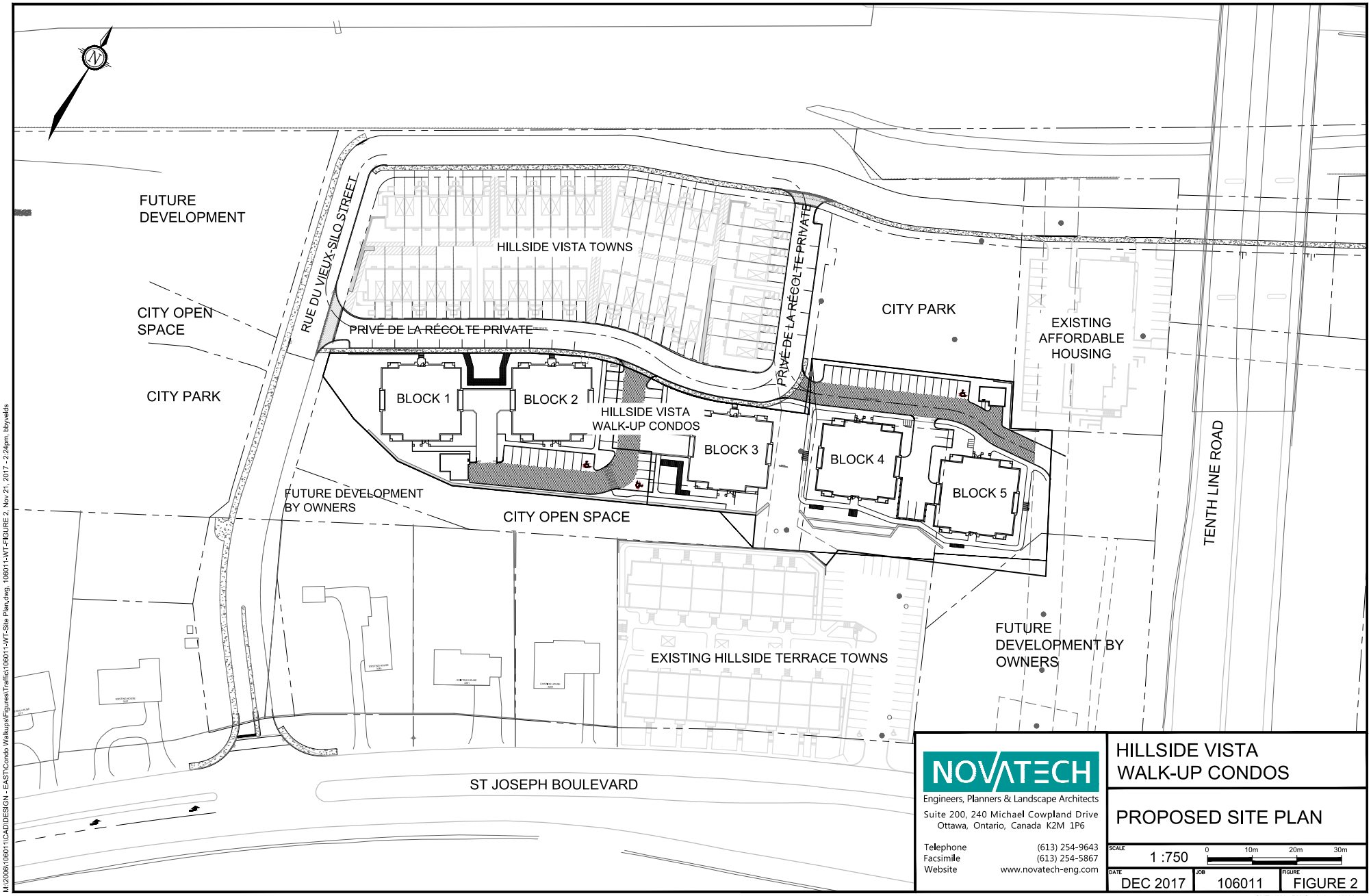
HILLSIDE VISTA INC. PHASE 1

SITE GENERATED TRAFFIC VOLUMES

NOV 2013 106011B FIGURE #6

OTHER AREA DEVELOPMENTS

Hillside Vista Walk-Up Condos



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Website www.novatech-eng.com

HILLSIDE VISTA WALK-UP CONDOS

PROPOSED SITE PLAN

SCALE 1 :750 (0, 10m, 20m, 30m)
DATE DEC 2017
JOB 106011
FIGURE FIGURE 2

M:\2006\106011\CAD\DESIGN - EAST\Condo Walkups\Figures\Traffic\106011-WT-Site Plan.dwg, 106011-WT-FIGURE 2, Nov 21, 2017 - 2:24pm, bbyvelds

cycle to process vehicles in queue. All other movements at the St. Joseph/Tenth Line intersection currently operate with acceptable queues.

3.0 DEMAND FORECASTING

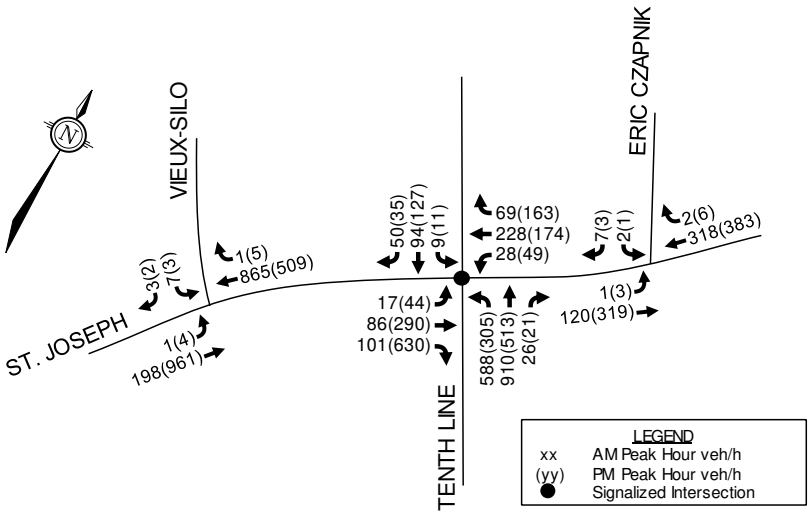
3.1 Background Traffic

As mentioned previously, a TB was prepared by Novatech, dated November 2013, for Phase 1A of the OTC East Residential Development lands (City file # D07-12-13-0208). Given the most recent traffic volumes at the St. Joseph/Tenth Line intersection do not capture the projected Phase 1A site-generated traffic volumes summarized in the November 2013 TB, the subsequent future background traffic projections will include a revised site trip generation (assuming the same trip generation rates, modal share values, trip distribution and assignment outlined in Sections 3.2 and 3.3) for 44 townhome dwelling units, currently being constructed.

In addition to the revised site trip generation, it is assumed that approximately half the projected Phase 1A site-generated traffic will take advantage of the new full-movement connection to St. Joseph Boulevard. For analysis purposes, this is considered a reasonable assumption, given the proximity of the new St. Joseph Boulevard connection to Phase 1A, the proximity/location of the OR174 on/off-ramps, etc. The new full-movement St. Joseph Boulevard connection (west of Tenth Line Road) is depicted as Vieux-Silo Street on the proposed Site Plan (**Figure 2**).

With regard to general background traffic growth, the November 2013 TB included a 1% annual growth rate, applied to existing traffic volumes along St. Joseph Boulevard, to account for area development. As such, the subsequent analysis will also include a 1% annual growth rate applied to existing background traffic volumes along St. Joseph Boulevard. For the purpose of this assessment, the expected date of full occupancy is assumed to be 2018, and the resultant future background traffic volumes (i.e. 1% annual background traffic growth and projected site-generated traffic for Phase 1A) at study area intersections are depicted on **Figure 5**.

Figure 5: Future Background Peak Hour Traffic Volumes



3.2 Projected Site-Generated Traffic

The following **Table 2** summarizes the projected peak hour vehicle trip generation for 90 residential condominium dwelling units, proposed for a portion of Phase 1B of the OTC East

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:

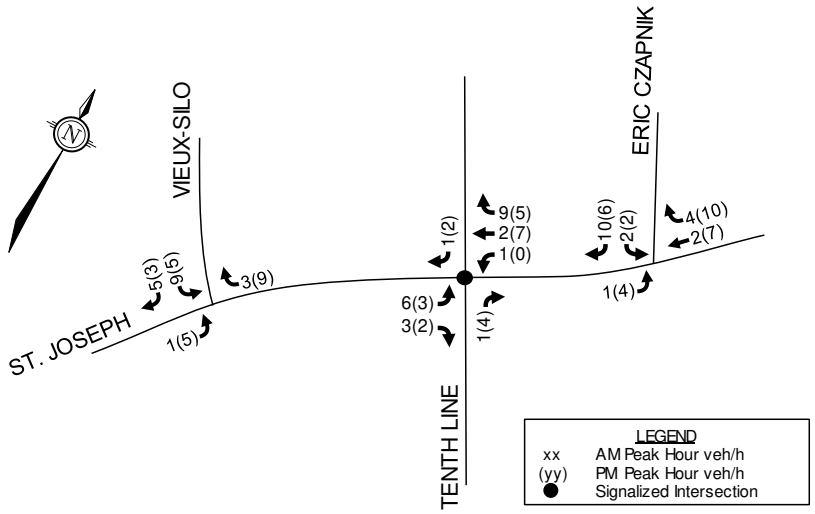
55%	to/from the west via OR174;
18%	to/from the west via St. Joseph Boulevard;
5%	to/from the east via St. Joseph Boulevard;
5%	to/from the east via OR174;
2%	to/from the north via Tenth Line Road; and
15%	to/from the south via Tenth Line Road.
100%	

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



OTHER AREA DEVELOPMENTS

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211 Centrum Boulevard

1 Screening

This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, the trip generation, location and safety triggers were met and a TIA is required including the Design Review component and the Network Impact Component.

2 Existing and Planned Conditions

2.1 Proposed Development

The proposed development located at 211 Centrum Boulevard, currently zoned as Mixed-Use Centre (MC), is planned to include 397 retirement home units across one nine- and one 17-storey building connected by a four-storey podium to be built in a single phase for occupancy by 2024. The proposed design includes 282 underground parking spaces and 21 space surface lot accommodating visitor parking. Access to the underground garage will be via an access to Brisebois Crescent and an access to the surface lot will be via a drop-off loop on Brisebois Crescent. Figure 1 illustrates the Study Area Context and Figure 2 illustrates the proposed concept plan.

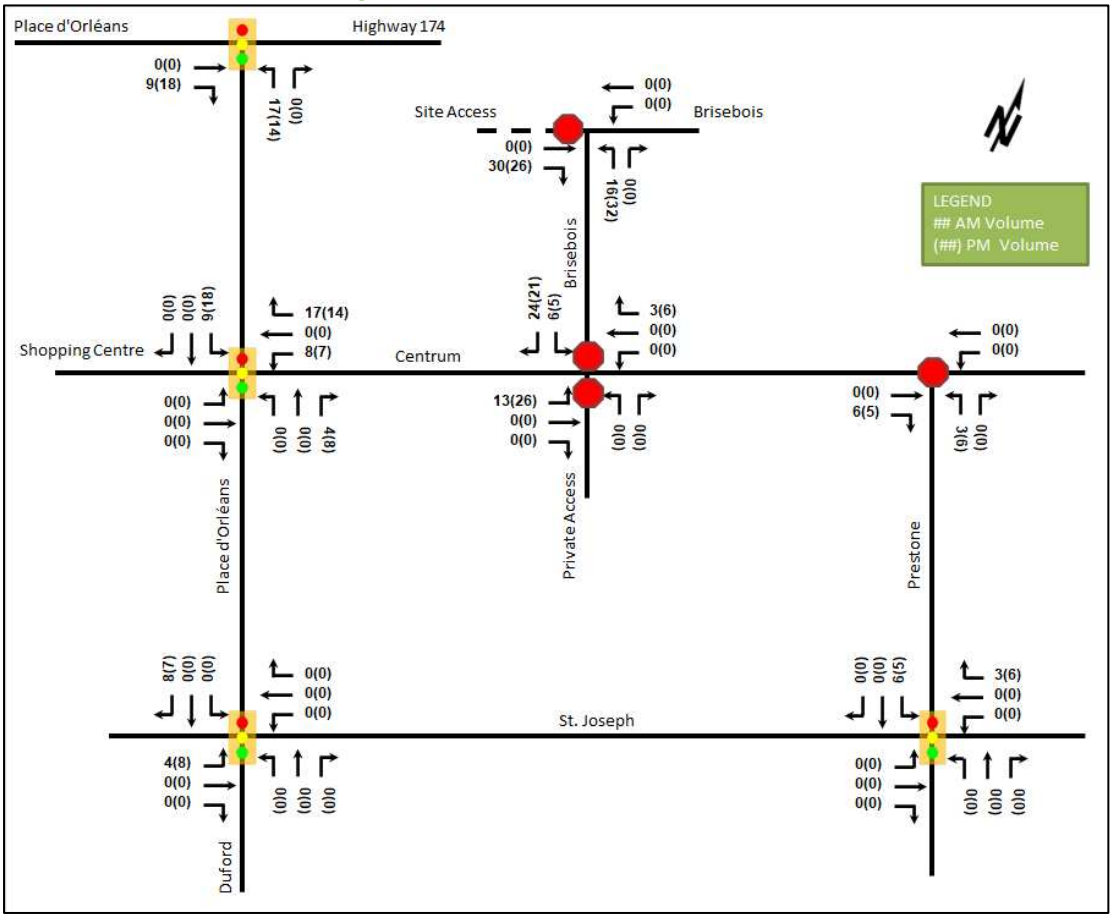
Figure 1: Area Context Plan

Source: http://maps.ottawa.ca/geoOttawa/ Accessed: December 4, 2019

5.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the Study Area road network. Figure 9 illustrates the new site generated volumes.

Figure 9: New Site Generation Auto Volumes



6 Background Network Travel Demand

6.1 Transportation Network Plans

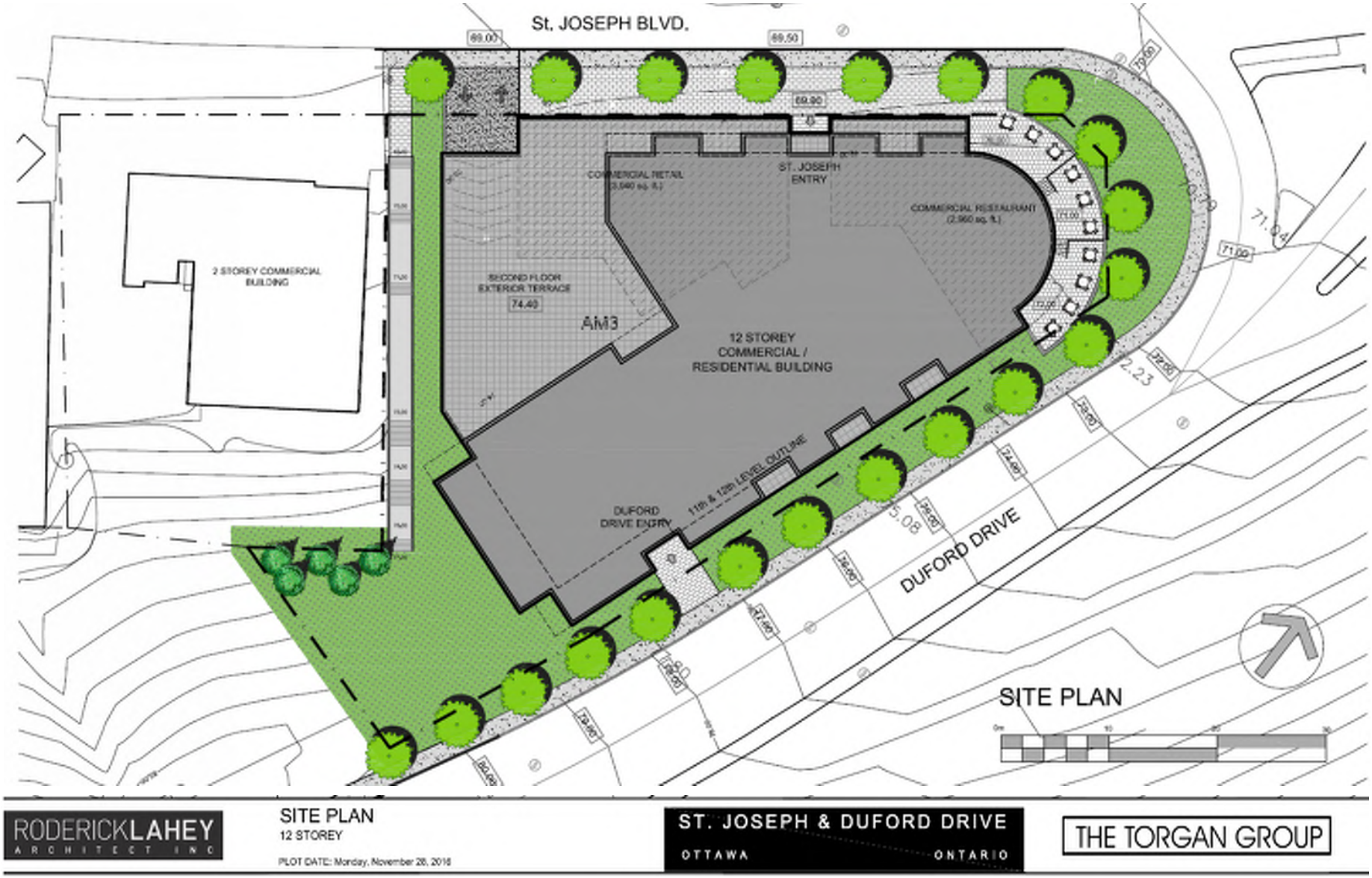
The transportation network plans were discussed in Section 2.3.1 and are not anticipated to impact to site, trip generation, or distribution.

6.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for each of the study area roadways. Table 13 summarizes the results of the model and the projections are provided in Appendix E.

OTHER AREA DEVELOPMENTS

3030 St. Joseph Boulevard



PARSONS

Figure 2: Proposed Site Plan

Table 5: Mid-Rise Apartment Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	50%	9	21	30	22	16	38
Auto Passenger	15%	3	7	10	7	5	12
Transit	25%	5	10	15	10	8	18
Non-motorized	10%	1	4	5	4	3	7
Total Person Trips	100%	18	42	60	43	32	75
Total 'New' Auto Trips		**9**	**21**	**30**	**22**	**16**	**38**

Table 6: Total Site Vehicle Trip Generation

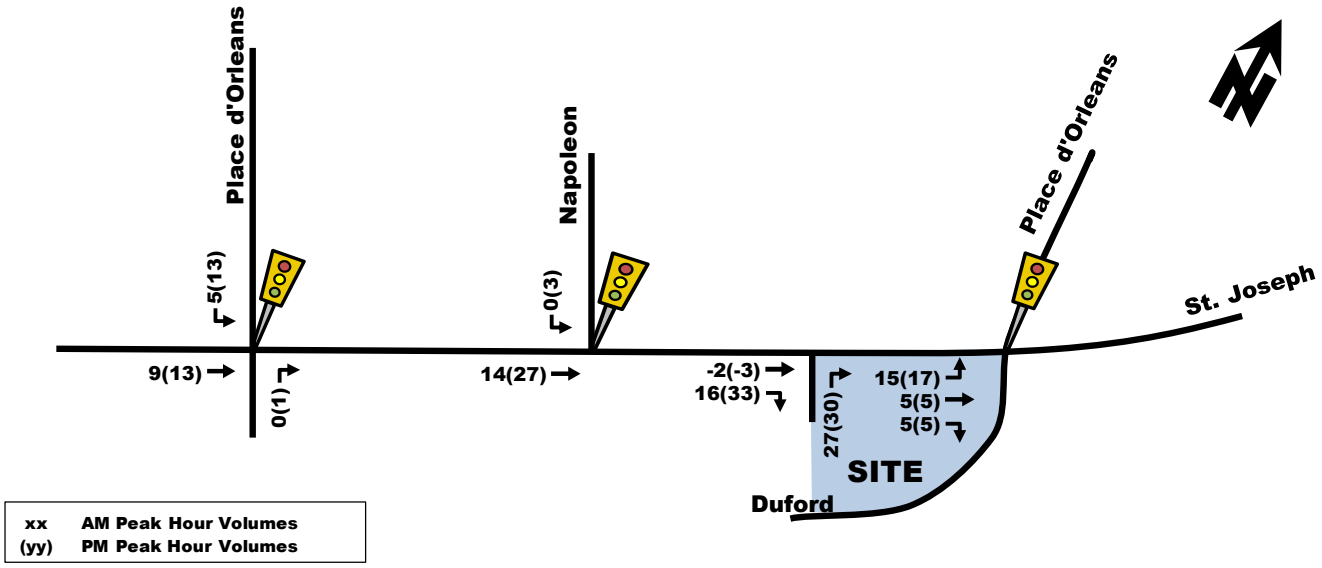
Land Use	AM Peak (veh/h)			PM Peak (veh/h)		
	In	Out	Total	In	Out	Total
Specialty Retail	7	6	13	11	14	25
Mid-Rise Apartments	9	21	30	22	16	38
Less Retail Pass-by (25%)	-2	-2	-4	-3	-3	-6
Total Site-Generated Auto Trips	**14**	**25**	**39**	**30**	**27**	**57**

As shown in Table 6, the resulting number of potential 'new' two-way vehicle trips for the proposed development is approximately 40 and 60 veh/h during the weekday morning and afternoon peak hours, respectively.

