8600 Jeanne D'Arc Blvd North Petrie's Landing III

TIA Report

Final

December 2023

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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8600 Jeanne d'Arc Blvd North – Petrie's Landing III

TIA Report

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TIA Final Report

Parsons has been retained by Brigil to prepare a Transportation Impact Assessment (TIA) in support of a Zoning By-Law Amendment (ZBLA) and an Official Plan Amendment (OPA) for a residential development located at 8600 Jeanne d'Arc Blvd N., also known as Petrie's Landing III in Orléans district. This document follows the new TIA process, as outlined in the City Transportation Impact Assessment (TIA) Guidelines (2017). The following report represents Step 5 – Final Report.

1. Screening Form

The screening form confirmed the need for a TIA Report based on the trip generation trigger, given that the proposed development consists of twelve mixed-use buildings with approximately 3,000 to 3,200 residential apartment units, 110,000 ft^2 of office space and 165,000 ft^2 of commercial space; and the location trigger, given that the development is located within a transit-oriented development (within 600m radius of Trim LRT Station) and spine cycling route. The safety trigger was not met. The Screening Form and responses to city comments have been provided in **Appendix A**.

2. Scoping Report

2.1. Existing and Planned Conditions

2.1.1. PROPOSED DEVELOPMENT

The subject site is located at the municipal addresses of 8600 Jeanne d'Arc Blvd N, bounded by Jeanne d'Arc Blvd to the north, Centre des Métiers Minto to the east, Ottawa Regional Road 174 (H174) to the south, and Taylor Creek to the west. The lot is currently vacant.

The proposed study area includes the intersections of Trim/H174, Trim/Jeanne d'Arc, Tweddle/Jeanne d'Arc, Tenth Line/Jeanne d'Arc, Tenth Line/St. Joseph, Old Tenth Line/St. Joseph, and roadway segments adjacent to the site or between intersections as shown in **Figure 1**. The latest envisioned development has been provided in **Figure 2** with a summary of site statistics in **Table 1**. Note that the final unit count is still being refined.

Figure 1: Local Context

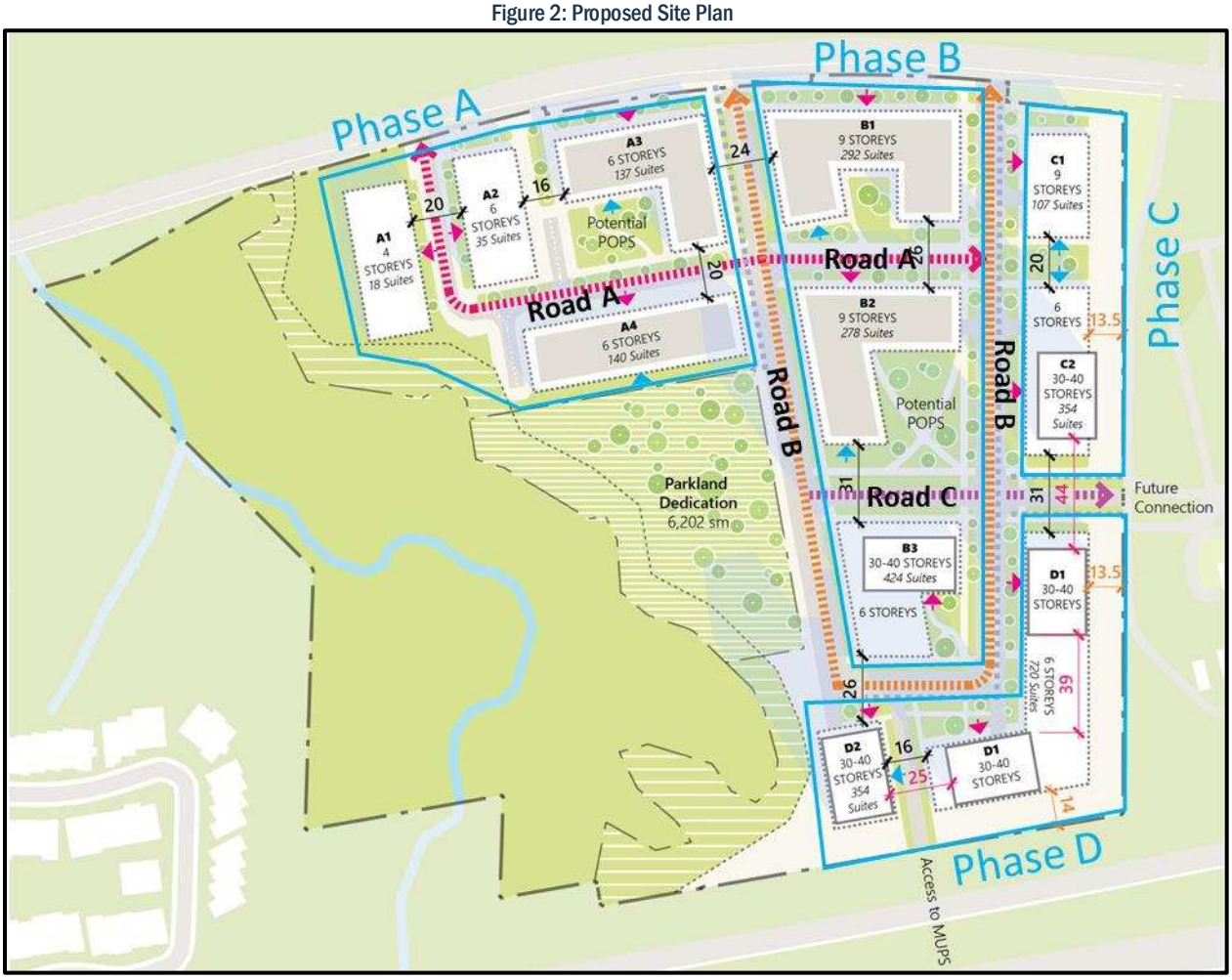
The development will be built out in multiple phases extending past 2030 horizon. Currently, there are four phases, A to D, proposed but are subject to change based on market demands. Once complete, the full buildout of the site will make use of three accesses into the site, including two public roads and a private road, all to and from Jeanne d'Arc Blvd.

Table 1: Proposed Site Statistics

Phase of Development (A to D) and Building Number	Number of Storeys	Number of Units[1]	Proposed Office Space (ft²)	Proposed Commercial Space (ft²)
A1	4	18	110,000 ft² with exact distribution to be determined.	165,000 ft² with exact distribution to be determined.
A2	6	88		
A3	6	141		
A4	6	145		
B1	9	302		
B2	9	288		
B3	30-40	439		
C1	9	110		
C2	30-40	408		
D1	30-40	830		
D2	30-40	408		
	Combined Totals	3,177	110,000 ft²	165,000 ft²

1. The number of units and office/commercial GFA is still being refined and will be confirmed by Site Plan Application. For the purpose of this analysis, the higher density estimates have been carried forward to analyze the 'worst case' scenario.

Figure 2: Proposed Site Plan



The property is currently zoned as development reserve (DR) for future urban developments. Under this zoning, this site has a specific policy clause which states "urban employment area", requiring the site to provide at least 10,000 m^2 (107,640 ft^2) of office space prior to permitting any residential uses. Once that policy is fulfilled, then mixed-use buildings including residential can be built, with a maximum height of 10-storeys which triggers the re-zoning application (ZBLA) and Official Plan Amendment (OPA) to allow a higher maximum building height proposed up to 40-storeys.

It is noteworthy that the recently approved New Official Plan recommends intensification near rapid transit stations such as Trim LRT station expected to be completed by early 2025[1]. Within the higher density principles, high-rise buildings have been categorized as 10 to 40-storeys high. The Orléans Corridor Secondary Plan that is currently ongoing also recommends parts of this development be granted permission to build up to 40-storeys and the other half limited to 9-storeys. More details regarding the secondary plan are provided in **Section 2.1.3**.

2.1.2. EXISTING CONDITIONS

Area Road Network

Ottawa Regional Road 174 (H174) is an east-west City-owned freeway, which extends from H417 in the west to past City of Ottawa limits, near Canan Road. Within the study area, H174 has a four-lane cross section and auxiliary turn lanes are provided at its intersection with the recently realigned Trim Road. The posted speed limit within the study area is 90 km/h.

Trim Road is classified as an arterial roadway which extends from Jeanne d'Arc Blvd (formerly known as North Service Road) to beyond the town of Navan. Trim Road was recently realigned, being shifted approximately 250 meters east of its former location, displaced by the new location of future Trim LRT Station. Within the study area, Trim Road has a two-lane cross section north of H174 and a three-lane cross section south of H174 (two northbound, one southbound). The former Trim Road alignments towards H174 have been closed off and function as cul-de-sac driveways. The posted speed limit is 50 km/h.

Jeanne d'Arc Blvd is a major collector roadway west of the realigned Trim Road. East of Trim Road, Jeanne d'Arc Blvd continues as Inlet Private as a local road. Within the study area, Jeanne d'Arc Blvd has a two-lane cross section. The posted speed limit is 60 km/h.

Tenth Line Road is a north-south arterial roadway that extends from Jeanne d'Arc Blvd in the north to Smith Road in the south. Within the study area, Tenth Line Road has a four-lane cross-section, the posted speed limit is 60 km/h.

Inlet Private is the continuation of Jeanne d'Arc Blvd east of the realigned Trim Road and extends for about 200m to the east to Brigil Petrie's Landing I Towers. Inlet Private is a local roadway with an unposted speed limit assumed to be 50km/h.

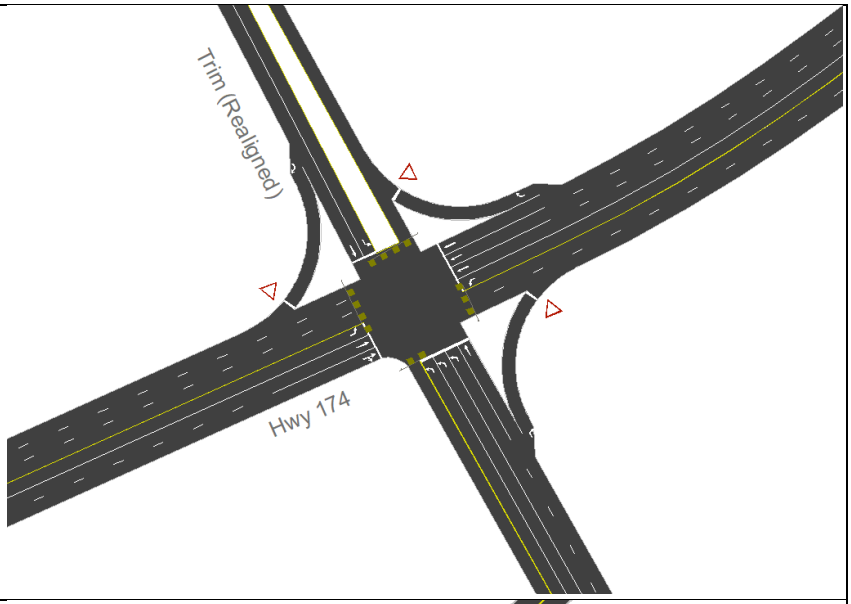
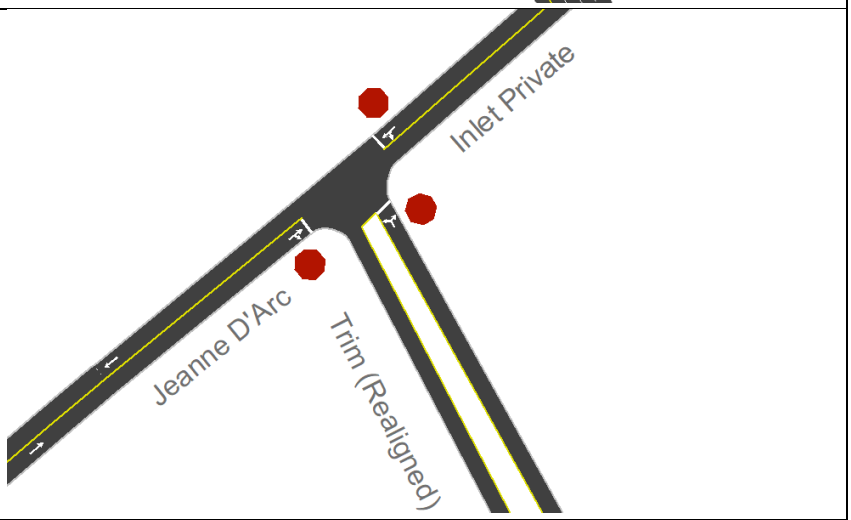
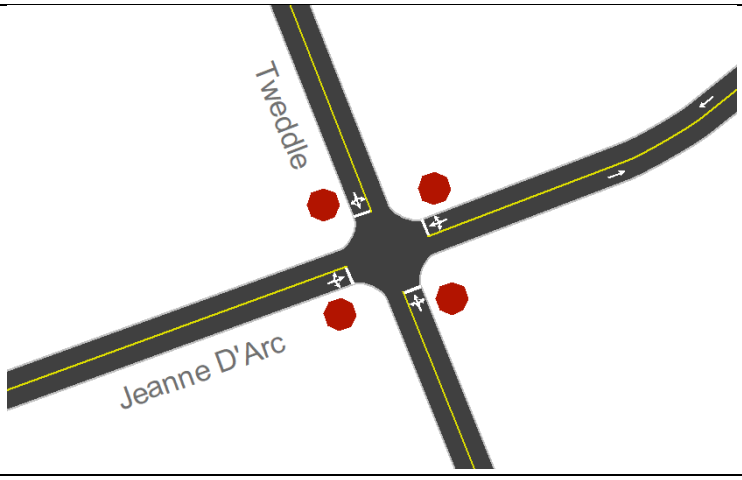
Tweddle Road is the northern continuation of former Trim Road, extending north of H174 to Petrie Island Beach. South of Jeanne d'Arc Blvd, Tweddle Road operates as a cul-de-sac. Tweddle Road is a local road with a posted speed limit of 40km/h.

Old Tenth Line Road is a north-south City-owned off-ramp that extends from H174 in the north (for eastbound off-vehicles) and extends to Tenth Line Road. South of St. Joseph, Old Tenth Line Road is an arterial road. Within the study area, Old Tenth Line Road has a three-lane cross-section, with two southbound lanes and one northbound lane. The posted speed limit is 60 km/h.

[1] https://ottawa.ctvnews.ca/stage-2-of-ottawa-lrt-faces-further-delay-1.6333917#:~:text=It's%20now%20scheduled%20to%20open%20in%20late%202026.

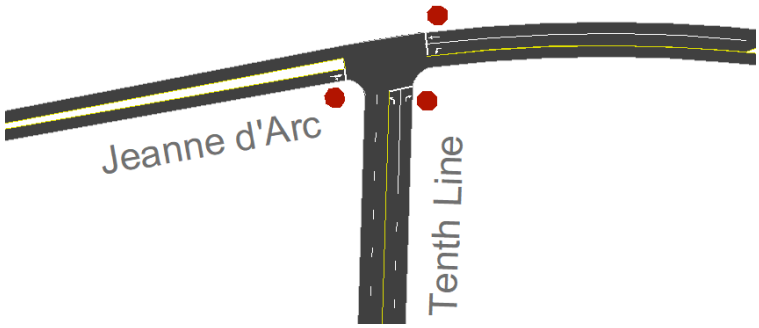
Existing Study Area Intersections

The Trim/H174 was recently relocated approximately 250 meters east of the former location. The design shown and described below shows the ultimate buildout design, however it is acknowledged that the existing intersection is mostly the same with the exception that it has a double northbound left instead of triple left.

Trim/H174 (realigned – ultimate) The Trim/ H174 intersection is a signalized four-legged intersection. The eastbound approach consists of a single left-turn lane and two through lanes. The westbound approach consists of a single left-turn lane, a triple through lane and a channelized right-turn lane. The northbound approach consists of a triple left-turn lane, a single through lane and a channelized right-turn lane. The southbound approach consists of a single left-turn lane, a single through lane and a channelized right-turn lane. A bi-directional cross-ride is proposed on the east leg of the intersection.	
Trim/Jeanne d'Arc (realigned) The Trim/Jeanne d'Arc intersection is a three-legged intersection with all-way STOP control. All approaches consist of a single full-movement lane. The south approach proposes a bi-directional cross-ride facility which connects the proposed MUP on the east side of Trim Road to the MUP on the south side of Jeanne d'Arc Blvd.	
Tweddle/Jeanne d'Arc The Tweddle/Jeanne d'Arc intersection is a four-legged intersection with all-way STOP control. All approaches consist of a single full-movement lane. Bi-directional cross-ride facilities are proposed on the east approach and north approach, connecting the MUP on the south side of Jeanne d'Arc east of Tweddle to the MUP on the north side of Jeanne d'Arc Blvd west of Tweddle Road.	

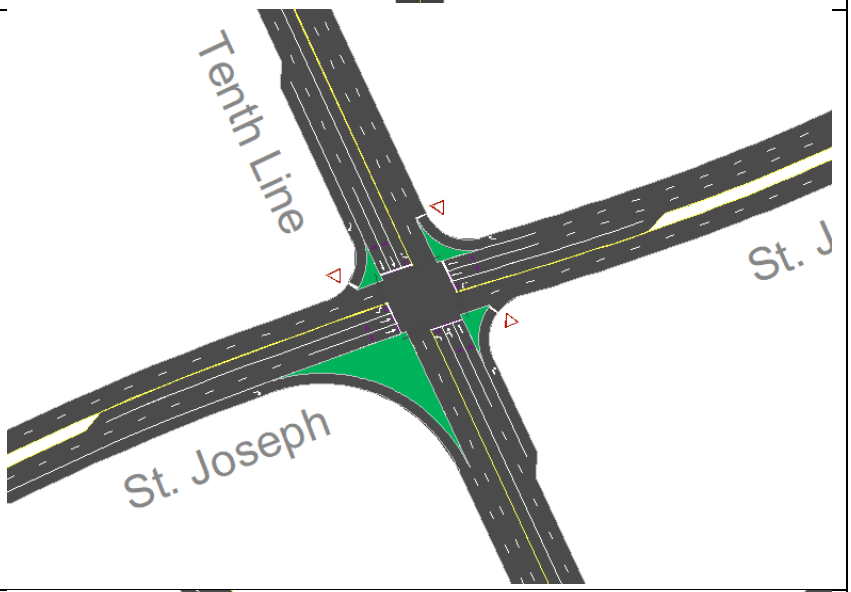
Tenth Line/Jeanne d'Arc

The Tenth Line/Jeanne d'Arc intersection is an unsignalized three-legged all-way stop intersection. The eastbound approach consists of a single through-right turn lane. The westbound approach consists of a left-turn lane and a through lane. The northbound approach consists of a left-turn lane and a right-turn lane. All movements are permitted at this location.



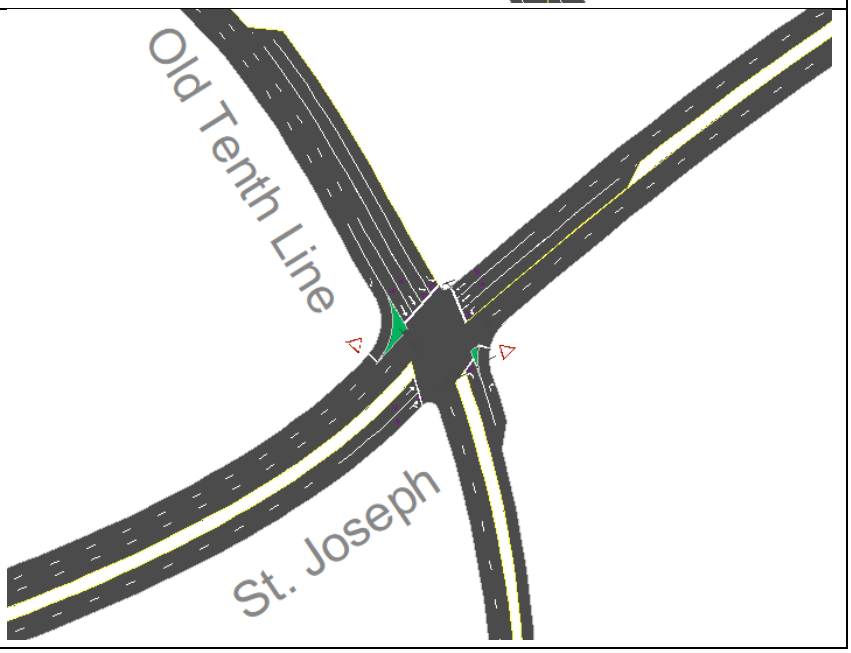
Tenth Line/St. Joseph

The Tenth Line/St. Joseph intersection is a signalized four-legged intersection. All approaches except for the south approach consist of a channelized right-turn lane, a left-turn lane and two through lanes. The south approach consists of a channelized right-turn lane, a left-turn lane and a through-left shared lane, and a single through lane. All movements are permitted at this location.



Old Tenth Line/St. Joseph

The Old Tenth Line/St. Joseph intersection is a signalized four-legged intersection. The north approach is a one-way only off-ramp from H174 and consists of a channelized right-turn lane, a double left-turn lane and two through lanes. The west approach consists of a shared through-right lane and a through lane. The south approach consists of a single left-turn lane and a channelized right-turn lane. The east approach consists of a single left-turn lane and two through lanes. Trucks are not allowed to continue southbound, and pedestrians cannot cross on the east leg. Vehicles are not allowed to turn or continue northbound.



Existing Driveways to Adjacent Developments

The existing driveways on adjacent roads to the development and within influence as shown in **Figure 3** include:

- Prestige Circle is a public road that provides 6 driveway accesses to Brigil's Petrie's Landing II which consists of approximately 460 residential. This road is approximately 420m west from the site's boundary line.
- Parkrose Private provides access to a small community of approximately 110 row houses. This access is approximately 180m west from the site's boundary line.
- Centre des Métiers Minto College is a technical school with approximately 90 parking spaces. This access is approximately 20m east from the site's boundary line.
- 8865 Jeanne d'Arc Blvd has 8 parking spaces to service the Brigil sale center. This access is approximately 360m east from the site's boundary line.

Figure 3: Existing Driveways Adjacent to Development

Existing Area Traffic Management Measures

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

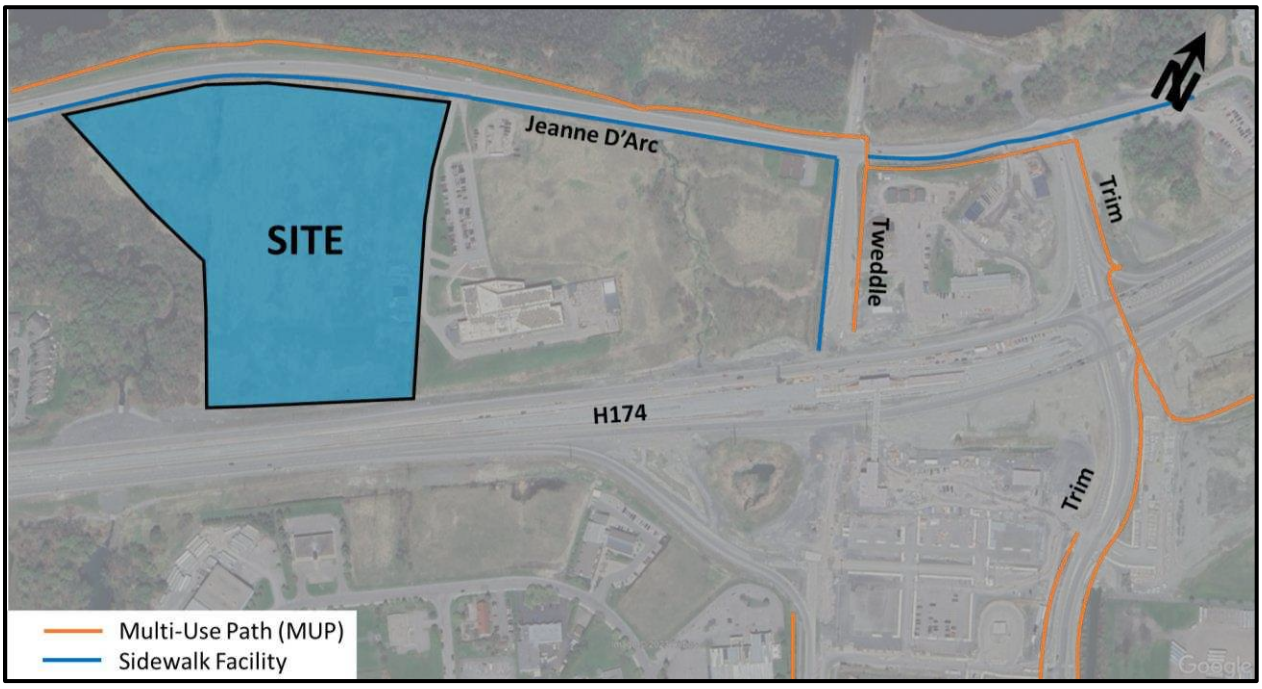
- Red light cameras at Tenth Line/St. Joseph and at Old Tenth Line/St. Joseph
- Two "Prepare to Stop when Flashing" signals on H174, each approximately 600m to the west of Old Trim Road and 600m to the east of Trim Road; and,
- One High Deer Collision Corridor signal on H174 westbound approximately 300m to the west of Old Trim Road.