5.2. ASSIGNMENT OF SITE-GENERATED TRAFFIC

As the only vehicular connection to the proposed development and its garage is via the proposed right-in/right-out driveway to St. Joseph Boulevard, the assignment of peak hour site-generated traffic is very straight forward, as depicted in Figure 4. At the two Place d'Orleans intersections east and west of the site driveway, site-generated traffic was distributed based on a combination of the current distribution proportions and OR174 access.

Figure 4: Assignment of Site-Generated Traffic



OTHER AREA DEVELOPMENTS

Petrie's Landing

Petrie's Landing I

Brigil is proposing the construction of the remainder 4 of 6 total residential Towers, consisting of approximately 806 additional residential units and 1,500 sq. meters of commercial. The proposed Petrie's Landing I is located on Jeanne D'Arc Boulevard, approximately 1.5 km east of the subject site, as illustrated in **Figure 5**. Currently, Tower I has been built and Tower II is nearing completion. The projected two-way vehicle trips for this proposed residential development are approximately 70 to 65 veh/h for Tower II and 210 to 180 veh/h for Towers III-VI during the AM and PM peak hours respectively.

Petrie's Landing III

Brigil is proposing the construction of a mixed-use development consisting of approximately 370,000 ft^2 of office, 23,000 ft^2 of retail and up to 790 residential units. The proposed Petrie's Landing III is located on Jeanne D'Arc Boulevard, approximately 500 meters east of the subject site, as illustrated in **Figure 5**. The projected two-way vehicle trips for this proposed mixed-use development is approximately 660 and 685 veh/h during the morning and afternoon peak hours, respectively.

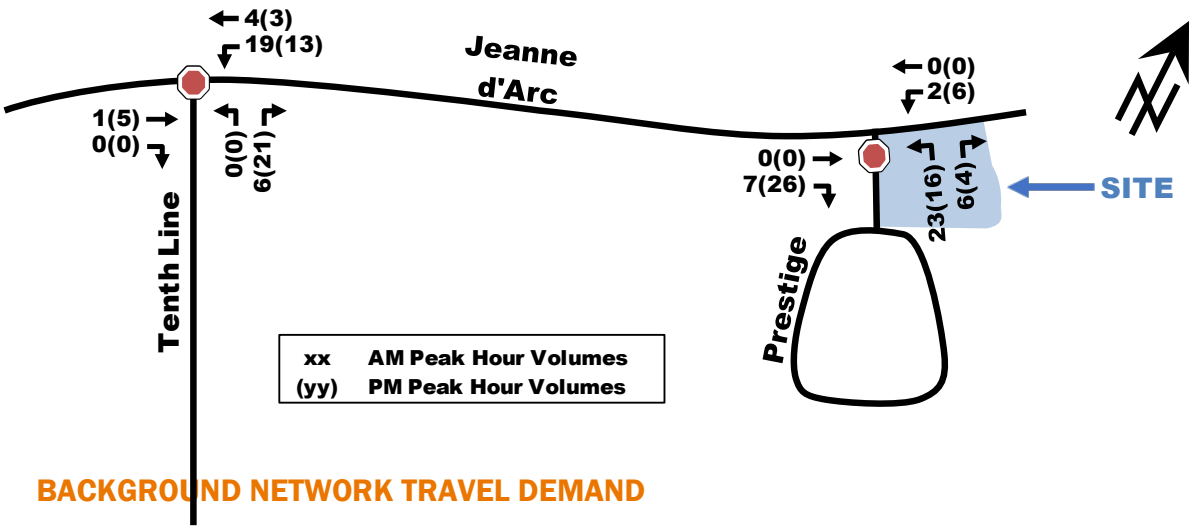
Figure 5: Petrie's Landing I, II and III Concept Plan

Cardinal Creek Village

Tamarack Homes is currently constructing a 1,446-unit subdivision and a 430,000 ft^2 shopping centre, south of OR-174 and east of Cardinal Creek, as illustrated in **Figure 6**. The Transportation Impact Study (prepared by IBI Group) projected approximately 1,460 veh/h and 2,619 veh/h by horizon year 2031 (full build-out) during the morning and afternoon peak hours, respectively.

Based on these distributions, 'new' site-generated trips to/from the proposed development are assigned to study area intersections and are illustrated as **Figure 8**.

Figure 8: Site-Generated Traffic (Block 8)



3.2. BACKGROUND NETWORK TRAVEL DEMAND

3.2.1. TRANSPORTATION NETWORK PLANS

The transportation network changes have been discussed within Section 2.1.3., and none were anticipated to impact the transportation analysis for this development.

3.2.2. BACKGROUND GROWTH

A 2% annual background traffic growth has been added along the Jeanne D'Arc Boulevard through movements to anticipate future development growth along the corridor. Given that Jeanne D'Arc Boulevard between Tenth Line Road and Trim Road (arterials on each side of the study area) are bound by OR 174 and the Ottawa River, a 2% background growth is conservative. Known future developments were superimposed on top of the 2% annual growth and are described in section 3.2.3.

3.2.3. OTHER AREA DEVELOPMENTS

Other area developments were outlined in **Section 2.1.3**. Trips generated by these developments have been summarized in **Table 6**.

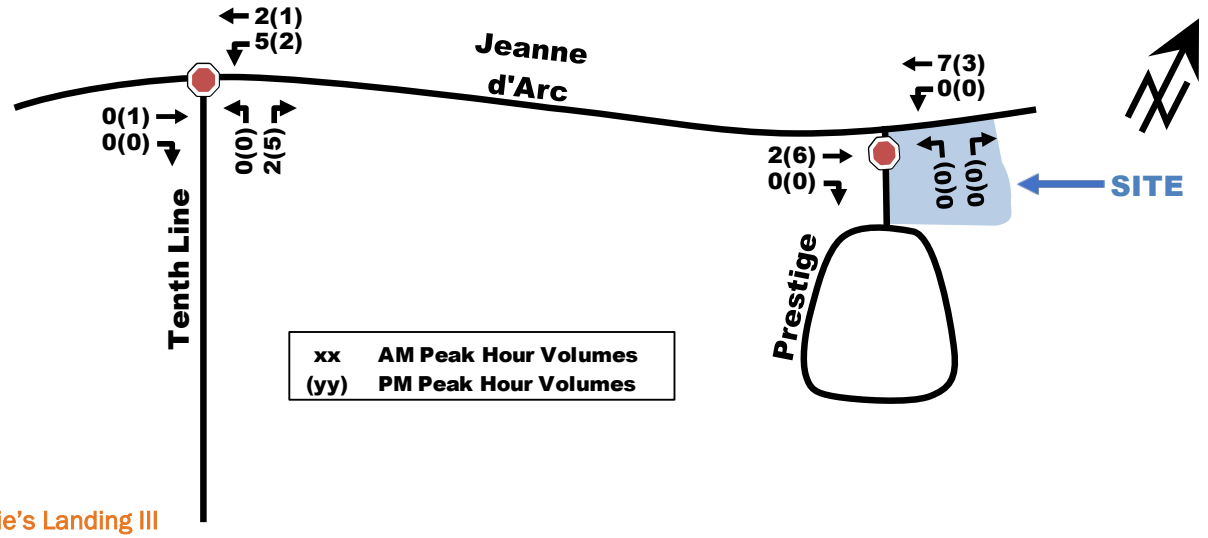
Table 6: Other Area Developments Vehicle Trip Generation

	AM Peak (persons/h)			PM Peak (persons/h)		
	In	Out	Total	In	Out	Total
Petrie's Landing I	72	210	282	144	101	245
Petrie's Landing II – Blocks 6 & 7	11	35	46	48	30	78
Petrie's Landing III	422	237	659	254	430	584
Cardinal Creek (External Only)	412	940	1,352	1,246	980	2,226
Total	917	1,422	2,339	1,692	1,541	3,233

Petrie's Landing I – Tower II to VI

Petrie's Landing I – Tower II to VI are expected to be fully occupied by 2024. For a more conservative analysis, all Towers were superimposed to background 2022 and forward. The projected traffic volumes are illustrated in **Figure 9**.

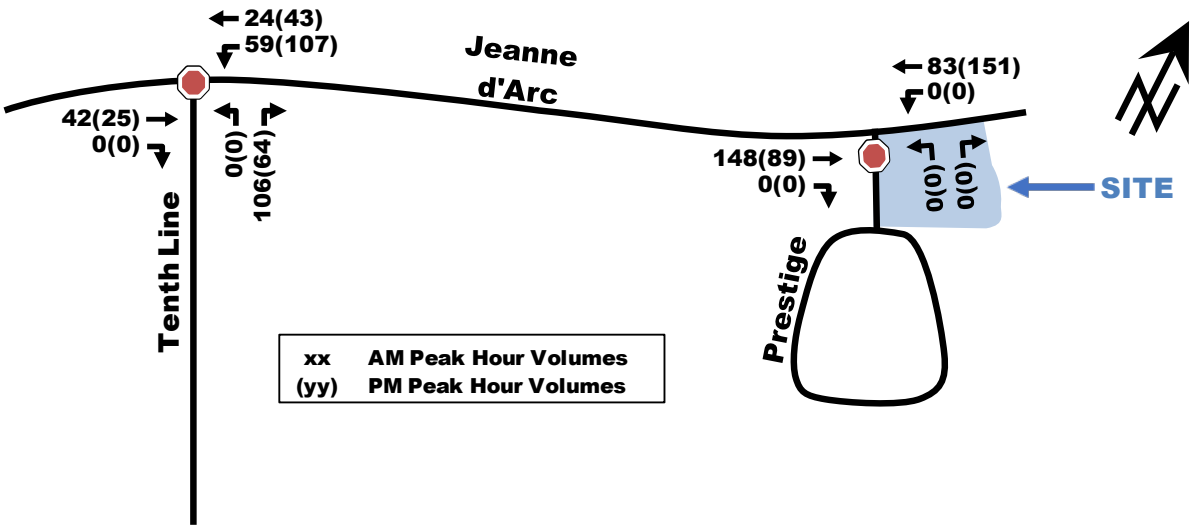
Figure 9: Petrie's Landing I Tower II - IV Projected Traffic Volumes



Petrie's Landing III

Figure 10 illustrates the projected traffic volumes for Petrie's Landing III at full build-out, obtained from the 2013 Petrie's Landing I TIS. Considering assumed time horizons, 30% of build-out volumes will be applied in year 2022, and 100% in year 2027.

Figure 10: Petrie's Landing III Projected Traffic Volumes – Full Build-Out



APPENDIX G

Relevant Excerpts of *TRANS Trip Generation Manual* (WSP, 2020)

to make use of this resource while considering the local land use context and trip characteristics for all travel modes through local and regional data.

Table 2: Person-Trip Conversion Factor

Factor	Application	Apply To	Period	Value
Person-Trip Conversion Factor	**Vehicle to person-trip conversion**, to normalize the measure of trip rates to account for all modes. Applicable to the ITE trip generation rates, which are mainly reported as vehicle trip rates.	Vehicle trip rates	All	1.28

3 RESIDENTIAL TRIP GENERATION RATES

3.1 Development of Residential Trip Rates

The residential trip generation rates in this manual are reflect the number of **person-trips per household** during the **peak period**. The morning peak period is from 7:00 AM to 9:30 AM, while the afternoon peak period is from 3:30 PM to 6:00 PM.

A geographic review of trip generation rates found that rates varied by dwelling type but not significantly by the geographic sectors and districts used in the 2009 TRANS Trip Generation Study[1]. As such, residential trip generation rates in this manual are defined for the following three dwelling types:

- Single-Family Detached Housing
- Multifamily Housing (Low-Rise)
- Multifamily Housing (High-Rise)

Low-rise housing refers to any building that houses multiple families that is two storeys or less (e.g. semi-detached homes, townhouses). High-rise housing refers to any building that houses multiple families that is three or more storeys (e.g. apartments and condo buildings). These dwelling types are from the TRANS Origin-Destination Survey but are organized to be equivalent to the categories of the ITE *Trip Generation Manual* and local generator surveys.

[1] While person trip rates were not found to vary significantly with geographic area, location does have an impact on mode share as discussed in Section 4.2. As a result, vehicular trip rates do vary by geography as reflected in previous versions of the manual. The variation by dwelling type, in part, reflects differences in the number of persons per dwelling.

3.2 Recommended Residential Trip Generation Rates

A blended trip rate was developed from the three data sources through application of a rank-sum weighting process, considering the strengths and weaknesses of each dataset for the dwelling type in question. The recommended blended **residential person-trip rates** are presented in **Table 3**. All rates represent person-trips per dwelling unit and are to be applied to the **AM or PM peak period.**

Table 3: Recommended Residential Person-trip Rates

ITE Land Use Code	Dwelling Unit Type	Period	Person-Trip Rate
210	Single-detached	AM	2.05
		PM	2.48
220	Multi-Unit (Low-Rise)	AM	1.35
		PM	1.58
221 & 222	Multi-Unit (High-Rise)	AM	0.80
		PM	0.90

3.3 Adjustment Factors – Peak Period to Peak Hour

The various trip generation data sources require some adjustment to standardize the data for developing robust blended trip rates. The peak period conversion factor in **Table 4** may be used where applicable to develop trip generation rate estimates in the desired format.

Table 4: Adjustment Factors for Residential Trip Generation Rates

Factor	Application	Apply To	Period	Value
Peak Period Conversion Factor	**Peak period to peak hour conversion.** Because the 2020 TRANS Trip Generation Study reports trip generation rates by peak period, factors must be applied if the practitioner requires peak hour rates. In practice, the conversion to peak hour trip rates should occur **after** the application of modal shares.	Person-trip rates per peak period	AM	0.50
			PM	0.44
		Vehicle trip rates per peak period	AM	0.48
			PM	0.44
		Transit trip rates per peak period	AM	0.55
			PM	0.47
		Cycling trip rates per peak period	AM	0.58
			PM	0.48
		Walking trip rates per peak period	AM	0.58
			PM	0.52

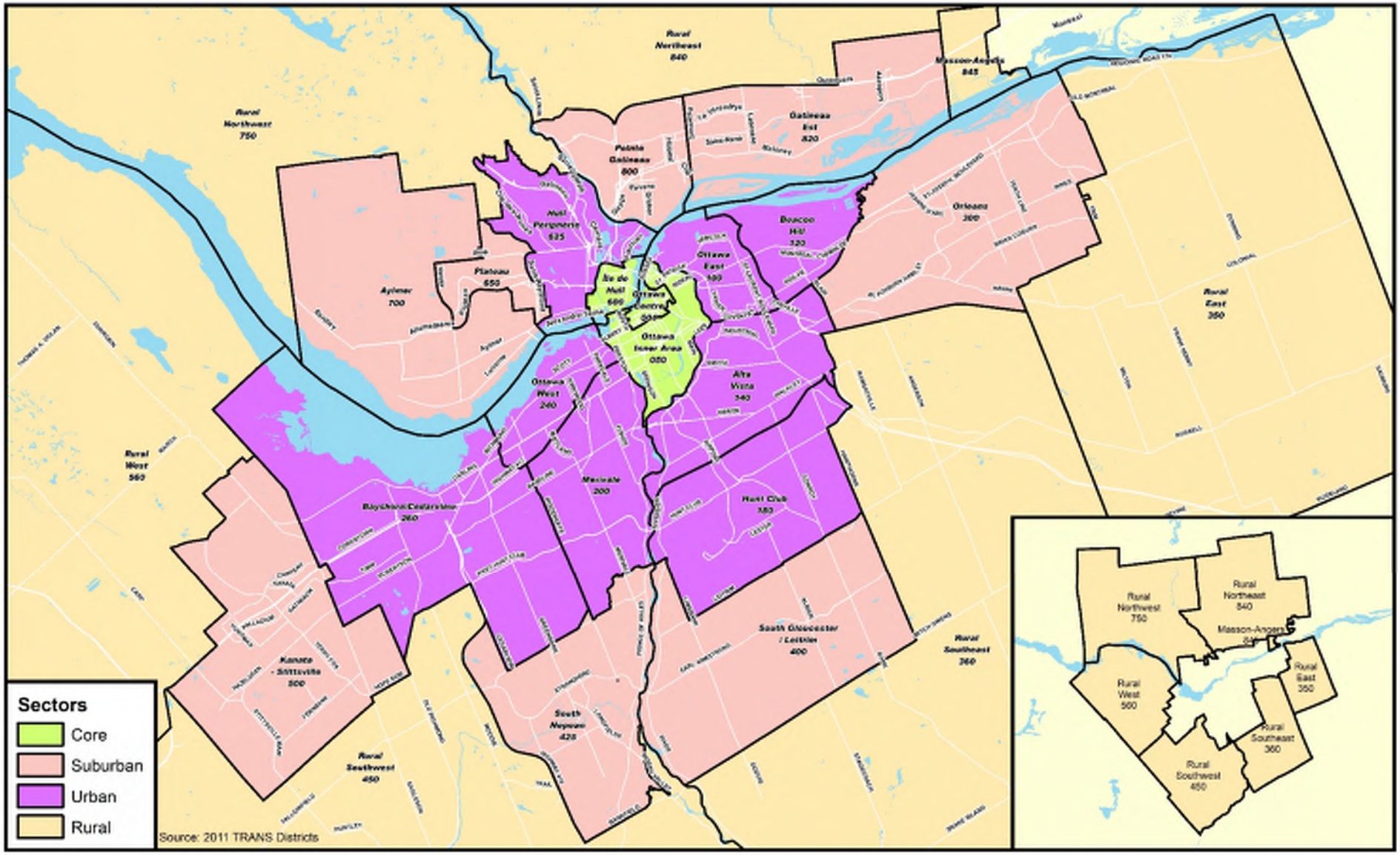


Figure 1: National Capital Region by Sector

Table 8: Residential Mode Share for High-Rise Multifamily Housing

District	Period	Mode				
		Auto Driver	Auto Pass.	Transit	Cycling	Walking
Ottawa Centre	AM	18%	2%	26%	1%	52%
	PM	17%	9%	21%	1%	52%
Ottawa Inner Area	AM	26%	6%	28%	5%	34%
	PM	25%	8%	21%	6%	39%
Île de Hull	AM	27%	3%	37%	12%	21%
	PM	26%	8%	27%	11%	28%
Ottawa East	AM	39%	7%	38%	2%	13%
	PM	40%	14%	28%	3%	15%
Beacon Hill	AM	48%	9%	30%	3%	10%
	PM	52%	16%	28%	0%	4%
Alta Vista	AM	38%	12%	42%	2%	7%
	PM	45%	16%	28%	2%	9%
Hunt Club	AM	39%	6%	44%	1%	9%
	PM	44%	11%	35%	2%	9%
Merivale	AM	41%	6%	42%	2%	8%
	PM	41%	11%	33%	2%	13%
Ottawa West	AM	28%	11%	41%	3%	16%
	PM	33%	11%	26%	7%	23%
Bayshore/Cedarview	AM	40%	12%	38%	2%	8%
	PM	40%	15%	33%	1%	11%
Hull Périphérie	AM	48%	11%	30%	1%	10%
	PM	47%	15%	23%	3%	13%
Orleans	AM	54%	7%	29%	0%	10%
	PM	61%	13%	21%	0%	6%
South Gloucester / Leitrim	AM	50%	15%	25%	1%	9%
	PM	53%	17%	21%	1%	9%
South Nepean	AM	58%	6%	30%	2%	4%
	PM	54%	15%	25%	0%	7%
Kanata - Stittsville	AM	43%	26%	28%	0%	4%
	PM	55%	19%	21%	0%	5%
Plateau	AM	53%	9%	35%	3%	1%
	PM	65%	7%	25%	2%	1%
Aylmer	AM	45%	17%	25%	0%	13%
	PM	31%	21%	23%	4%	20%
Pointe Gatineau	AM	44%	15%	24%	3%	14%
	PM	52%	15%	20%	2%	11%
Gatineau Est	AM	53%	10%	25%	0%	12%
	PM	61%	10%	25%	0%	4%
Masson-Angers	AM	63%	15%	19%	0%	3%
	PM	64%	18%	16%	0%	1%
Other Rural Districts	AM	63%	15%	19%	0%	3%
	PM	64%	18%	16%	0%	1%

5 RESIDENTIAL DIRECTIONAL SPLITS

After calculating the total person trips generated by the development and applying the appropriate modal shares, directional factors can be applied to estimate the number of inbound and outbound trips by vehicle. The vehicle trip directional splits were developed for both the AM and PM peak periods[2]. The vehicle trip directional splits, as shown in **Table 9**, have been developed for the NCR based on a review of the local trip generator surveys as well as the latest published data in the ITE *Trip Generation Manual* (10th Edition).

Table 9: Recommended Vehicle Trip Directional Splits (Peak Period)

ITE Land Use Code	Dwelling Unit Type	Period	Inbound	Outbound
210	Single-detached	AM	30%	70%
		PM	62%	38%
220	Multi-Unit (Low-Rise)	AM	30%	70%
		PM	56%	44%
221 & 222	Multi-Unit (High-Rise)	AM	31%	69%
		PM	58%	42%

6 NON-RESIDENTIAL MODE SHARE

Mode shares were developed for three types of non-residential development: schools (elementary and high school); employment generators; and commercial (retail) generators. These mode shares were developed through data provided by the Ville de Gatineau from local school surveys as well as the TRANS Origin-Destination Survey. The non-residential mode shares presented below are limited and do not capture all development types. For data on the travel characteristics associated with colleges and universities, transportation terminals, and sports and entertainment venues in the National Capital Region, practitioners should refer to the various reports for the TRANS *Special Generators Survey* (2013), which are posted on the TRANS website. For other development types, practitioners may need to carry out their own local generator data collection where necessary.

[2] A directional split for active transportation was calculated based on the local generator surveys for low-rise and mid-rise land uses. The splits are mostly in-line with the vehicle directional splits, which could be used as a rough assumption for areas with lower vehicle mode share.

APPENDIX H

Strategic Long-Range Model and Intersection Growth Rate Figures

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Network Mapping

2011 Model - Base case

N/A

User Initials: TIMW
Plot Prepared: May 31, 2021
EMME Scenario: 21711

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

100 200 300 400 500

The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Network Mapping

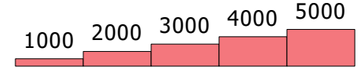
2031 Model - Base case

N/A

User Initials: TIMW
Plot Prepared: May 31, 2021
EMME Scenario: 21711

Legend

AM Peak Hour Total Traffic Volume



Distance (m)

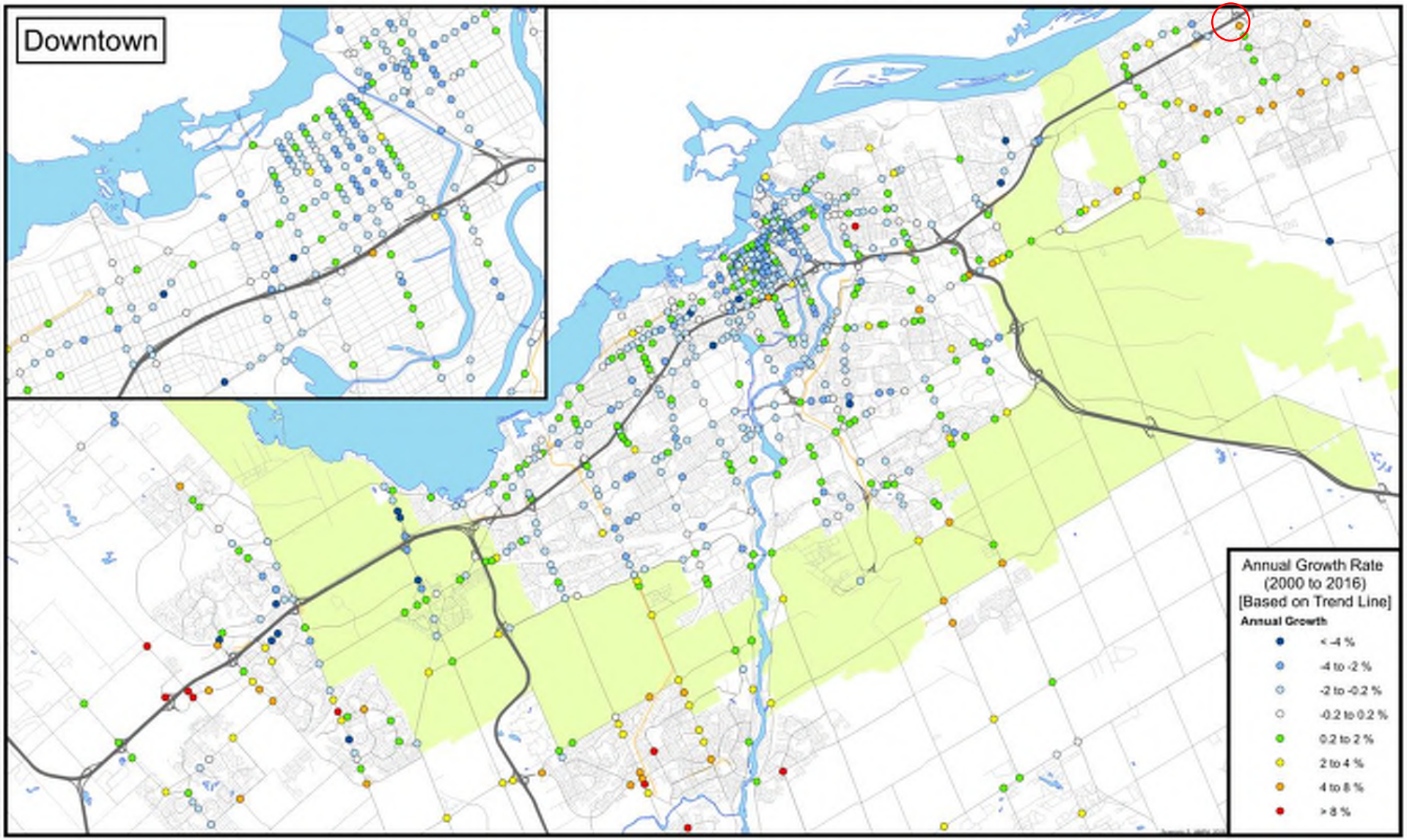
The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

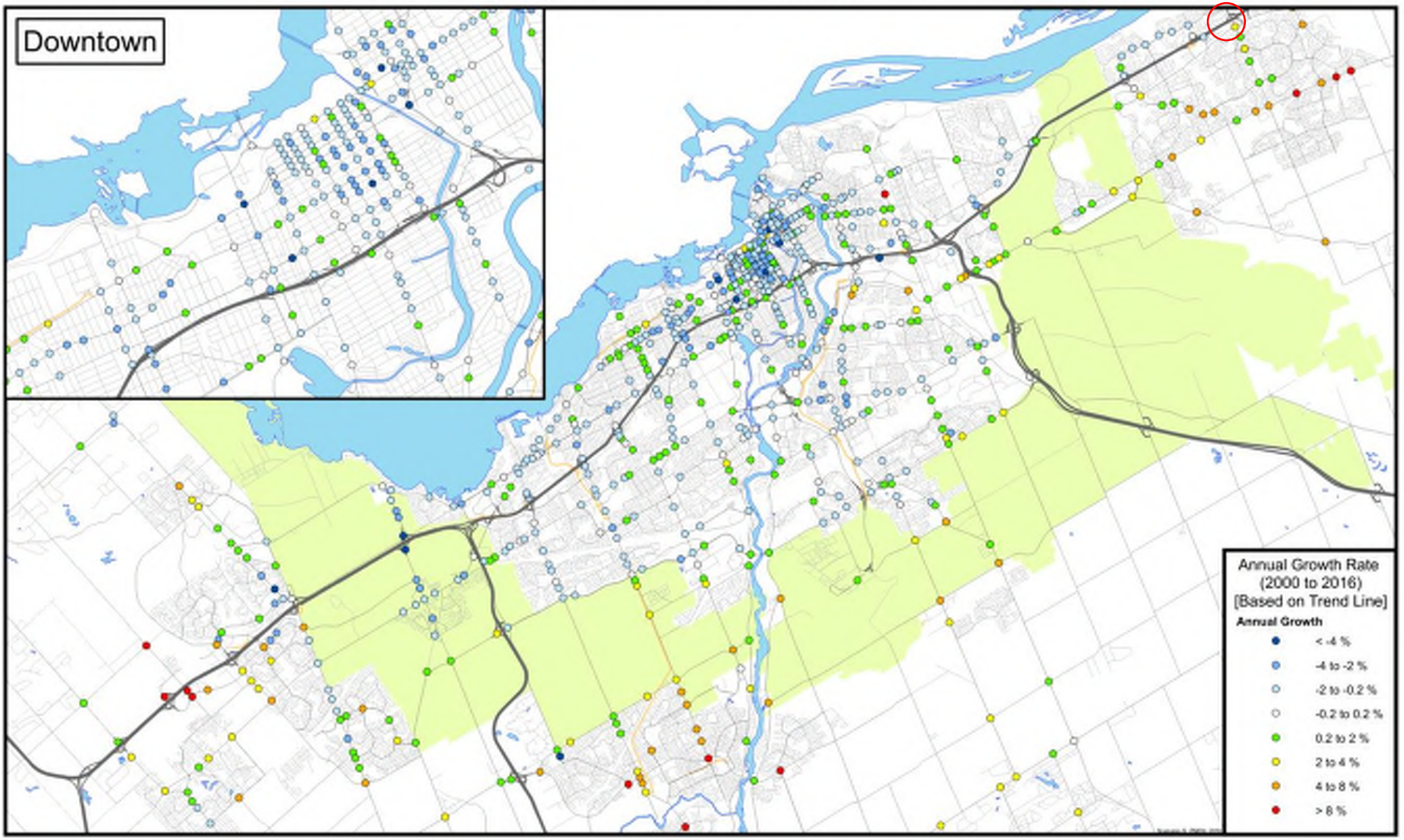
INTERSECTION TRAFFIC GROWTH RATE, AM PEAK PERIOD

Total Vehicular Volume Entering the Intersection, 2000 to 2016



INTERSECTION TRAFFIC GROWTH RATE, PM PEAK PERIOD

Total Vehicular Volume Entering the Intersection, 2000 to 2016



APPENDIX I

Signal Timing Plans

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

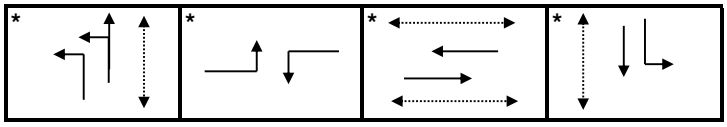
Intersection:	***Main:*** Tenth Line	***Side:***	St. Joseph
Controller:	**ATC 3**	**TSD:**	**6126**
Author:	Matthew Anderson	**Date:**	26-May-2021

Existing Timing Plans†

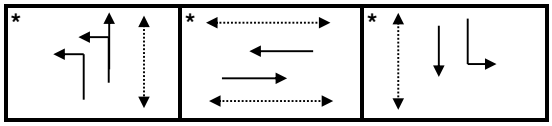
	Plan				**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	***Walk***	***DW***	***A+R***
Cycle	Free	Free	Free	Free			
Offset	-	-	-	-			
NB Thru/Left	max=59.3	max=49.3	max=59.3	max=49.3	7	19	3.7+2.6
EB Left	max=14	max=14	max=14	-	-	-	3.7+2.3
WB Left	max=14	max=14	max=14	-	-	-	3.7+2.3
EB Thru	max=28.1	max=28.1	max=28.1	max=25.1	7	16	3.7+2.4
WB Thru	max=28.1	max=28.1	max=28.1	max=25.1	7	16	3.7+2.4
SB Thru/Left	max=28.3	max=28.3	max=28.3	max=28.3	7	19	3.7+2.6

Phasing Sequence‡

Plan: 1,2,3



Plan: 4



Note: 1) All Plans have a minimum recall on the NB movement of 22 seconds green

Schedule

Weekday

Time	Plan
0:15	4
6:30	1
9:30	2
15:00	3
18:30	2
23:30	4

Saturday

Time	Plan
0:15	4
7:00	2
20:00	4

Sunday

Time	Plan
0:15	4
7:00	2
19:00	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $59.96 ($53.06 + HST)

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

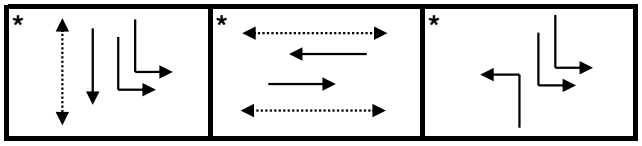
Intersection:	**Main:** Old Tenth Line / Off-Ramp		**Side:**	St. Joseph
Controller:	**MS-3200**		**TSD:**	5910
Author:	Matthew Anderson		**Date:**	26-May-2021

Existing Timing Plans†

	Plan				**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	***Walk***	***DW***	***A+R***
Cycle	Free	Free	Free	Free			
Offset	-	-	-	-			
SB Thru	34	30	35	24	7	16	3.7+3.3
EB Thru	31.6	27.6	26.6	26.6	7	12	3.7+2.9
WB Thru	31.6	27.6	26.6	26.6	7	12	3.7+2.9
NB Left (fp)	16.3	16.3	16.3	11.3	-	-	3.7+2.6
SB Left (fp)	45	40	45	35	-	-	3.7+3.3

Phasing Sequence‡

Plan: All



Notes: 1) The SB Thru and SB Left have min recalls of 15s and 5s green respectively

Schedule

Weekday

Time	Plan
0:15	4
6:30	1
9:30	2
15:00	3
18:30	2
23:30	4

Saturday

Time	Plan
0:15	4
7:00	2
20:00	4

Sunday

Time	Plan
0:15	4
7:00	2
19:00	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

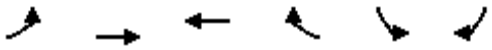
(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $59.96 ($53.06 + HST)

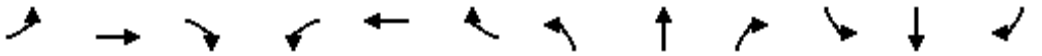
APPENDIX J

Existing Synchro Analysis



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	203	741	1	7	3
Future Volume (vph)	1	203	741	1	7	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt					0.963	
Flt Protected	0.950				0.965	
Satd. Flow (prot)	1674	3316	3316	0	1638	0
Flt Permitted	0.950				0.965	
Satd. Flow (perm)	1674	3316	3316	0	1638	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		410.1	145.9		128.9	
Travel Time (s)		24.6	8.8		9.3	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	2%	1%	1%	1%
Adj. Flow (vph)	1	226	823	1	8	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	226	824	0	11	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.0	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.7%		ICU Level of Service A	
Analysis Period (min) 15			

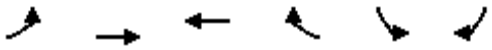


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	75	119	37	272	42	416	796	20	7	124	54
Future Volume (vph)	16	75	119	37	272	42	416	796	20	7	124	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		0.0	160.0		55.0	105.0		60.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	30.0			25.0			25.0			35.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.91	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.99	1.00		0.98						
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.998		0.950		
Satd. Flow (prot)	1674	3316	1455	1470	3316	1441	1509	3112	1441	1674	3283	1483
Flt Permitted	0.568			0.630			0.950	0.998		0.950		
Satd. Flow (perm)	994	3316	1435	974	3316	1406	1509	3112	1441	1674	3283	1483
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132			126			125			125
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		82.1			144.1			338.4			235.5	
Travel Time (s)		4.9			8.6			20.3			14.1	
Confl. Peds. (#/hr)	7		1	1		7						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	4%	15%	2%	5%	2%	4%	5%	1%	3%	2%
Adj. Flow (vph)	18	83	132	41	302	47	462	884	22	8	138	60
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	18	83	132	41	302	47	416	930	22	8	138	60
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			5.0			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		6	6		2	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	6	6	6	2	2	2
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	22.0	22.0	22.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.1	29.1	11.0	29.1	29.1	32.3	32.3	32.3	32.3	32.3	32.3
Total Split (s)	14.0	29.1	29.1	14.0	29.1	29.1	59.3	59.3	59.3	32.3	32.3	32.3
Total Split (%)	10.4%	21.6%	21.6%	10.4%	21.6%	21.6%	44.0%	44.0%	44.0%	24.0%	24.0%	24.0%
Maximum Green (s)	8.0	23.0	23.0	8.0	23.0	23.0	53.0	53.0	53.0	26.0	26.0	26.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.4	2.3	2.4	2.4	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.1	6.1	6.0	6.1	6.1	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	Min	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		16.0	16.0		16.0	16.0	19.0	19.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)		1	1		7	7	1	1	1	1	1	1
Act Effct Green (s)	17.8	14.1	14.1	19.6	17.0	17.0	37.7	37.7	37.7	13.2	13.2	13.2
Actuated g/C Ratio	0.19	0.15	0.15	0.21	0.18	0.18	0.41	0.41	0.41	0.14	0.14	0.14
v/c Ratio	0.07	0.16	0.40	0.17	0.49	0.13	0.68	0.73	0.03	0.03	0.29	0.19
Control Delay	31.8	40.8	11.9	32.5	40.4	0.7	31.0	28.6	0.1	42.7	41.8	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	40.8	11.9	32.5	40.4	0.7	31.0	28.6	0.1	42.7	41.8	1.3
LOS	C	D	B	C	D	A	C	C	A	D	D	A
Approach Delay		23.7			34.8			28.9			30.1	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	2.1	6.2	0.0	4.8	19.9	0.0	56.4	65.2	0.0	1.1	10.6	0.0
Queue Length 95th (m)	9.0	16.2	16.3	16.3	49.9	0.0	132.1	131.9	0.0	5.9	24.0	0.0
Internal Link Dist (m)		58.1			120.1			314.4			211.5	
Turn Bay Length (m)				70.0			160.0		55.0	105.0		60.0
Base Capacity (vph)	261	891	482	253	893	470	934	1927	940	508	997	538
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.09	0.27	0.16	0.34	0.10	0.45	0.48	0.02	0.02	0.14	0.11

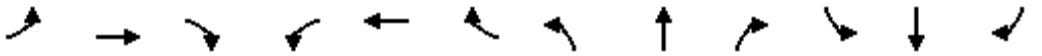
Intersection Summary			
Area Type:	Other		
Cycle Length: 134.7			
Actuated Cycle Length: 92.3			
Natural Cycle: 105			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 29.5		Intersection LOS: C	
Intersection Capacity Utilization 62.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Tenth Line & St. Joseph



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	20	82	333	13	9	40
Future Volume (vph)	20	82	333	13	9	40
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.995		0.890	
Flt Protected	0.950				0.991	
Satd. Flow (prot)	1674	3316	4698	0	1554	0
Flt Permitted	0.950				0.991	
Satd. Flow (perm)	1674	3316	4698	0	1554	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		144.1	123.1		184.3	
Travel Time (s)		8.6	7.4		13.3	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	3%	1%	1%	1%
Adj. Flow (vph)	22	91	370	14	10	44
Shared Lane Traffic (%)						
Lane Group Flow (vph)	22	91	384	0	54	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.5	5.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	10.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.4%		ICU Level of Service A	
Analysis Period (min) 15			

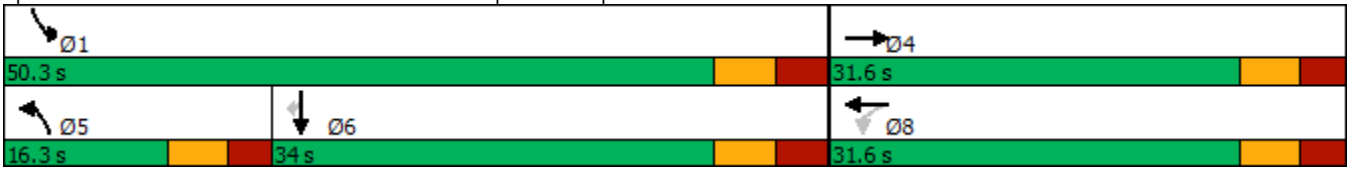


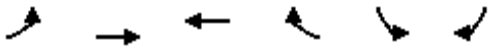
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	76	0	31	289	0	0	0	101	49	285	50
Future Volume (vph)	0	76	0	31	289	0	0	0	101	49	285	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		15.0	110.0		130.0
Storage Lanes	0		0	1		0	1		1	2		1
Taper Length (m)	10.0			35.0			10.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Ped Bike Factor												0.99
Frt									0.850			0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3221	0	1642	3316	0	1762	0	1483	2982	3316	1210
Flt Permitted				0.700						0.950		
Satd. Flow (perm)	0	3221	0	1210	3316	0	1762	0	1483	2982	3316	1195
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									882			132
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		123.1			246.7			275.2			235.3	
Travel Time (s)		7.4			14.8			16.5			14.1	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	5%	1%	3%	2%	1%	1%	1%	2%	10%	2%	25%
Adj. Flow (vph)	0	84	0	34	321	0	0	0	112	54	317	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	0	34	321	0	0	0	112	54	317	56
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	Left	Left	R NA	Left	Left	Right
Median Width(m)		5.0			4.5			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors		2		1	2		1		1	1	2	1
Detector Template		Thru		Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (m)		30.5		6.1	30.5		6.1		6.1	6.1	30.5	6.1
Trailing Detector (m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)		1.8		6.1	1.8		6.1		6.1	6.1	1.8	6.1
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7						28.7	
Detector 2 Size(m)		1.8			1.8						1.8	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Perm
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			6
Detector Phase		4		8	8		5			1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		10.0		10.0	10.0		5.0			5.0	15.0	15.0
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	30.0
Total Split (s)		31.6		31.6	31.6		16.3			50.3	34.0	34.0
Total Split (%)		38.6%		38.6%	38.6%		19.9%			61.4%	41.5%	41.5%
Maximum Green (s)		25.0		25.0	25.0		10.0			43.3	27.0	27.0
Yellow Time (s)		3.7		3.7	3.7		3.7			3.7	3.7	3.7
All-Red Time (s)		2.9		2.9	2.9		2.6			3.3	3.3	3.3
Lost Time Adjust (s)		0.0		0.0	0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)		6.6		6.6	6.6		6.3			7.0	7.0	7.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0		3.0			3.0	3.0	3.0
Recall Mode		None		None	None		None			Min	Min	Min
Walk Time (s)		7.0		7.0	7.0						7.0	7.0
Flash Dont Walk (s)		12.0		12.0	12.0						16.0	16.0
Pedestrian Calls (#/hr)		0		0	0						1	1
Act Effct Green (s)		10.6		10.6	10.6				40.8	16.5	16.5	16.5
Actuated g/C Ratio		0.26		0.26	0.26				1.00	0.40	0.40	0.40
v/c Ratio		0.10		0.11	0.37				0.08	0.04	0.24	0.10
Control Delay		12.6		13.5	14.3				0.1	7.5	8.5	0.5
Queue Delay		0.0		0.0	0.0				0.0	0.0	0.0	0.0
Total Delay		12.6		13.5	14.3				0.1	7.5	8.5	0.5
LOS		B		B	B				A	A	A	A
Approach Delay		12.6			14.3			0.1			7.3	
Approach LOS		B			B			A			A	
Queue Length 50th (m)		2.0		1.6	8.2				0.0	0.9	6.3	0.0
Queue Length 95th (m)		6.3		6.8	19.1				0.0	3.0	12.7	0.5
Internal Link Dist (m)		99.1			222.7			251.2			211.3	
Turn Bay Length (m)				60.0					15.0	110.0		130.0
Base Capacity (vph)		1993		748	2052				1483	2906	2216	842
Starvation Cap Reductn		0		0	0				0	0	0	0
Spillback Cap Reductn		0		0	0				0	0	0	0
Storage Cap Reductn		0		0	0				0	0	0	0
Reduced v/c Ratio		0.04		0.05	0.16				0.08	0.02	0.14	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 81.9			
Actuated Cycle Length: 40.8			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.37			
Intersection Signal Delay: 9.5		Intersection LOS: A	
Intersection Capacity Utilization 32.5%		ICU Level of Service A	
Analysis Period (min) 15			