Pedestrian/Cycling Network

There is 2m sidewalk on the south side of Jeanne d'Arc Blvd and Inlet Private. The north side of Jeanne d'Arc Blvd has a paved, separated 3m multi-use pathway (MUP) which extends from Tweddle Road westward to Tenth Line Road, but no facilities on the north side of Jeanne d'Arc Blvd east of Tweddle Road. 2m Sidewalk facilities are provided on the west side of former Trim Road (now called Tweddle Road) on the north side of H174. South of H174, the east and west sides of former Trim Road have paved multi-use pathways (MUPs).

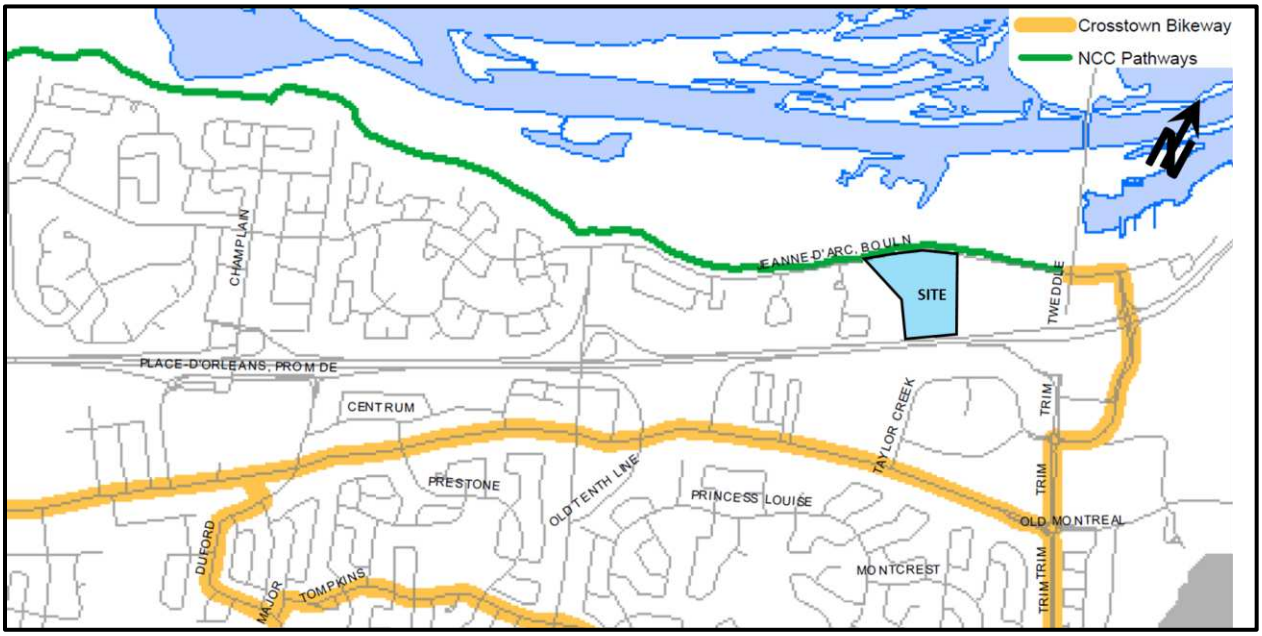
Since the realignment of Trim/H174 intersection new facilities have been incorporated on the realigned Trim Road, including a 3m MUP on the east side from Jeanne d'Arc Blvd to the most southernly point of Trim Road withing the study area. A new 3m MUP on the south side of Jeanne d'Arc Blvd from Trim to Tweddle was recently built. Tenth Line Road, Old Tenth Line Road and St. Joseph Boulevard all have sidewalks on both sides of the road. Sidewalks and Multi-Use Pathways (MUPs) have been illustrated in **Figure 4**.

Figure 4: Existing Sidewalks and MUPs Near the Site



The Crosstown Bikeway Network (March 1, 2023)[2] from the new Transportation Master Plan as shown in **Figure 5**, classifies the realigned Trim Rd and St. Joseph Blvd as a "cross-town bikeway", while the pathway just north of Jeanne d'Arc Blvd is classified as part of NCC pathways. Jeanne d'Arc Blvd west of Tweddle has paved shoulders and a Multi-Use Pathway (MUP) on the north side of the road. The new realigned Trim Road has MUPs on both sides of the road south of H174 and on the east side of the road north of H174. A new MUP has been added to the south side of Jeanne d'Arc Blvd between Tweddle Rd and Trim Rd. St. Joseph Boulevard has bike lanes east of Old Tenth Line Road, originating just east of the eastbound on ramp to beyond Trim Road.

Figure 5: Crosstown Bikeway Network (TMP Phase 1)



[2] Crosstown Bikeway Network, March 1, 2023

Transit Network

The transit network for the study area is illustrated in **Figure 6** with nearby transit stops shows in **Figure 7**. The following OC Transpo routes currently operating within 600m walking distance to the site include:

- **Route #38 (Blair <-> Jeanne d'Arc/Trim):** identified by OC Transpo as a "Local Route", this route operates on customized routing and schedules, to serve local destinations with connection to the Confederation LRT Line. Route #38 operates at an average rate of every 30 minutes during weekdays. Bus stops for this route are available on both sides of Jeanne d'Arc Blvd, adjacent to the site (stops #0755 and #0754).

Figure 6: Area Transit Network

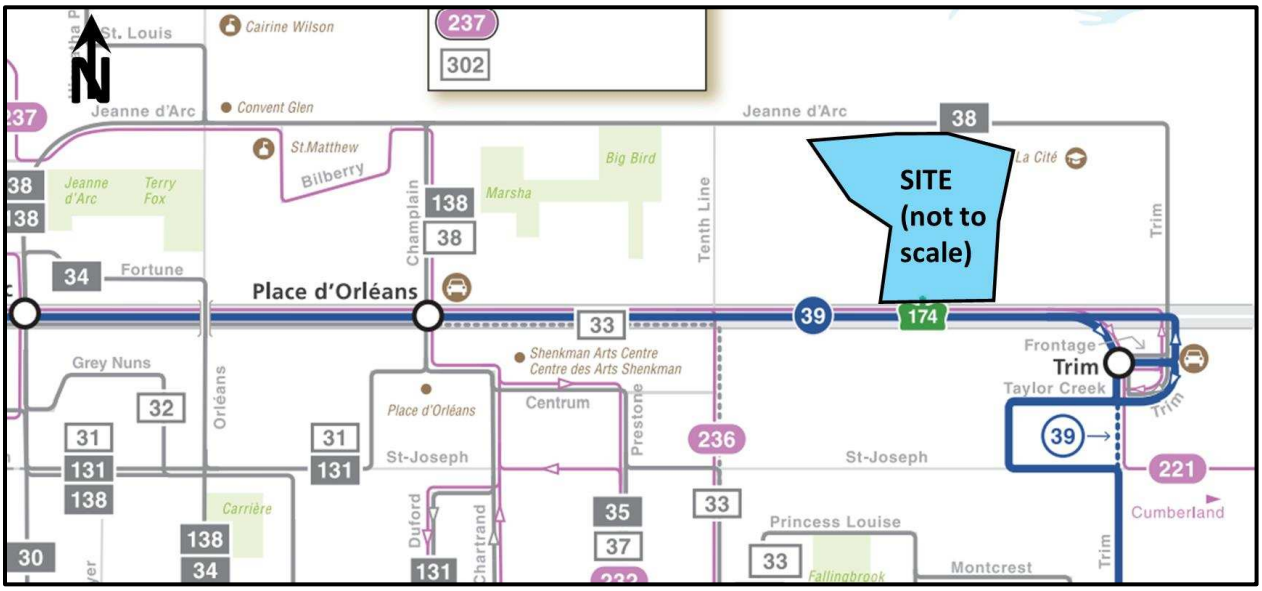
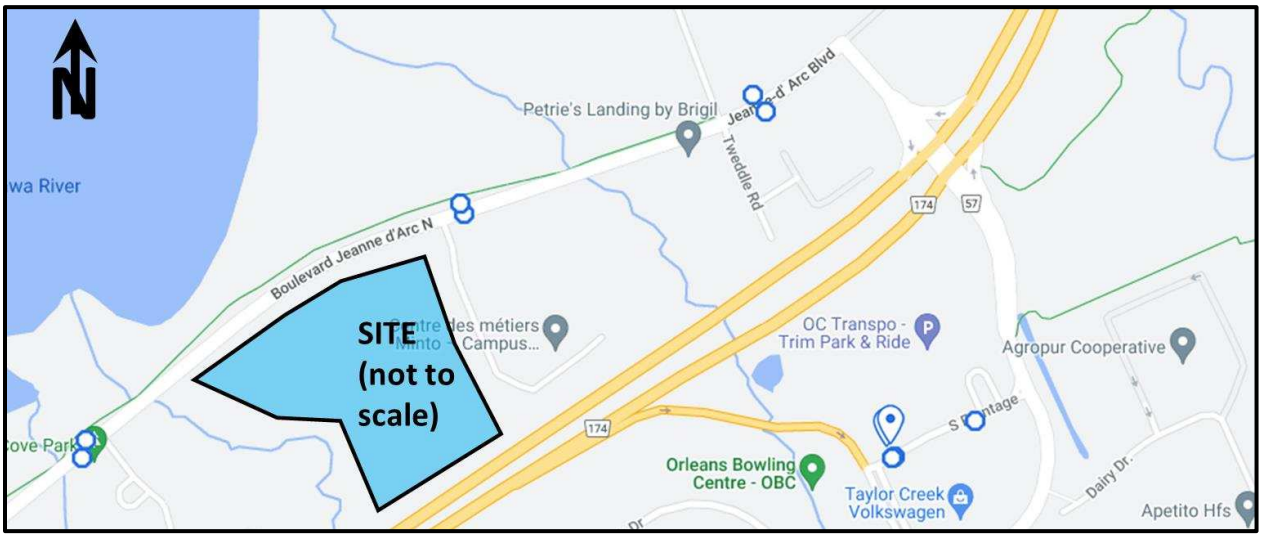


Figure 7: Nearby Transit Stops



Peak Hour Travel Demands

The existing peak hour traffic vehicle and active travel volumes within the study area, as illustrated in **Figure 8** and **Figure 9** respectively, were obtained from the City of Ottawa and counts performed by Parsons. The peak hour traffic volume count data has been provided in **Appendix B**. Note that intersections counted prior to 2024 had additional volumes layered on to reflect trip generations for developments built after their count date.

Figure 8: Existing Peak Hour Traffic Volumes

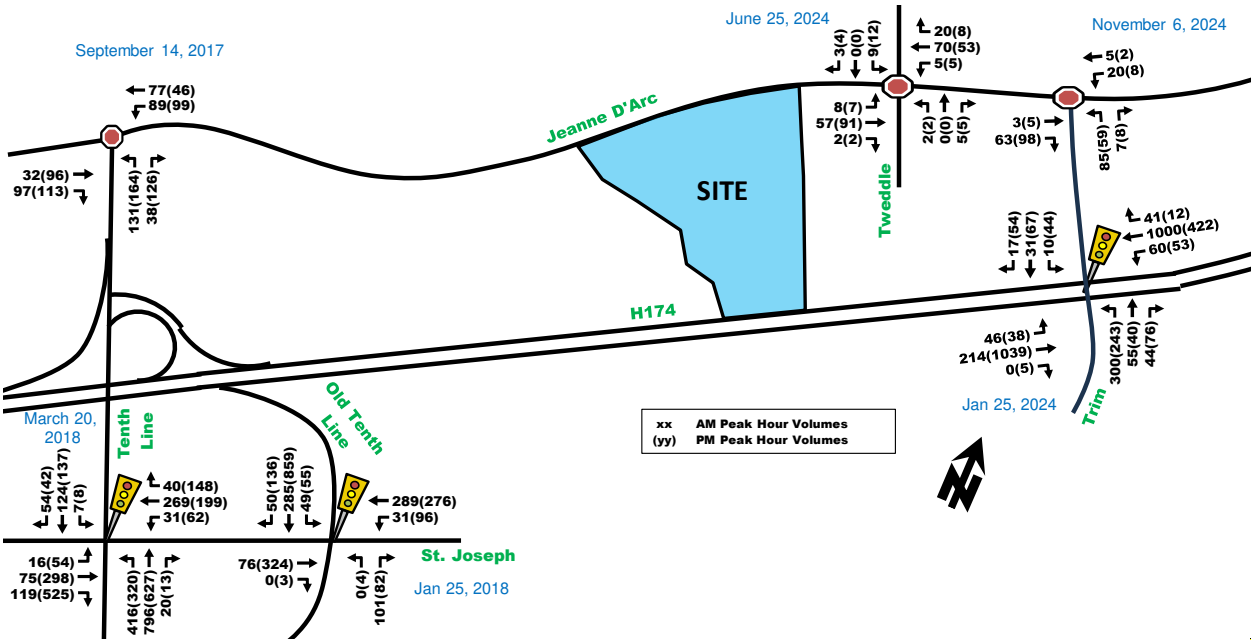
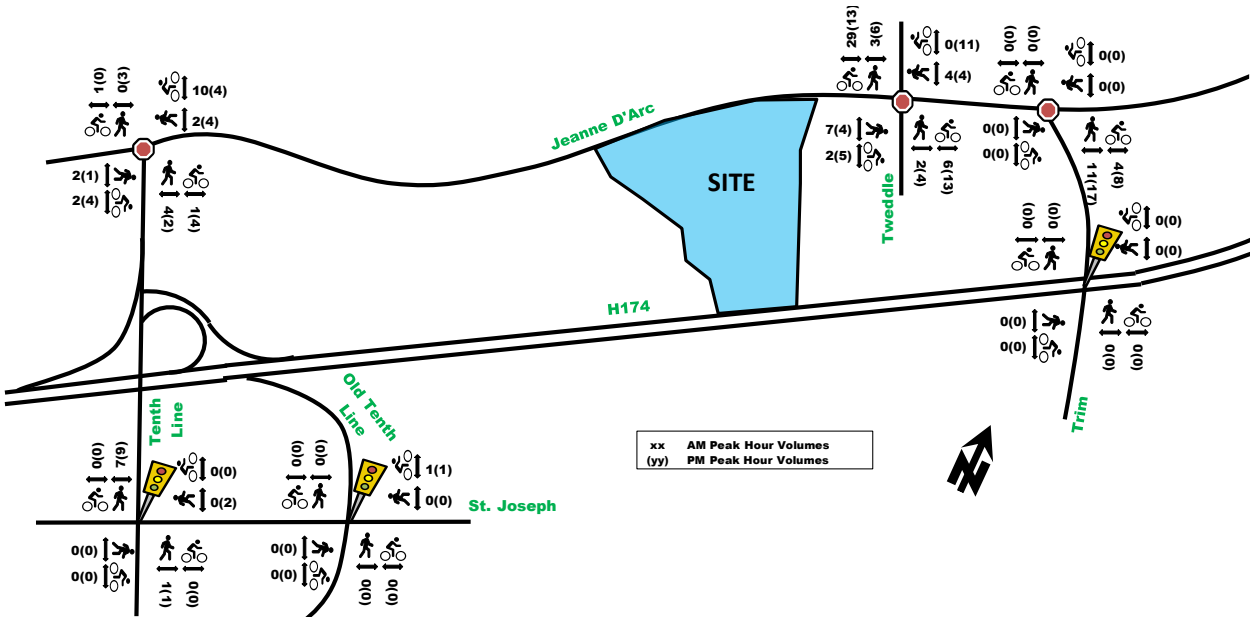


Figure 9: Existing Peak Hour Pedestrian/Cycling Volumes



Existing Road Safety Conditions

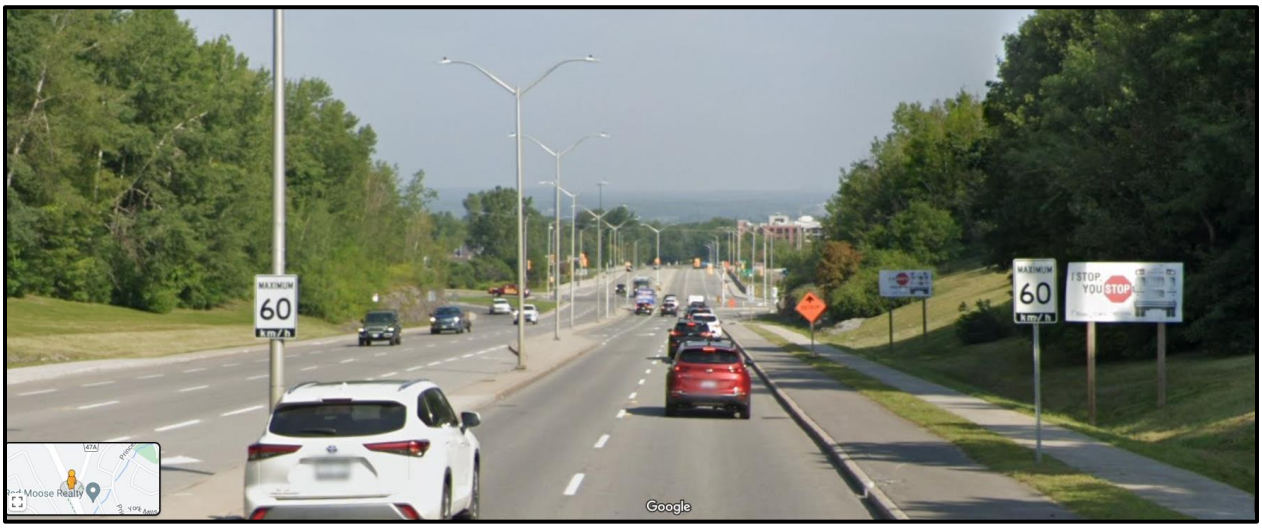
A five-year collision history data (2017-2021, inclusive) was obtained from the City of Ottawa open data source for all intersections and road segments within the study area. Note that the collisions recorded for Trim/H174 and Tweddle/Jeanne d'Arc (former Trim/Jeanne d'Arc) reflect the old road geometry as the shift in intersection location occurred in late 2021. No collisions were found at either of the two new intersections (realigned Trim/H174 and realigned Trim/Jeanne d'Arc). Upon analyzing the collision data, the total number of collisions observed within the study area was determined to be 184 collisions within the past five-years, with 84% causing property damage only and 16% causing non-fatal injuries. There were no fatal injuries recorded. Within the study area, the quantity of collisions, and/or distance of mid-block at each location has occurred at a rate of:

- Former Trim/H174: 56
- Former Trim/Jeanne d'Arc: 2
- Tenth Line/Jeanne d'Arc: 5
- Tenth Line Ramps H174: 9
- Tenth Line/St. Joseph: 70
- Old Tenth Line/St. Joseph: 30
- Mid-block Jeanne d'Arc: 2 (2.1km)
- Mid-block Tenth Line: 9 (750m)
- Mid-block St. Joseph: 1 (250m)
- Collisions with Pedestrians: 0
- Collisions with Cyclists: 1 (<1%)

Overall, there were very few collisions with active transportation users, likely because very few people bike or walk to work within this study area. The former Trim Road intersections have significantly changed and are pending newer data to identify new trends and deficiencies based on their new geometries.

The intersection of Tenth Line/St. Joseph exhibited a higher quantity of collisions than other intersections, with rear end type collision accounting for more than 50% of collision types. The heavy northbound movement may have sight line issues caused by grades from the road dropping from the plateau escarpment down to the valley below as shown in **Figure 10**.

Figure 10: Tenth Line Road Looking North Towards Tenth Line/St. Joseph Intersection



The heavy northbound movement and reduced total reaction time available due to grades impeding vision of downstream vehicles which may suddenly stop due to a red light could cause this increased risk of collision at this location. Most collisions, 84% result in property damage only. The City of Ottawa could consider adding an advanced "prepare to stop" flashing beacon upstream of the intersection to warn drivers of upcoming red lights and likely stopped vehicles.

Detailed collision analysis has been provided in **Appendix C**.

2.1.3. PLANNED CONDITIONS

Planned Study Area Transportation Network Changes

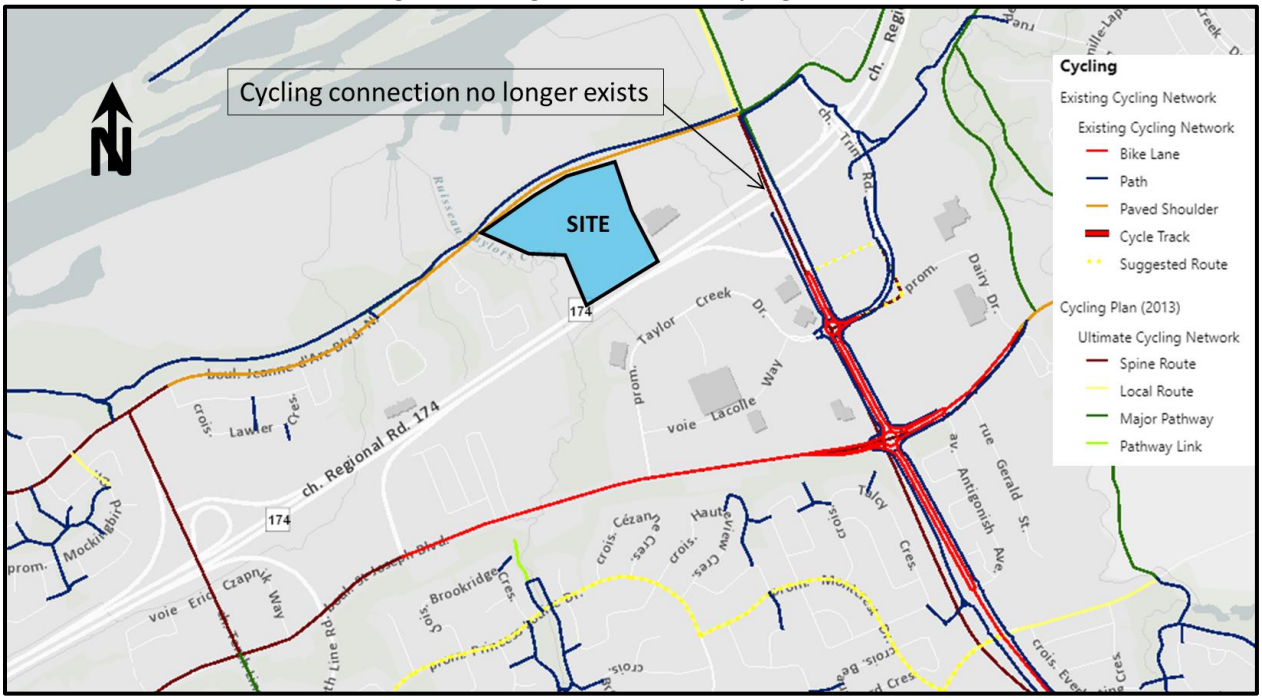
2013 Transportation Master Plan – (Partially Superseded by ongoing TMP Update)

A new TMP is still being developed and expected to be released by end of year 2025. The update will include a new list of road and transit priority projects. Phase 1 was released in 2024 which placed a large focus on amplifying density near rapid transit stations and creating a focus on 15-minute neighbourhoods. Phase 1 also provided details for the active transportation network, including the Crosstown Bikeway Network (2023) which was shown in **Figure 5** and is the current cycling plan. Although superseded by the (new) Official Plan and ongoing TMP update, the Ottawa 2013 Ultimate Cycling Plan still provides some insight on possible planned

future facilities. A major pathway was proposed on the south side of Jeanne d'Arc Blvd east of Tweddle Road, extending beyond the Trim/Jeanne d'Arc intersection and continuing between Brigil Petrie's Landing I development and H174 towards the Cardinal Creek pathways. The segment of Tenth Line Road from Jeanne d'Arc Blvd to St. Joseph Boulevard was classified as a future spine route, and the segment from Tenth Line Road to the existing cycle tracks on St. Joseph Boulevard were proposed as spine route also. **Figure 11** depicts the existing and future network based on the superseded 2013 Ultimate Plan. Note that the figure does not reflect the realignment of Trim Road.

In addition to the Ultimate Cycling Plan shown below, the Orléans Corridor Secondary Plan (more detail later in this section) proposes physically separated cycling facilities along the entire frontage of the site on the south side of Jeanne d'Arc Blvd, extending from Taylor Creek Drive to Tweddle Road, connecting to a recently built MUP.