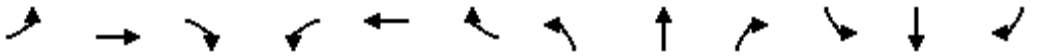
Splits and Phases: 4: Old Tenth Line/OR 174 EB Ramp & St. Joseph





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	4	874	556	5	3	2
Future Volume (vph)	4	874	556	5	3	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.999		0.946	
Flt Protected	0.950				0.971	
Satd. Flow (prot)	1674	3349	3345	0	1619	0
Flt Permitted	0.950				0.971	
Satd. Flow (perm)	1674	3349	3345	0	1619	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		410.1	145.9		128.9	
Travel Time (s)		24.6	8.8		9.3	
Confl. Peds. (#/hr)	4			4		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	4	971	618	6	3	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	971	624	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.0	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.5%		ICU Level of Service A	
Analysis Period (min) 15			

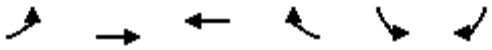


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	298	525	62	199	148	320	627	13	8	137	42
Future Volume (vph)	54	298	525	62	199	148	320	627	13	8	137	42
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		0.0	160.0		55.0	105.0		60.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	30.0			25.0			25.0			35.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.91	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.99	1.00		0.97			0.98	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.998		0.950		
Satd. Flow (prot)	1674	3316	1455	1470	3316	1441	1509	3112	1441	1674	3283	1483
Flt Permitted	0.614			0.484			0.950	0.998		0.950		
Satd. Flow (perm)	1070	3316	1435	748	3316	1401	1509	3112	1419	1672	3283	1483
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			583			164			125			125
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		82.1			144.1			338.4			235.5	
Travel Time (s)		4.9			8.6			20.3			14.1	
Confl. Peds. (#/hr)	9		1	1		9			2	2		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	4%	15%	2%	5%	2%	4%	5%	1%	3%	2%
Adj. Flow (vph)	60	331	583	69	221	164	356	697	14	9	152	47
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	60	331	583	69	221	164	320	733	14	9	152	47
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			5.0			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		6	6		2	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	6	6	6	2	2	2
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	22.0	22.0	22.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.1	29.1	11.0	29.1	29.1	32.3	32.3	32.3	32.3	32.3	32.3
Total Split (s)	14.0	29.1	29.1	14.0	29.1	29.1	59.3	59.3	59.3	32.3	32.3	32.3
Total Split (%)	10.4%	21.6%	21.6%	10.4%	21.6%	21.6%	44.0%	44.0%	44.0%	24.0%	24.0%	24.0%
Maximum Green (s)	8.0	23.0	23.0	8.0	23.0	23.0	53.0	53.0	53.0	26.0	26.0	26.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.4	2.3	2.4	2.4	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.1	6.1	6.0	6.1	6.1	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		16.0	16.0		16.0	16.0	19.0	19.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)		1	1		9	9	1	1	1	1	1	1
Act Effct Green (s)	23.1	17.1	17.1	23.2	17.2	17.2	32.0	32.0	32.0	13.2	13.2	13.2
Actuated g/C Ratio	0.25	0.18	0.18	0.25	0.19	0.19	0.35	0.35	0.35	0.14	0.14	0.14
v/c Ratio	0.19	0.54	0.79	0.28	0.36	0.42	0.61	0.68	0.02	0.04	0.33	0.15
Control Delay	27.9	40.5	12.3	29.9	37.9	10.2	33.1	31.0	0.1	40.8	41.4	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	40.5	12.3	29.9	37.9	10.2	33.1	31.0	0.1	40.8	41.4	1.0
LOS	C	D	B	C	D	B	C	C	A	D	D	A
Approach Delay		22.9			26.7			31.2			32.2	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	6.4	25.1	0.0	7.4	16.2	0.0	47.1	55.5	0.0	1.3	12.1	0.0
Queue Length 95th (m)	20.7	52.3	37.4	23.5	36.0	17.8	96.5	97.7	0.0	6.2	25.1	0.0
Internal Link Dist (m)		58.1			120.1			314.4			211.5	
Turn Bay Length (m)				70.0			160.0		55.0	105.0		60.0
Base Capacity (vph)	324	875	808	255	875	490	918	1894	912	499	980	530
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.38	0.72	0.27	0.25	0.33	0.35	0.39	0.02	0.02	0.16	0.09

Intersection Summary			
Area Type:	Other		
Cycle Length: 134.7			
Actuated Cycle Length: 92.6			
Natural Cycle: 105			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 27.5		Intersection LOS: C	
Intersection Capacity Utilization 63.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Tenth Line & St. Joseph



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	24	295	394	18	10	25
Future Volume (vph)	24	295	394	18	10	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.993		0.903	
Flt Protected	0.950				0.986	
Satd. Flow (prot)	1674	3349	4689	0	1569	0
Flt Permitted	0.950				0.986	
Satd. Flow (perm)	1674	3349	4689	0	1569	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		144.1	123.1		184.3	
Travel Time (s)		8.6	7.4		13.3	
Confl. Peds. (#/hr)	4			4		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	3%	1%	1%	1%
Adj. Flow (vph)	27	328	438	20	11	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	328	458	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.5	5.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	10.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

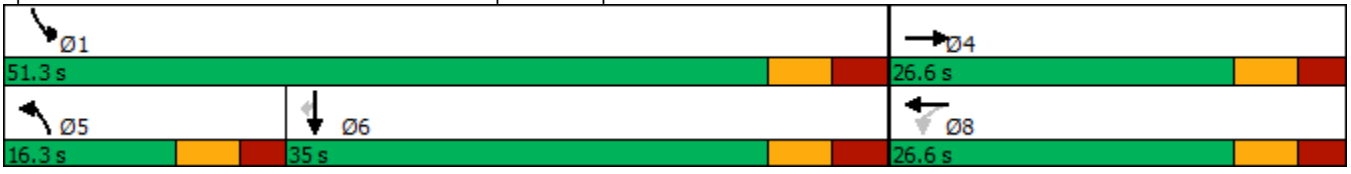
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.7%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	324	3	96	276	0	4	0	82	55	859	136
Future Volume (vph)	0	324	3	96	276	0	4	0	82	55	859	136
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		15.0	110.0		130.0
Storage Lanes	0		0	1		0	1		1	2		1
Taper Length (m)	10.0			35.0			10.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Ped Bike Factor							1.00					0.99
Frt		0.999							0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3313	0	1674	3316	0	1353	0	1498	3248	3349	1401
Flt Permitted				0.535			0.950			0.950		
Satd. Flow (perm)	0	3313	0	943	3316	0	1352	0	1498	3248	3349	1383
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1							237			151
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		123.1			246.7			275.2			235.3	
Travel Time (s)		7.4			14.8			16.5			14.1	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	25%	1%	1%	1%	1%	8%
Adj. Flow (vph)	0	360	3	107	307	0	4	0	91	61	954	151
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	363	0	107	307	0	4	0	91	61	954	151
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	Left	Left	R NA	Left	Left	Right
Median Width(m)		5.0			4.5			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors		2		1	2		1		1	1	2	1
Detector Template		Thru		Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (m)		30.5		6.1	30.5		6.1		6.1	6.1	30.5	6.1
Trailing Detector (m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)		1.8		6.1	1.8		6.1		6.1	6.1	1.8	6.1
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7						28.7	
Detector 2 Size(m)		1.8			1.8						1.8	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Perm
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			6
Detector Phase		4		8	8		5			1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		10.0		10.0	10.0		5.0			5.0	15.0	15.0
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	30.0
Total Split (s)		26.6		26.6	26.6		16.3			51.3	35.0	35.0
Total Split (%)		34.1%		34.1%	34.1%		20.9%			65.9%	44.9%	44.9%
Maximum Green (s)		20.0		20.0	20.0		10.0			44.3	28.0	28.0
Yellow Time (s)		3.7		3.7	3.7		3.7			3.7	3.7	3.7
All-Red Time (s)		2.9		2.9	2.9		2.6			3.3	3.3	3.3
Lost Time Adjust (s)		0.0		0.0	0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)		6.6		6.6	6.6		6.3			7.0	7.0	7.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0		3.0			3.0	3.0	3.0
Recall Mode		None		None	None		None			Min	Min	Min
Walk Time (s)		7.0		7.0	7.0						7.0	7.0
Flash Dont Walk (s)		12.0		12.0	12.0						16.0	16.0
Pedestrian Calls (#/hr)		0		0	0						1	1
Act Effct Green (s)		12.9		12.9	12.9		6.1		50.9	23.7	21.9	21.9
Actuated g/C Ratio		0.25		0.25	0.25		0.12		1.00	0.47	0.43	0.43
v/c Ratio		0.43		0.45	0.37		0.03		0.06	0.04	0.66	0.22
Control Delay		19.2		25.6	18.7		27.0		0.1	7.4	15.3	3.8
Queue Delay		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		19.2		25.6	18.7		27.0		0.1	7.4	15.3	3.8
LOS		B		C	B		C		A	A	B	A
Approach Delay		19.2			20.5			1.2			13.4	
Approach LOS		B			C			A			B	
Queue Length 50th (m)		12.0		6.8	10.0		0.3		0.0	1.1	25.7	0.0
Queue Length 95th (m)		30.7		24.4	26.2		2.9		0.0	3.9	75.1	9.6
Internal Link Dist (m)		99.1			222.7			251.2			211.3	
Turn Bay Length (m)				60.0					15.0	110.0		130.0
Base Capacity (vph)		1375		391	1375		280		1498	2843	1945	866
Starvation Cap Reductn		0		0	0		0		0	0	0	0
Spillback Cap Reductn		0		0	0		0		0	0	0	0
Storage Cap Reductn		0		0	0		0		0	0	0	0
Reduced v/c Ratio		0.26		0.27	0.22		0.01		0.06	0.02	0.49	0.17

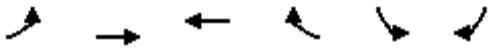
Intersection Summary			
Area Type:	Other		
Cycle Length: 77.9			
Actuated Cycle Length: 50.9			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 15.3		Intersection LOS: B	
Intersection Capacity Utilization 59.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: Old Tenth Line/OR 174 EB Ramp & St. Joseph



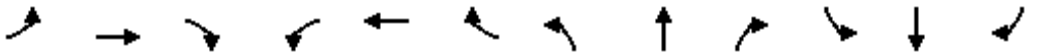
APPENDIX K

Background Synchro Analysis



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	232	811	4	16	8
Future Volume (vph)	2	232	811	4	16	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.999		0.955	
Flt Protected	0.950				0.968	
Satd. Flow (prot)	1674	3316	3313	0	1629	0
Flt Permitted	0.950				0.968	
Satd. Flow (perm)	1674	3316	3313	0	1629	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		410.1	145.9		128.9	
Travel Time (s)		24.6	8.8		9.3	
Confl. Peds. (#/hr)	8			8		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	1%
Adj. Flow (vph)	2	232	811	4	16	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	232	815	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.0	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.8%		ICU Level of Service A	
Analysis Period (min) 15			

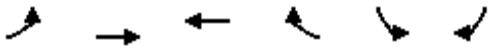


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	93	133	41	301	55	453	929	23	8	189	60
Future Volume (vph)	23	93	133	41	301	55	453	929	23	8	189	60
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		0.0	160.0		55.0	105.0		60.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	30.0			25.0			25.0			35.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.91	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.99	1.00		0.97						
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.998		0.950		
Satd. Flow (prot)	1674	3316	1455	1470	3316	1441	1509	3112	1441	1674	3283	1483
Flt Permitted	0.562			0.629			0.950	0.998		0.950		
Satd. Flow (perm)	980	3316	1435	972	3316	1399	1509	3112	1441	1674	3283	1483
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			133			126			125			125
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		82.1			144.1			338.4			235.5	
Travel Time (s)		4.9			8.6			20.3			14.1	
Confl. Peds. (#/hr)	10		1	1		10						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	4%	15%	2%	5%	2%	4%	5%	1%	3%	2%
Adj. Flow (vph)	23	93	133	41	301	55	453	929	23	8	189	60
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	23	93	133	41	301	55	408	974	23	8	189	60
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			5.0			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		6	6		2	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	6	6	6	2	2	2
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	22.0	22.0	22.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.1	29.1	11.0	29.1	29.1	32.3	32.3	32.3	32.3	32.3	32.3
Total Split (s)	14.0	29.1	29.1	14.0	29.1	29.1	59.3	59.3	59.3	32.3	32.3	32.3
Total Split (%)	10.4%	21.6%	21.6%	10.4%	21.6%	21.6%	44.0%	44.0%	44.0%	24.0%	24.0%	24.0%
Maximum Green (s)	8.0	23.0	23.0	8.0	23.0	23.0	53.0	53.0	53.0	26.0	26.0	26.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.4	2.3	2.4	2.4	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.1	6.1	6.0	6.1	6.1	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		16.0	16.0		16.0	16.0	19.0	19.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)		1	1		7	7	1	1	1	1	1	1
Act Effct Green (s)	18.1	14.3	14.3	19.7	17.1	17.1	40.4	40.4	40.4	14.0	14.0	14.0
Actuated g/C Ratio	0.19	0.15	0.15	0.21	0.18	0.18	0.42	0.42	0.42	0.15	0.15	0.15
v/c Ratio	0.10	0.19	0.41	0.17	0.51	0.16	0.64	0.74	0.03	0.03	0.40	0.19
Control Delay	33.5	42.8	12.1	34.3	42.5	0.9	29.9	29.2	0.1	43.6	43.8	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	42.8	12.1	34.3	42.5	0.9	29.9	29.2	0.1	43.6	43.8	1.3
LOS	C	D	B	C	D	A	C	C	A	D	D	A
Approach Delay		25.5			35.9			28.9			33.8	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	3.0	7.8	0.0	5.4	22.5	0.0	57.2	72.5	0.0	1.2	16.0	0.0
Queue Length 95th (m)	10.7	17.9	16.3	16.3	49.7	0.0	129.2	140.6	0.0	5.9	31.5	0.0
Internal Link Dist (m)		58.1			120.1			314.4			211.5	
Turn Bay Length (m)				70.0			160.0		55.0	105.0		60.0
Base Capacity (vph)	251	859	470	244	862	456	900	1857	910	490	961	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.11	0.28	0.17	0.35	0.12	0.45	0.52	0.03	0.02	0.20	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 134.7			
Actuated Cycle Length: 95.9			
Natural Cycle: 115			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 30.3		Intersection LOS: C	
Intersection Capacity Utilization 71.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Tenth Line & St. Joseph



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	100	368	17	11	50
Future Volume (vph)	21	100	368	17	11	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.993		0.889	
Flt Protected	0.950				0.991	
Satd. Flow (prot)	1674	3316	4689	0	1553	0
Flt Permitted	0.950				0.991	
Satd. Flow (perm)	1674	3316	4689	0	1553	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		144.1	123.1		184.3	
Travel Time (s)		8.6	7.4		13.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	3%	1%	1%	1%
Adj. Flow (vph)	21	100	368	17	11	50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	100	385	0	61	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.5	5.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	10.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

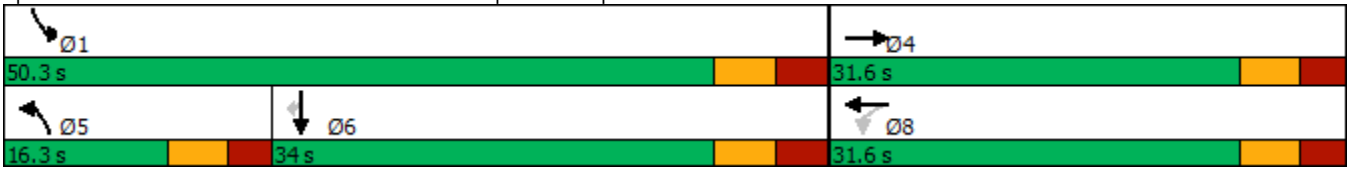
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.0%		ICU Level of Service A	
Analysis Period (min) 15			

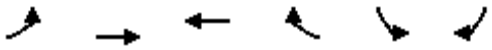
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	96	0	34	324	0	0	0	110	53	311	55
Future Volume (vph)	0	96	0	34	324	0	0	0	110	53	311	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		15.0	110.0		130.0
Storage Lanes	0		0	1		0	1		1	2		1
Taper Length (m)	10.0			35.0			10.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Ped Bike Factor												0.99
Frt									0.850			0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3221	0	1642	3316	0	1762	0	1483	2982	3316	1210
Flt Permitted				0.692						0.950		
Satd. Flow (perm)	0	3221	0	1196	3316	0	1762	0	1483	2982	3316	1195
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									868			132
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		123.1			246.7			275.2			235.3	
Travel Time (s)		7.4			14.8			16.5			14.1	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	5%	1%	3%	2%	1%	1%	1%	2%	10%	2%	25%
Adj. Flow (vph)	0	96	0	34	324	0	0	0	110	53	311	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	96	0	34	324	0	0	0	110	53	311	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	Left	Left	R NA	Left	Left	Right
Median Width(m)		5.0			4.5			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors		2		1	2		1		1	1	2	1
Detector Template		Thru		Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (m)		30.5		6.1	30.5		6.1		6.1	6.1	30.5	6.1
Trailing Detector (m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)		1.8		6.1	1.8		6.1		6.1	6.1	1.8	6.1
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7						28.7	
Detector 2 Size(m)		1.8			1.8						1.8	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Perm
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			6
Detector Phase		4		8	8		5			1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		10.0		10.0	10.0		5.0			5.0	15.0	15.0
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	30.0
Total Split (s)		31.6		31.6	31.6		16.3			50.3	34.0	34.0
Total Split (%)		38.6%		38.6%	38.6%		19.9%			61.4%	41.5%	41.5%
Maximum Green (s)		25.0		25.0	25.0		10.0			43.3	27.0	27.0
Yellow Time (s)		3.7		3.7	3.7		3.7			3.7	3.7	3.7
All-Red Time (s)		2.9		2.9	2.9		2.6			3.3	3.3	3.3
Lost Time Adjust (s)		0.0		0.0	0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)		6.6		6.6	6.6		6.3			7.0	7.0	7.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0		3.0			3.0	3.0	3.0
Recall Mode		None		None	None		None			Min	Min	Min
Walk Time (s)		7.0		7.0	7.0						7.0	7.0
Flash Dont Walk (s)		12.0		12.0	12.0						16.0	16.0
Pedestrian Calls (#/hr)		1		0	0						1	1
Act Effct Green (s)		11.6		11.6	11.6				42.0	16.5	16.5	16.5
Actuated g/C Ratio		0.28		0.28	0.28				1.00	0.39	0.39	0.39
v/c Ratio		0.11		0.10	0.35				0.07	0.05	0.24	0.10
Control Delay		12.0		12.6	13.6				0.1	8.6	9.4	0.4
Queue Delay		0.0		0.0	0.0				0.0	0.0	0.0	0.0
Total Delay		12.0		12.6	13.6				0.1	8.6	9.4	0.4
LOS		B		B	B				A	A	A	A
Approach Delay		12.0			13.5			0.1			8.1	
Approach LOS		B			B			A			A	
Queue Length 50th (m)		2.2		1.6	8.3				0.0	0.9	6.2	0.0
Queue Length 95th (m)		6.7		6.5	18.6				0.0	3.7	15.6	0.3
Internal Link Dist (m)		99.1			222.7			251.2			211.3	
Turn Bay Length (m)				60.0					15.0	110.0		130.0
Base Capacity (vph)		1958		727	2016				1483	2850	2177	830
Starvation Cap Reductn		0		0	0				0	0	0	0
Spillback Cap Reductn		0		0	0				0	0	0	0
Storage Cap Reductn		0		0	0				0	0	0	0
Reduced v/c Ratio		0.05		0.05	0.16				0.07	0.02	0.14	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 81.9			
Actuated Cycle Length: 42			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.35			
Intersection Signal Delay: 9.6		Intersection LOS: A	
Intersection Capacity Utilization 33.7%		ICU Level of Service A	
Analysis Period (min) 15			

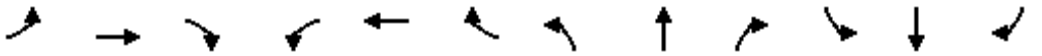
Splits and Phases: 4: Old Tenth Line/OR 174 EB Ramp & St. Joseph





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	9	963	612	14	8	5
Future Volume (vph)	9	963	612	14	8	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.997		0.948	
Flt Protected	0.950				0.970	
Satd. Flow (prot)	1674	3349	3338	0	1621	0
Flt Permitted	0.950				0.970	
Satd. Flow (perm)	1674	3349	3338	0	1621	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		410.1	145.9		128.9	
Travel Time (s)		24.6	8.8		9.3	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	9	963	612	14	8	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	963	626	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.0	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.1%		ICU Level of Service A	
Analysis Period (min) 15			