Figure 11: Existing and Future 'Ultimate Cycling Network"

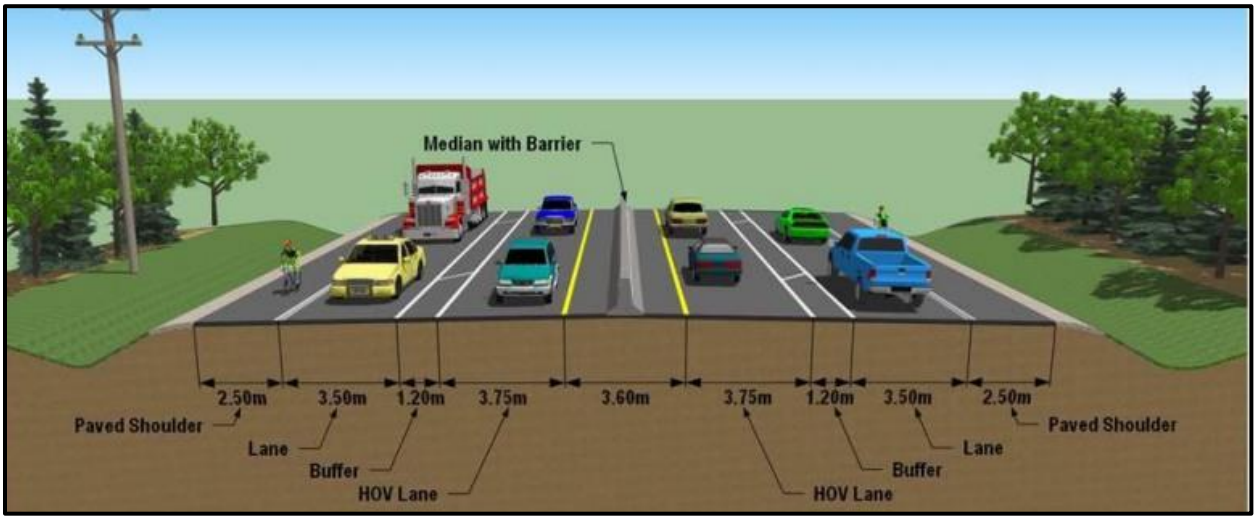


Source: Geoottawa.ca. Cycling facilities from former Trim Road to Tweddle via H174 no longer exist due to Stage 2 LRT.

H174 Widening (pre-2014)

An Environmental Assessment for the potential widening of H174 was conducted by the Townships of Prescott-Russell/City of Ottawa. The widening of H174 to six-lanes from H417 to Trim Road and to four-lanes from Trim Road to the City boundary is identified as a road project in the 2013 City of Ottawa Transportation Master Plan. However, the widening of H174 is not identified as part of the Affordable Network Plan within the TMP. Therefore, the road widening of H174 east of Trim Road is unlikely within the foreseeable future. A potential cross-section is illustrated in **Figure 12**.

Figure 12: H174 Widening Potential Cross-Section East of the Site



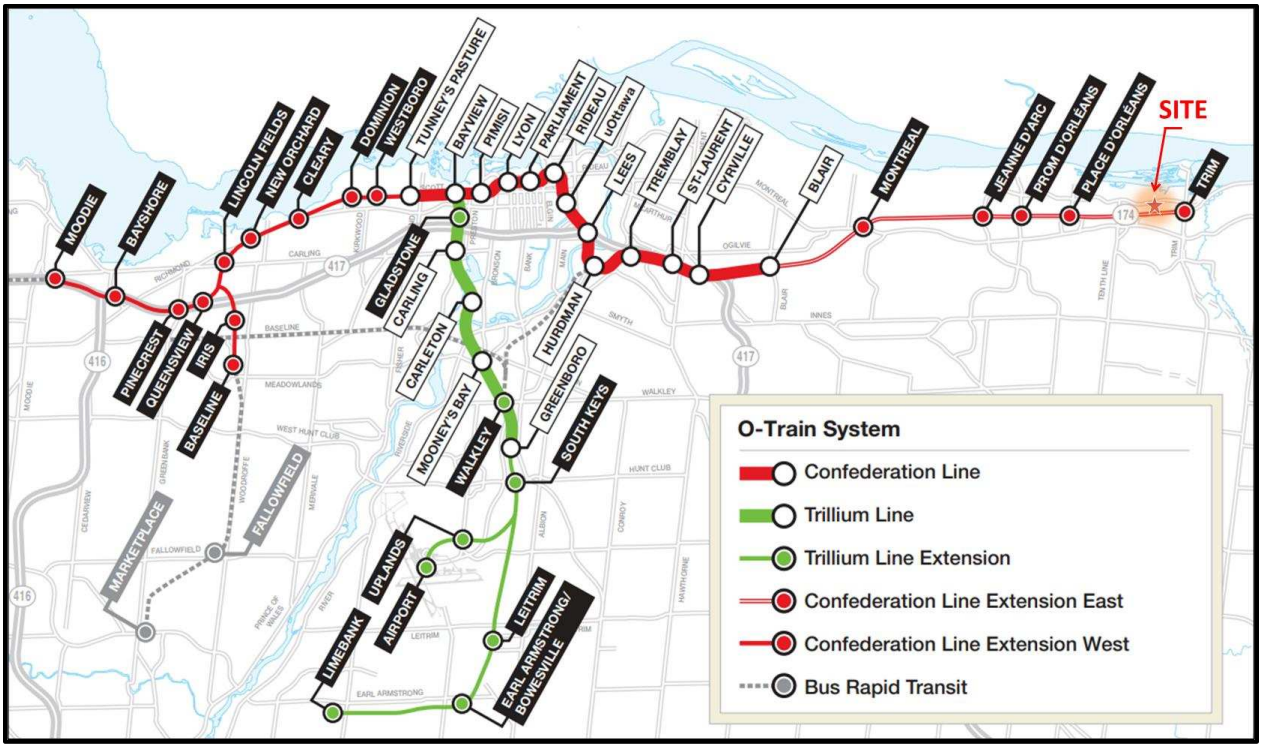
Source: http://ottwatch.ca/meetings/file/366361

Stage 2 LRT (Construction Began 2019)

Stage 2 of the City of Ottawa LRT system is currently under construction. Stage 2, as shown in **Figure 13,** is a package of three extensions – south, east and west – totaling 44 km of new rail and 24 new LRT stations. The subject site will be located within 450 to 800m of rapid transit Trim Station in a direct line radius, however at least 1.3km walking distance based on existing pedestrian infrastructure.

The current construction schedule forecasts the Confederation Line East extension will be completed by early 2025[3].

Figure 13: Stage 2 LRT System Map



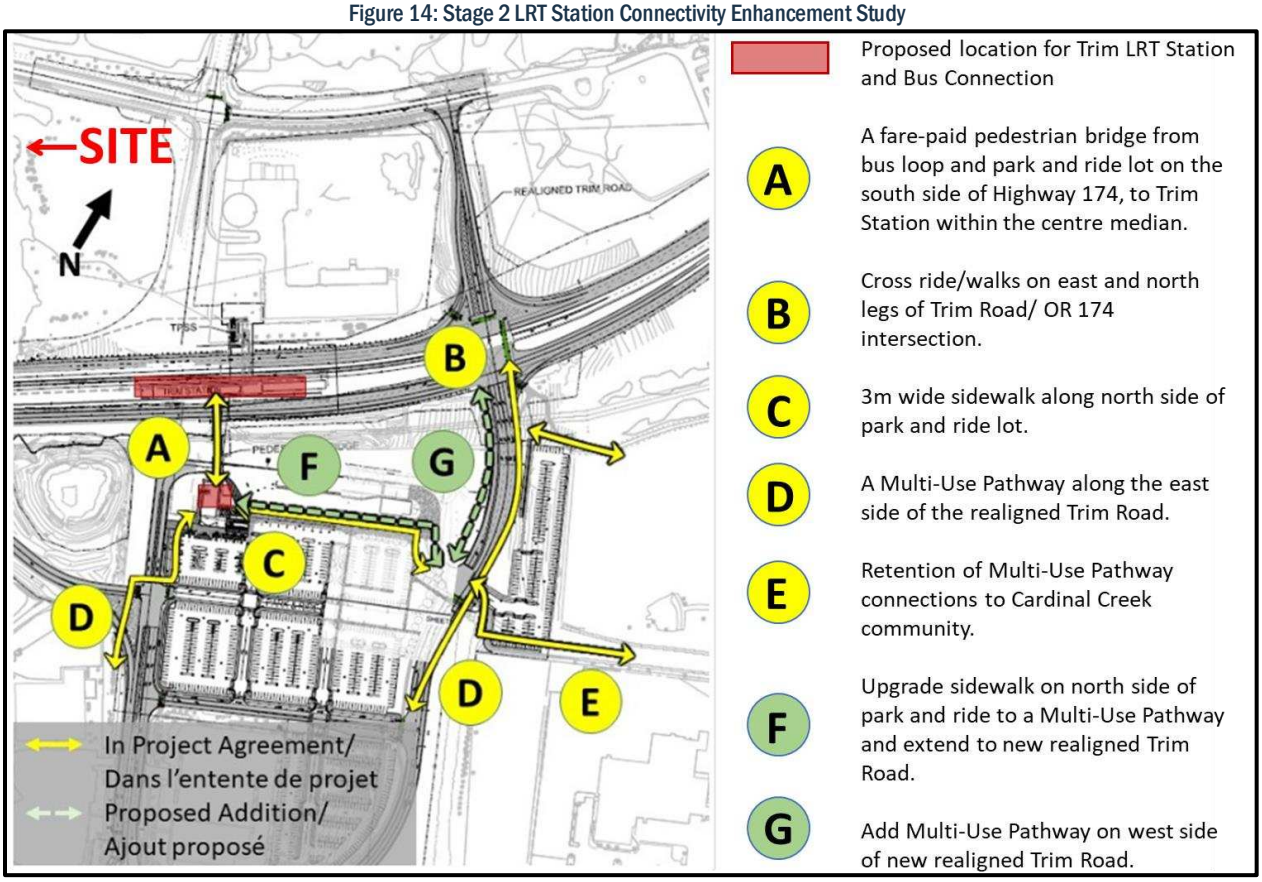
[3] https://ottawa.ctvnews.ca/stage-2-of-ottawa-lrt-faces-further-delay-1.6333917#:~:text=The%20Confederation%20Line%20west%20extension,to%20open%20in%20late%202026.

Construction of the new Trim LRT Station is well underway. As part of the construction, the former Trim/H174 at-grade intersection was relocated approximately 250 meters east to allow for the new LRT station to be located at the former location of the intersection. **Section 4.1** will provide further detail on active transportation facilities proposed at the new intersection once fully built-out. At the moment, the new relocated Trim/H174 intersection has been built to interim conditions while the construction of the future Trim LRT Station is ongoing.

The Trim Road Park and Ride Facility will be modified to include a new bus loop, bus lay-bys, and bus station platforms. It is noteworthy that the subject site is located within 600m from the future Trim Road LRT Station and is therefore considered to be within the Trim Station TOD area. **Section 4.1** will discuss potential mitigations to reduce the existing long walking route to get to the future LRT station.

Figure 14 illustrates the planned LRT station location and recently constructed interchange at Trim/H174. This new intersection location accommodates the LRT rail tracks. Trim Road was truncated both north and south of H174 to accommodate the new station. Trim Road to the south of H174 has been realigned to the Trim Road roundabout connection with Taylor Creek Drive. **Figure 14** is only a preliminary design and subject to change as the detailed design of the realignment is still ongoing. The precise location and types of facilities proposed by the new realigned Trim/H174 and new Trim/Jeanne d'Arc have yet to be finalized within the final detailed design plan. **Section 4.1** will provide additional details.

Figure 14: Stage 2 LRT Station Connectivity Enhancement Study



Source: https://ottawa.ca/en/city-hall/public-engagement/projects/stage-2-lrt-station-connectivity-enhancement-study

Official Plan (2021)

According to the Official Plan (OP), the site is located within the Trim Protected Major Transit Station Area (PMTSA) within Schedule C1, which has specific policies targeted at higher density developments supported by active transportation trips to rapid transit stations.

Orléans Corridor Secondary Plan (June 8th, 2022)

The City of Ottawa has undertaken a secondary plan for Orléans which has the intention of providing more specific direction and guidance beyond the recently approved New Official Plan for Ottawa. The secondary plan has a high level of focus on LRT transit connectivity and specific corridors.

Policy 28 within the Orléans Corridor Secondary Plan states:

"A multi-use pathway (MUP) will be constructed to link Tweddle Road, connecting the future active transportation bridge to the future street network in the master planned development site at 8600 Jeanne d'Arc Blvd. The pathway will cross the watercourse west of Tweddle Road, utilize the Highway 174 right-of-way, and may traverse the Collège La Cité campus, linking the station with both the campus, and the future street network of the master planned development. The MUP will be designed, funded, and constructed by the proponent of the master planned development at 8600 Jeanne d'Arc Blvd, as a condition of development approval and completed prior to occupancy of the first phase"[4]

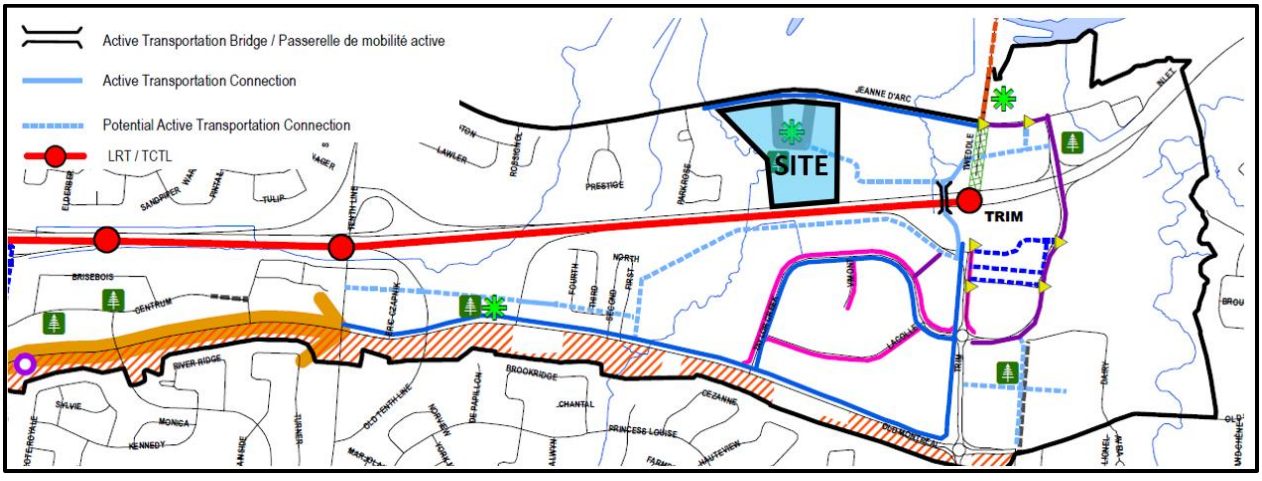
In conjunction to the Orléans Corridor Secondary Plan, the City of Ottawa has undertaken a separate Environmental Assessment (EA) Study to determine the feasibility of adding a pedestrian bridge from the Trim LRT Station to the north side of H174, reducing the walking distance to the future development to a potential 450 to 850m walk from all locations within site.

The City of Ottawa is currently updating its Transportation Master Plan, which highlights a future bridge connection over H174 near to the Trim LRT Station within the "Active Transportation Major Structures" early figures released.

Figure 15 illustrates the potential future MUP connection from Trim LRT Station to the site of this development based on the Orléans Corridor Secondary Plan. The full figure has been provided in **Appendix D**, along with other key maps from the secondary plan and New TMP.

It is understood that this bridge connection is moving ahead and will provide a direct connection from the bridge to the LRT Station. Further discussion provided in **Section 4.1.**

Figure 15: Orléans Corridor Secondary Plan – Schedule C Mobility Improvements



Other Area Developments

The following section outlines adjacent developments in the general area that were considered in the TIA. The criteria for inclusion of other area developments are either approved developments or developments that have an active planning application that are generally within a 1km radius of the subject site. **Figure 16** illustrates the location and relative size of relevant other area developments.

[4] https://pub-ottawa.escribemeetings.com/filestream.ashx?DocumentId=94222

Figure 16: Other Area Developments

1-Petrie's Landing I

This development proposed by Brigil has evolved since it was approved in 2021, with the current site proposing the construction of a residential development consisting of approximately 1,320 residential units total within 6 towers. The updated traffic counts reflect trip volumes from already built towers 1 to 3. The proposed Petrie's Landing I is located off of Inlet Private and is located approximately 850m east of the subject site. The projected two-way vehicle trips to be layered on for this proposed residential development are approximately 300 to 270 veh/h during the AM and PM peak hours respectively according to a TIA prepared by Parsons (July 2019) plus addendums (June 2021) and ongoing.

2-Petrie's Landing II

Brigil is proposing the construction of a residential development consisting of approximately 460 residential units total within 8 block buildings. At the time this report was written, blocks 1 through 7 are occupied and block 8 is under construction. Block 8 has been decreased from 214 to 113 units as per the latest update done by Parsons on February 23, 2021. The most recent count reflects trip volumes from blocks 1 through 5 for intersections counted prior to 2024 and will have the remainder block volumes layered on separately. The proposed Petrie's Landing II is located south of Jeanne d'Arc Blvd, approximately 700m west of the subject site. The projected two-way vehicle trips to be layered on for this proposed residential development are approximately 155 to 130 veh/h during the AM and PM peak hours, respectively according to a TIA prepared by Parsons (February 2021).

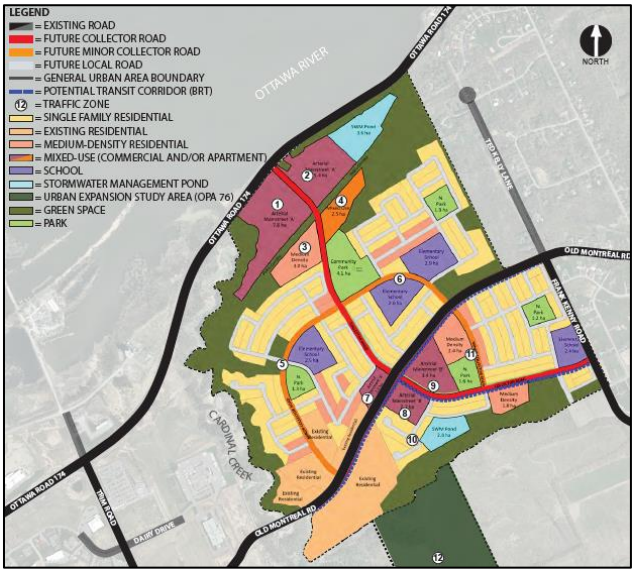
3-1015 Tweddle Road

Vuze is proposing a mixed-use development consisting of four 24 to 32-storey buildings with approximately 1,260 residential units based on a November 2024 update, and 27,000 ft^2 of commercial retail and restaurant uses. Based on an updated TIA being prepared by Parsons (on-going), then approximately 150 to 145 new two-way vehicle trips from this site are forecasted, which will be layered on to background volumes. The site is located approximately 550m east of the subject site.

4-Cardinal Creek

Tamarack Homes is currently constructing a 1,446-unit subdivision and a 430,000 ft^2 shopping centre, south of H174 and east of Cardinal Creek, as illustrated in **Figure 17**. The Transportation Impact Study (prepared by IBI Group, October 2013) 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. These volumes will be layered on to background conditions. The site is located approximately 2kms away once their new access to H174 is complete.

Figure 17: Cardinal Creek Village



5-Phoenix Homes

Phoenix Homes is currently constructing a subdivision consisting of 432 terrace flats, 35 townhomes and 16 semi-detached homes along Old Montreal Road, within Cardinal Creek Village. The Transportation Impact Study (prepared by WSP Group, March 2018) projected approximately 251 veh/h and 295 veh/h by horizon year 2022 (full build-out) during the morning and afternoon peak hours, respectively. These volumes will be layered on to background conditions. The site is located approximately 3kms away.

6-Hillside Commons

Phoenix Homes is proposing a 9-storey apartment building consisting of 274 residential units, located at the northwest corner of Tenth Line/St. Joseph intersection. The Transportation Impact Study (prepared by Novatech, January 2023) projected approximately 60 veh/h by horizon year 2024 (full build-out) during the morning and afternoon peak hours. These volumes will be layered on to background conditions.

7-265 Centrum

Bayview Orléans Inc is proposing three high-rise mixed-use buildings, a 30, 35 and 40-storey apartment buildings consisting of 1,127 residential units, 8,970 ft^2 of commercial space and 31,571 ft^2 of office space, located near the Shenkman Center. The Transportation Impact Study (prepared by CGH, March 2023) projected approximately 545 to 555 veh/h by horizon year 2028 (full build-out) during the morning and afternoon peak hours. These volumes will be layered on to background conditions.

2.2. Study Area and Time Periods

Full buildout of the proposed residential development is envisioned well beyond 2030. For the purpose of this analysis, it will be assumed that the development will be complete by 2035, using the weekday morning and afternoon peak hour time periods.

Proposed study area intersections and boundary roads are outlined below and highlighted in **Figure 18**.

- Trim/H174 intersection;
- Trim/Jeanne d'Arc intersection;
- Tweddle/Jeanne d'Arc intersection;
- Tenth Line/Jeanne d'Arc;
- Tenth Line/St. Joseph intersection;
- Old Tenth Line/St. Joseph intersection; and,
- Along Jeanne d'Arc Blvd adjacent to the site.

Figure 18: Study Area Boundaries and Intersections

2.3. Exemption Review

Table 2 below summarizes the modules/elements of the TIA process which are recommended to be exempt in the subsequent steps of the TIA process, based on the City's TIA guidelines and the subject site.

Table 2: Exemptions Review Summary

Module	Element	Exemption Consideration
4.1 Development Design	4.1.2 Circulation and Access	Only required for Site Plan Application (SPA)
4.2 Parking	All Elements	Only required for SPA. The parking is expected to meet By-Law requirements once a Site Plan Application (SPA) is submitted

3. Forecasting Report

3.1. Development-Generated Travel Demand

3.1.1. TRIP GENERATION AND MODE SHARES

The development will be a greenfield development, to be constructed on a barren parcel of land. The latest plan of subdivision proposes 3,022 units, however, for this trip generation analysis, 3,200 units will be used to show a higher unit potential consistent with previous plans and submissions. Trip generation rates for proposed residential units, envisioned within twelve buildings, were based on the City's 2020 TRANS Trip Generation Manual. The trip generation rates for proposed commercial and office uses were based on the ITE's Trip Generation Manual 11th Edition. These trip generation rates have been summarized in Table 3. Each phase will be analyzed individually through their Site Plan Application (SPA) submissions, however for this ZBLA and OPA submission, only the most critical ultimate buildout scenario will be analyzed.

Table 3: 2020 TRANS Residential Trip Generation Rates & ITE Commercial/Office Rates

Land Use	Data Source	Units or Size	Trip Rates	
			AM Peak	PM Peak
High Rise Apartments	TRANS 2020	3,200 units	T = 0.80(du)	T = 0.90(du)
Shopping Center (>150K ft²)	ITE 820	165,000 ft²	T = 0.84(x)	T = 3.40(x)
General Office	ITE 710	110,000 ft²	T = 0.86Ln(x) + 1.16	T = 0.83Ln(x) + 1.29
Note: T = Average Vehicle Trip Ends; du = dwelling units; x = GFA in 1,000 ft²; average rate equation was used for commercial				

ITE derives its trip generation rates based on empirical data from various sites observed. Shopping centers are normally large stand-alone isolated buildings in major arterial nodes with regional attractions (i.e. malls), which does not meet the developments site context with small dispersed commercial uses within the twelve buildings and accessed by an isolated arterial route.

Similarly, office land uses generally comprise of large office complexes, with office only uses such as the office buildings downtown or Tunney's Pasture Complex as an example. Given that the office land uses will be scattered within site buildings and will normally be dispersed in smaller blocks throughout, a more local attraction or flexible space use for residents is appropriate. To better represent the more locally targeted commercial and office uses, a direct reduction in people trips of 40% and 10% respectively was deemed appropriate. Note that further discussion regarding pass-by trips and internally reduced have been provided in following "Further Assumptions" below and **Table 8**.

Using the TRANS Trip Generation rates, the total amount of person trips generated by the upper limit of 3,200 residential units was calculated. Similarly, using the ITE trip rates, commercial and office vehicle trip generation rates were converted to modified person trips by multiplying them by 1.28 to account for typical North American auto occupancy, transit use and non-motorized mode. This modified person trip was then multiplied by the respective land use size to obtain a person trip. The resultant people trip generation per land use are summarized in **Table 4**.

Table 4: Projected Peak Period Person Trip Generation – TRANS Model 2020 & ITE

Land Use	Land Use Size	AM Peak Period Person Trips	PM Peak Period Person Trips
Twelve Residential Buildings	3,200 units	**2,560**	**2,880**
Commercial Uses	165,000 ft²	*177*	*718*
Commercial Uses 40% Reduction		**106**	**431**
Office Uses	110,000 ft²	*233*	*230*
Office Uses 10% Reduction		**209**	**207**

The projected site peak period person trips for residential uses were then divided based on the mode shares for Orléans according to TRANS 2020 table 5, as summarized in **Table 5**.

Table 5: Residential Peak Period Trips using TRANS 2020 Mode Shares

Travel Mode	AM Peak Period		PM Peak Period	
	Mode Share	Person Trip	Mode Share	Person Trips
Auto Driver	54%	1,386	61%	1,743
Auto Passenger	7%	182	13%	363
Transit	29%	734	21%	604
Cycling	0%	0	0%	0
Walking	10%	258	6%	170
Total Person Trips	100%	2,560	100%	2,880

Standard traffic analysis is usually conducted using the morning and afternoon peak hour trips as they represent a worst-case scenario. The 2020 TRANS Manual uses peak periods which can exceed the peak hours. Table 4 within the 2020 TRANS Manual includes factors for converting peak periods into peak hour traffic volumes as seen in **Table 6**. Note that conversion factors for passenger trips are assumed to be the same as auto driver.

Table 6: Peak Period to Peak Hour Conversion Factor (2020 TRANS Manual - Residential)

Travel Mode	Peak Period to Peak Hour Conversion Factors	
	AM	PM
Auto Driver	0.48	0.44
Passenger	0.48	0.44
Transit	0.55	0.47
Bike	0.58	0.48
Walk	0.58	0.52

Using the peak period to peak hour conversion rates from **Table 6**, the derived peak period trips by mode shares for Orléans, and the inbound and outbound splits from table 9 within the TRANS 2020 Manual, then the residential peak hour trips generated by the site for TRANS 2020 Orléans mode share can be calculated, as seen summarized in **Table 7**.

Table 7: Residential Peak Hour Trips Generated Using TRANS 2020 Mode Shares

Travel Mode	Mode Share	AM Peak Hour (Trips/h)			Mode Share	PM Peak Hour (Trips/h)		
		In	Out	Total		In	Out	Total
Auto Driver	54%	194	432	626	61%	418	303	721
Auto Passenger	7%	25	57	82	13%	87	63	150
Transit	29%	118	262	379	21%	155	112	267
Cycling	0%	0	0	0	0%	0	0	0
Walking	10%	44	97	141	6%	48	35	83
Total Person Trips	100%	381	847	1,228	100%	708	513	1,221
Total 'New' Residential Auto Trips		**194**	**432**	**626**	-	**418**	**303**	**721**

Mode Share Assumptions:

The site is located within 450 to 800m radius to future Trim LRT Station. Since the last submission of this report in September of 2023, it is now understood that the active transportation bridge over H174 has been confirmed and that a new Multi-Use Pathway (MUP) will connect this bridge to the development following a corridor between H174 and Centre des Métiers Minto Campus (refer to Section 2.1.3.). With this new bridge and MUP connection, the majority of units will be located within a 600m walk to the Trim LRT Station and at the furthest locations, up to 850m walk, encouraging transit-oriented trips and a reduction in forecasted vehicular trips. Note that the highest density and height buildings are proposed closest to the MUP and LRT Station.

The proposed mode shares for each land use have been summarized in **Table 8**.

Table 8: TRANS and Proposed Mode Shares for Each Land Use

Land Use	Travel Mode	TRANS Mode Share		Proposed Mode Share	Proposed Modal Share Rationale
		AM	PM	AM & PM	
Residential	Auto Driver	54%	61%	35%	The site will be within 450 to 850m walk to high quality transit (LRT) with the proposed new MUP and active transportation bridge over H174. A large shift from driving alone to transit is anticipated. The site is located near MUPs and cycling trails which may promote cycling for those who commute within Orleans. Walking trips may be a little far removed for major destinations.
	Auto Pass.	7%	13%	10%	
	Transit	29%	21%	45%	
	Cycling	0%	0%	5%	
	Walking	10%	6%	5%	
Commercial	Auto Driver	77%	71%	25%	This development is not located adjacent to a major commuter arterial road. It is unlikely that people will significantly divert their driving trips to this location. Currently, there are over 10,000 new residential units proposed within a 1km radius, with Petrie's Landing I, II and III, 1009 Tweddle, etc., which would attract walking trips.
	Auto Pass.	14%	20%	5%	
	Transit	3%	2%	35%	
	Cycling	0%	1%	5%	
	Walking	6%	5%	30%	
Office	Auto Driver	71%	71%	40%	The site will be within 450 to 850m walk to high quality transit (LRT) with the proposed new MUP and active transportation bridge over H174. A large shift from driving alone to transit is anticipated. The site is located near MUPs and cycling trails which may attract some trips from within Orleans. Some residents from nearby high-density developments may walk to an office space at the site.
	Auto Pass.	6%	6%	6%	
	Transit	13%	13%	44%	
	Cycling	1%	1%	5%	
	Walking	8%	8%	5%	

Further Assumptions:

As described previously in this module, a 40% reduction in people trips for commercial uses and 10% reduction in people trips for office uses was deemed appropriate given their context as ancillary uses within local community of residential towers and its site context abutting an arterial road which does not provide significant connectivity to the surrounding neighborhoods or functions as a major commuting route. Neither the

commercial nor the office uses are meant to act as stand-alone regional attractors such as a large shopping center or a large office complex.

The commercial and office elements of the proposed development are intended primarily to serve locally within this development and nearby high-density developments such as Centre des Métiers Minto adjacent to the site, future proposed development at 1009 Tweddle Road, Petrie's Landing I and II, and adjacent Taylor Creek community.

Given the mixture of land uses proposed onsite, an internal reduction rate was applied based on mixed-use parameters described in Section 6.5 of the ITE Trip Generation Manual 3rd Edition, to account for multi-purpose trips such as a local resident shopping within the development prior to travelling to work. These trips may be reduced to eliminate potentially double counted trips, which has been incorporated in the trip generation tables that follow. The base calculation for determining the quantity of internal reductions has been provided in **Appendix E.**

Pass-by trips were also considered for commercial uses. Pass-by trips are intermediate trips along the original route between the primary origin and destination, such as a trip to retail within this site between an origin and destination trip that is not within this site. These are not considered 'new' trips, but existing trips already on the network. Appendix E of the ITE Trip Generation Manual 3rd edition was used to determine pass-by rates. Pass-by trips were calculated after the internal reduction factor was applied. Note that a slightly lower than recommended pass-by trip for commercial uses was used given that Jeanne d'Arc Blvd adjacent to the site does not provide direct connectivity serving large communities and overall traffic volumes on Jeanne d'Arc Blvd are low, providing a low pool of vehicles which may produce a pass-by trip.

Modified Trip Generation Based on Assumptions

The following **Table 9** for residential trips, **Table 10** for commercial trips and **Table 11** for office trips have been derived using people trips from **Table 4**, mode shares from **Table 8**, and future assumptions as described above.

Table 9: Residential Peak Hour Trips Generated – Proposed Mode Shares

Travel Mode	Mode Share AM & PM	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	35%	140	310	450	248	178	426
Pre-Internal Reduction		*142*	*315*	*457*	*264*	*191*	*455*
Vehicles Reduced		*-2*	*-5*	*-7*	*-16*	*-13*	*-29*
Auto Passenger	10%	40	90	131	75	55	130
Transit	45%	182	405	588	339	245	585
Cycling	5%	20	45	65	38	27	65
Walking	5%	20	45	65	38	27	65
Total Person Trips	100%	405	901	1,306	753	546	1,299
Total 'New' Residential Auto Trips		**140**	**310**	**450**	**248**	**178**	**426**

Table 10: Shopping Center Peak Hour Trips Generated – Proposed Mode Shares

Travel Mode	Mode Share	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	25%	11	6	17	43	41	84
Pre-Internal Reduction		*17*	*11*	*28*	*52*	*57*	*109*
Vehicles Reduced		*-6*	*-5*	*-11*	*-9*	*-16*	*-25*
Auto Passenger	5%	4	2	6	10	12	22
Transit	35%	22	14	36	72	78	150
Cycling	5%	3	2	5	10	11	21
Walking	30%	19	12	31	62	67	129
Total Person Trips	100%	59	36	95	197	209	406
Less Pass-by 0% AM (25% PM)		0	0	0	-11	-11	-22
Total 'New' Shopping Center Auto Trips		**11**	**6**	**17**	**32**	**30**	**62**

Table 11: General Office Peak Hour Trips Generated – Proposed Mode Shares

Travel Mode	Mode Share	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	40%	69	8	77	5	64	69
Pre-Internal Reduction		*74*	*11*	*85*	*14*	*69*	*83*
Vehicles Reduced		*-5*	*-3*	*-8*	*-9*	*-5*	*-14*
Auto Passenger	6%	11	2	13	3	11	14
Transit	44%	80	11	91	15	75	90
Cycling	5%	9	1	10	2	9	10
Walking	5%	9	1	10	2	9	10
Total Person Trips	100%	178	23	201	27	168	193
Less Pass-by 0% AM (0% PM)		0	0	0	0	0	0
Total 'New' General Office Auto Trips		**69**	**8**	**77**	**5**	**64**	**69**

The combined trips generated at full buildout using the proposed mode shares, assuming direct connectivity to LRT via a new MUP and active transportation bridge over H174 can be found on **Table 12**.

Table 12: Total Combined Trips Generated – Proposed Mode Shares

Travel Mode	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
	In	Out	Total	In	Out	Total
Auto Driver	220	324	544	296	283	579
Pre-Internal Reduction	*233*	*337*	*570*	*330*	*317*	*647*
Vehicles Reduced	*-13*	*-13*	*-26*	*-34*	*-34*	*-68*
Auto Passenger	55	94	150	88	78	166
Transit	284	430	715	426	398	825
Cycling	32	48	80	50	47	96
Walking	48	58	106	102	103	204
Total Person Trips	640	955	1,595	961	910	1,869
Less Pass-by AM (PM)	0	0	0	-11	-11	-22
Total 'New' Combined Auto Trips	**220**	**324**	**544**	**285**	**272**	**557**

As shown in **Table 12,** based on the understanding that a pedestrian and cyclist connectivity plus a bridge to Trim LRT Station will be provided, reducing walking distances to approximately 450 to 850m to the LRT Station, then the proposed site is projected to generate approximately 545 to 555 new auto-trips per hour during the weekday commuter peak hours if the proposed twelve buildings with ground retail and office uses were built.

The increase in two-way transit trips is estimated to be approximately 715 to 825 persons per hour, and the increase in walk/cycling trips is approximately 185 to 300 persons per hour during the peak hours.

If a direct connection to the future Trim LRT Station is not achieved, it is forecasted that a larger percentage of people will drive and fewer would take transit, with forecasted vehicular volumes of 855 to 880 during the peak hours (using TRANS mode shares), an increase in vehicles of approximately 315 to 325 more vehicles during the AM and PM peak hours respectively.

3.1.2. TRIP DISTRIBUTION

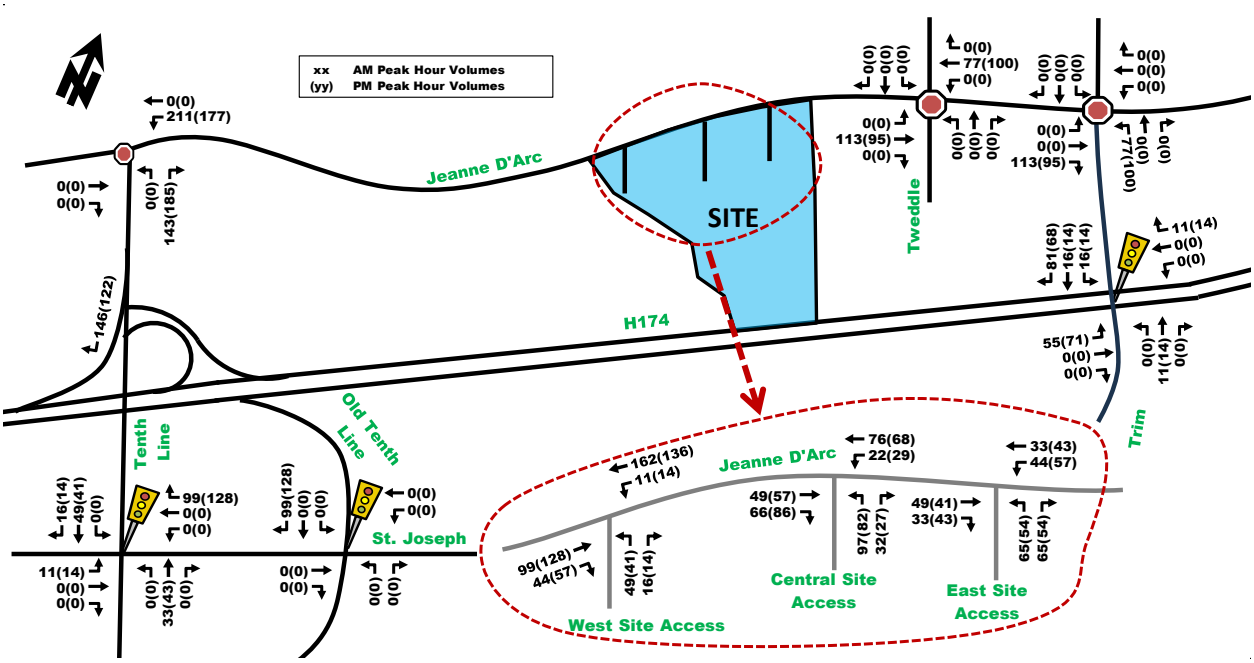
Based on the OD Mode Share Survey, existing traffic volume counts and the location of adjacent arterial roadways and neighborhoods, the distribution of site-generated traffic volumes has been illustrated in **Figure 19**.

Figure 19: Site Generated Traffic Percent Distribution

3.1.3. TRIP ASSIGNMENT

Figure 20 illustrates 'new' site-generated vehicle trips from Table 12 which reflect the addition of a direct connectivity from the development to the LRT Station. Note that negative numbers reflect pass-by trips.

Figure 20: 'New' Site-Generated Traffic - Direct Connection to LRT



3.2. Background Network Travel Demands

3.2.1. TRANSPORTATION NETWORK PLANS

As mentioned in **Section 2.1.3** Planned Conditions, the Stage 2 LRT expansion is currently underway, with estimated completion of Trim LRT Station by early 2025. located within 450m to 800m radius of the site.

For further detail, refer to **Section 2.1.3**.

3.2.2. BACKGROUND GROWTH

The emphasis in the New Official Plan and 2013 Transportation Master Plan (and is expected to remain a key objective in the ongoing TMP update) is to prioritize transit, encourage intensification around transit stations, encourage mixed-use developments and provide "complete streets" that better accommodate the active transportation needs of its residents and reduce the use of the private auto.

Once Stage 2 LRT extension is completed, approximately 77% of Ottawa residents will be within 5km of light rail[5]. More specifically, this development and nearby developments will be located even closer to LRT, with this development located within 450 to 800m radius from future Trim LRT Station. This large improvement in transit facilities will likely result in more transit related trips and fewer vehicle related trips within the study area.

The following background traffic growth (summarized in **Table 13**) was calculated based on historical traffic count data (years 2010, 2012, and 2017, 2023 and 2024) provided by the City of Ottawa at the Trim/H174 intersection near the site. Detailed background traffic growth analysis is included as **Appendix F**.

[5] https://ottawa.ca/en/planning-development-and-construction/major-projects/stage-2-light-rail-transit-project/overview#section-74f946f7-8138-491b-a748-f8e569072c88

Table 13: Trim/H174 Historical Background Growth (2010-2024)

Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	1.62%	-3.66%	-1.70%	-3.76%	**-2.71%**
AM Peak	4.45%	-3.56%	-1.06%	-3.13%	**-2.13%**
PM Peak	4.21%	-3.48%	-1.92%	-4.63%	**-2.92%**

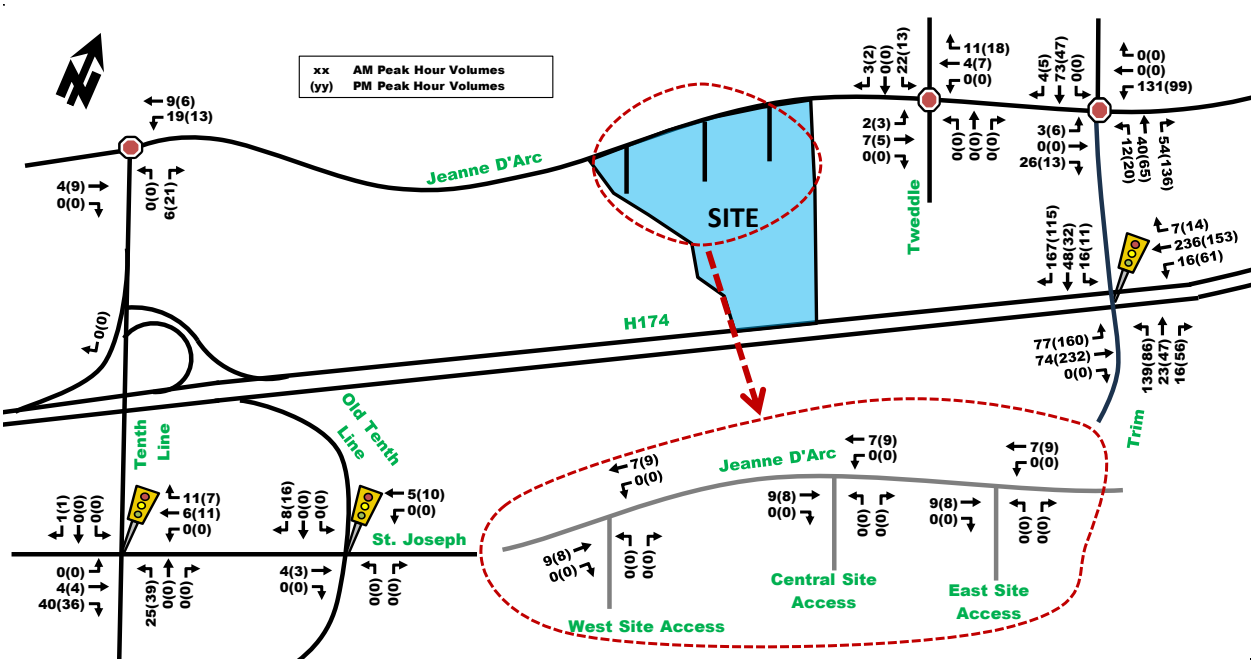
As shown in **Table 13**, the H174/Trim intersection has experienced negative growth over the years. The data overall suggests an increase in volumes at the north leg which can be explained by the new Brigil Towers from Petrie's Landing I, and a decrease in all other movements. It is acknowledged that Jeanne d'Arc Blvd will continue to experience growth due to substantial new developments, but these will be layered on individually.

Given the current trends observed in **Table 13**, future forecasted reduction in vehicle usage due to City wide transit and cycling initiatives, improvements to high quality LRT near the site and the lasting Covid-19 work from home/flexible work schedule, then a 0% annual growth rate (plus layering of other known developments) is adequate and may even represent a conservative assumption. Known other area developments will be manually added to study area intersections.

3.2.3. OTHER DEVELOPMENTS

The volumes from the other area development as mentioned in **Section 2.1.3** were layered onto the existing traffic volumes for the future analysis volumes. It is acknowledged that there are some areas remaining which may be developed at a future date, as shown in **Figure 24** and provided in **Appendix D. Figure 21** illustrates the site generated volumes for other area developments including the remainder of Petrie's Landing I and II, remainder of Cardinal Creek, Phoenix Developments, 265 Centrum, and 3277 St. Joseph.

Figure 21: Other Area Development Background Volumes



Some developments are located within two shown intersections, resulting in the appearance of unbalanced volumes.

3.3. Demand Rationalization

Within the past few years, major changes have occurred within the City of Ottawa, affecting travel patterns and transportation demand.

The Covid-19 pandemic has had long-lasting effects on work culture, reducing many former traditional AM peak and PM peak hour work commute trips. Some trips have been eliminated altogether by people who have decided to continue to work from home. Others have adopted a more flexible work schedule, reducing pressures on the peak hour demands. Although some have begun to return to offices and places of work, it has become evident that a full return to in-person work is not likely.

In 2017, the City of Ottawa completed Stage 1 LRT which provided a large improvement to rapid transit; however, it did not provide a seamless connectivity to Orléans, requiring transit users to transfer at Blair Station and continue their commute on a bus. By early 2025, Stage 2 LRT expansion is anticipated, which would eliminate the need to transfer from LRT to a bus and highly improve the commute experience. Once Stage 2 LRT is complete, a much larger shift in vehicle users to transit users is forecasted for the Orléans district.

More specifically, this development is located within 800m radius of one of the Stage 2 LRT stations, Trim Station. The station is proposed within the median of the eastbound and westbound highway travel lanes. The original design of the station only includes a connection to the southern side of the highway, resulting in a walking distance from the site to the LRT Station of more than 1,300m walk. Given the large population growth proposed north of the highway with this development, Petrie's Landing I, 1015 Tweddle Rd and the college, a plan to provide a new connection from the north side of the highway to the LRT Station is proposed and considered essential to support these developments. This new bridge connection would then reduce the walking distance from this development to the LRT Station to within 450 to 850m. These improvements in connectivity from nearby high-density developments to the LRT Station will leverage rapid transit and reduce overall reliance on personal motor vehicles.

The background growth projections as discussed in **Section 3.2.2.** support the changes to work environment and city-wide transit initiatives. Once Stage 2 LRT is complete, an even further reduction in background volumes is anticipated, which could result in further reductions in background volumes. For this reason, a 0% background volume growth is not only justified, but it may even be considered conservative. Known other future development volumes will be layered on individually to account for their influence. Sufficient capacity is anticipated throughout the study area.

4. Strategy Report

4.1.1. DESIGN FOR SUSTAINABLE MODES

Location of Transit Facilities

A large portion of the site is within 600m radius of the future Trim LRT Station which is forecasted to be operational by early 2025. However, H174 provides a large physical barrier from the site to the LRT Station using existing infrastructure, resulting in walking distances of approximately 1.2 to 1.7km walk which would severely impact the attractiveness of transit ridership for this development.

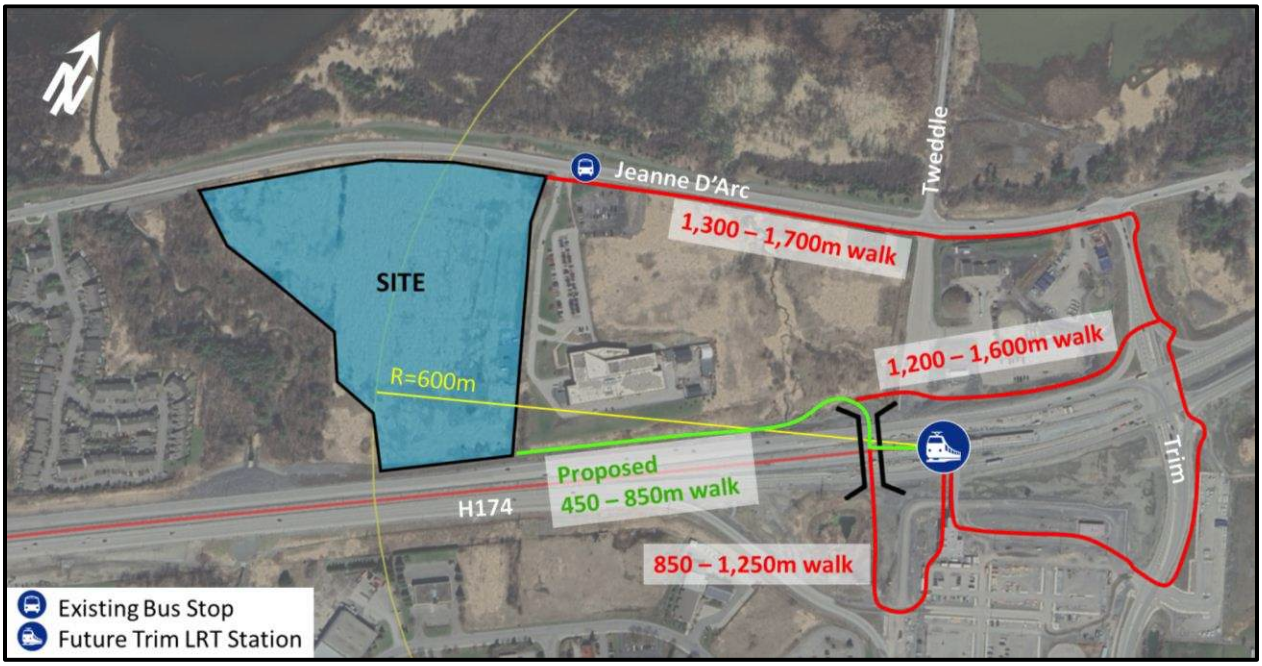
To reduce the required walking/biking distance to and from the site and LRT Station, a bridge and a MUP along the north side of H174 has been proposed and considered fundamental to support this development and adjacent major developments. At the time this report was written, bridge piers for this active transportation link have been built, located just west of the LRT Station and approximately 35m west of Tweddle Rd. While conversation with the Active Transportation Planning Group could not confirm if the bridge would provide a direct connection to the LRT Station, this report assumes that this direct connection **will be provided** to meet city policy within the Official Plan, the Orleans Corridor Secondary Plan, the New Transportation Master Plan and other guiding policies. A direct connectivity from the bridge down to the LRT Station would result in walking distances from anywhere within the site to the LRT Station of approximately 450 to 850m which is consistent

with a transit-oriented development (TOD). **Figure 22** illustrates the location of the proposed active transportation bridge and possible routes from the site to the LRT Station.