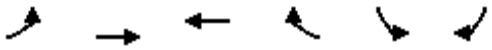


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	335	574	68	230	166	349	741	18	9	218	48
Future Volume (vph)	62	335	574	68	230	166	349	741	18	9	218	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		0.0	160.0		55.0	105.0		60.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	30.0			25.0			25.0			35.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.91	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.99	1.00		0.97			0.98	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.998		0.950		
Satd. Flow (prot)	1674	3316	1455	1470	3316	1441	1509	3111	1441	1674	3283	1483
Flt Permitted	0.608			0.470			0.950	0.998		0.950		
Satd. Flow (perm)	1058	3316	1435	727	3316	1399	1509	3111	1417	1672	3283	1483
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			574			166			125			125
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		82.1			144.1			338.4			235.5	
Travel Time (s)		4.9			8.6			20.3			14.1	
Confl. Peds. (#/hr)	10		1	1		10			3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	4%	15%	2%	5%	2%	4%	5%	1%	3%	2%
Adj. Flow (vph)	62	335	574	68	230	166	349	741	18	9	218	48
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	62	335	574	68	230	166	314	776	18	9	218	48
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			5.0			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		6	6		2	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	6	6	6	2	2	2
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	22.0	22.0	22.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.1	29.1	11.0	29.1	29.1	32.3	32.3	32.3	32.3	32.3	32.3
Total Split (s)	14.0	29.1	29.1	14.0	29.1	29.1	59.3	59.3	59.3	32.3	32.3	32.3
Total Split (%)	10.4%	21.6%	21.6%	10.4%	21.6%	21.6%	44.0%	44.0%	44.0%	24.0%	24.0%	24.0%
Maximum Green (s)	8.0	23.0	23.0	8.0	23.0	23.0	53.0	53.0	53.0	26.0	26.0	26.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.4	2.3	2.4	2.4	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.1	6.1	6.0	6.1	6.1	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		16.0	16.0		16.0	16.0	19.0	19.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)		1	1		9	9	1	1	1	1	1	1
Act Effct Green (s)	23.5	17.6	17.6	23.6	17.6	17.6	34.1	34.1	34.1	14.3	14.3	14.3
Actuated g/C Ratio	0.24	0.18	0.18	0.25	0.18	0.18	0.35	0.35	0.35	0.15	0.15	0.15
v/c Ratio	0.20	0.55	0.79	0.29	0.38	0.42	0.59	0.70	0.03	0.04	0.45	0.15
Control Delay	30.0	42.7	12.5	32.0	40.0	10.5	32.5	32.0	0.1	42.0	43.9	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	42.7	12.5	32.0	40.0	10.5	32.5	32.0	0.1	42.0	43.9	1.0
LOS	C	D	B	C	D	B	C	C	A	D	D	A
Approach Delay		24.0			28.2			31.6			36.4	
Approach LOS		C			C			C			D	
Queue Length 50th (m)	7.2	27.2	0.0	8.0	18.1	0.0	48.2	62.9	0.0	1.4	18.5	0.0
Queue Length 95th (m)	21.8	54.3	37.1	23.8	38.1	17.8	93.8	104.6	0.0	6.4	35.3	0.0
Internal Link Dist (m)		58.1			120.1			314.4			211.5	
Turn Bay Length (m)				70.0			160.0		55.0	105.0		60.0
Base Capacity (vph)	315	846	793	245	846	480	887	1829	884	482	946	516
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.40	0.72	0.28	0.27	0.35	0.35	0.42	0.02	0.02	0.23	0.09

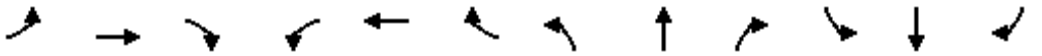
Intersection Summary			
Area Type:	Other		
Cycle Length: 134.7			
Actuated Cycle Length: 96.3			
Natural Cycle: 105			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 28.9		Intersection LOS: C	
Intersection Capacity Utilization 66.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Tenth Line & St. Joseph



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	28	332	442	28	12	31
Future Volume (vph)	28	332	442	28	12	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.991		0.903	
Flt Protected	0.950				0.986	
Satd. Flow (prot)	1674	3349	4681	0	1569	0
Flt Permitted	0.950				0.986	
Satd. Flow (perm)	1674	3349	4681	0	1569	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		144.1	123.1		184.3	
Travel Time (s)		8.6	7.4		13.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	3%	1%	1%	1%
Adj. Flow (vph)	28	332	442	28	12	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	332	470	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.5	5.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	10.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.9%		ICU Level of Service A	
Analysis Period (min) 15			

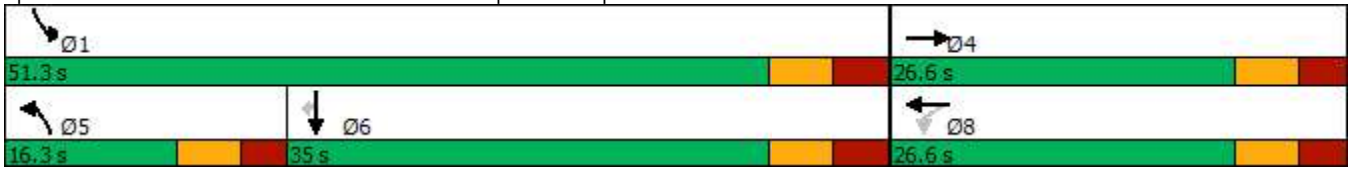


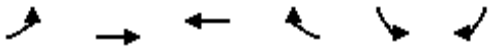
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	365	3	105	324	0	4	0	89	60	936	148
Future Volume (vph)	0	365	3	105	324	0	4	0	89	60	936	148
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		15.0	110.0		130.0
Storage Lanes	0		0	1		0	1		1	2		1
Taper Length (m)	10.0			35.0			10.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Ped Bike Factor							1.00					0.99
Frt		0.999							0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3313	0	1674	3316	0	1353	0	1498	3248	3349	1401
Flt Permitted				0.533			0.950			0.950		
Satd. Flow (perm)	0	3313	0	939	3316	0	1352	0	1498	3248	3349	1383
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1							237			148
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		123.1			246.7			275.2			235.3	
Travel Time (s)		7.4			14.8			16.5			14.1	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	25%	1%	1%	1%	1%	8%
Adj. Flow (vph)	0	365	3	105	324	0	4	0	89	60	936	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	368	0	105	324	0	4	0	89	60	936	148
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	Left	Left	R NA	Left	Left	Right
Median Width(m)		5.0			4.5			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors		2		1	2		1		1	1	2	1
Detector Template		Thru		Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (m)		30.5		6.1	30.5		6.1		6.1	6.1	30.5	6.1
Trailing Detector (m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)		1.8		6.1	1.8		6.1		6.1	6.1	1.8	6.1
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7						28.7	
Detector 2 Size(m)		1.8			1.8						1.8	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Perm
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			6
Detector Phase		4		8	8		5			1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		10.0		10.0	10.0		5.0			5.0	15.0	15.0
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	30.0
Total Split (s)		26.6		26.6	26.6		16.3			51.3	35.0	35.0
Total Split (%)		34.1%		34.1%	34.1%		20.9%			65.9%	44.9%	44.9%
Maximum Green (s)		20.0		20.0	20.0		10.0			44.3	28.0	28.0
Yellow Time (s)		3.7		3.7	3.7		3.7			3.7	3.7	3.7
All-Red Time (s)		2.9		2.9	2.9		2.6			3.3	3.3	3.3
Lost Time Adjust (s)		0.0		0.0	0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)		6.6		6.6	6.6		6.3			7.0	7.0	7.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0		3.0			3.0	3.0	3.0
Recall Mode		None		None	None		None			Min	Min	Min
Walk Time (s)		7.0		7.0	7.0						7.0	7.0
Flash Dont Walk (s)		12.0		12.0	12.0						16.0	16.0
Pedestrian Calls (#/hr)		1		0	0						1	1
Act Effct Green (s)		13.0		13.0	13.0		6.1		50.9	23.5	21.7	21.7
Actuated g/C Ratio		0.26		0.26	0.26		0.12		1.00	0.46	0.43	0.43
v/c Ratio		0.43		0.44	0.38		0.02		0.06	0.04	0.66	0.22
Control Delay		19.1		25.1	18.6		27.2		0.1	7.5	15.3	3.8
Queue Delay		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		19.1		25.1	18.6		27.2		0.1	7.5	15.3	3.8
LOS		B		C	B		C		A	A	B	A
Approach Delay		19.1			20.2			1.2			13.4	
Approach LOS		B			C			A			B	
Queue Length 50th (m)		12.0		6.6	10.4		0.3		0.0	1.1	24.8	0.0
Queue Length 95th (m)		31.1		24.0	27.6		2.9		0.0	3.8	73.3	9.4
Internal Link Dist (m)		99.1			222.7			251.2			211.3	
Turn Bay Length (m)				60.0					15.0	110.0		130.0
Base Capacity (vph)		1377		390	1378		281		1498	2843	1948	866
Starvation Cap Reductn		0		0	0		0		0	0	0	0
Spillback Cap Reductn		0		0	0		0		0	0	0	0
Storage Cap Reductn		0		0	0		0		0	0	0	0
Reduced v/c Ratio		0.27		0.27	0.24		0.01		0.06	0.02	0.48	0.17

Intersection Summary			
Area Type:	Other		
Cycle Length: 77.9			
Actuated Cycle Length: 50.9			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 15.3		Intersection LOS: B	
Intersection Capacity Utilization 63.2%		ICU Level of Service B	
Analysis Period (min) 15			

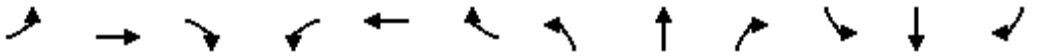
Splits and Phases: 4: Old Tenth Line/OR 174 EB Ramp & St. Joseph





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	263	922	4	16	8
Future Volume (vph)	2	263	922	4	16	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.999		0.955	
Flt Protected	0.950				0.968	
Satd. Flow (prot)	1674	3316	3313	0	1629	0
Flt Permitted	0.950				0.968	
Satd. Flow (perm)	1674	3316	3313	0	1629	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		410.1	145.9		128.9	
Travel Time (s)		24.6	8.8		9.3	
Confl. Peds. (#/hr)	8			8		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	1%
Adj. Flow (vph)	2	263	922	4	16	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	263	926	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.0	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.0%		ICU Level of Service A	
Analysis Period (min) 15			

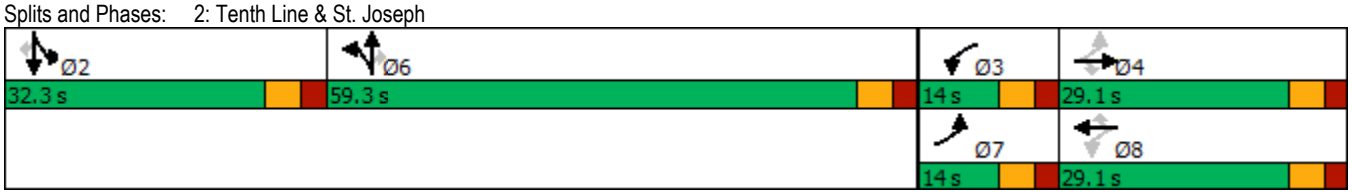


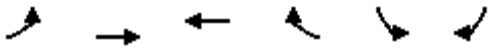
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	104	151	47	342	61	516	1106	26	9	253	68
Future Volume (vph)	26	104	151	47	342	61	516	1106	26	9	253	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		0.0	160.0		55.0	105.0		60.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	30.0			25.0			25.0			35.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.91	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.99	1.00		0.97						
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.998		0.950		
Satd. Flow (prot)	1674	3316	1455	1470	3316	1441	1509	3111	1441	1674	3283	1483
Flt Permitted	0.468			0.621			0.950	0.998		0.950		
Satd. Flow (perm)	817	3316	1435	960	3316	1399	1509	3111	1441	1674	3283	1483
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			151			126			125			125
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		82.1			144.1			338.4			235.5	
Travel Time (s)		4.9			8.6			20.3			14.1	
Confl. Peds. (#/hr)	10		1	1		10						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	4%	15%	2%	5%	2%	4%	5%	1%	3%	2%
Adj. Flow (vph)	26	104	151	47	342	61	516	1106	26	9	253	68
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	26	104	151	47	342	61	464	1158	26	9	253	68
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			5.0			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		6	6		2	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	6	6	6	2	2	2
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	22.0	22.0	22.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.1	29.1	11.0	29.1	29.1	32.3	32.3	32.3	32.3	32.3	32.3
Total Split (s)	14.0	29.1	29.1	14.0	29.1	29.1	59.3	59.3	59.3	32.3	32.3	32.3
Total Split (%)	10.4%	21.6%	21.6%	10.4%	21.6%	21.6%	44.0%	44.0%	44.0%	24.0%	24.0%	24.0%
Maximum Green (s)	8.0	23.0	23.0	8.0	23.0	23.0	53.0	53.0	53.0	26.0	26.0	26.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.4	2.3	2.4	2.4	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.1	6.1	6.0	6.1	6.1	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		16.0	16.0		16.0	16.0	19.0	19.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)		1	1		7	7	1	1	1	1	1	1
Act Effct Green (s)	21.2	15.7	15.7	23.1	18.8	18.8	48.9	48.9	48.9	15.4	15.4	15.4
Actuated g/C Ratio	0.19	0.14	0.14	0.21	0.17	0.17	0.45	0.45	0.45	0.14	0.14	0.14
v/c Ratio	0.12	0.22	0.45	0.20	0.60	0.18	0.69	0.84	0.04	0.04	0.55	0.22
Control Delay	35.5	46.3	12.0	36.7	49.7	1.1	33.6	35.3	0.1	45.3	50.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	46.3	12.0	36.7	49.7	1.1	33.6	35.3	0.1	45.3	50.9	1.6
LOS	D	D	B	D	D	A	C	D	A	D	D	A
Approach Delay		26.9			41.8			34.3			40.6	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	4.1	10.3	0.0	7.6	36.2	0.0	81.6	112.4	0.0	1.7	26.8	0.0
Queue Length 95th (m)	11.5	19.6	17.3	18.1	56.1	0.0	153.2	#192.7	0.0	6.5	41.0	0.0
Internal Link Dist (m)		58.1			120.1			314.4			211.5	
Turn Bay Length (m)				70.0			160.0		55.0	105.0		60.0
Base Capacity (vph)	227	724	431	240	724	403	759	1565	787	413	810	460
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.14	0.35	0.20	0.47	0.15	0.61	0.74	0.03	0.02	0.31	0.15

Intersection Summary			
Area Type:	Other		
Cycle Length: 134.7			
Actuated Cycle Length: 109.8			
Natural Cycle: 125			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 35.5		Intersection LOS: D	
Intersection Capacity Utilization 77.9%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

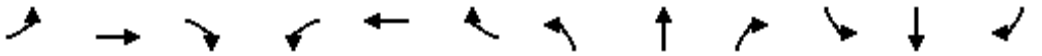
Splits and Phases: 2: Tenth Line & St. Joseph





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	113	418	17	11	50
Future Volume (vph)	21	113	418	17	11	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.994		0.889	
Flt Protected	0.950				0.991	
Satd. Flow (prot)	1674	3316	4693	0	1553	0
Flt Permitted	0.950				0.991	
Satd. Flow (perm)	1674	3316	4693	0	1553	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		144.1	123.1		184.3	
Travel Time (s)		8.6	7.4		13.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	3%	1%	1%	1%
Adj. Flow (vph)	21	113	418	17	11	50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	113	435	0	61	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.5	5.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	10.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.9%		ICU Level of Service A	
Analysis Period (min) 15			

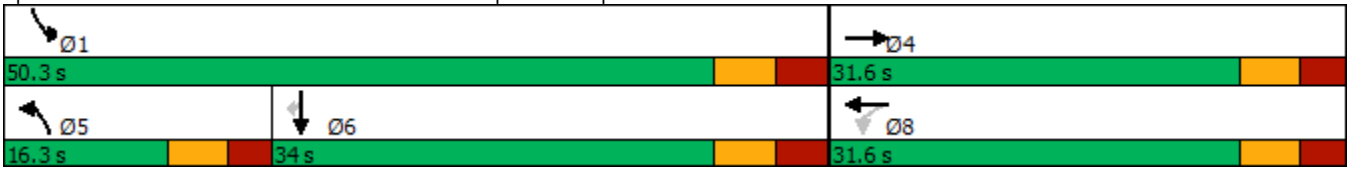


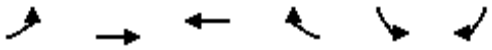
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	107	0	38	367	0	0	0	125	61	353	62
Future Volume (vph)	0	107	0	38	367	0	0	0	125	61	353	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		15.0	110.0		130.0
Storage Lanes	0		0	1		0	1		1	2		1
Taper Length (m)	10.0			35.0			10.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Ped Bike Factor												0.99
Frt									0.850			0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3221	0	1642	3316	0	1762	0	1483	2982	3316	1210
Flt Permitted				0.684						0.950		
Satd. Flow (perm)	0	3221	0	1182	3316	0	1762	0	1483	2982	3316	1195
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									844			132
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		123.1			246.7			275.2			235.3	
Travel Time (s)		7.4			14.8			16.5			14.1	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	5%	1%	3%	2%	1%	1%	1%	2%	10%	2%	25%
Adj. Flow (vph)	0	107	0	38	367	0	0	0	125	61	353	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	107	0	38	367	0	0	0	125	61	353	62
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	Left	Left	R NA	Left	Left	Right
Median Width(m)		5.0			4.5			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors		2		1	2		1		1	1	2	1
Detector Template		Thru		Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (m)		30.5		6.1	30.5		6.1		6.1	6.1	30.5	6.1
Trailing Detector (m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)		1.8		6.1	1.8		6.1		6.1	6.1	1.8	6.1
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7						28.7	
Detector 2 Size(m)		1.8			1.8						1.8	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Perm
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			6
Detector Phase		4		8	8		5			1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		10.0		10.0	10.0		5.0			5.0	15.0	15.0
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	30.0
Total Split (s)		31.6		31.6	31.6		16.3			50.3	34.0	34.0
Total Split (%)		38.6%		38.6%	38.6%		19.9%			61.4%	41.5%	41.5%
Maximum Green (s)		25.0		25.0	25.0		10.0			43.3	27.0	27.0
Yellow Time (s)		3.7		3.7	3.7		3.7			3.7	3.7	3.7
All-Red Time (s)		2.9		2.9	2.9		2.6			3.3	3.3	3.3
Lost Time Adjust (s)		0.0		0.0	0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)		6.6		6.6	6.6		6.3			7.0	7.0	7.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0		3.0			3.0	3.0	3.0
Recall Mode		None		None	None		None			Min	Min	Min
Walk Time (s)		7.0		7.0	7.0						7.0	7.0
Flash Dont Walk (s)		12.0		12.0	12.0						16.0	16.0
Pedestrian Calls (#/hr)		1		0	0						1	1
Act Effct Green (s)		11.6		11.6	11.6				42.0	16.5	16.5	16.5
Actuated g/C Ratio		0.28		0.28	0.28				1.00	0.39	0.39	0.39
v/c Ratio		0.12		0.12	0.40				0.08	0.05	0.27	0.11
Control Delay		12.0		12.8	14.0				0.1	8.6	9.6	0.7
Queue Delay		0.0		0.0	0.0				0.0	0.0	0.0	0.0
Total Delay		12.0		12.8	14.0				0.1	8.6	9.6	0.7
LOS		B		B	B				A	A	A	A
Approach Delay		12.0			13.9			0.1			8.4	
Approach LOS		B			B			A			A	
Queue Length 50th (m)		2.5		1.7	9.5				0.0	1.0	7.1	0.0
Queue Length 95th (m)		7.4		7.1	21.1				0.0	4.1	17.6	0.9
Internal Link Dist (m)		99.1			222.7			251.2			211.3	
Turn Bay Length (m)				60.0					15.0	110.0		130.0
Base Capacity (vph)		1957		718	2015				1483	2850	2176	829
Starvation Cap Reductn		0		0	0				0	0	0	0
Spillback Cap Reductn		0		0	0				0	0	0	0
Storage Cap Reductn		0		0	0				0	0	0	0
Reduced v/c Ratio		0.05		0.05	0.18				0.08	0.02	0.16	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 81.9			
Actuated Cycle Length: 42			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.40			
Intersection Signal Delay: 9.8		Intersection LOS: A	
Intersection Capacity Utilization 34.9%		ICU Level of Service A	
Analysis Period (min) 15			

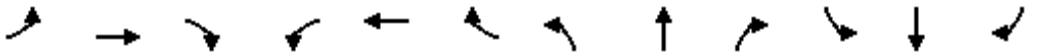
Splits and Phases: 4: Old Tenth Line/OR 174 EB Ramp & St. Joseph





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	9	1094	695	14	8	5
Future Volume (vph)	9	1094	695	14	8	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.997		0.948	
Flt Protected	0.950				0.970	
Satd. Flow (prot)	1674	3349	3338	0	1621	0
Flt Permitted	0.950				0.970	
Satd. Flow (perm)	1674	3349	3338	0	1621	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		410.1	145.9		128.9	
Travel Time (s)		24.6	8.8		9.3	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	9	1094	695	14	8	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	1094	709	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.0	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.9%		ICU Level of Service A	
Analysis Period (min) 15			