To provide the best benefits to both the local community (such as those biking to Petrie Island or the Ottawa River Pathway), the college, this development and other large nearby developments (approximately 6,000 units proposed north of the highway and within TOD potential), then **it is highly recommended that the future active transportation bridge provide:**

1. **A complete north-south crossing of H174 that is open to the public (is not part of a transit fare paid zone).**
2. **A direct connection to the LRT Station through a fare gate that does not disrupt through flow for active users. An elevator should be considered for accessible users down to the LRT Station.**
3. **A ramp on both sides of the highway which has accessible grades that can be used by all users including cyclists and wheelchair users.**

Figure 22: Walking Scenarios to Trim LRT Station



The subject site has existing bus stops located near the northeast quadrant of the site, located near the driveway to Centre des Métiers Minto and also approximately 200m to the west of the site near the Parkrose Private access, servicing local route 38. The distance between these bus stops is approximately 580m. Based on the separation between bus stops and the likely high demand for transit for this development, a new bus stop is recommended fronting the site. Based on the separation between stops, a new stop located close to the center site access is recommended, which would be located approximately 200m west of the existing stop serving Centre des Métiers Minto. Refer to **Section 4.5** for supportive development design and infrastructure checklist to promote alternate modes of transportation.

Pedestrian/Cycling Routes and Facilities

The latest site concept proposes internal walkways that permeate the site, providing connectivity from all buildings to sidewalk infrastructure within the site and connecting to the external site network. The Orléans Corridor Secondary Plan proposes physically separated cycling facilities on Jeanne d'Arc Blvd from the western edge of the site to the recently built MUP on the east side of Tweddle Road. An additional MUP already exists on the north side of Jeanne d'Arc Blvd.

Based on OTM Book 18, Figure 5.5, and proposed internal roads of 30km/h plus estimated traffic volumes of lesser than 2,500 vehicles per day, per access, then a shared operating space is deemed adequate without the need for a designated biking space or physically separated facilities. This can be reviewed during site plan application to ensure that future conditions still hold.

As mentioned previously and shown in **Figure 22**, a new MUP between Centre des Métiers Minto and north side of H174 is proposed, which would significantly shorten the distance between this development and future Trim LRT Station, given that a new bridge connection to the north is provided.

Internal facilities are anticipated to meet or exceed city design standards and roads are envisioned to be built as complete streets, prioritizing active transportation. **Section 4.1.3.** provides more details on proposed road and active transportation infrastructure.

Bicycle Parking

Bicycle parking is anticipated to meet or exceed the minimum by-law. Further details will be available during Site Plan Application process.

4.1.2. CIRCULATION AND ACCESS

Exempt, refer to **Table 2**.

4.1.3. NEW STREETS NETWORK

The new roads proposed along with their designation for the development have been illustrated in **Figure 23** and described below. The internal site roads are all proposed as 30km/h streets, designed in accordance with the Local Residential Street 30km/h Design Toolbox. Three internal intersections have been proposed as possible candidates for raised intersection treatment to promote traffic calming at pedestrian crossing locations, as shown in **Figure 23**. A Geometric Road Design Drawing (GRDD) has been provided in **Appendix G**, which includes large vehicle turning templates. The GRDD has been designed to accommodate MSU type trucks meeting at the public road curves without overlapping sweep paths, however larger HSU trucks would overlap if they encountered each other at the same time. Based on the size of commercial units envisioned and condo units normally being smaller than a single detached home, it is not expected that a large quantity of HSU type trucks will use these roads, and the risk of two HSU trucks meeting at these bends is very unlikely. For this reason, providing the tighter road bends is recommended to promote traffic calming. On-street parking has been proposed at various locations.

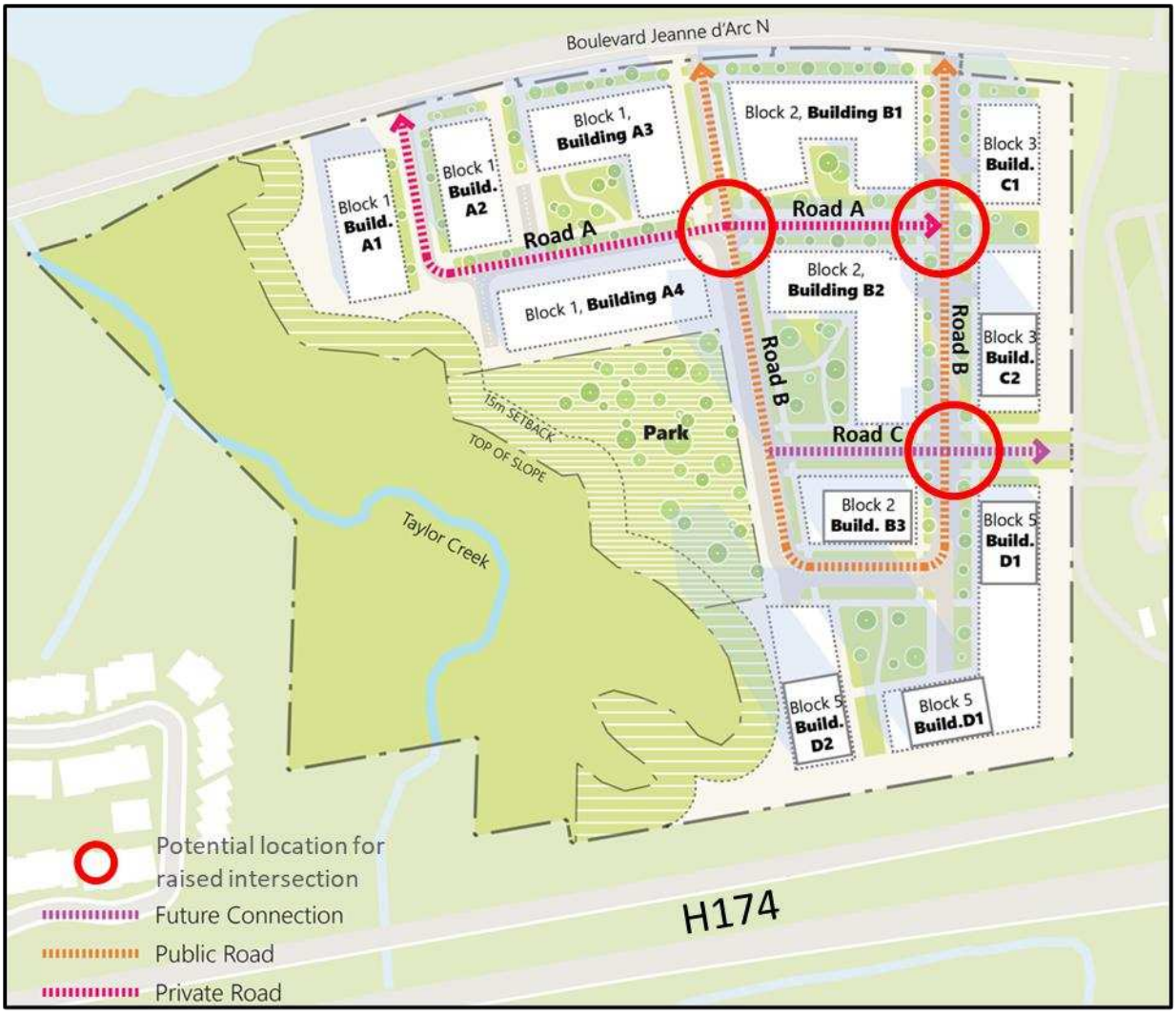
Road A: A private road as shown in red will provide access to the western site access and bisect both sides of the public local road crescent. The private road will be treated like a private laneway with a focus on active transportation and providing limited vehicle access for trucks, deliveries and local resident access. The design of Road A is still being refined and will be confirmed at the Site Plan Control stage.

Road B: A public local road crescent with a 20m right-of-way (ROW) as shown in orange has been proposed, which would provide access to the central and eastern site accesses. The cross-section for the public road has been proposed in accordance with the recently released 2023 City of Ottawa 20m ROW local street cross-section. The 20m City of Ottawa ROW have been provided in **Appendix G** along with the draft Plan of Subdivision schematic**.** As per the City of Ottawa 20m ROW, it will include a single travel lane per direction with periodic bulb-outs for loading or parking for a combined asphalt width of 8.5m. The 20m ROW public road is anticipated to have 2.0m wide sidewalks on both sides of the road and 3.75m of boulevard for landscaping and utility infrastructure.

This road is expected to be designed as 30 km/h residential streets, based on the corresponding City toolbox document, which includes both horizontal and vertical deflections measures such as bulb-outs and speed humps. Traffic calming measures will be confirmed during Site Plan Control stage.

Road C: A future connection to the Centre des Métiers Minto as shown in purple may be provided or may be reserved for active transportation users only. This connection is conceptual at this time and will be confirmed during Site Plan Control stage.

Figure 23: Proposed New Streets Servicing the Site



4.2. Parking

This section is exempt, refer to **Table 2**. To be confirmed during the Site Plan Control application for each future development Phase.

4.3. Boundary Street Design

4.3.1. EXISTING & FUTURE CONDITIONS

The boundary street to the proposed development is Jeanne d'Arc Blvd.

- *Jeanne d'Arc Blvd:*
  - 1 vehicle travel lane in each direction;
  - >2m MUP on north side of road with greater than 8m boulevard separation;
  - 2m sidewalk on south side of road with bike lane boulevard separation;
  - Less than 3,000 vehicles per day existing, assumed exceeds 3,000 in future;

- Posted speed 60km/h (used 70km/h);
- Classified as major collector roadway;
- Classified as future spine route. Existing curbside bike lanes and paved shoulder. Assumed physically separated bike lanes in future as per Orléans Corridor Secondary Plan; and,
- Not identified as a Truck Route.

The proposed site is located within 600m of a rapid transit and not within 300m of a school. Multi-modal Level of Service analysis for the subject road segments adjacent to the site is summarized in **Table 14** with detail analysis provided in **Appendix H**.

Table 14: MMLOS – Boundary Street Segments Existing and Future Conditions

Road Segment	Level of Service							
	Pedestrian		Bicycle		Transit		Truck	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target
Jeanne d'Arc North Side Existing	F	A	C	B	D	N/A	C	N/A
Jeanne d'Arc South Side Existing	B	A	C	B	D	N/A	C	N/A
Jeanne d'Arc South Side Future	E	A	A	B	D	N/A	C	N/A

Pedestrian

Neither existing nor future Jeanne d'Arc Blvd road segment met the pedestrian PLoS targets due to the 60km/h posted speed limit. The MUP north of Jeanne d'Arc Blvd was omitted from analysis given its distance from the roadway, however it would still not meet the ambitious PLoS target 'A' driven by its proximity to LRT Station. To achieve a PLoS 'A' in future conditions, the posted speed would need to be reduced to 30km/h and verified compliance using a speed test.

Bicycle

If the speed limit was reduced to 50km/h and verified compliance using a speed test, then both sides of the road would meet the BLoS targets in existing conditions. The BLoS target is met using future conditions.

Transit

Jeanne d'Arc Blvd is not part of a transit priority corridor.

Truck

Jeanne d'Arc Blvd is not part of a truck route.

4.4. Access Intersection Location

As per the new City of Ottawa TIA Guidelines revisions from June 14, 2023, this module has been compressed and former sections 4.4.2 Access Control and 4.4.3 Access Design have been moved to sections 4.9.1 and 4.9.2 respectively. This module will focus on the location of the future access intersections.

As previously discussed in **Section 4.1.3**, the development is proposing three new access to Jeanne d'Arc Blvd. The easternmost driveway is proposed as a public road along with the center access, and the western access is proposed as a private road. From east to west, the accesses will have a separation of approximately 100m from east to center access and 120m from center to western access. The type of access control will be determined in **Section 4.9.1.**

Although the quantity of parking spaces is not yet known at this time, it can be assumed that the development will provide more than 300 parking spaces. According to the City of Ottawa Private Approach By-Law Section 25, if a site has more than 300 parking spaces, a minimum distance between the private approach and signalized intersection is 75m. In the unlikely event that an access needs to be signalized, the distance between each access is greater than 75m and would thus satisfy the Private Approach By-Law.

4.5. Transportation Demand Management

4.5.1. CONTEXT FOR TDM

It was assumed that trips generated by the proposed development will have a general balanced inbound and outbound distribution during peak hours. Residents are more likely to leave the site in the morning peak period to go to work and return from work in the afternoon peak period, while office uses are likelier to arrive in the morning peak period and depart in the afternoon. Commercial users will likely come and go throughout the day, with a heavier influence in the afternoon peak period.

Sections 3.1.1 and 3.1.2 describe how many trips are anticipated per travel mode and anticipates the likely locations that they will travel to and from based on the OD-Survey 2011 for Orléans. The site is located between 450 to 800m from future Trim LRT Station, making it a great candidate for transit-oriented travel. Additionally, shared parking provisions for residential/commercial/office uses could reduce the overall need for quantity of parking provided, given that commercial parking likely occurs at different times than residential visitor parking and office patrons.

4.5.2. NEED AND OPPORTUNITY

With investments in rapid transit within walkable distance, the site has a good opportunity to levy this upcoming service and help reduce its environmental footprint and congestion throughout the city. A strong focus on TDM measures to encourage sustainable active mode shares is highly recommended.

4.5.3. TDM PROGRAM

The TDM infrastructure and measures checklist has been completed as a recommended draft list given that this is a zoning by-law application and not a detailed Site Plan Application (SPA). These checklists will be revisited during SPA submission for each phase of development. The draft measures have been provided in Appendix I.

Regarding the TDM Supportive Development Design and Infrastructure Checklist:

- All ten (10) Required measures related to walking and cycling (facilities and bicycle parking) and vehicle parking are anticipated to be satisfied.
- Thirteen (13) of fourteen (14) Basic measures related to walking and cycling, transit, ridesharing and parking are anticipated to be satisfied or are not applicable.
- Five (5) of the of the seven (7) candidate Better measures are also proposed or are non-applicable, including:
    - Providing bikeshare and rideshare facilities.
    - Separate long-term and short-term parking areas.

Regarding the TDM Measures Checklist, the developer has indicated there is a willingness to consider the following measures:

- Six (6) out of seven (7) “basic” measures related to walking, cycling, transit, parking and TDM marketing will likely be satisfied. Three (3) of those, which have been designated by an asterisk (*), are considered by the TDM Measures to be some of the most dependably effective tools to encourage sustainable travel modes. This includes:
    - Designate an internal coordinator or contract with external coordinator.
    - Display walking and cycling information at major entrances.
    - Display transit information at major entrances.
    - *Offer preloaded PRESTO card to residents with one monthly transit pass.
    - * Unbundle parking costs from monthly rent.
    - * Provide multi-modal travel information package to new residents.
- Six (6) out of eleven (11) “better” measures related to walking, cycling, transit, parking and TDM marketing will likely be satisfied. One (1) of those, which has been designated by an asterisk (*), is

considered by the TDM Measures to be some of the most dependably effective tools to encourage sustainable travel modes. This includes:

- Contract with provider to install on-site bikeshare and carshare.
- Offer on-site cycling courses for residents or subsidize off-site courses.
- *Offer personalized trip planning to new residents.
- Conduct periodic surveys to identify travel related behaviors.

4.6. Neighborhood Traffic Management

4.6.1. ADJACENT NEIGHBORHOODS

There are no adjacent neighbourhoods with local or collector roads which would provide commuter routes for this development. Jeanne d'Arc Blvd is a major collector road with no direct frontage homes which will provide direct access to H174. This section is therefore exempt.

Although not an adjacent neighbourhood and rather an internal site road, the new public local road loop will be designed as a 30km/h residential street, including speed humps and bulb-outs as well as on-street parking as traffic calming methods (as discussed in **Section 4.1.3.**). The internal roads are short in distance and have various curvatures and features to dissuade speeding within the site. The internal roads do not provide connectivity to any other city road or developments, mitigating any risk of traffic infiltration or shortcutting through the site. As such, the local road classification for the new public street was considered appropriate.

4.7. Transit

4.7.1. ROUTE CAPACITY

Section 3.1.2 projects approximately 715 to 825 two-way transit trips for the AM and PM peak hours respectively. While a MUP and bridge over H174 is proposed, it is crucial that a direct connection between the bridge and Trim LRT Station be provided. It is assumed that this direct connection will be provided, with all buildings to be within a 450 to 850m walking distance to the LRT station which is considered a very reasonable walking distance for most abled people. Should the bridge only cross to the southern side of H174 and require transit users to then walk around the station fences and back north to the LRT Station, then this walking distance would be further increased resulting in a less attractive transit option. A design without a direct connection to the LRT Station would not be in support of city's guiding policies surrounding a PMSTA area (Schedule C1 – Official Plan). It is noteworthy that the highest densities proposed within the site are all located on the southeast quadrant of the site, closest to the LRT Station.

The OC Transpo website suggests that the Confederation Line will have a capacity of 600 passengers per train with a headway of 12 trains per hour, resulting in a capacity of 7,200 passengers per hour per direction. It is important to note that of the forecasted trips, some will be headed towards Trim Station while others will be departing this station. Based on the projected capacity of the Confederation Line, there should be sufficient capacity to accommodate all transit trips. Additional capacity is available on local bus route #38 and other buses operating out of Trim Station.

4.7.2. TRANSIT PRIORITY

Jeanne d'Arc Blvd is not part of a transit priority corridor. The intersections from the site to Jeanne d'Arc Blvd are anticipated to be stop controlled on the site access and free-flow on Jeanne d'Arc Blvd, thus not significantly affecting bus travel times.

The Confederation LRT Line is grade separated from all intersections and will not be affected by vehicular traffic generated by the site.

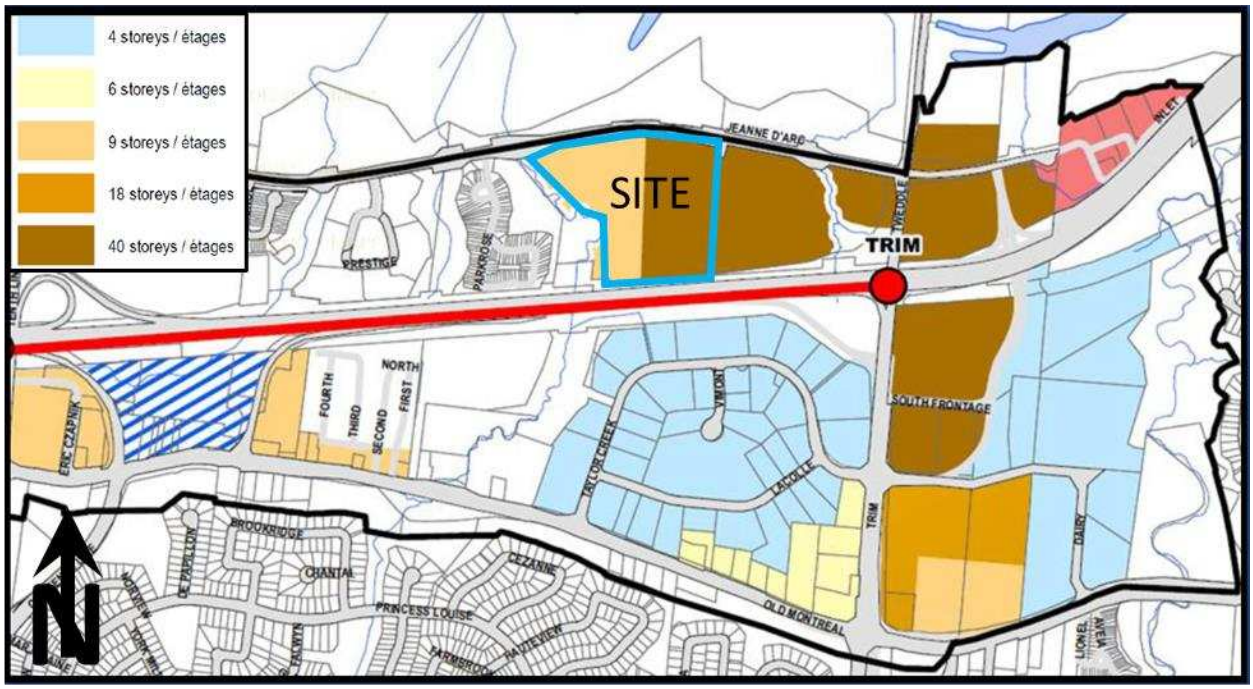
4.8. Review of Network Concept

The proposed site is currently zoned as DR (developmental reserve) which allow buildings up to 3-storeys or 11m high. All buildings will exceed 3-storeys high, and given the densities proposed, the development will exceed 200 peak hour person trips more than the equivalent volume permitted by the established zoning.

Although there will be an increase in people trips by the new development, far exceeding the current established zoning, it does fit within the Orléans Corridor Secondary Plan and Official Plan guidelines context. Within the Official Plan for the City of Ottawa, the site is located in a Protected Major Transit Station Area (PMTSA), and within the Orléans Corridor Secondary Plan, the eastern half of the site is located within a Station Core Zone, which have targets for providing high density near these major transit hubs.

In addition, within the Orléans Corridor Secondary Plan, the eastern half of the site has been denoted as a zone allowing 40-storey high buildings, and the western half with 9-storey buildings allowed, as seen in **Figure 24** (and provided in high definition in **Appendix D**). The latest site concept for this development as shown in **Figure 2** proposes buildings with maximum heights consistent with the secondary plan.

Figure 24: Orléans Corridor Secondary Plan Maximum Building Heights



Given the site's context, with the proposed MUP and bridge connection from the site to the future Trim LRT Station via the north side of H174, achieving a walking distance of 450 to 850m to high quality rapid transit facilities, then the scale of this development is considered adequate and aligns with City of Ottawa's long term planning vision.

4.9. Intersection Design

4.9.1. INTERSECTION CONTROL

A traffic signal warrant for the three site intersections was completed and the need for traffic signals at any of the site accesses was not warranted. A further analysis determined that even if all in and out vehicle traffic from the site was combined into a single access, the need for traffic signals would still not be warranted.

Similarly, an all-way-stop-control (AWSC) warrant was performed at all site access intersections, where none of the locations meet any of the AWSC warrant unless all vehicular traffic was forced into a single access. **Section**

4.9.3. will assume that all study area intersections will be kept as unsignalized intersections with stop control on the southern leg. If intersection operations are subpar, or the need for a controlled pedestrian crossing of Jeanne d'Arc Blvd is deemed necessary to access westbound transit stop for example, then consideration for AWSC or signalized intersection will be further explored.

It's recommended that each individual Site Plan Application reassess the need for a revised intersection control. All warrant analysis has been provided in **Appendix J** and a brief summary in **Table 15**.

4.9.2. INTERSECTION DESIGN

The internal roads have been designed to city's standard for a 30km/h residential street as shown in **Appendix G**. Auxiliary left-turn lane warrants were reviewed using the Geometric Design Guide Part 3 Nomographs (MTO left-turn warrant), with detailed analysis in **Appendix K** and a brief summary in **Table 15**. Overall, it was found that none of the three accesses suggest the need for an auxiliary lane.

There may be consideration for a right-turn storage/deceleration lane, particularly at the central access which forecasts approximately 100 right-turns during the PM peak hour. However, the site context and low through volumes may negate the need for this storage lane. Further review for the need of right-turn lanes is recommended during Site Plan Application.

The upcoming analysis will assume no auxiliary right-turn or left-turn lanes will be provided, resulting in a more conservative analysis. The outcome of the intersection capacity results in this study (**Section 4.9.3**) will further confirm the auxiliary lane requirements based on a capacity and delay perspective.

Potential implications related to future driveways to the subject site and site access to Jeanne d'Arc Blvd (such as truck movements) will be reviewed during the Site Plan Control application for each individual phase of development.

Table 15: Warrant Analysis Summary Table

Warrant Type	Intersection Location			
	West	Center	East	Combined
Signal Warrant	31% No	31% No	27% No	60% No
All-Way-Stop-Control Warrant	33% No	79% No	78% No	153% Yes
Left-Tum Lane Storage Warrant	0m	0m	0m	-

Based on the Ontario Traffic Manual (OTM) Book 15, Figure 2, there may be a need for a pedestrian crossing referred to as a PXO. Even if the pedestrian volumes crossing Jeanne d'Arc Blvd do not meet the initial flow chart required volumes, the site still has a strong pedestrian desire line to and from the north side of the road, to either access the westbound transit bus stop or the multi-use pathway north of the Jeanne d'Arc Blvd. Table 7 within the OTM Book 15 was then used to determine which type of PXO would be most appropriate.

At this time, it is assumed that the 60km/h speed limit will be retained in the future, the crossing would be for a 2-lane cross-section road and the daily two-way vehicular volume will be greater than the 4,500 lower bound, resulting in the need for a level 2 Type B PXO treatment. A Type B PXO includes rectangular rapid flashing beacons with tell-tale, no passing zone and warning sign for pedestrian ahead. **Appendix L** includes the decision-making tool and sample Type B PXO treatments for mid-block and at an unsignalized intersection.

Alternatively, one of the three intersections could be converted to an all-way-stop-controlled (AWSC) intersection which would provide pedestrian crossing and traffic calming on Jeanne d'Arc Blvd along the site boundary. Based on an initial review, the center access might be the better location for an AWSC between the three accesses, as it provides a central crossing point for the site and provides the best separation between the two adjacent existing bus stops on Jeanne d'Arc Blvd serving Centre des Métiers Minto and Parkrose Pvt.

Multi-Modal Level of Service

Only signalized intersections are considered for the intersection Level of Service measures in the MMLOS Guidelines. The MMLOS analysis is summarized in **Table 16**, with detailed analyses provided in **Appendix M**.

Table 16: MMLOS – Existing and Future Intersection Conditions

Intersection	Level of Service							
	Pedestrian		Bicycle		Transit		Truck	
	pLoS	Target	bLoS	Target	tLoS	Target	TkLoS	Target
Trim/H174	F	A	D	C	F	N/A	A	D
Tenth Line/St. Joseph	F	C	F	C	F	N/A	A	D
Old Tenth Line/St. Joseph	F	C	E	C	-	N/A	A	D

Pedestrian

- No signalized intersection within the study area met the desirable pedestrian target. All intersections had a pLoS of 'F' predominantly based on the number of lanes that would need to be crossed for pedestrians (note that the number of lanes was determined from dividing the crossing distance by 3.5m and not by actual visible lanes). No mitigation would lower the pLoS to a level close to the desired MMLOS target without significantly reducing the vehicle capacity.

Bicycle

- No intersection met the bicycle minimum desirable target of bLoS 'C'. All intersections had at least one approach using mixed cycling facilities. If cycling facilities were provided at all intersection legs, including reducing the length of right-turning vehicle space to pocket bike lane conflict zone and left-turn treatments provided, then the bLoS target would be met.

Transit

- No intersection had transit priority corridors or measures, and as such, no tLoS minimum desirable target has been set.

Truck

- The truck TkLoS minimum desirable target was met at all study area intersections.

4.9.3. INTERSECTION PERFORMANCE

Existing Conditions

The following **Table 17** provides a summary of the existing traffic operations at the study area intersection based on volumes from **Figure 8** and Synchro (V11) traffic analysis software. The subject intersections were assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The Synchro model outputs of existing conditions are provided within **Appendix N**.

Table 17: Existing Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Signalized Intersections						
Trim/H174	B(B)	0.63(0.65)	NBL(EBT)	30.5(32.0)	A(B)	0.42(0.62)
Tenth Line/St. Joseph	B(C)	0.70(0.79)	NBT(EBR)	35.9(31.1)	B(B)	0.64(0.66)
Old Tenth Line/St. Joseph	A(C)	0.33(0.75)	SBT(SBT)	16.8(20.3)	A(B)	0.31(0.63)
Unsignalized Intersections						
Trim/Jeanne d'Arc	A(A)	8(8)	NB(NB)	8(7)	A(A)	-
Tweddle/Jeanne d'Arc	A(A)	8(8)	WB(EB)	8(8)	A(A)	-
Tenth Line/Jeanne d'Arc	B(B)	10(11)	NB(EB)	9(10)	A(B)	-
Note: Analysis of signalized intersections assumes a PHF of 0.90 and a saturation flow rate of 1800 veh/h/lane.						

As shown in **Table 17**, all the intersections within the subject area are currently operating 'as a whole' at good LoS 'B' or better during the AM and PM peak hours with 'critical movements' at study area intersections currently operating at a good LoS 'C' or better during both peak hours.

Background Conditions

As discussed in **Section 3.2**, a 0% annual growth factor plus layering of other area developments was used to develop the background traffic volumes. **Figure 25** shows the projected background volumes in the network considering approved and proposed developments within the area. The projected operational results are shown in **Table 18**. The detailed Synchro results can be found in **Appendix O**.

Figure 25: Future 2035 Background Study Area Intersection Volumes

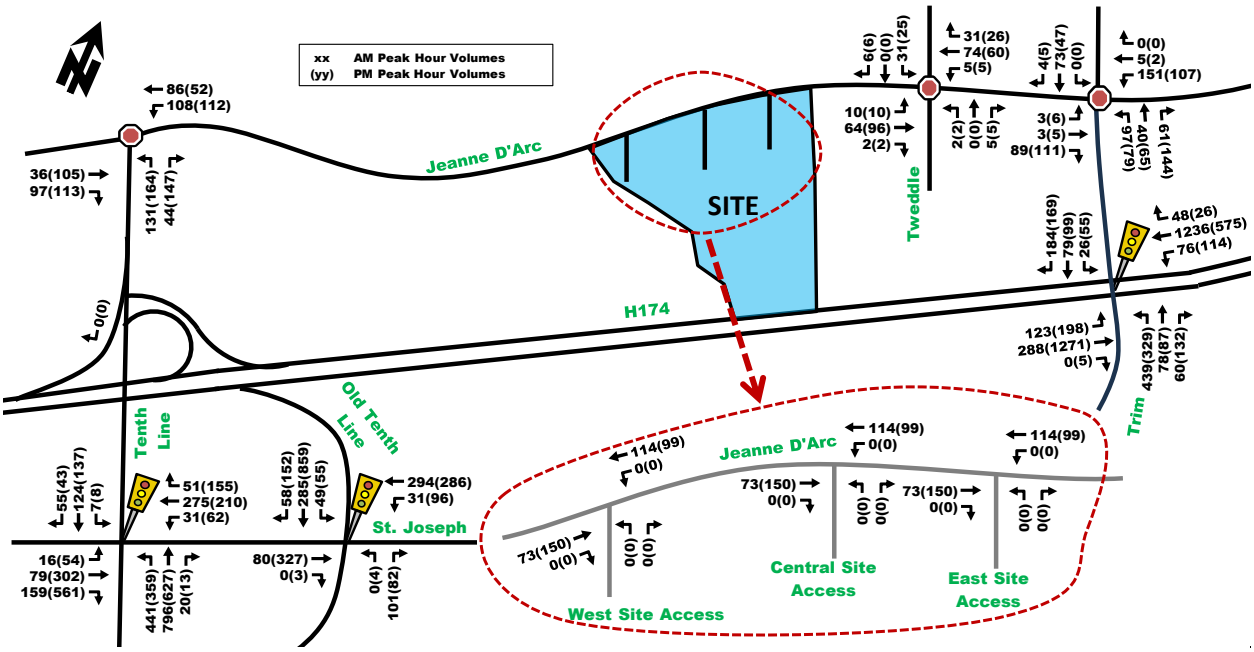


Table 18: Future 2035 Background Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Signalized Intersections						
Trim/H174	B(D)	0.69(0.82)	NBL(EBT)	37.1(40.2)	B(C)	0.62(0.77)
Tenth Line/St. Joseph	B(C)	0.63(0.78)	NBL(EBR)	34.0(30.3)	A(B)	0.51(0.62)
Old Tenth Line/St. Joseph	A(B)	0.30(0.68)	SBT(SBT)	16.5(19.0)	A(A)	0.28(0.57)
Unsignalized Intersections						
Trim/Jeanne d'Arc	A(B)	9(10)	WB(NB)	9(9)	A(A)	-
Tweddle/Jeanne d'Arc	A(A)	8(8)	SB(EB)	8(8)	A(A)	-
Tenth Line/Jeanne d'Arc	B(B)	10(10)	NB(EB)	9(10)	A(B)	-
Note: Analysis of signalized intersections assumes a PHF of 1.00 and a saturation flow rate of 1800 veh/h/lane.						

As seen in **Table 18**, most intersections will operate similarly to existing or slightly worse given the increase in background vehicle volumes. All intersections continue to operate overall at good LoS 'C' or better and with critical movements of 'D' or better.

Future Conditions at Full-Buildout – Direct Connection to LRT

The future full-buildout volumes assuming proposed mode shares reflecting a direct link to the future Trim LRT Station are illustrated in **Figure 26**. The projected traffic volumes are summarized in **Table 19**, with detailed Synchro results provided in **Appendix P**.

Figure 26: Full-Buildout 2035 Total Projected Peak Hour Traffic Volumes

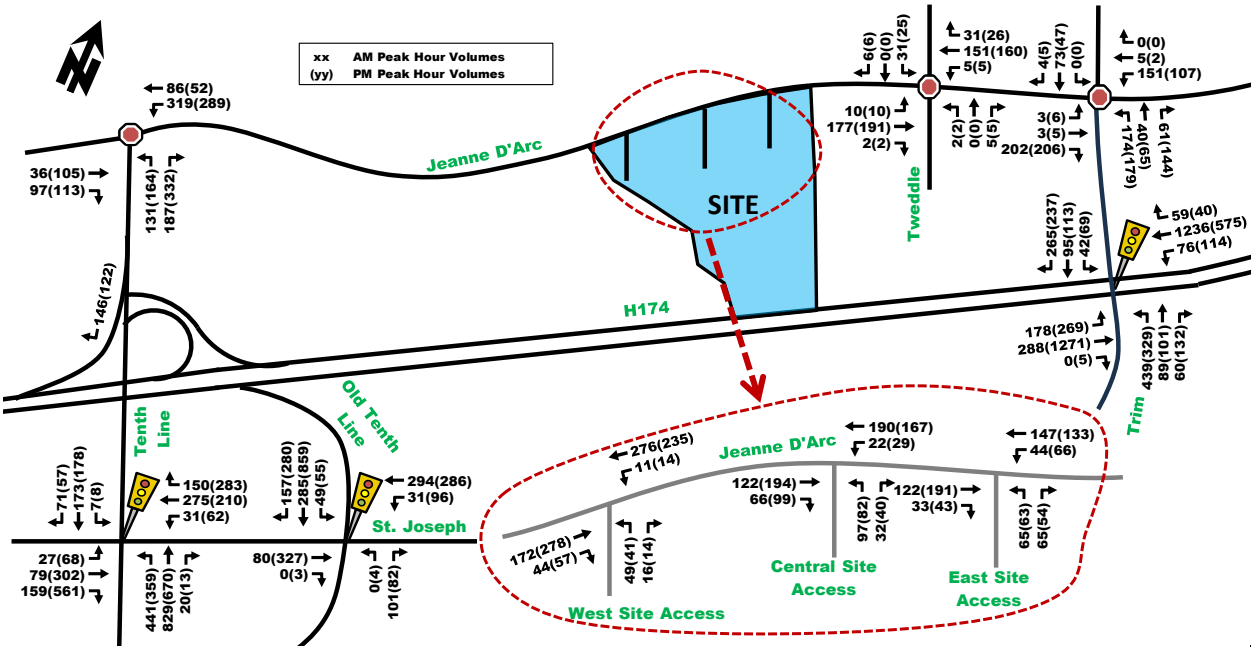


Table 19: Full-Buildout 2035 Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Signalized Intersections						
Trim/H174[1]	D(D)	0.84(0.90)	WBL(EBT)	43.1(47.4)	A(D)	0.51(0.85)
Tenth Line/St. Joseph	B(C)	0.66(0.78)	NBT(EBR)	33.6(29.9)	A(B)	0.60(0.64)
Old Tenth Line/St. Joseph	A(B)	0.30(0.68)	SBT(SBT)	14.8(17.8)	A(A)	0.28(0.57)
Unsignalized Intersections						
Trim/Jeanne d'Arc	B(B)	11(12)	NB(NB)	10(11)	B(B)	-
Tweddle/Jeanne d'Arc	A(A)	8(9)	EB(EB)	8(8)	A(A)	-
Tenth Line/Jeanne d'Arc	C(C)	15(16)	WB(WB)	12(14)	B(B)	-
West Access/Jeanne d'Arc	B(B)	12(13)	NB(NB)	2(1)	A(A)	-
Central Access/Jeanne d'Arc	B(B)	13(14)	NB(NB)	3(3)	A(A)	-
East Access/Jeanne d'Arc	B(B)	12(14)	NB(NB)	4(4)	A(A)	-

Note: Analysis of signalized intersections assumes a PHF of 1.00 and a saturation flow rate of 1800 veh/h/lane. 1. Signal timing was optimized to improve intersection operations.

As shown in **Table 19**, all intersections will operate at good LoS 'D' or better and with critical movements of good 'D' or better. Overall, in terms of intersection capacity, all intersections are anticipated to operate within city standards. The section below will analyze queueing implications, if any.

4.9.4. QUEUEING ANALYSIS

The following **Table 20** summarizes queuing results based on Synchro and SimTraffic software for various intersection locations were deemed sensitive or at risk of queue spillback on to downstream intersection using the full buildout 2035 traffic volumes.

Table 20: Queueing Analysis at Sensitive Locations – 2035 Full Buildout

Movement & Location	Storage Length + Taper	Queue AM (PM) (in meters)			
		Synchro1		SimTraffic	
		50th Percentile	95th Percentile	50th Percentile	95th Percentile
EBL Trim/H174	175 + 25 m	44 (67)	67 (#109)	42 (78)	71 (154)
EB Trim/Jeanne d'Arc	160 m	-	-	16 (14)	27 (24)
NB Trim/Jeanne d'Arc	150 m	-	-	26 (37)	54 (62)
WBL Site Access (crit.)	-	-	-	3 (5)	11 (15)
NB Site Access (crit.)	-	-	-	11 (11)	18 (21)
1. Synchro queues were only used for signalized intersections. # = 95th percentile volume exceeds capacity, queue may be longer.					

As seen in **Table 20**, all queues are within their storage capacity with additional with a good margin of space remaining between its upstream intersection or its auxiliary lane storage. A further sensitivity was completed to determine how much additional traffic could be added before queues begin to approach capacity. For this test, a 25% increase in total all movement volumes at Trim/Jeanne d'Arc were performed and a 25% increase in total eastbound left-turning volumes at Trim/H174 intersection. Only the PM peak hour was analyzed as it is more critical than the AM peak hour. The resultant queues have been summarized in **Table 21**. Detailed SimTraffic outputs have been provided in **Appendix Q.**

Table 21: Queueing Analysis Sensitivity – 25% Increase in Volumes

Movement & Location	Storage Length + Taper	Queue PM Only (in meters)	
		Synchro1	SimTraffic
		95th Percentile	95th Percentile
EBL Trim/H174	175 + 25 m	#149	204
EB Trim/Jeanne d'Arc	160 m	-	34
NB Trim/Jeanne d'Arc	150 m	-	77
1. Synchro queues were only used for signalized intersections. # = 95th percentile volume exceeds capacity, queue may be longer.			

A 25% increase in all turning movements at Trim/Jeanne d'Arc intersection did not show any adverse effects, and queues are anticipated to remain within their mid-block sections without spilling on to adjacent intersections such as Tweddle/Jeanne d'Arc or Trim/H174 intersection.

The eastbound left-turning movement at Trim/H174 intersection is forecasted to approach its storage capacity plus taper lane length for the 95th percentile, though on average during the heaviest PM peak hour would still remain within the storage capacity, with a forecasted 50th percentile queue of 131m. It is noteworthy to mention that this 25% increase reflects all traffic volumes, inclusive of other area developments and background volumes and not just an increase in volumes forecasted from this development alone.

As previously discussed in **Section 3.3 Demand Rationalization**, it could be argued that the background volumes may be overly conservative, especially considering the investments by the City of Ottawa to the surrounding transit and active transportation networks, including the Stage 2 extension and the future Trim LRT Station. Flexible working schedules stemming from the Covid-19 pandemic may also result in sustained decreases in vehicle background volumes in the fullness of time. These trends will take time to mature as Stage 2 construction concludes. While significant development in surrounding community was forecasted in this TIA, the specific timing is ultimately uncertain and largely dependent on market forces, which may ebb and flow over time. For these reasons, re-evaluation of the Trim/H174 intersection should be completed as part of future Site Plan Control applications for individual phases to verify the results herein. If capacity and queuing projections continue to show significant stress approaching the buildout horizon in this TIA, the city may then consider the viability of adding an additional eastbound left-turn lane, but for the time being, **no changes to the road network are recommended**.

5. Findings and Recommendations

Based on the results summarized herein the following findings and recommendations are provided:

Existing Conditions

- The site is currently a vacant field.
- Local bus route #38 operates adjacent to the site. Trim Station which is located generally within 600m radius from the site is currently under construction as part of the Confederation LRT Line Expansion, anticipated to be operational by year 2025. Based on the latest information, it is understood that an active transportation bridge to be built just west of Tweddle Rd will provide a crossing over H174 and a direct connection to the LRT Station. The effective walk distance from the site to the LRT Station will be 450-850m for all blocks within the site.
- Tenth Line/St. Joseph exhibited a high quantity of collisions, likely due to a sight line issue caused by grades and heavy volumes. The City of Ottawa could consider an advanced "prepare to stop" flashing beacon upstream to warn drivers of upcoming red lights and likely stopped vehicles. No other intersections or road segments revealed any reoccurring collision pattern of concern.
- All study area intersections currently operate at very good LoS 'B' or better, with critical movements operating at good LoS 'C' or better.

Proposed Development

- Brigil is proposing a mixed-use development consisting of 12 buildings ranging in height from 4 to 40-storeys. A total of 3,022 residential units are currently being proposed (used 3,200 units for trip generation for a more conservative max potential), approximately 110,000 ft^2 of office space and 165,000 ft^2 of commercial retail space is envisioned. The site will likely be built out in four phases, extending past the year 2030 horizon.
- The City of Ottawa's New Transportation Master Plan that is currently being developed highlights a future bridge connection over H174 near to the Trim LRT Station within the "Active Transportation Major Structures" early figures released. Within the Orléans Corridor Secondary Plan, a clause states that a multi-use pathway (MUP) along the north side of H174 from the development to a future new grade-separated crossing to the Trim LRT Station will be required for development approval prior to the occupancy of the first phase. It is understood that this MUP and bridge will be built.
- The trip generation for the site forecasts approximately 545 to 555 'new' two-way vehicle trips, 715 to 825 'new' two-way transit trips and 185 to 300 'new' two-way active trips.
- The proposed development includes a new local public street (Road B) and a new local private street (Road A). The public street has been proposed designed according to the recent City of Ottawa 20m ROW local road cross section including 2m wide sidewalks on both sides. The private road is still being refined but is expected to function as a private laneway catered to active transportation users, with limited access to delivery trucks and residential access. A future connection to Centre des Métiers Minto (Road C) has been identified, but this connection is currently conceptual, and the road user type has yet to be identified.

  The site roads are proposed as a 30km/h residential street, based on the corresponding City of Ottawa toolbox, which includes speed humps and periodic bulbouts with parking on one side. Three internal intersections have been proposed as potential candidates for raised intersection treatment. With three access intersections to Jeanne d'Arc Blvd to spread site generated traffic, and no connection to any other road eliminating the risk of cut through or infiltrated traffic, the designation as local streets is appropriate.

- TDM measures are highly encouraged for the site, including but not limited to preloaded Presto cards for new tenants, TDM coordinator, unbundled car parking from monthly rent, shared commercial/residential visitor parking provisions, providing bike share and car share facilities, etc. TDM measures will be confirmed in each Site Plan Application.

Future Conditions

- Peak hour traffic volumes from nearby adjacent developments were incorporated into the future traffic volume projections, including on-going updates for Petrie's Landing I development and 1015 Tweddle Rd. No additional background volume growth was applied.
- The MMLOS road segment analysis showed that none of the pedestrian target level of service were met due to lack of sidewalk facilities, lack of boulevard separation and posted speeds of 60km/h being too high. The bicycle BLoS targets were only met for future south side of Jeanne d'Arc Blvd, adjacent to the development. The existing facilities could meet the target goal if Jeanne d'Arc Blvd's operating speed was lowered to 50km/h, confirmed by a speed survey. There were no transit or truck targets for road segments.
- The MMLOS intersection (for signalized intersections only) analysis showed that only truck target goals were met. There were no transit targets set as no intersection was within a transit priority corridor.

  Bicycle intersection targets were not met due to lack of cycling facilities, the introduction of pocket bike lanes being too long and exposing cyclists to right-turning vehicle conflict for too long (on St. Joseph) or operating speeds being too high.

  The pedestrian targets were not met at any intersection due to the quantity of lanes required to cross.
- Future conditions forecast good overall intersection performance of LoS 'D' or better and good critical movements of LoS 'D' or better. Overall, queues are anticipated to remain within their auxiliary turn lane capacity and are not anticipated to spill back on to upstream intersections based on forecasted future volumes.
- A sensitivity test was completed at sensitive locations, increasing the overall future forecasted traffic volumes by 25% (inclusive of forecasted trips generated from all nearby developments), which resulted in good overall operations at Trim/Jeanne d'Arc intersection. The need for auxiliary turn lanes at this intersection were not warranted.
- The eastbound left-turn at Trim/H147 intersection was shown to be sensitive in the PM peak hour should the future forecasted traffic volumes were increased by 25%. If the base background volumes were slightly lower than forecasted in this report, then there would be no queueing implications. For this reason, the recommended approach for this intersection is 'do nothing', and re-evaluate every time a large new development in the study area is built is.
    - The sensitivity of this movement to minor fluctuations in vehicle traffic further validates the importance of the city's continued investment in a highly connected network of infrastructure conducive to transit-oriented developments. The construction of the proposed pedestrian bridge from the north side of H174 to the Trim LRT Station will further leverage the new LRT Station and further strengthen connectivity for all developments in the area. It is essential that a direct connection from the bridge to the LRT Station be provided to support all the new development being proposed north of H174, to provide the best incentive possible for local residents to choose transit versus driving.
    - There is redundancy in the road network. If frequent queues and delays form at Trim/H174, commuters coming from the west may adapt their route and more likely use Tenth Line Rd as an alternative route. Sensitivity testing showed there is sufficient capacity to accommodate all of site generated traffic via the Tenth Line Rd and Jeanne d'Arc Blvd corridor.

- If none of the above works as a mitigation to queues, a double eastbound left-turn could be considered.

- Warrants were completed and none of the site access intersections were deemed candidates for signalized intersections. An all-way-stop-control could be considered at one of the intersections to satisfy future pedestrian desire lines to the north side of Jeanne d'Arc Blvd to connect to the westbound transit stop and multi-use pathway. Alternatively, a Level 2 Type B PXO was deemed appropriate. The need for a left-turn lane was not warranted.
- Active transportation details will become available once a Site Plan Application is filed for each phase of development, however the site is anticipated to provide a network of integrated sidewalk facilities which connect to the MUP proposed along the north side of H174 to the future active transportation bridge over H174.

Based on the preceding report, the proposed Brigil Development located at 8600 Jeanne d'Arc Blvd is recommended from a transportation perspective.