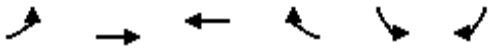


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	380	653	77	260	189	397	884	20	10	303	54
Future Volume (vph)	70	380	653	77	260	189	397	884	20	10	303	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		0.0	160.0		55.0	105.0		60.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	30.0			25.0			25.0			35.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.91	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.99	1.00		0.97			0.98	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.998		0.950		
Satd. Flow (prot)	1674	3316	1455	1470	3316	1441	1509	3111	1441	1674	3283	1483
Flt Permitted	0.560			0.395			0.950	0.998		0.950		
Satd. Flow (perm)	976	3316	1435	611	3316	1399	1509	3111	1417	1672	3283	1483
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			653			189			125			125
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		82.1			144.1			338.4			235.5	
Travel Time (s)		4.9			8.6			20.3			14.1	
Confl. Peds. (#/hr)	10		1	1		10			3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	4%	15%	2%	5%	2%	4%	5%	1%	3%	2%
Adj. Flow (vph)	70	380	653	77	260	189	397	884	20	10	303	54
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	70	380	653	77	260	189	357	924	20	10	303	54
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			5.0			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		6	6		2	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	6	6	6	2	2	2
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	22.0	22.0	22.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.1	29.1	11.0	29.1	29.1	32.3	32.3	32.3	32.3	32.3	32.3
Total Split (s)	14.0	29.1	29.1	14.0	29.1	29.1	59.3	59.3	59.3	32.3	32.3	32.3
Total Split (%)	10.4%	21.6%	21.6%	10.4%	21.6%	21.6%	44.0%	44.0%	44.0%	24.0%	24.0%	24.0%
Maximum Green (s)	8.0	23.0	23.0	8.0	23.0	23.0	53.0	53.0	53.0	26.0	26.0	26.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.4	2.3	2.4	2.4	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.1	6.1	6.0	6.1	6.1	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		16.0	16.0		16.0	16.0	19.0	19.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)		1	1		9	9	1	1	1	1	1	1
Act Effct Green (s)	26.1	20.1	20.1	26.2	20.2	20.2	41.0	41.0	41.0	16.7	16.7	16.7
Actuated g/C Ratio	0.24	0.19	0.19	0.24	0.19	0.19	0.38	0.38	0.38	0.15	0.15	0.15
v/c Ratio	0.24	0.62	0.82	0.37	0.42	0.46	0.62	0.78	0.03	0.04	0.60	0.16
Control Delay	34.7	48.5	13.2	38.5	44.8	10.5	34.5	36.1	0.1	44.8	50.7	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	48.5	13.2	38.5	44.8	10.5	34.5	36.1	0.1	44.8	50.7	1.0
LOS	C	D	B	D	D	B	C	D	A	D	D	A
Approach Delay		26.7			31.5			35.1			43.2	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	10.2	37.6	0.0	11.4	24.8	0.0	65.0	91.4	0.0	1.8	31.4	0.0
Queue Length 95th (m)	24.5	62.3	42.2	26.9	43.2	19.3	109.1	131.0	0.0	6.7	48.7	0.0
Internal Link Dist (m)		58.1			120.1			314.4			211.5	
Turn Bay Length (m)				70.0			160.0		55.0	105.0		60.0
Base Capacity (vph)	291	752	830	215	752	463	789	1627	800	429	842	473
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.51	0.79	0.36	0.35	0.41	0.45	0.57	0.03	0.02	0.36	0.11

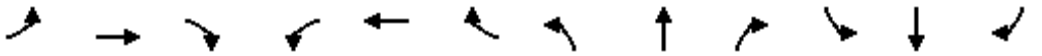
Intersection Summary			
Area Type:	Other		
Cycle Length: 134.7			
Actuated Cycle Length: 108.1			
Natural Cycle: 105			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 32.6		Intersection LOS: C	
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Tenth Line & St. Joseph



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	28	376	502	28	12	31
Future Volume (vph)	28	376	502	28	12	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.992		0.903	
Flt Protected	0.950				0.986	
Satd. Flow (prot)	1674	3349	4685	0	1569	0
Flt Permitted	0.950				0.986	
Satd. Flow (perm)	1674	3349	4685	0	1569	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		144.1	123.1		184.3	
Travel Time (s)		8.6	7.4		13.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	3%	1%	1%	1%
Adj. Flow (vph)	28	376	502	28	12	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	376	530	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.5	5.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	10.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.0%		ICU Level of Service A	
Analysis Period (min) 15			

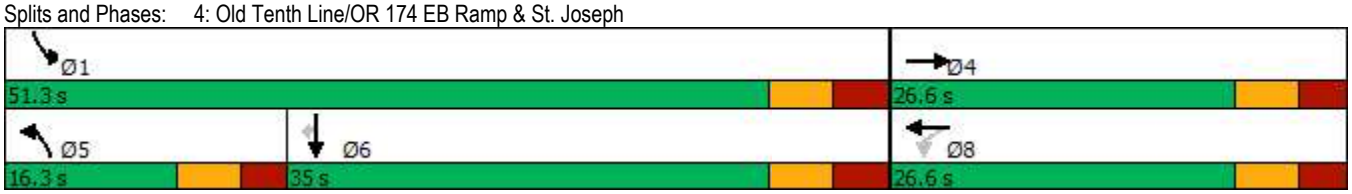


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	414	4	119	365	0	5	0	102	68	1065	169
Future Volume (vph)	0	414	4	119	365	0	5	0	102	68	1065	169
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		15.0	110.0		130.0
Storage Lanes	0		0	1		0	1		1	2		1
Taper Length (m)	10.0			35.0			10.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Ped Bike Factor							1.00					0.99
Frt		0.999							0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3313	0	1674	3316	0	1353	0	1498	3248	3349	1401
Flt Permitted				0.507			0.950			0.950		
Satd. Flow (perm)	0	3313	0	894	3316	0	1352	0	1498	3248	3349	1383
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1							237			169
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		123.1			246.7			275.2			235.3	
Travel Time (s)		7.4			14.8			16.5			14.1	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	25%	1%	1%	1%	1%	8%
Adj. Flow (vph)	0	414	4	119	365	0	5	0	102	68	1065	169
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	418	0	119	365	0	5	0	102	68	1065	169
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	Left	Left	R NA	Left	Left	Right
Median Width(m)		5.0			4.5			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors		2		1	2		1		1	1	2	1
Detector Template		Thru		Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (m)		30.5		6.1	30.5		6.1		6.1	6.1	30.5	6.1
Trailing Detector (m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)		1.8		6.1	1.8		6.1		6.1	6.1	1.8	6.1
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7						28.7	
Detector 2 Size(m)		1.8			1.8						1.8	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Perm
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			6
Detector Phase		4		8	8		5			1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		10.0		10.0	10.0		5.0			5.0	15.0	15.0
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	30.0
Total Split (s)		26.6		26.6	26.6		16.3			51.3	35.0	35.0
Total Split (%)		34.1%		34.1%	34.1%		20.9%			65.9%	44.9%	44.9%
Maximum Green (s)		20.0		20.0	20.0		10.0			44.3	28.0	28.0
Yellow Time (s)		3.7		3.7	3.7		3.7			3.7	3.7	3.7
All-Red Time (s)		2.9		2.9	2.9		2.6			3.3	3.3	3.3
Lost Time Adjust (s)		0.0		0.0	0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)		6.6		6.6	6.6		6.3			7.0	7.0	7.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0		3.0			3.0	3.0	3.0
Recall Mode		None		None	None		None			Min	Min	Min
Walk Time (s)		7.0		7.0	7.0						7.0	7.0
Flash Dont Walk (s)		12.0		12.0	12.0						16.0	16.0
Pedestrian Calls (#/hr)		1		0	0						1	1
Act Effct Green (s)		13.9		13.9	13.9		6.1		54.8	26.6	24.7	24.7
Actuated g/C Ratio		0.25		0.25	0.25		0.11		1.00	0.49	0.45	0.45
v/c Ratio		0.50		0.52	0.43		0.03		0.07	0.04	0.71	0.24
Control Delay		20.8		29.2	20.1		28.4		0.1	7.6	17.0	3.7
Queue Delay		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		20.8		29.2	20.1		28.4		0.1	7.6	17.0	3.7
LOS		C		C	C		C		A	A	B	A
Approach Delay		20.8			22.4			1.4			14.8	
Approach LOS		C			C			A			B	
Queue Length 50th (m)		17.1		9.4	14.7		0.4		0.0	1.4	32.7	0.0
Queue Length 95th (m)		35.4		27.6	31.0		3.5		0.0	4.2	#96.2	10.1
Internal Link Dist (m)		99.1			222.7			251.2			211.3	
Turn Bay Length (m)				60.0					15.0	110.0		130.0
Base Capacity (vph)		1264		341	1265		258		1498	2680	1788	817
Starvation Cap Reductn		0		0	0		0		0	0	0	0
Spillback Cap Reductn		0		0	0		0		0	0	0	0
Storage Cap Reductn		0		0	0		0		0	0	0	0
Reduced v/c Ratio		0.33		0.35	0.29		0.02		0.07	0.03	0.60	0.21

Intersection Summary			
Area Type:	Other		
Cycle Length: 77.9			
Actuated Cycle Length: 54.8			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 68.5%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Old Tenth Line/OR 174 EB Ramp & St. Joseph



APPENDIX L

Transportation Demand Management Checklists

TRANSPORTATION DEMAND MANAGEMENT

TDM-Supportive Development Design and Infrastructure Checklist

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)*	☐ - N/A
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)	☐

TRANSPORTATION DEMAND MANAGEMENT

TDM Measures Checklist

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 M

MMLOS Analysis

Segment MMLOS Analysis

This section provides a review of the boundary streets St. Joseph Boulevard and Tenth Line Road, 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, based on the targets for the 'Mixed Use Centre' designation.

Exhibit 4 of the MMLOS Guidelines has been used to evaluate the segment pedestrian level of service (PLOS) of the boundary streets. Exhibit 22 of the MMLOS Guidelines suggest a target PLOS C for all roadways within Mixed Use Centres. The results of the segment PLOS analysis are summarized in **Table 1**.

Exhibit 11 of the MMLOS Guidelines has been used to evaluate the segment bicycle level of service (BLOS) of the boundary streets. Within Mixed Use Centres, Exhibit 22 of the MMLOS Guidelines suggest a target BLOS A for Crosstown Bikeways (St. Joseph Boulevard west of Tenth Line Road), a target BLOS C for arterial Spine Routes (Tenth Line Road north of St. Joseph Boulevard). The results of the segment BLOS analysis are summarized in **Table 2**.

Exhibit 15 of the MMLOS Guidelines has been used to evaluate the segment transit level of service (TLOS) of the boundary streets. While only Tenth Line Road has a target TLOS D (since it is identified as a Transit Priority Corridor with Isolated Measures), St. Joseph Boulevard has also been evaluated for TLOS, as there is currently transit service on both roadways. The results of the segment TLOS analysis are summarized in **Table 3**.

Exhibit 20 of the MMLOS Guidelines has been used to evaluate the segment truck level of service (TkLOS) of the boundary streets. Within Mixed Use Centres, Exhibit 22 of the MMLOS Guidelines suggest a target TkLOS D for arterial roadways with a truck route designation (St. Joseph Boulevard, Tenth Line Road). The results of the segment TkLOS analysis are summarized in **Table 4**.

Table 1: PLOS Segment Analysis

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed[1]	PLOS
St. Joseph Boulevard (Vieux-Silo Street to Tenth Line Road, north side)					
1.5m	0m	> 3,000 vpd	No	70 km/h	**F**
St. Joseph Boulevard (Vieux-Silo Street to Tenth Line Road, south side)					
1.5m	0m	> 3,000 vpd	No	70 km/h	**F**
Tenth Line Road (Ottawa Road 174 to St. Joseph Boulevard, east side)					
≥ 2.0m	0m	> 3,000 vpd	No	70 km/h	**F**
Tenth Line Road (Ottawa Road 174 to St. Joseph Boulevard, west side)					
≥ 2.0m	0m	≤ 3,000 vpd	No	70 km/h	**D**

1. Operating speed taken as the speed limit plus 10 km/h for St. Joseph Boulevard and Tenth Line Road

Table 2: BLOS Segment Analysis

Road Class	Type of Route	Type of Bikeway	Travel Lanes	Operating Speed	BLOS
St. Joseph Boulevard (Vieux-Silo Street to Tenth Line Road)					
Arterial	Crosstown Bikeway	Mixed Traffic	4	70 km/h	**F**
Tenth Line Road (Ottawa Road 174 to St. Joseph Boulevard)					
Arterial	Spine Route	Mixed Traffic	4	70 km/h	**F**

Table 3: TLOS Segment Analysis

Facility Type	Exposure to Congestion Delay, Friction, and Incidents			TLOS
	Congestion	Friction	Incident Potential	
St. Joseph Boulevard (Vieux-Silo Street to Tenth Line Road)				
Mixed Traffic – Limited Parking/Driveway Friction	Yes	Low	Medium	D
Tenth Line Road (Ottawa Road 174 to St. Joseph Boulevard)				
Mixed Traffic – Limited Parking/Driveway Friction	Yes	Low	Medium	D

Table 4: TkLOS Segment Analysis

Curb Lane Width	Number of Travel Lanes Per Direction	TkLOS
St. Joseph Boulevard (Vieux-Silo Street to Tenth Line Road)		
> 3.7m	2	A
Tenth Line Road (Ottawa Road 174 to St. Joseph Boulevard)		
> 3.7m	2	A

Intersection MMLOS Analysis

The following is a review of the MMLOS of the signalized intersections within the study area, using complete streets principles. St. Joseph Boulevard/Tenth Line Road has been evaluated using the MMLOS targets for intersections within a Mixed Use Centre, while St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp has been evaluated using the MMLOS targets for intersections within the General Urban Area, and are based on existing conditions.

Exhibit 5 of the Addendum to the MMLOS Guidelines has been used to evaluate the existing PLOS at the intersections listed above. Exhibit 22 of the MMLOS Guidelines identifies a target PLOS C for all roadways within the Mixed Use Centre and General Urban Area designations. The results of the intersection PLOS analysis are summarized in **Table 5** through **Table 6**.

Exhibit 12 of the MMLOS Guidelines has been used to evaluate the existing BLOS at the intersections listed above. Within the Mixed Use Centre, Exhibit 22 of the MMLOS Guidelines identifies a target BLOS A for Crosstown Bikeways (St. Joseph Boulevard west of Tenth Line Road, Tenth Line Road south of St. Joseph Boulevard) and a target BLOS C for arterial Spine Routes (St. Joseph Boulevard east of Tenth Line Road, Tenth Line Road north of St. Joseph Boulevard). Within the General Urban Area, Exhibit 22 suggests a target BLOS C for Spine Routes (St. Joseph Boulevard), and a target BLOS D for roadways with no cycling route designation (Old Tenth Line Road). The Ottawa Road 174 EB Off-Ramp has not been evaluated for BLOS, as it is a freeway exit. The results of the intersection BLOS analysis are summarized in **Table 7**.

Exhibit 16 of the MMLOS Guidelines has been used to evaluate the existing TLOS at the intersections listed above. Exhibit 22 of the MMLOS Guidelines identifies a target TLOS D for Transit Priority Corridors with Isolated Measures (Tenth Line Road), and does not identify a target TLOS for roadways without a Rapid Transit or Transit Priority designation (St. Joseph Boulevard, Old Tenth Line Road, Ottawa Road 174 EB Off-Ramp). The TLOS has been evaluated for every approach that is currently used by transit. The results of the intersection TLOS analysis are summarized in **Table 8**.

Exhibit 21 of the MMLOS Guidelines has been used to evaluate the existing TkLOS at the intersections listed above. Exhibit 22 of the MMLOS Guidelines identifies a target TkLOS D for arterial truck routes (St. Joseph Boulevard, Tenth Line Road, Ottawa Road 174 EB Off-Ramp), and a target TkLOS E for arterial roadways with no truck route designation (Old Tenth Line Road). The results of the intersection TkLOS analysis are summarized in **Table 9**.

Table 5: PLOS Intersection Analysis – St. Joseph Boulevard/Tenth Line Road

CRITERIA	North Approach		South Approach		East Approach		West Approach	
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		6.0		6.0		34.0		3.0
DELAY SCORE		**59.0**		**59.0**		**35.3**		**61.9**
LOS		**E**		**E**		**D**		**F**
OVERALL		**F**		**F**		**F**		**F**

Table 6: PLOS Intersection Analysis – St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp

CRITERIA	North Approach		South Approach		East Approach		West Approach	
PETSI SCORE								
CROSSING DISTANCE CONDITIONS								
Median > 2.4m in Width	No	6	No	23	N/A	0	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	0	Protected	0
Right Turn Conflict	Permissive or Yield	-5	Permissive or Yield	-5	N/A	0	Permissive or Yield	-5
Right Turn on Red	N/A	0	N/A	0	N/A	0	RTOR Allowed	-3
Leading Pedestrian Interval	No	-2	No	-2	N/A	0	No	-2
CORNER RADIUS								
Parallel Radius	No Right Turn	0	> 3m to 5m	-4	N/A	0	> 25m	-9
Parallel Right Turn Channel	No Right Turn	0	No Right Turn Channel	-4	N/A	0	Conventional with Receiving	-3
Perpendicular Radius	> 25m	-9	> 15m to 25m	-8	N/A	0	N/A	0
Perpendicular Right Turn Channel	Conventional with Receiving	-3	Smart Channel	2	N/A	0	N/A	0
CROSSING TREATMENT								
Treatment	Standard	-7	Standard	-7	N/A	0	Standard	-7
PETSI SCORE		**-20**		**-13**		**-**		**-39**
LOS		**F**		**F**		**-**		**F**
DELAY SCORE								
Cycle Length		77.9		77.9		0		81.9
Pedestrian Walk Time		8.0		8.0		0.0		11.0
DELAY SCORE		**31.4**		**31.4**		**-**		**30.7**
LOS		**D**		**D**		**-**		**D**
OVERALL		**F**		**F**		**-**		**F**

Table 7: BLOS Intersection Analysis

Approach	Facility Type	Criteria	Travel Lanes and/or Speed	BLOS
St. Joseph Boulevard/Tenth Line Road				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane < 50m; turning speed ≤ 25 km/h	**D**
		Left Turn Accommodation	Dual left turn lanes	**F**
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane < 50m; turning speed ≤ 25 km/h	**D**
		Left Turn Accommodation	Dual left turn lanes	**F**
East Approach	Pocket Bike Lane	Right Turn Lane Characteristics	Right turn lane > 50m and introduced to the right; turning speed ≤ 30 km/h	**D**
		Left Turn Accommodation	2 lanes crossed, ≥ 50 km/h	**F**
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane > 50m	**F**
		Left Turn Accommodation	2 lanes crossed, ≥ 50 km/h	**F**
St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp				
North Approach	Mixed Traffic	Right Turn Lane Characteristics	Approach is a freeway exit; cyclists prohibited	N/A
		Left Turn Accommodation		
South Approach	Mixed Traffic	Right Turn Lane Characteristics	Right turn lane < 50m; turning speed ≤ 25 km/h	**D**
		Left Turn Accommodation	0 lanes crossed, ≥ 60 km/h	**D**
East Approach	Mixed Traffic	Right Turn Lane Characteristics	No right turns	-
		Left Turn Accommodation	2 lanes crossed, ≥ 60 km/h	**F**
West Approach	Mixed Traffic	Right Turn Lane Characteristics	Shared through/right turn lane	A
		Left Turn Accommodation	No left turns	-

Table 8: TLOS Intersection Analysis

Approach	Delay[1]		TLOS
	AM Peak	PM Peak	
St. Joseph Boulevard/Tenth Line Road			
South Approach	29 sec	31 sec	**E**
East Approach	35 sec	27 sec	**E**
St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp			
North Approach	7 sec	13 sec	C

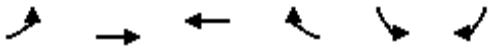
1. Delay based on outputs from Synchro analysis of existing conditions

Table 9: TkLOS Intersection Analysis

Approach	Effective Corner Radius	Number of Receiving Lanes Departing Intersection	TkLOS
St. Joseph Boulevard/Tenth Line Road			
North Approach	> 15m	2	A
South Approach	> 15m	2	A
East Approach	> 15m	3	A
West Approach	> 15m	3	A
St. Joseph Boulevard/Old Tenth Line Road/Ottawa Road 174 EB Off-Ramp			
North Approach	> 15m	3	A
South Approach	> 15m	2	A
East Approach	No right turns	-	N/A
West Approach	< 10m	2	D

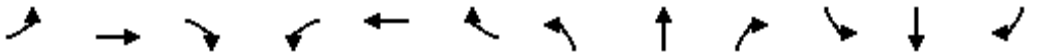
APPENDIX N

Total Synchro Analysis



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	232	823	4	26	11
Future Volume (vph)	5	232	823	4	26	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.999		0.960	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1674	3316	3313	0	1634	0
Flt Permitted	0.950				0.966	
Satd. Flow (perm)	1674	3316	3313	0	1634	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		410.1	145.9		128.9	
Travel Time (s)		24.6	8.8		9.3	
Confl. Peds. (#/hr)	8			8		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	1%
Adj. Flow (vph)	5	232	823	4	26	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	232	827	0	37	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.0	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.2%		ICU Level of Service A	
Analysis Period (min) 15			