Prepared By:

Juan Lavin, P. Eng.
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Reviewed By:

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Senior Transportation Engineer

APPENDIX A

SCREENING FORM

PARSONS

Office: +1 613.738.4160
1223 Michael Street, Suite 100|Ottawa, ON K1J 7T2

City of Ottawa 2017 TIA Guidelines

TIA Screening Form

Date	8-Jun-23
Project	Petrie's Landing III
Project Number	478566 - 01000

Results of Screening	Yes/No
Development Satisfies the Trip Generation Trigger	Yes
Development Satisfies the Location Trigger	Yes
Development Satisfies the Safety Trigger	No

Module 1.1 - Description of Proposed Development	
Municipal Address	8600 Jeanne D'Arc Boulevard N
Description of location	Vacant land bound by Jeanne D'Arc, Hwy 174, Taylor Creek and Centre des Metiers Minto Desjardins de la Cite
Land Use	Mixed-use, proposing residential, retail, restaurant/bar and office space
Development Size	Proposed appoximately 3,177 residential units, 110,000sqft office space, 165,000sqft ground floor commercial spaces
Number of Accesses and Locations	3 proposed, 2 public roads with ROW 20m, 1 private road with ROW
Development Phasing	Multi-phased
Buildout Year	2030+
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger		
Land Use Type	Townhomes or Apartments	
Development Size	3000	Units
Trip Generation Trigger Met?	Yes	

Module 1.3 - Location Triggers		
Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	Yes	Jeanne D'Arc is a spine route
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	Yes	Within 600m of Trim LRT Station
Location Trigger Met?	Yes	

Module 1.4 - Safety Triggers		
Posted Speed Limit on any boundary road	<80	km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No	
A proposed driveway is 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) or within auxiliary lanes of an intersection;	No	
A proposed driveway makes use of an existing median break that serves an existing site	No	
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	No	
The development includes a drive-thru facility	No	
Safety Trigger Met?	No	

Demonstration Plan

- Tower Separation Dimensions
- Tower Separation Dimensions
- Phasing Line
- Future Connection
- Public Road
- Private Road
- Primary Entrance
- Secondary Entrance
- Non-Residential Podium

Block	Use*	Unit Total	Gross Floor Area Total
Block 1 "A" buildings	Residential Low-Rise Residential / Mixed-Use Mid-Rise	392	39,150 m²
Block 2 "B" buildings	Residential / Mixed-Use Mid-Rise Residential / Mixed-Use High-Rise	1,089	88,015 m²
Block 3 "C" buildings	Residential / Mixed-Use Mid-Rise Residential / Mixed-Use High-Rise	477	37,908 m²
Block 5 "D" buildings	Residential / Mixed-Use High-Rise	1,065	83,172 m²
Total		3,022 units	248,245 m²

*the proposed uses are subject to change, and through the refinement of the Draft Plan of Subdivision, the location of non-residential uses will be confirmed.

APPENDIX B

TRAFFIC COUNT DATA

Transportation Services - Traffic Services

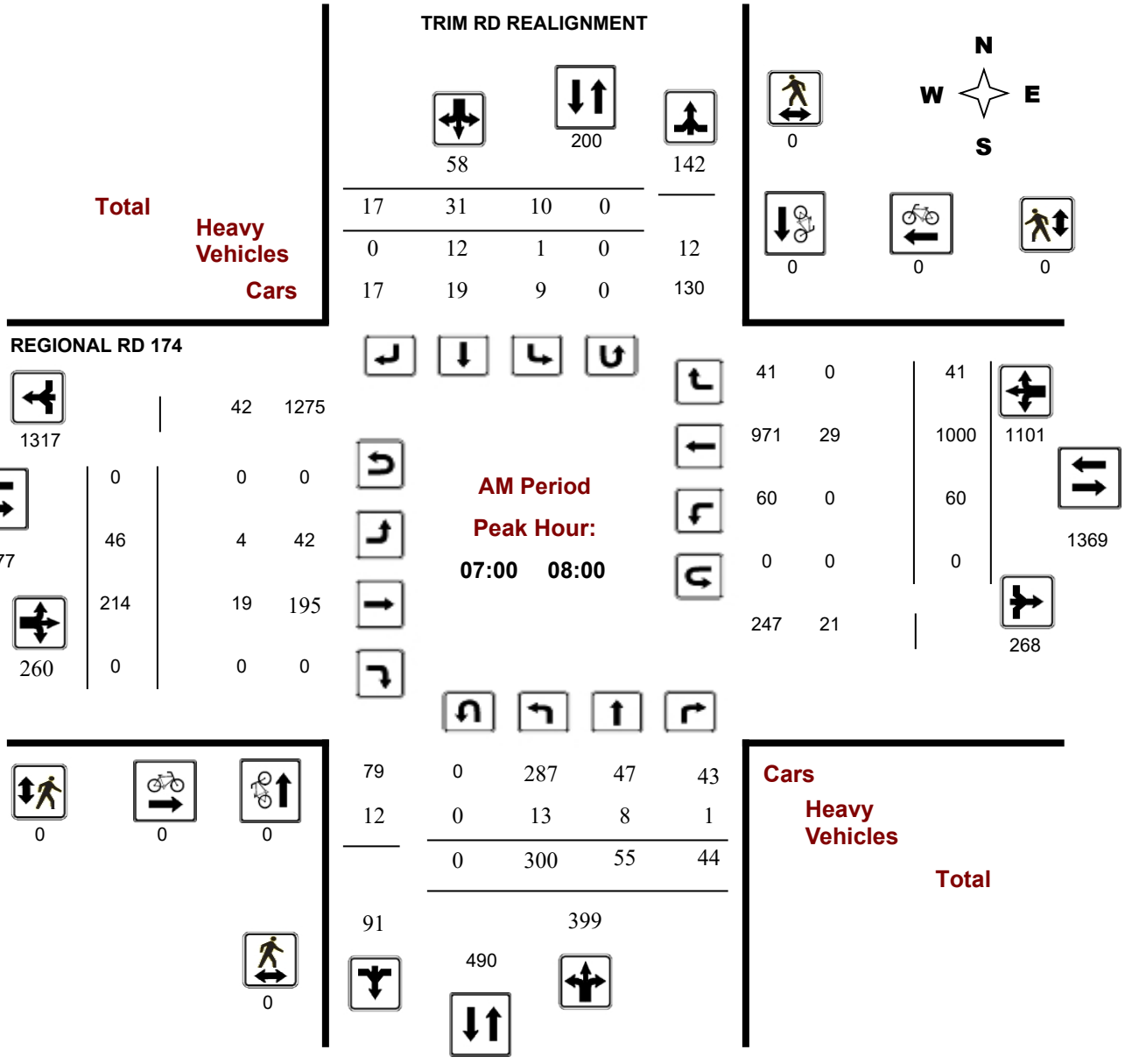
Turning Movement Count - Study Results

REGIONAL RD 174 @ TRIM RD REALIGNMENT

Survey Date: Thursday, January 25, 2024 **WO No:** 41642

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

AM Period Peak Hour Diagram



Transportation Services - Traffic Services

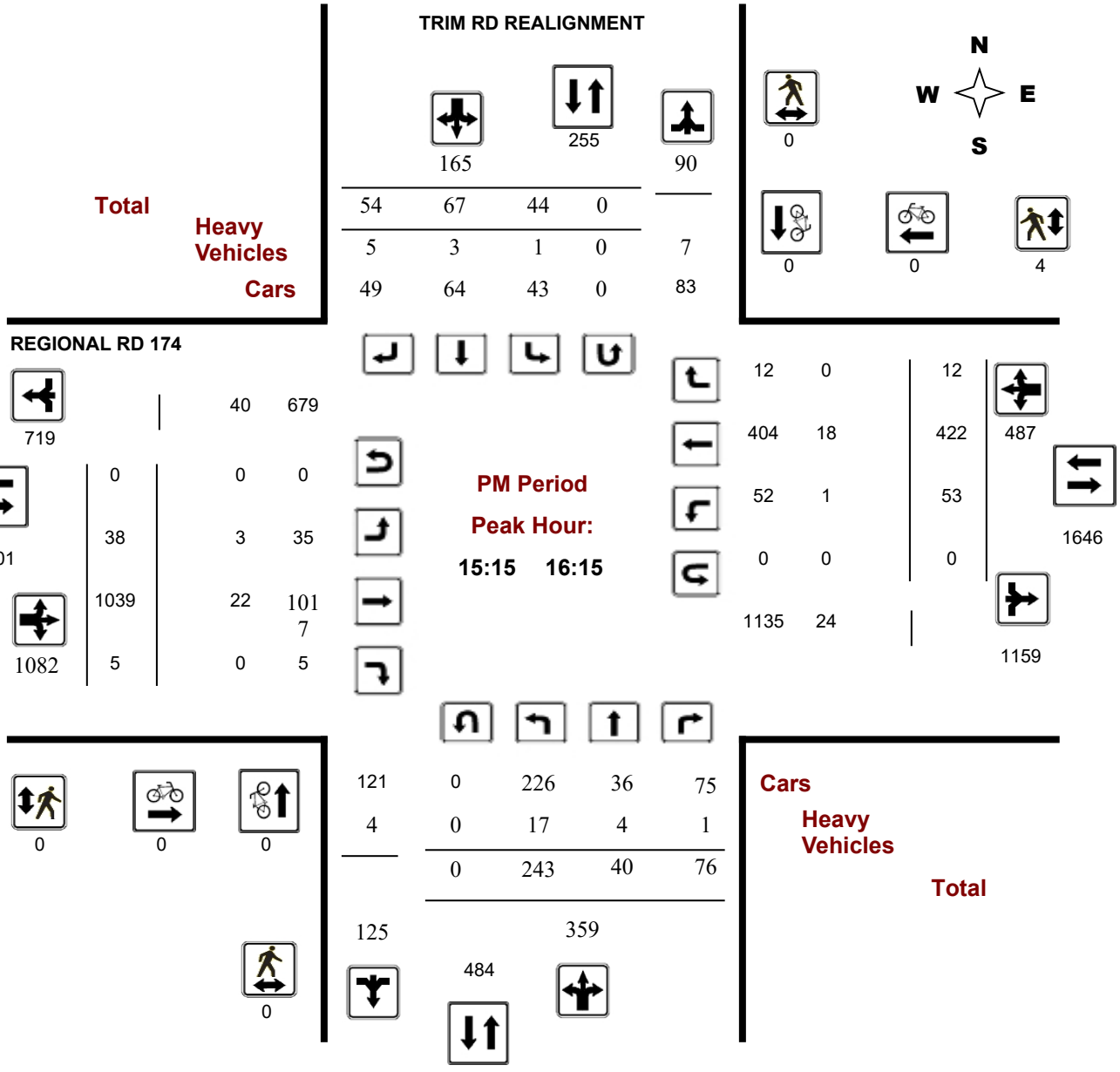
Turning Movement Count - Study Results

REGIONAL RD 174 @ TRIM RD REALIGNMENT

Survey Date: Thursday, January 25, 2024 **WO No:** 41642

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

PM Period Peak Hour Diagram



DIRECTIONAL TRAFFIC FLOW

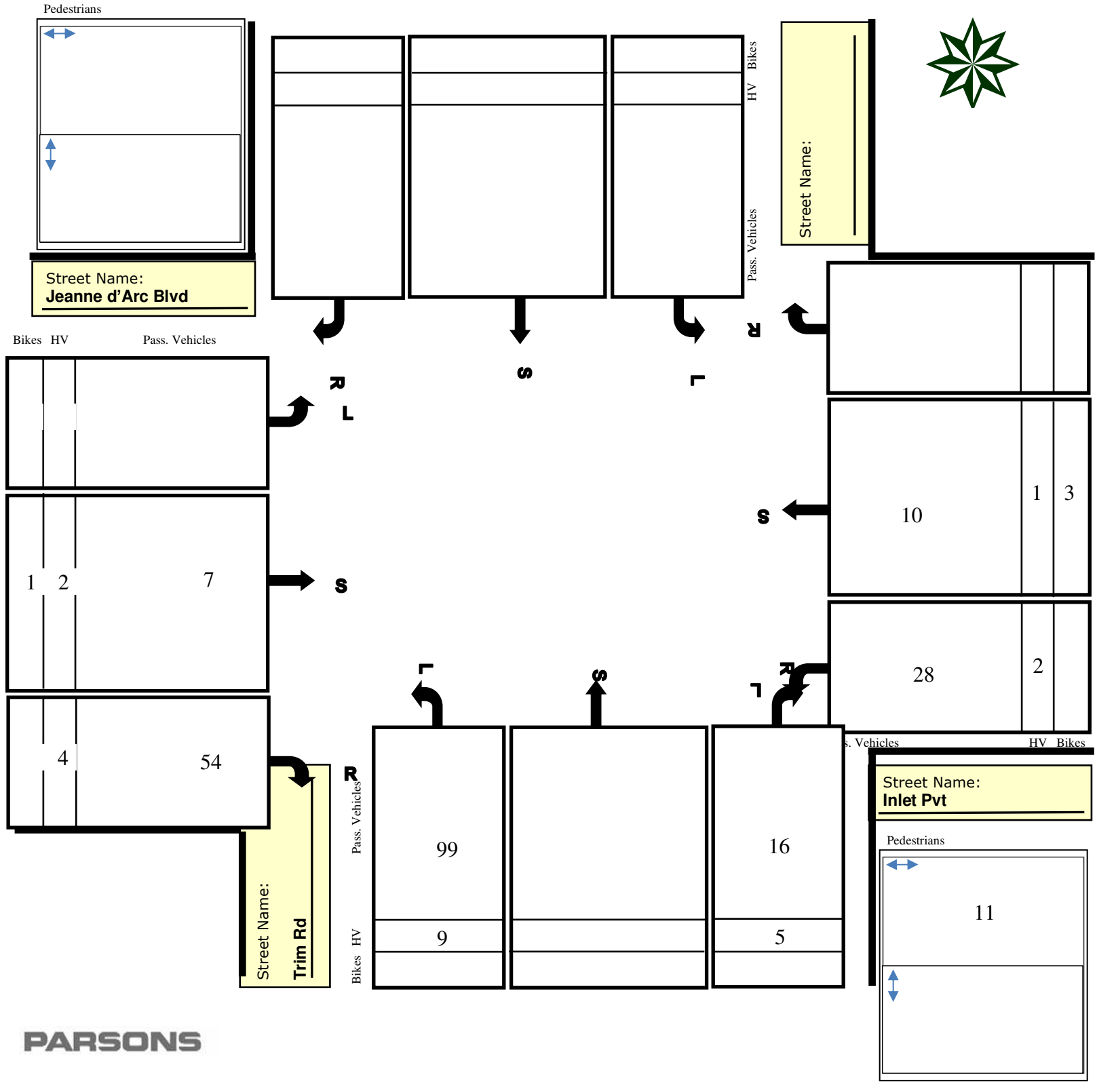
Intersection: **Jeanne d'Arc Blvd** at **Trim Rd**

DATE: Day: **6th** Month: **November** Year: **2024** Day of Week: **Wednesday**

Observer: **Juan Lavin** Weather: **Warm, wet and cloudy**

Chkd by: ..... Date: .....

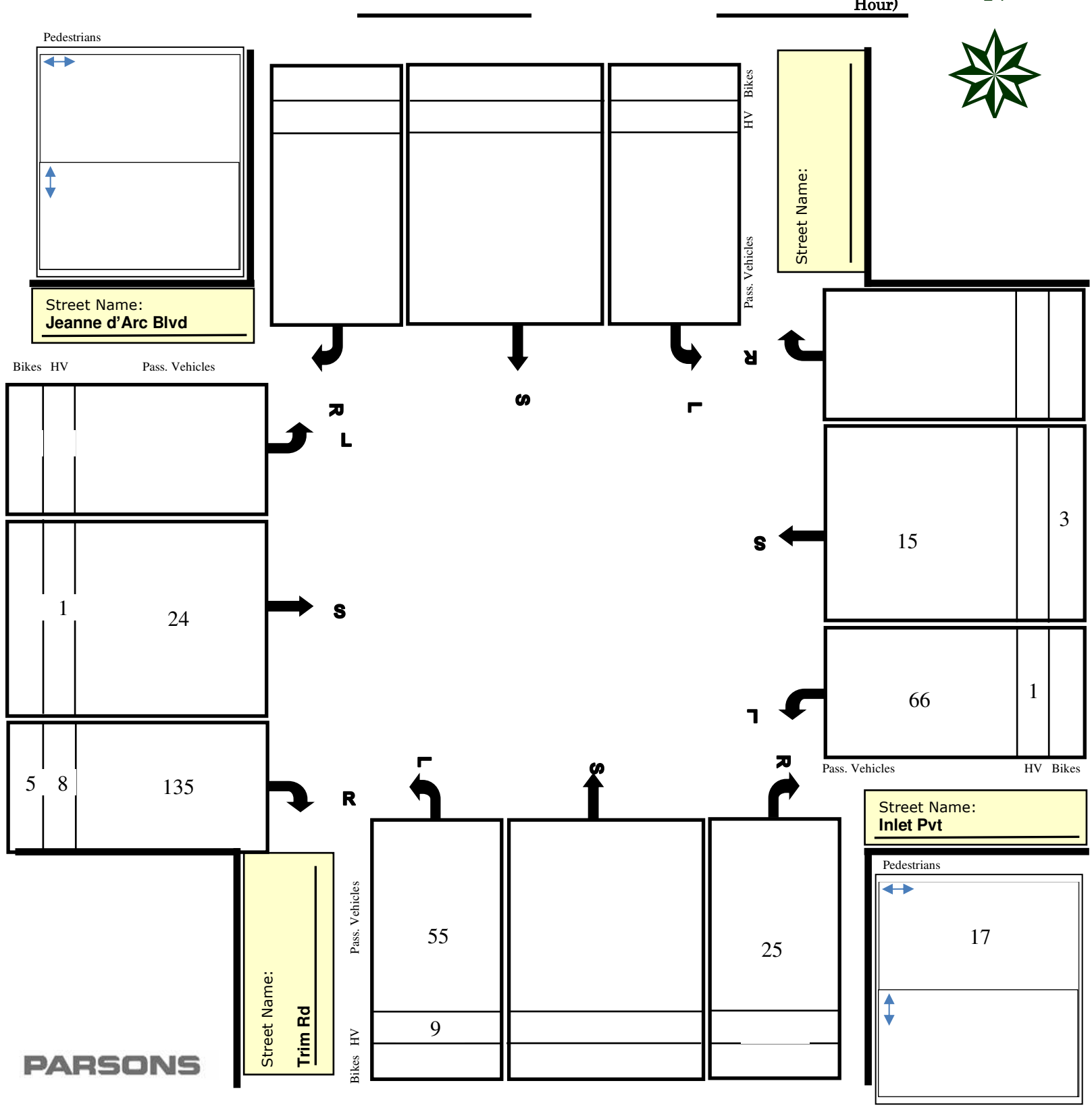
TIME PERIOD: From: **7:30 AM** To: **8:30 AM**



PARSONS

DIRECTIONAL TRAFFIC FLOW

TIME PERIOD: From: 3:15pm To: 4:15pm (Peak Hour)



PARSONS

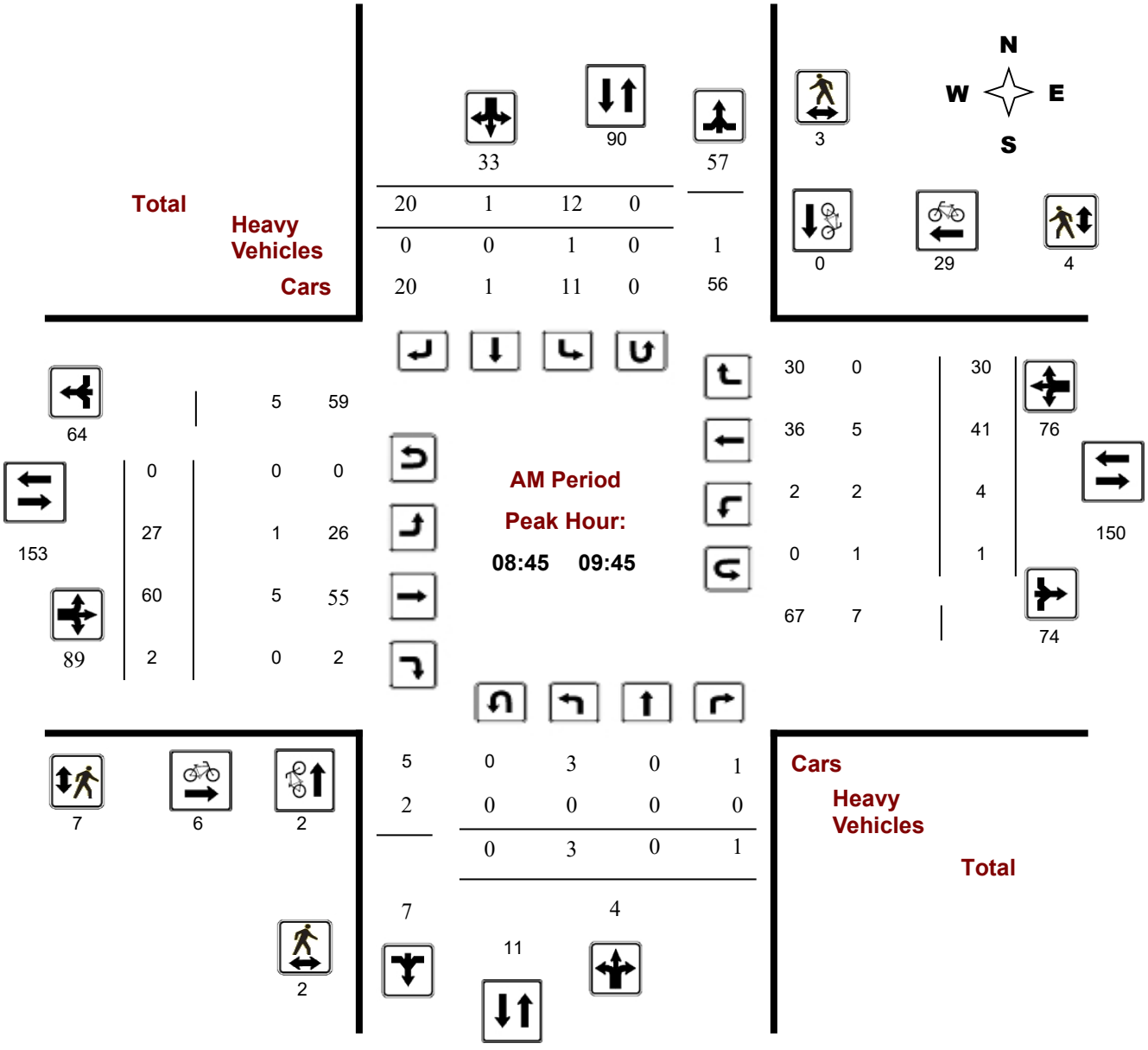
Transportation Services - Traffic Services

Turning Movement Count - Study Results

TWEDDLE RD & JEANNE-D'ARC BLVD

Survey Date: Tuesday, June 25, 2024
Start Time: 07:00
WO No: 41857
Device: Miovision