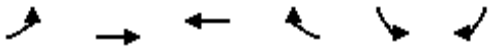


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	93	143	41	303	66	458	929	23	8	189	61
Future Volume (vph)	23	93	143	41	303	66	458	929	23	8	189	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		0.0	160.0		55.0	105.0		60.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	30.0			25.0			25.0			35.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.91	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.99	1.00		0.97						
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.998		0.950		
Satd. Flow (prot)	1674	3316	1455	1470	3316	1441	1509	3112	1441	1674	3283	1483
Flt Permitted	0.559			0.629			0.950	0.998		0.950		
Satd. Flow (perm)	975	3316	1435	972	3316	1399	1509	3112	1441	1674	3283	1483
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143			126			125			125
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		82.1			144.1			338.4			235.5	
Travel Time (s)		4.9			8.6			20.3			14.1	
Confl. Peds. (#/hr)	10		1	1		10						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	4%	15%	2%	5%	2%	4%	5%	1%	3%	2%
Adj. Flow (vph)	23	93	143	41	303	66	458	929	23	8	189	61
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	23	93	143	41	303	66	412	975	23	8	189	61
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			5.0			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		6	6		2	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	6	6	6	2	2	2
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	22.0	22.0	22.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.1	29.1	11.0	29.1	29.1	32.3	32.3	32.3	32.3	32.3	32.3
Total Split (s)	14.0	29.1	29.1	14.0	29.1	29.1	59.3	59.3	59.3	32.3	32.3	32.3
Total Split (%)	10.4%	21.6%	21.6%	10.4%	21.6%	21.6%	44.0%	44.0%	44.0%	24.0%	24.0%	24.0%
Maximum Green (s)	8.0	23.0	23.0	8.0	23.0	23.0	53.0	53.0	53.0	26.0	26.0	26.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.4	2.3	2.4	2.4	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.1	6.1	6.0	6.1	6.1	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		16.0	16.0		16.0	16.0	19.0	19.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)		1	1		7	7	1	1	1	1	1	1
Act Effct Green (s)	18.2	14.3	14.3	19.7	17.1	17.1	40.4	40.4	40.4	14.0	14.0	14.0
Actuated g/C Ratio	0.19	0.15	0.15	0.21	0.18	0.18	0.42	0.42	0.42	0.15	0.15	0.15
v/c Ratio	0.10	0.19	0.43	0.17	0.51	0.19	0.65	0.74	0.03	0.03	0.40	0.19
Control Delay	33.5	42.8	12.0	34.3	42.6	1.2	30.1	29.2	0.1	43.6	43.8	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	42.8	12.0	34.3	42.6	1.2	30.1	29.2	0.1	43.6	43.8	1.3
LOS	C	D	B	C	D	A	C	C	A	D	D	A
Approach Delay		24.9			35.1			29.0			33.8	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	3.0	7.8	0.0	5.4	22.6	0.0	58.0	72.6	0.0	1.2	16.0	0.0
Queue Length 95th (m)	10.7	17.9	17.0	16.3	50.0	0.0	130.9	140.9	0.0	5.9	31.5	0.0
Internal Link Dist (m)		58.1			120.1			314.4			211.5	
Turn Bay Length (m)				70.0			160.0		55.0	105.0		60.0
Base Capacity (vph)	251	857	477	244	861	456	899	1854	909	489	959	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.11	0.30	0.17	0.35	0.14	0.46	0.53	0.03	0.02	0.20	0.12

Intersection Summary			
Area Type:	Other		
Cycle Length: 134.7			
Actuated Cycle Length: 96			
Natural Cycle: 115			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 30.1		Intersection LOS: C	
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Tenth Line & St. Joseph



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	100	370	24	15	61
Future Volume (vph)	21	100	370	24	15	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.991		0.892	
Flt Protected	0.950				0.990	
Satd. Flow (prot)	1674	3316	4681	0	1556	0
Flt Permitted	0.950				0.990	
Satd. Flow (perm)	1674	3316	4681	0	1556	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		144.1	123.1		184.3	
Travel Time (s)		8.6	7.4		13.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	3%	1%	1%	1%
Adj. Flow (vph)	21	100	370	24	15	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	100	394	0	76	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.5	5.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	10.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

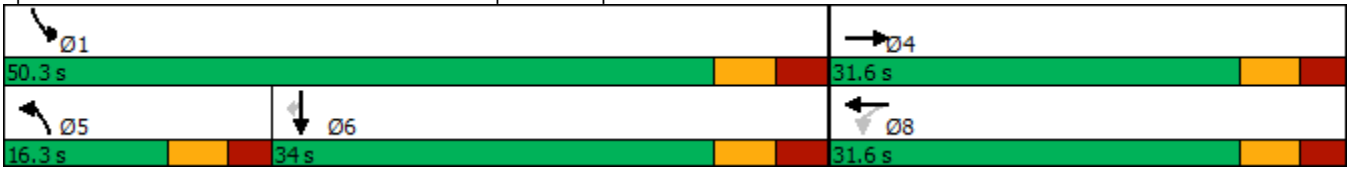
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.1%		ICU Level of Service A	
Analysis Period (min) 15			

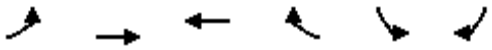
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	100	0	34	325	0	0	0	110	53	311	63
Future Volume (vph)	0	100	0	34	325	0	0	0	110	53	311	63
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		15.0	110.0		130.0
Storage Lanes	0		0	1		0	1		1	2		1
Taper Length (m)	10.0			35.0			10.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Ped Bike Factor												0.99
Frt									0.850			0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3221	0	1642	3316	0	1762	0	1483	2982	3316	1210
Flt Permitted				0.689						0.950		
Satd. Flow (perm)	0	3221	0	1191	3316	0	1762	0	1483	2982	3316	1195
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									863			132
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		123.1			246.7			275.2			235.3	
Travel Time (s)		7.4			14.8			16.5			14.1	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	5%	1%	3%	2%	1%	1%	1%	2%	10%	2%	25%
Adj. Flow (vph)	0	100	0	34	325	0	0	0	110	53	311	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	100	0	34	325	0	0	0	110	53	311	63
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	Left	Left	R NA	Left	Left	Right
Median Width(m)		5.0			4.5			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors		2		1	2		1		1	1	2	1
Detector Template		Thru		Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (m)		30.5		6.1	30.5		6.1		6.1	6.1	30.5	6.1
Trailing Detector (m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)		1.8		6.1	1.8		6.1		6.1	6.1	1.8	6.1
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7						28.7	
Detector 2 Size(m)		1.8			1.8						1.8	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Perm
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			6
Detector Phase		4		8	8		5			1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		10.0		10.0	10.0		5.0			5.0	15.0	15.0
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	30.0
Total Split (s)		31.6		31.6	31.6		16.3			50.3	34.0	34.0
Total Split (%)		38.6%		38.6%	38.6%		19.9%			61.4%	41.5%	41.5%
Maximum Green (s)		25.0		25.0	25.0		10.0			43.3	27.0	27.0
Yellow Time (s)		3.7		3.7	3.7		3.7			3.7	3.7	3.7
All-Red Time (s)		2.9		2.9	2.9		2.6			3.3	3.3	3.3
Lost Time Adjust (s)		0.0		0.0	0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)		6.6		6.6	6.6		6.3			7.0	7.0	7.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0		3.0			3.0	3.0	3.0
Recall Mode		None		None	None		None			Min	Min	Min
Walk Time (s)		7.0		7.0	7.0						7.0	7.0
Flash Dont Walk (s)		12.0		12.0	12.0						16.0	16.0
Pedestrian Calls (#/hr)		1		0	0						1	1
Act Effct Green (s)		11.6		11.6	11.6				42.0	16.5	16.5	16.5
Actuated g/C Ratio		0.28		0.28	0.28				1.00	0.39	0.39	0.39
v/c Ratio		0.11		0.10	0.36				0.07	0.05	0.24	0.11
Control Delay		12.0		12.6	13.6				0.1	8.6	9.4	0.8
Queue Delay		0.0		0.0	0.0				0.0	0.0	0.0	0.0
Total Delay		12.0		12.6	13.6				0.1	8.6	9.4	0.8
LOS		B		B	B				A	A	A	A
Approach Delay		12.0			13.5			0.1			8.1	
Approach LOS		B			B			A			A	
Queue Length 50th (m)		2.4		1.6	8.3				0.0	0.9	6.2	0.0
Queue Length 95th (m)		7.0		6.5	18.7				0.0	3.7	15.6	1.0
Internal Link Dist (m)		99.1			222.7			251.2			211.3	
Turn Bay Length (m)				60.0					15.0	110.0		130.0
Base Capacity (vph)		1958		724	2016				1483	2850	2177	830
Starvation Cap Reductn		0		0	0				0	0	0	0
Spillback Cap Reductn		0		0	0				0	0	0	0
Storage Cap Reductn		0		0	0				0	0	0	0
Reduced v/c Ratio		0.05		0.05	0.16				0.07	0.02	0.14	0.08

Intersection Summary			
Area Type:	Other		
Cycle Length: 81.9			
Actuated Cycle Length: 42			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.36			
Intersection Signal Delay: 9.5		Intersection LOS: A	
Intersection Capacity Utilization 33.7%		ICU Level of Service A	
Analysis Period (min) 15			

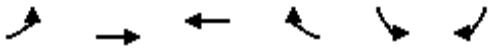
Splits and Phases: 4: Old Tenth Line/OR 174 EB Ramp & St. Joseph





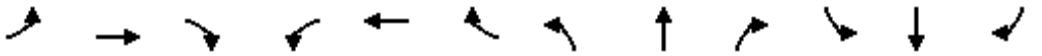
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	259	814	8	0	12
Future Volume (vph)	0	259	814	8	0	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	25.0			0.0	0.0	0.0
Storage Lanes	1			0	0	1
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.86	0.95	0.95	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	6003	3312	0	0	1510
Flt Permitted						
Satd. Flow (perm)	0	6003	3312	0	0	1510
Link Speed (k/h)		60	60		50	
Link Distance (m)		55.5	82.1		81.0	
Travel Time (s)		3.3	4.9		5.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	259	814	8	0	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	259	822	0	0	12
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		0.0	0.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.0%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	14	963	620	14	14	6
Future Volume (vph)	14	963	620	14	14	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.997		0.959	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1674	3349	3338	0	1633	0
Flt Permitted	0.950				0.966	
Satd. Flow (perm)	1674	3349	3338	0	1633	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		410.1	145.9		128.9	
Travel Time (s)		24.6	8.8		9.3	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	14	963	620	14	14	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	963	634	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.0	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.1%		ICU Level of Service A	
Analysis Period (min) 15			

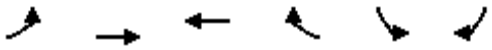


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	335	580	68	235	173	358	741	18	9	218	49
Future Volume (vph)	62	335	580	68	235	173	358	741	18	9	218	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		0.0	160.0		55.0	105.0		60.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	30.0			25.0			25.0			35.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.91	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.99	1.00		0.97			0.98	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.998		0.950		
Satd. Flow (prot)	1674	3316	1455	1470	3316	1441	1509	3112	1441	1674	3283	1483
Flt Permitted	0.605			0.469			0.950	0.998		0.950		
Satd. Flow (perm)	1053	3316	1435	725	3316	1399	1509	3112	1417	1672	3283	1483
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			580			173			125			125
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		82.1			144.1			338.4			235.5	
Travel Time (s)		4.9			8.6			20.3			14.1	
Confl. Peds. (#/hr)	10		1	1		10			3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	4%	15%	2%	5%	2%	4%	5%	1%	3%	2%
Adj. Flow (vph)	62	335	580	68	235	173	358	741	18	9	218	49
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	62	335	580	68	235	173	322	777	18	9	218	49
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			5.0			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		6	6		2	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	6	6	6	2	2	2
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	22.0	22.0	22.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.1	29.1	11.0	29.1	29.1	32.3	32.3	32.3	32.3	32.3	32.3
Total Split (s)	14.0	29.1	29.1	14.0	29.1	29.1	59.3	59.3	59.3	32.3	32.3	32.3
Total Split (%)	10.4%	21.6%	21.6%	10.4%	21.6%	21.6%	44.0%	44.0%	44.0%	24.0%	24.0%	24.0%
Maximum Green (s)	8.0	23.0	23.0	8.0	23.0	23.0	53.0	53.0	53.0	26.0	26.0	26.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.4	2.3	2.4	2.4	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.1	6.1	6.0	6.1	6.1	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		16.0	16.0		16.0	16.0	19.0	19.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)		1	1		9	9	1	1	1	1	1	1
Act Effct Green (s)	23.5	17.6	17.6	23.6	17.6	17.6	34.4	34.4	34.4	14.3	14.3	14.3
Actuated g/C Ratio	0.24	0.18	0.18	0.24	0.18	0.18	0.36	0.36	0.36	0.15	0.15	0.15
v/c Ratio	0.20	0.56	0.79	0.29	0.39	0.44	0.60	0.70	0.03	0.04	0.45	0.15
Control Delay	30.1	42.8	12.5	32.1	40.2	10.5	32.8	31.9	0.1	42.0	44.1	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	42.8	12.5	32.1	40.2	10.5	32.8	31.9	0.1	42.0	44.1	1.0
LOS	C	D	B	C	D	B	C	C	A	D	D	A
Approach Delay		24.0			28.2			31.7			36.3	
Approach LOS		C			C			C			D	
Queue Length 50th (m)	7.3	27.6	0.0	8.1	18.7	0.0	50.0	63.1	0.0	1.4	18.7	0.0
Queue Length 95th (m)	21.8	54.3	37.4	23.8	38.7	18.3	96.5	104.6	0.0	6.4	35.3	0.0
Internal Link Dist (m)		58.1			120.1			314.4			211.5	
Turn Bay Length (m)				70.0			160.0		55.0	105.0		60.0
Base Capacity (vph)	313	843	797	244	843	485	884	1824	882	481	944	515
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.40	0.73	0.28	0.28	0.36	0.36	0.43	0.02	0.02	0.23	0.10

Intersection Summary			
Area Type:	Other		
Cycle Length: 134.7			
Actuated Cycle Length: 96.6			
Natural Cycle: 105			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 28.9		Intersection LOS: C	
Intersection Capacity Utilization 66.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Tenth Line & St. Joseph



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	28	332	447	43	15	38
Future Volume (vph)	28	332	447	43	15	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.987		0.903	
Flt Protected	0.950				0.986	
Satd. Flow (prot)	1674	3349	4664	0	1569	0
Flt Permitted	0.950				0.986	
Satd. Flow (perm)	1674	3349	4664	0	1569	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		144.1	123.1		184.3	
Travel Time (s)		8.6	7.4		13.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	3%	1%	1%	1%
Adj. Flow (vph)	28	332	447	43	15	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	332	490	0	53	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.5	5.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	10.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

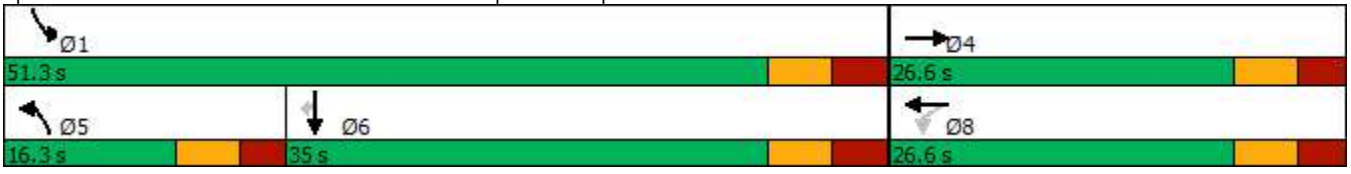
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.3%		ICU Level of Service A	
Analysis Period (min) 15			

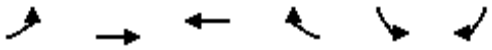
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	368	3	105	328	0	4	0	89	60	936	164
Future Volume (vph)	0	368	3	105	328	0	4	0	89	60	936	164
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		15.0	110.0		130.0
Storage Lanes	0		0	1		0	1		1	2		1
Taper Length (m)	10.0			35.0			10.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Ped Bike Factor							1.00					0.99
Frt		0.999							0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3313	0	1674	3316	0	1353	0	1498	3248	3349	1401
Flt Permitted				0.531			0.950			0.950		
Satd. Flow (perm)	0	3313	0	936	3316	0	1352	0	1498	3248	3349	1383
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1							237			164
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		123.1			246.7			275.2			235.3	
Travel Time (s)		7.4			14.8			16.5			14.1	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	25%	1%	1%	1%	1%	8%
Adj. Flow (vph)	0	368	3	105	328	0	4	0	89	60	936	164
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	371	0	105	328	0	4	0	89	60	936	164
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	Left	Left	R NA	Left	Left	Right
Median Width(m)		5.0			4.5			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors		2		1	2		1		1	1	2	1
Detector Template		Thru		Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (m)		30.5		6.1	30.5		6.1		6.1	6.1	30.5	6.1
Trailing Detector (m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)		1.8		6.1	1.8		6.1		6.1	6.1	1.8	6.1
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7						28.7	
Detector 2 Size(m)		1.8			1.8						1.8	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Perm
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			6
Detector Phase		4		8	8		5			1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		10.0		10.0	10.0		5.0			5.0	15.0	15.0
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	30.0
Total Split (s)		26.6		26.6	26.6		16.3			51.3	35.0	35.0
Total Split (%)		34.1%		34.1%	34.1%		20.9%			65.9%	44.9%	44.9%
Maximum Green (s)		20.0		20.0	20.0		10.0			44.3	28.0	28.0
Yellow Time (s)		3.7		3.7	3.7		3.7			3.7	3.7	3.7
All-Red Time (s)		2.9		2.9	2.9		2.6			3.3	3.3	3.3
Lost Time Adjust (s)		0.0		0.0	0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)		6.6		6.6	6.6		6.3			7.0	7.0	7.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0		3.0			3.0	3.0	3.0
Recall Mode		None		None	None		None			Min	Min	Min
Walk Time (s)		7.0		7.0	7.0						7.0	7.0
Flash Dont Walk (s)		12.0		12.0	12.0						16.0	16.0
Pedestrian Calls (#/hr)		1		0	0						1	1
Act Effct Green (s)		13.1		13.1	13.1		6.1		51.0	23.5	21.8	21.8
Actuated g/C Ratio		0.26		0.26	0.26		0.12		1.00	0.46	0.43	0.43
v/c Ratio		0.44		0.44	0.39		0.03		0.06	0.04	0.66	0.24
Control Delay		19.1		25.1	18.7		27.2		0.1	7.5	15.4	3.7
Queue Delay		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		19.1		25.1	18.7		27.2		0.1	7.5	15.4	3.7
LOS		B		C	B		C		A	A	B	A
Approach Delay		19.1			20.2			1.2			13.3	
Approach LOS		B			C			A			B	
Queue Length 50th (m)		12.1		6.6	10.6		0.3		0.0	1.1	25.0	0.0
Queue Length 95th (m)		31.4		24.0	28.0		2.9		0.0	3.8	73.3	9.9
Internal Link Dist (m)		99.1			222.7			251.2			211.3	
Turn Bay Length (m)				60.0					15.0	110.0		130.0
Base Capacity (vph)		1375		388	1376		280		1498	2839	1945	872
Starvation Cap Reductn		0		0	0		0		0	0	0	0
Spillback Cap Reductn		0		0	0		0		0	0	0	0
Storage Cap Reductn		0		0	0		0		0	0	0	0
Reduced v/c Ratio		0.27		0.27	0.24		0.01		0.06	0.02	0.48	0.19

Intersection Summary			
Area Type:	Other		
Cycle Length: 77.9			
Actuated Cycle Length: 51			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 15.3		Intersection LOS: B	
Intersection Capacity Utilization 63.3%		ICU Level of Service B	
Analysis Period (min) 15			

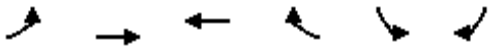
Splits and Phases: 4: Old Tenth Line/OR 174 EB Ramp & St. Joseph





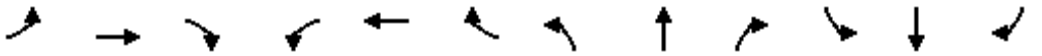
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	977	627	15	0	8
Future Volume (vph)	0	977	627	15	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	25.0			0.0	0.0	0.0
Storage Lanes	1			0	0	1
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.86	0.95	0.95	1.00	1.00
Frt			0.996			0.865
Flt Protected						
Satd. Flow (prot)	0	6063	3334	0	0	1510
Flt Permitted						
Satd. Flow (perm)	0	6063	3334	0	0	1510
Link Speed (k/h)		60	60		50	
Link Distance (m)		55.5	82.1		81.0	
Travel Time (s)		3.3	4.9		5.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	1%	2%	2%	2%
Adj. Flow (vph)	0	977	627	15	0	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	977	642	0	0	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		0.0	0.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.8%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	263	934	4	26	11
Future Volume (vph)	5	263	934	4	26	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.999		0.960	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1674	3316	3313	0	1634	0
Flt Permitted	0.950				0.966	
Satd. Flow (perm)	1674	3316	3313	0	1634	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		410.1	145.9		128.9	
Travel Time (s)		24.6	8.8		9.3	
Confl. Peds. (#/hr)	8			8		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	2%	1%	1%	1%
Adj. Flow (vph)	5	263	934	4	26	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	263	938	0	37	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.0	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.4%		ICU Level of Service A	
Analysis Period (min) 15			

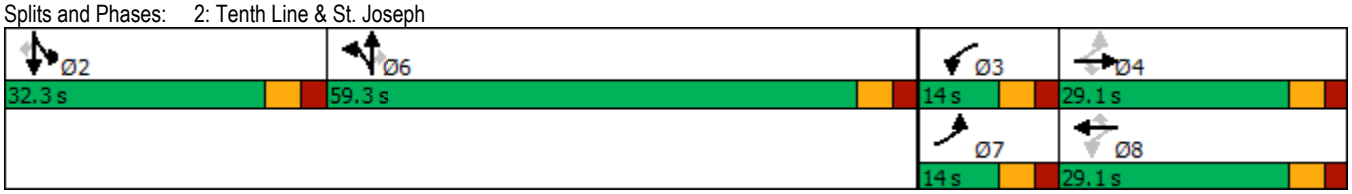


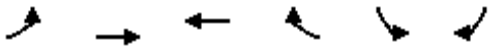
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	104	161	47	344	72	521	1106	26	9	253	69
Future Volume (vph)	26	104	161	47	344	72	521	1106	26	9	253	69
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		0.0	160.0		55.0	105.0		60.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	30.0			25.0			25.0			35.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.91	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.99	1.00		0.97						
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.998		0.950		
Satd. Flow (prot)	1674	3316	1455	1470	3316	1441	1509	3111	1441	1674	3283	1483
Flt Permitted	0.465			0.621			0.950	0.998		0.950		
Satd. Flow (perm)	812	3316	1435	960	3316	1399	1509	3111	1441	1674	3283	1483
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			161			126			125			125
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		82.1			144.1			338.4			235.5	
Travel Time (s)		4.9			8.6			20.3			14.1	
Confl. Peds. (#/hr)	10		1	1		10						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	4%	15%	2%	5%	2%	4%	5%	1%	3%	2%
Adj. Flow (vph)	26	104	161	47	344	72	521	1106	26	9	253	69
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	26	104	161	47	344	72	469	1158	26	9	253	69
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			5.0			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		6	6		2	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	6	6	6	2	2	2
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	22.0	22.0	22.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.1	29.1	11.0	29.1	29.1	32.3	32.3	32.3	32.3	32.3	32.3
Total Split (s)	14.0	29.1	29.1	14.0	29.1	29.1	59.3	59.3	59.3	32.3	32.3	32.3
Total Split (%)	10.4%	21.6%	21.6%	10.4%	21.6%	21.6%	44.0%	44.0%	44.0%	24.0%	24.0%	24.0%
Maximum Green (s)	8.0	23.0	23.0	8.0	23.0	23.0	53.0	53.0	53.0	26.0	26.0	26.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.4	2.3	2.4	2.4	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.1	6.1	6.0	6.1	6.1	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		16.0	16.0		16.0	16.0	19.0	19.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)		1	1		7	7	1	1	1	1	1	1
Act Effct Green (s)	21.3	15.8	15.8	23.2	18.8	18.8	48.8	48.8	48.8	15.4	15.4	15.4
Actuated g/C Ratio	0.19	0.14	0.14	0.21	0.17	0.17	0.44	0.44	0.44	0.14	0.14	0.14
v/c Ratio	0.12	0.22	0.47	0.20	0.61	0.21	0.70	0.84	0.04	0.04	0.55	0.22
Control Delay	35.5	46.3	12.0	36.7	49.7	1.7	34.0	35.4	0.1	45.4	50.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	46.3	12.0	36.7	49.7	1.7	34.0	35.4	0.1	45.4	50.9	1.6
LOS	D	D	B	D	D	A	C	D	A	D	D	A
Approach Delay		26.3			40.9			34.4			40.5	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	4.1	10.3	0.0	7.6	36.4	0.0	83.0	112.6	0.0	1.7	26.8	0.0
Queue Length 95th (m)	11.5	19.6	17.8	18.1	56.6	0.8	155.8	#192.7	0.0	6.5	41.0	0.2
Internal Link Dist (m)		58.1			120.1			314.4			211.5	
Turn Bay Length (m)				70.0			160.0		55.0	105.0		60.0
Base Capacity (vph)	227	723	438	241	723	403	758	1564	786	412	809	460
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.14	0.37	0.20	0.48	0.18	0.62	0.74	0.03	0.02	0.31	0.15

Intersection Summary			
Area Type:	Other		
Cycle Length: 134.7			
Actuated Cycle Length: 109.8			
Natural Cycle: 125			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 35.4		Intersection LOS: D	
Intersection Capacity Utilization 78.0%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Tenth Line & St. Joseph





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	113	420	24	15	61
Future Volume (vph)	21	113	420	24	15	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.992		0.892	
Flt Protected	0.950				0.990	
Satd. Flow (prot)	1674	3316	4685	0	1556	0
Flt Permitted	0.950				0.990	
Satd. Flow (perm)	1674	3316	4685	0	1556	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		144.1	123.1		184.3	
Travel Time (s)		8.6	7.4		13.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	3%	1%	1%	1%
Adj. Flow (vph)	21	113	420	24	15	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	113	444	0	76	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.5	5.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	10.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

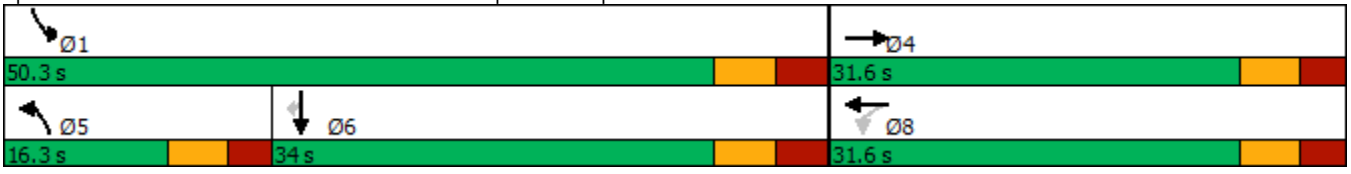
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.0%		ICU Level of Service A	
Analysis Period (min) 15			

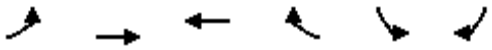
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	111	0	38	368	0	0	0	125	61	353	70
Future Volume (vph)	0	111	0	38	368	0	0	0	125	61	353	70
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		15.0	110.0		130.0
Storage Lanes	0		0	1		0	1		1	2		1
Taper Length (m)	10.0			35.0			10.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Ped Bike Factor												0.99
Frt									0.850			0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3221	0	1642	3316	0	1762	0	1483	2982	3316	1210
Flt Permitted				0.682						0.950		
Satd. Flow (perm)	0	3221	0	1179	3316	0	1762	0	1483	2982	3316	1195
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									839			132
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		123.1			246.7			275.2			235.3	
Travel Time (s)		7.4			14.8			16.5			14.1	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	5%	1%	3%	2%	1%	1%	1%	2%	10%	2%	25%
Adj. Flow (vph)	0	111	0	38	368	0	0	0	125	61	353	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	111	0	38	368	0	0	0	125	61	353	70
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	Left	Left	R NA	Left	Left	Right
Median Width(m)		5.0			4.5			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors		2		1	2		1		1	1	2	1
Detector Template		Thru		Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (m)		30.5		6.1	30.5		6.1		6.1	6.1	30.5	6.1
Trailing Detector (m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)		1.8		6.1	1.8		6.1		6.1	6.1	1.8	6.1
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7						28.7	
Detector 2 Size(m)		1.8			1.8						1.8	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Perm
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			6
Detector Phase		4		8	8		5			1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		10.0		10.0	10.0		5.0			5.0	15.0	15.0
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	30.0
Total Split (s)		31.6		31.6	31.6		16.3			50.3	34.0	34.0
Total Split (%)		38.6%		38.6%	38.6%		19.9%			61.4%	41.5%	41.5%
Maximum Green (s)		25.0		25.0	25.0		10.0			43.3	27.0	27.0
Yellow Time (s)		3.7		3.7	3.7		3.7			3.7	3.7	3.7
All-Red Time (s)		2.9		2.9	2.9		2.6			3.3	3.3	3.3
Lost Time Adjust (s)		0.0		0.0	0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)		6.6		6.6	6.6		6.3			7.0	7.0	7.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0		3.0			3.0	3.0	3.0
Recall Mode		None		None	None		None			Min	Min	Min
Walk Time (s)		7.0		7.0	7.0						7.0	7.0
Flash Dont Walk (s)		12.0		12.0	12.0						16.0	16.0
Pedestrian Calls (#/hr)		1		0	0						1	1
Act Effct Green (s)		11.6		11.6	11.6				42.0	16.5	16.5	16.5
Actuated g/C Ratio		0.28		0.28	0.28				1.00	0.39	0.39	0.39
v/c Ratio		0.12		0.12	0.40				0.08	0.05	0.27	0.13
Control Delay		12.1		12.8	14.0				0.1	8.6	9.6	1.1
Queue Delay		0.0		0.0	0.0				0.0	0.0	0.0	0.0
Total Delay		12.1		12.8	14.0				0.1	8.6	9.6	1.1
LOS		B		B	B				A	A	A	A
Approach Delay		12.1			13.9			0.1			8.3	
Approach LOS		B			B			A			A	
Queue Length 50th (m)		2.6		1.7	9.5				0.0	1.0	7.1	0.0
Queue Length 95th (m)		7.5		7.1	21.1				0.0	4.1	17.6	1.7
Internal Link Dist (m)		99.1			222.7			251.2			211.3	
Turn Bay Length (m)				60.0					15.0	110.0		130.0
Base Capacity (vph)		1957		716	2015				1483	2850	2176	829
Starvation Cap Reductn		0		0	0				0	0	0	0
Spillback Cap Reductn		0		0	0				0	0	0	0
Storage Cap Reductn		0		0	0				0	0	0	0
Reduced v/c Ratio		0.06		0.05	0.18				0.08	0.02	0.16	0.08

Intersection Summary			
Area Type:	Other		
Cycle Length: 81.9			
Actuated Cycle Length: 42			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.40			
Intersection Signal Delay: 9.8		Intersection LOS: A	
Intersection Capacity Utilization 35.0%		ICU Level of Service A	
Analysis Period (min) 15			

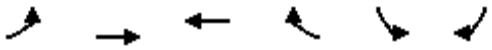
Splits and Phases: 4: Old Tenth Line/OR 174 EB Ramp & St. Joseph





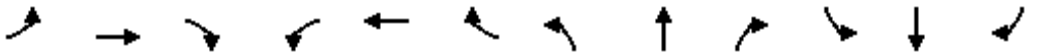
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	291	926	8	0	12
Future Volume (vph)	0	291	926	8	0	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	25.0			0.0	0.0	0.0
Storage Lanes	1			0	0	1
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.86	0.95	0.95	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	6003	3312	0	0	1510
Flt Permitted						
Satd. Flow (perm)	0	6003	3312	0	0	1510
Link Speed (k/h)		60	60		50	
Link Distance (m)		55.5	82.1		81.0	
Travel Time (s)		3.3	4.9		5.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	291	926	8	0	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	291	934	0	0	12
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		0.0	0.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.3%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	14	1094	703	14	14	6
Future Volume (vph)	14	1094	703	14	14	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.997		0.959	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1674	3349	3338	0	1633	0
Flt Permitted	0.950				0.966	
Satd. Flow (perm)	1674	3349	3338	0	1633	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		410.1	145.9		128.9	
Travel Time (s)		24.6	8.8		9.3	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	14	1094	703	14	14	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	1094	717	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.0	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	5.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.9%		ICU Level of Service A	
Analysis Period (min) 15			

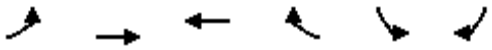


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	380	659	77	265	196	406	884	20	10	303	55
Future Volume (vph)	70	380	659	77	265	196	406	884	20	10	303	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	70.0		0.0	160.0		55.0	105.0		60.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	30.0			25.0			25.0			35.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.91	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99		0.99	1.00		0.97			0.98	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.998		0.950		
Satd. Flow (prot)	1674	3316	1455	1470	3316	1441	1509	3111	1441	1674	3283	1483
Flt Permitted	0.552			0.395			0.950	0.998		0.950		
Satd. Flow (perm)	962	3316	1435	611	3316	1399	1509	3111	1417	1672	3283	1483
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			659			196			125			125
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		82.1			144.1			338.4			235.5	
Travel Time (s)		4.9			8.6			20.3			14.1	
Confl. Peds. (#/hr)	10		1	1		10			3	3		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	4%	15%	2%	5%	2%	4%	5%	1%	3%	2%
Adj. Flow (vph)	70	380	659	77	265	196	406	884	20	10	303	55
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	70	380	659	77	265	196	365	925	20	10	303	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	L NA	Left	Right	L NA	Left	Right	L NA	Left	R NA	L NA	Left	R NA
Median Width(m)		7.0			7.0			5.0			5.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			5.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		6	6		2	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	6	6	6	2	2	2
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	22.0	22.0	22.0	10.0	10.0	10.0
Minimum Split (s)	11.0	29.1	29.1	11.0	29.1	29.1	32.3	32.3	32.3	32.3	32.3	32.3
Total Split (s)	14.0	29.1	29.1	14.0	29.1	29.1	59.3	59.3	59.3	32.3	32.3	32.3
Total Split (%)	10.4%	21.6%	21.6%	10.4%	21.6%	21.6%	44.0%	44.0%	44.0%	24.0%	24.0%	24.0%
Maximum Green (s)	8.0	23.0	23.0	8.0	23.0	23.0	53.0	53.0	53.0	26.0	26.0	26.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.3	2.4	2.4	2.3	2.4	2.4	2.6	2.6	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.1	6.1	6.0	6.1	6.1	6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		16.0	16.0		16.0	16.0	19.0	19.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)		1	1		9	9	1	1	1	1	1	1
Act Effct Green (s)	26.1	20.2	20.2	26.2	20.2	20.2	41.4	41.4	41.4	16.7	16.7	16.7
Actuated g/C Ratio	0.24	0.19	0.19	0.24	0.19	0.19	0.38	0.38	0.38	0.15	0.15	0.15
v/c Ratio	0.25	0.62	0.82	0.37	0.43	0.47	0.63	0.78	0.03	0.04	0.60	0.16
Control Delay	35.0	48.8	13.3	38.8	45.2	10.5	34.8	36.0	0.1	45.1	51.0	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	48.8	13.3	38.8	45.2	10.5	34.8	36.0	0.1	45.1	51.0	1.1
LOS	D	D	B	D	D	B	C	D	A	D	D	A
Approach Delay		26.8			31.6			35.1			43.3	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	10.4	38.3	0.0	11.6	25.6	0.0	67.2	92.0	0.0	1.8	31.8	0.0
Queue Length 95th (m)	24.5	62.3	42.4	26.9	44.1	19.9	111.8	131.1	0.0	6.7	48.7	0.0
Internal Link Dist (m)		58.1			120.1			314.4			211.5	
Turn Bay Length (m)				70.0			160.0		55.0	105.0		60.0
Base Capacity (vph)	287	749	834	215	749	468	786	1621	798	428	839	472
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.51	0.79	0.36	0.35	0.42	0.46	0.57	0.03	0.02	0.36	0.12

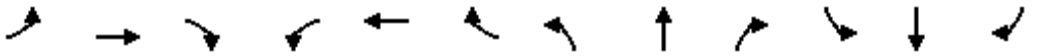
Intersection Summary			
Area Type:	Other		
Cycle Length: 134.7			
Actuated Cycle Length: 108.6			
Natural Cycle: 105			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 32.7		Intersection LOS: C	
Intersection Capacity Utilization 71.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Tenth Line & St. Joseph



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	28	376	507	43	15	38
Future Volume (vph)	28	376	507	43	15	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Ped Bike Factor						
Frt			0.988		0.903	
Flt Protected	0.950				0.986	
Satd. Flow (prot)	1674	3349	4668	0	1569	0
Flt Permitted	0.950				0.986	
Satd. Flow (perm)	1674	3349	4668	0	1569	0
Link Speed (k/h)		60	60		50	
Link Distance (m)		144.1	123.1		184.3	
Travel Time (s)		8.6	7.4		13.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	3%	1%	1%	1%
Adj. Flow (vph)	28	376	507	43	15	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	376	550	0	53	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	L NA	R NA
Median Width(m)		5.5	5.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		5.0	10.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.4%		ICU Level of Service A	
Analysis Period (min) 15			

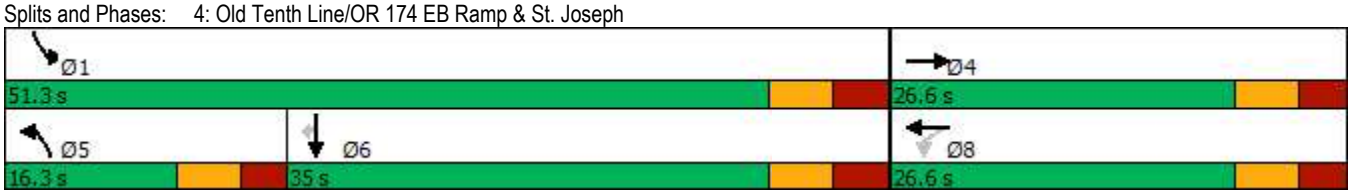


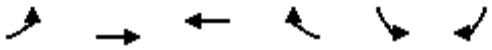
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	417	4	119	369	0	5	0	102	68	1065	185
Future Volume (vph)	0	417	4	119	369	0	5	0	102	68	1065	185
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		15.0	110.0		130.0
Storage Lanes	0		0	1		0	1		1	2		1
Taper Length (m)	10.0			35.0			10.0			60.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Ped Bike Factor							1.00					0.99
Frt		0.999							0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3313	0	1674	3316	0	1353	0	1498	3248	3349	1401
Flt Permitted				0.506			0.950			0.950		
Satd. Flow (perm)	0	3313	0	892	3316	0	1352	0	1498	3248	3349	1383
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1							237			185
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		123.1			246.7			275.2			235.3	
Travel Time (s)		7.4			14.8			16.5			14.1	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	25%	1%	1%	1%	1%	8%
Adj. Flow (vph)	0	417	4	119	369	0	5	0	102	68	1065	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	421	0	119	369	0	5	0	102	68	1065	185
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	L NA	Left	Right	Left	Left	R NA	Left	Left	Right
Median Width(m)		5.0			4.5			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		5.0			10.0			5.0			5.0	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors		2		1	2		1		1	1	2	1
Detector Template		Thru		Left	Thru		Left		Right	Left	Thru	Right
Leading Detector (m)		30.5		6.1	30.5		6.1		6.1	6.1	30.5	6.1
Trailing Detector (m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)		1.8		6.1	1.8		6.1		6.1	6.1	1.8	6.1
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)		28.7			28.7						28.7	
Detector 2 Size(m)		1.8			1.8						1.8	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Perm
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			6
Detector Phase		4		8	8		5			1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		10.0		10.0	10.0		5.0			5.0	15.0	15.0
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	30.0
Total Split (s)		26.6		26.6	26.6		16.3			51.3	35.0	35.0
Total Split (%)		34.1%		34.1%	34.1%		20.9%			65.9%	44.9%	44.9%
Maximum Green (s)		20.0		20.0	20.0		10.0			44.3	28.0	28.0
Yellow Time (s)		3.7		3.7	3.7		3.7			3.7	3.7	3.7
All-Red Time (s)		2.9		2.9	2.9		2.6			3.3	3.3	3.3
Lost Time Adjust (s)		0.0		0.0	0.0		0.0			0.0	0.0	0.0
Total Lost Time (s)		6.6		6.6	6.6		6.3			7.0	7.0	7.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0		3.0			3.0	3.0	3.0
Recall Mode		None		None	None		None			Min	Min	Min
Walk Time (s)		7.0		7.0	7.0						7.0	7.0
Flash Dont Walk (s)		12.0		12.0	12.0						16.0	16.0
Pedestrian Calls (#/hr)		1		0	0						1	1
Act Effct Green (s)		14.0		14.0	14.0		6.1		54.8	26.6	24.7	24.7
Actuated g/C Ratio		0.26		0.26	0.26		0.11		1.00	0.49	0.45	0.45
v/c Ratio		0.50		0.52	0.44		0.03		0.07	0.04	0.71	0.26
Control Delay		20.8		29.3	20.2		28.4		0.1	7.7	17.0	3.6
Queue Delay		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		20.8		29.3	20.2		28.4		0.1	7.7	17.0	3.6
LOS		C		C	C		C		A	A	B	A
Approach Delay		20.8			22.4			1.4			14.7	
Approach LOS		C			C			A			B	
Queue Length 50th (m)		17.3		9.4	15.0		0.4		0.0	1.4	33.0	0.0
Queue Length 95th (m)		35.6		27.6	31.3		3.5		0.0	4.2	#96.2	10.5
Internal Link Dist (m)		99.1			222.7			251.2			211.3	
Turn Bay Length (m)				60.0					15.0	110.0		130.0
Base Capacity (vph)		1263		340	1264		257		1498	2677	1787	824
Starvation Cap Reductn		0		0	0		0		0	0	0	0
Spillback Cap Reductn		0		0	0		0		0	0	0	0
Storage Cap Reductn		0		0	0		0		0	0	0	0
Reduced v/c Ratio		0.33		0.35	0.29		0.02		0.07	0.03	0.60	0.22

Intersection Summary			
Area Type:	Other		
Cycle Length: 77.9			
Actuated Cycle Length: 54.8			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 68.5%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Old Tenth Line/OR 174 EB Ramp & St. Joseph





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1109	711	15	0	8
Future Volume (vph)	0	1109	711	15	0	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	25.0			0.0	0.0	0.0
Storage Lanes	1			0	0	1
Taper Length (m)	30.0				10.0	
Lane Util. Factor	1.00	0.86	0.95	0.95	1.00	1.00
Frt			0.997			0.865
Flt Protected						
Satd. Flow (prot)	0	6063	3338	0	0	1510
Flt Permitted						
Satd. Flow (perm)	0	6063	3338	0	0	1510
Link Speed (k/h)		60	60		50	
Link Distance (m)		55.5	82.1		81.0	
Travel Time (s)		3.3	4.9		5.8	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	1%	2%	2%	2%
Adj. Flow (vph)	0	1109	711	15	0	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1109	726	0	0	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		0.0	0.0		5.0	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.2%		ICU Level of Service A	
Analysis Period (min) 15			