AM Period Peak Hour Diagram



Transportation Services - Traffic Services

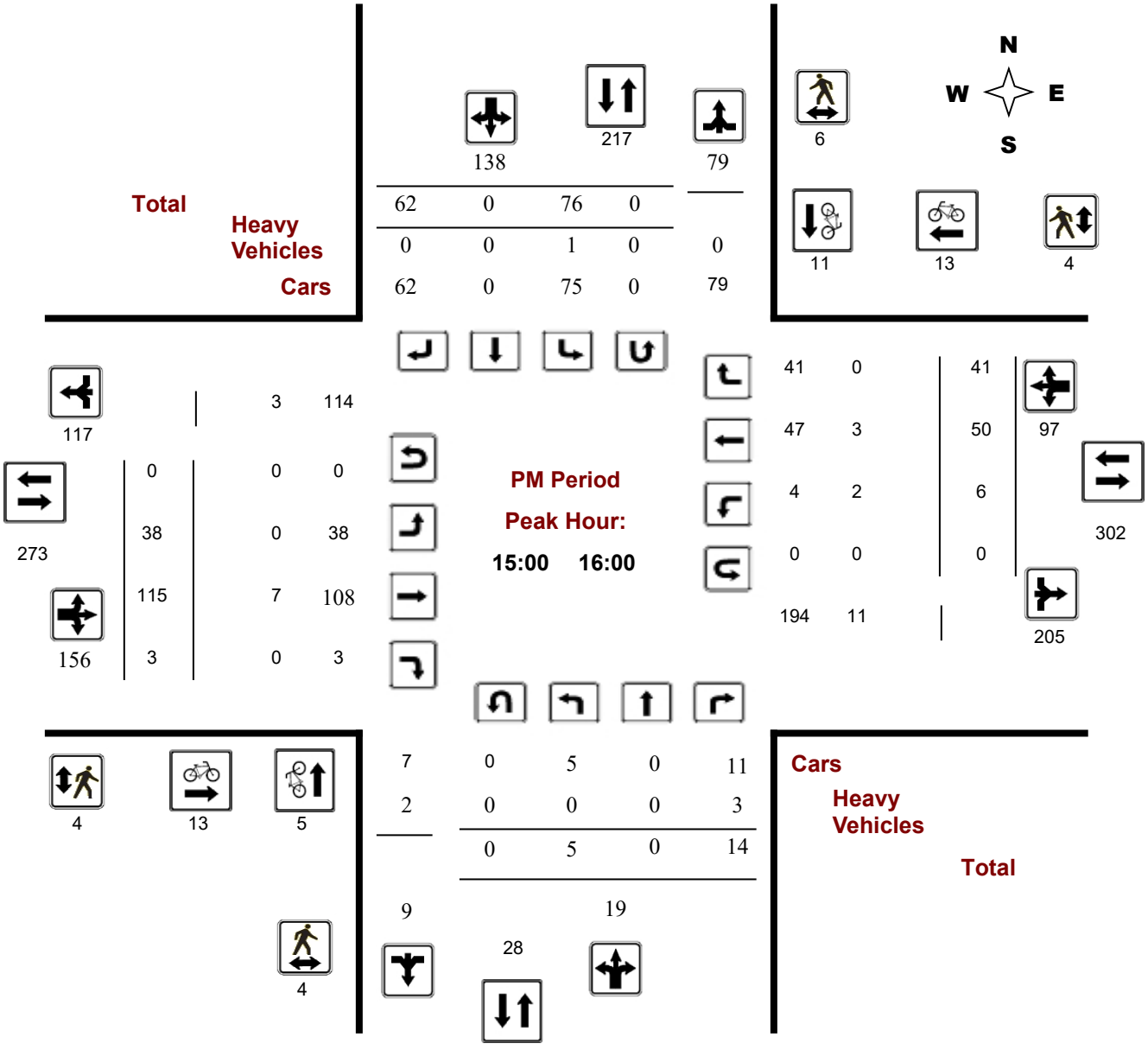
Turning Movement Count - Study Results

TWEDDLE RD & JEANNE-D'ARC BLVD

Survey Date: Tuesday, June 25, 2024 **WO No:** 41857

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

PM Period Peak Hour Diagram



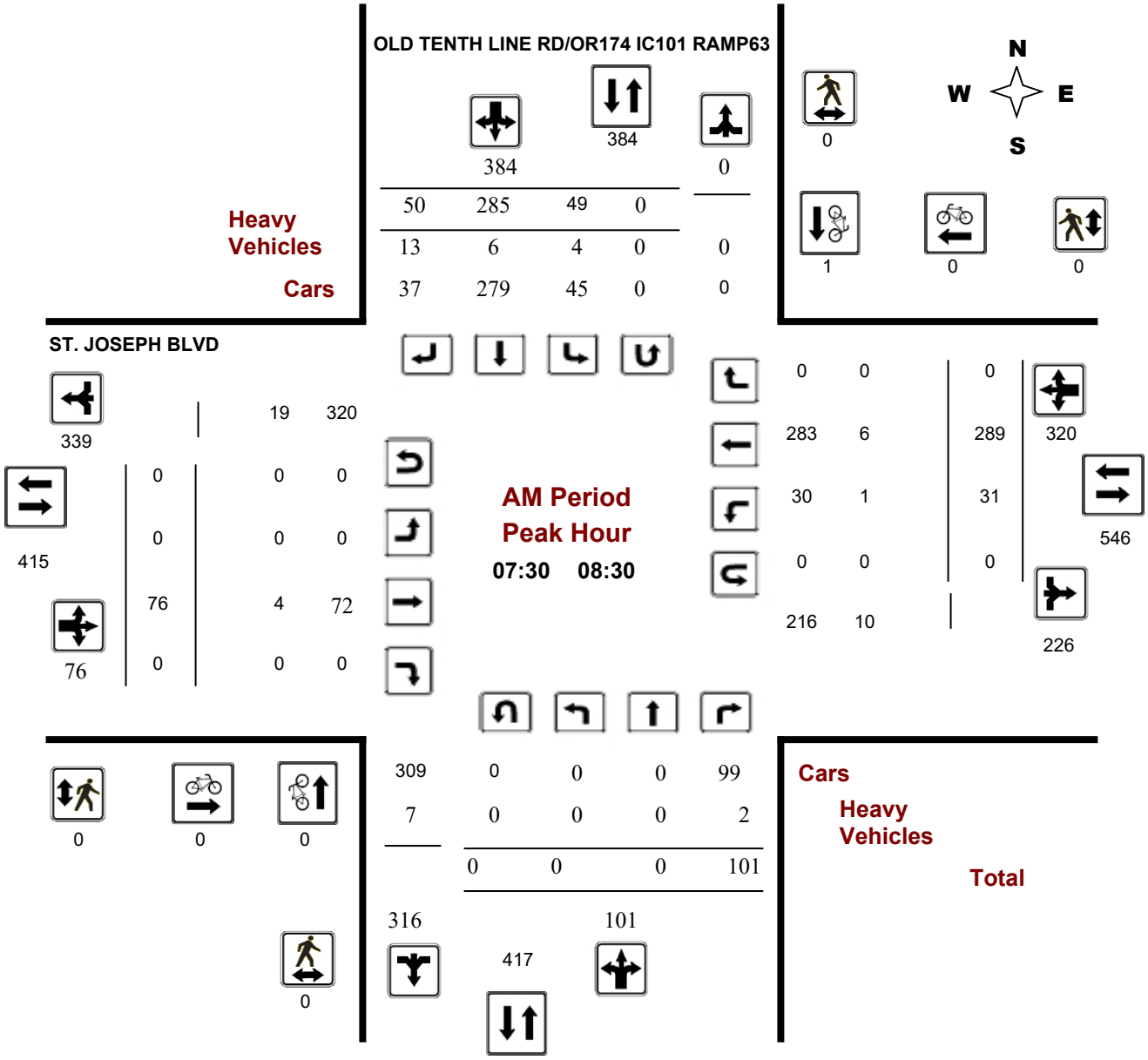
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

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

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

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



Comments

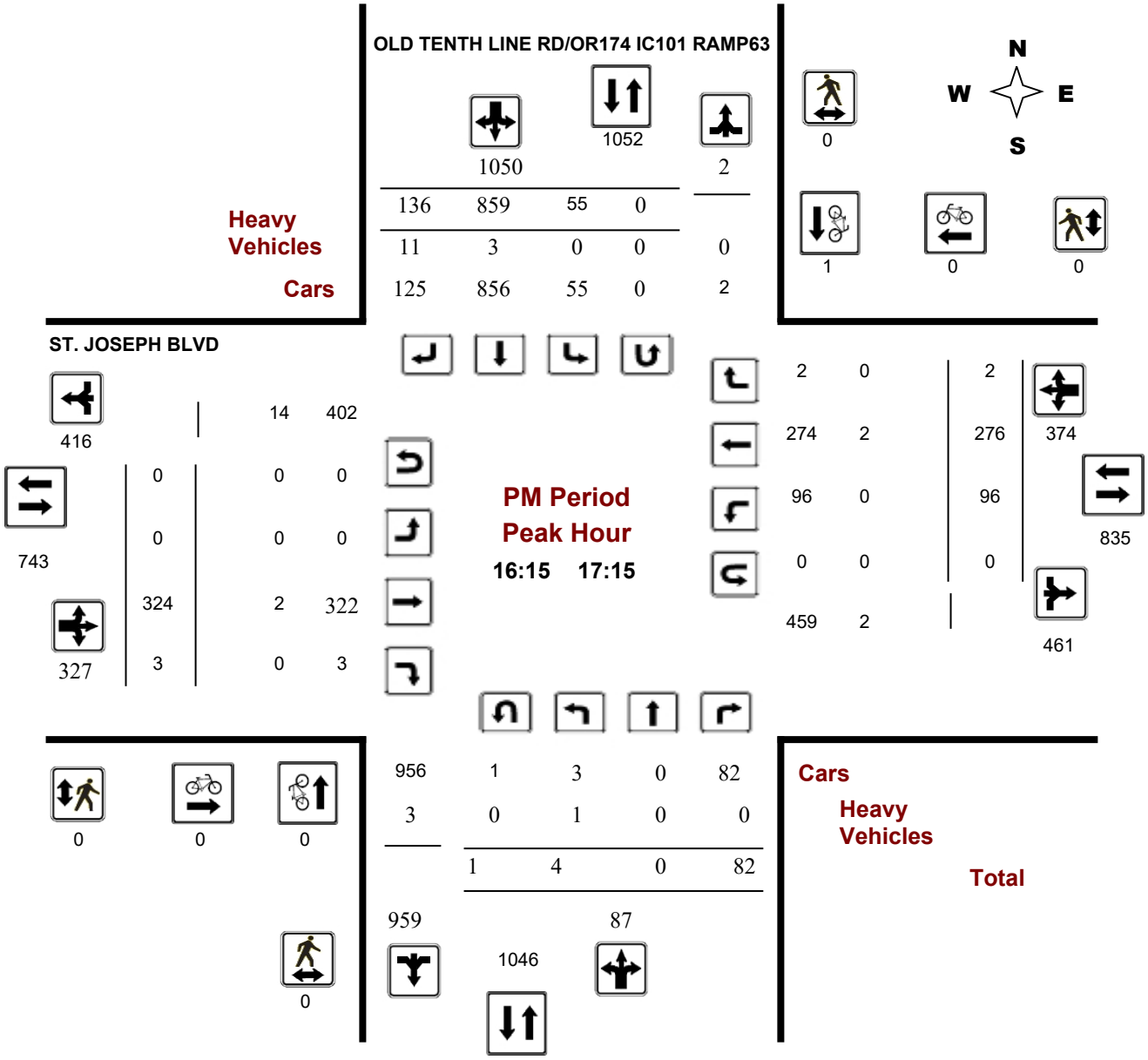
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

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

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

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



Comments

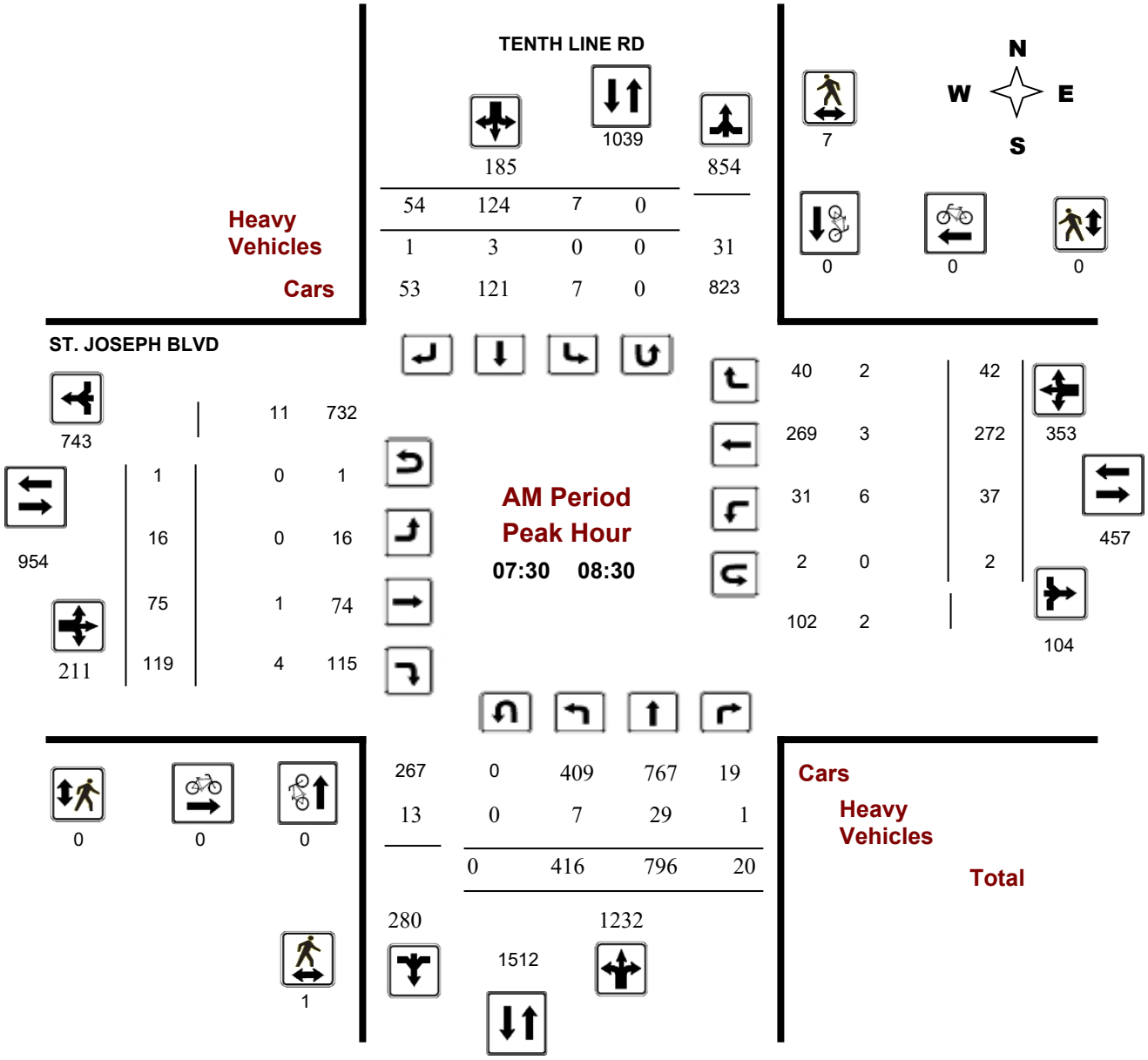
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ST. JOSEPH BLVD @ TENTH LINE RD

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

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



Comments

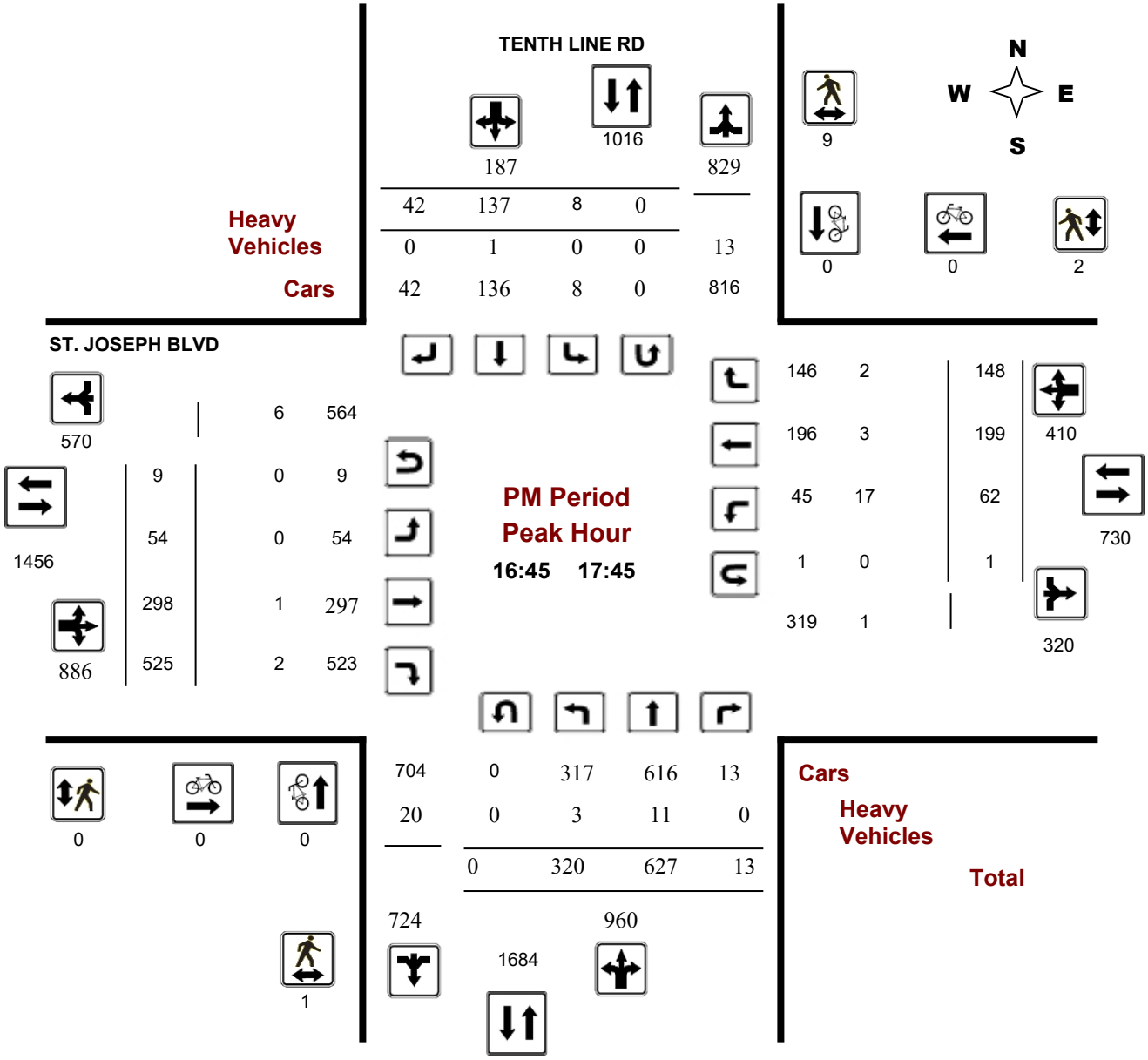
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ST. JOSEPH BLVD @ TENTH LINE RD

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

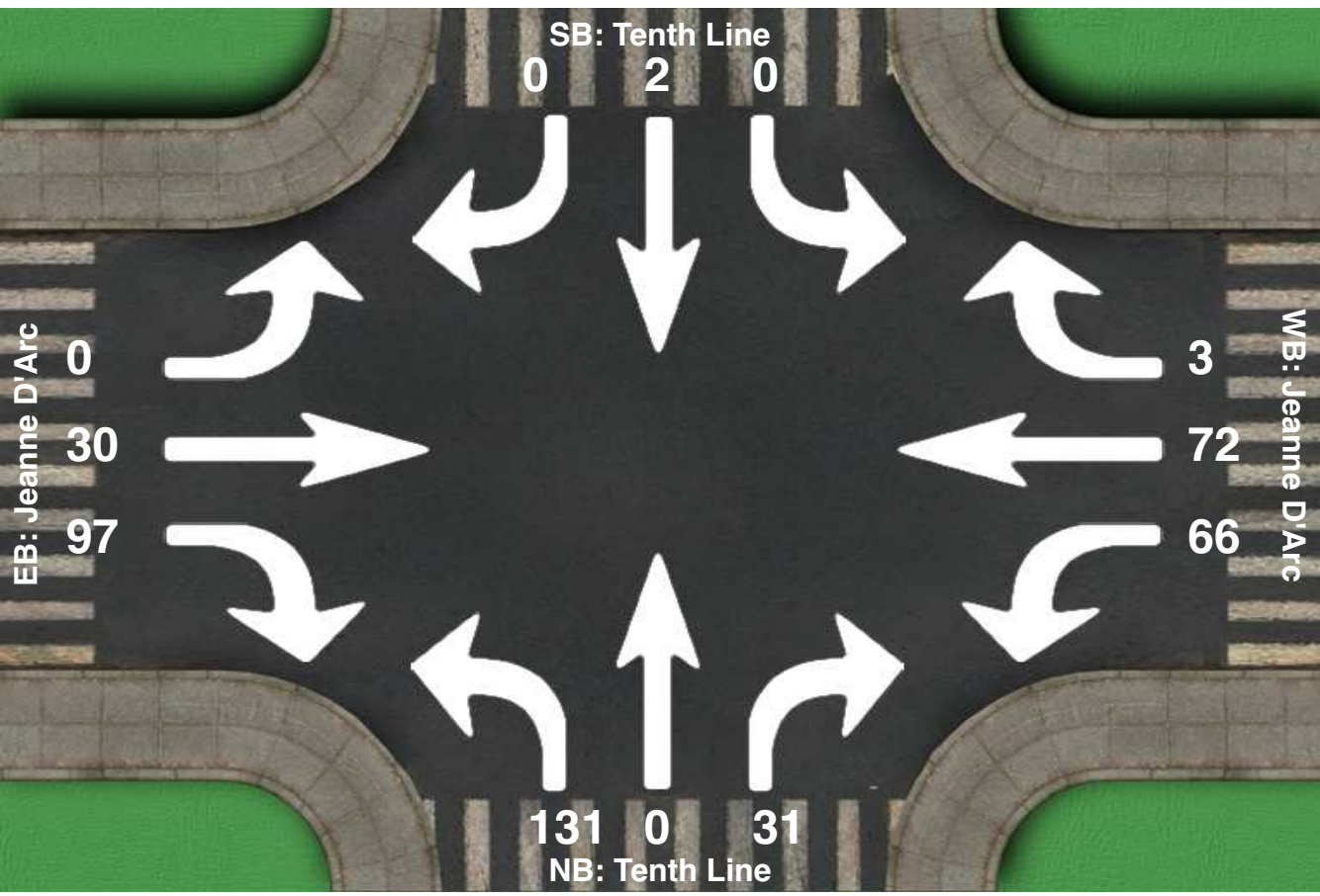
Start Time: 07:00 **Device:** Miovision



Comments

Intersection Peak Hour

Location: Tenth Line at Jeanne D'Arc , Ottawa
GPS Coordinates:
Date: 2017-09-14
Day of week: Thursday
Weather: Sunny
Analyst: Rani Nahas



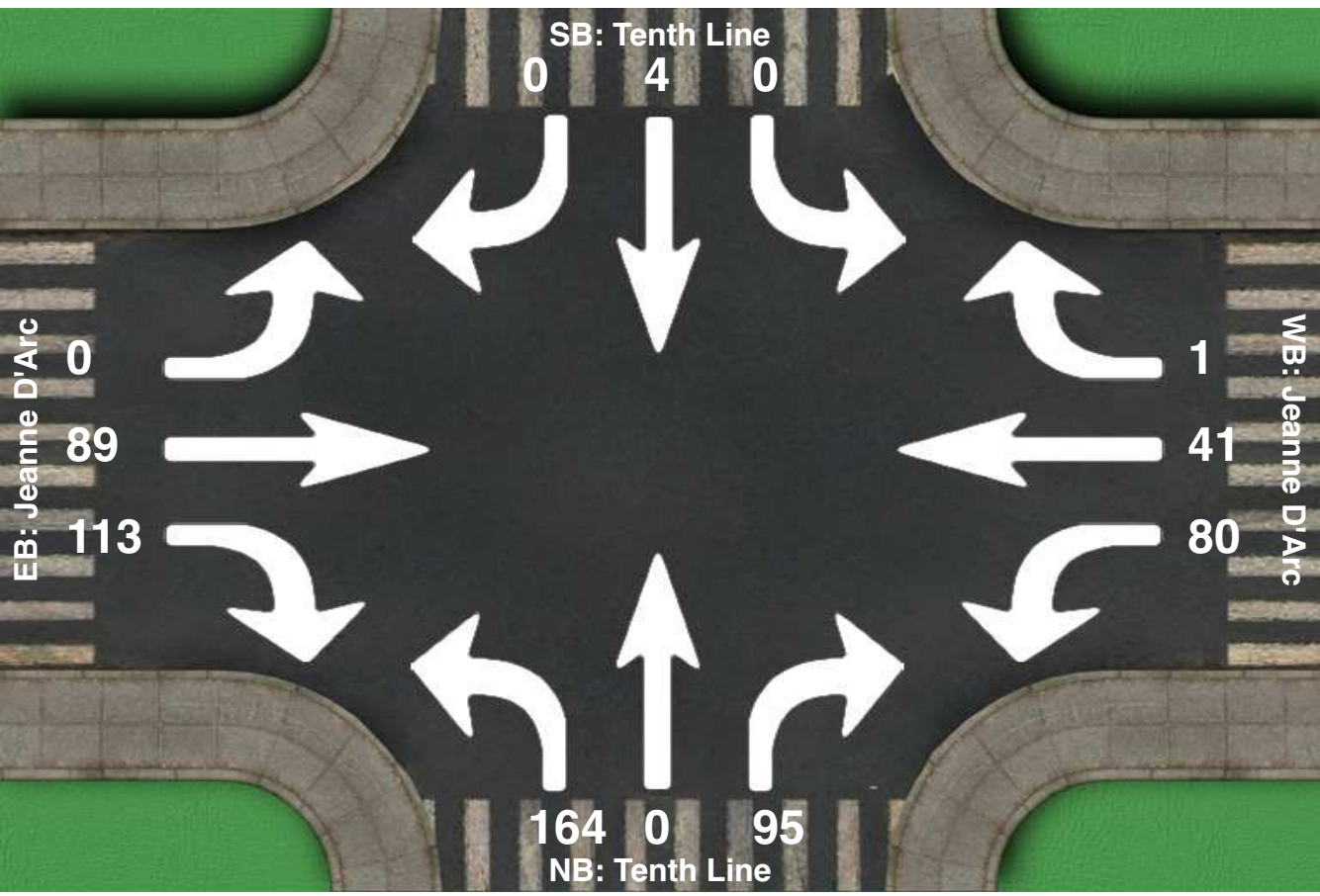
Intersection Peak Hour

07:15 - 08:15

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	2	0	66	72	3	131	0	31	0	30	97	432
Factor	0.00	0.08	0.00	0.61	0.60	0.25	0.68	0.00	0.52	0.00	0.36	0.73	0.84
Approach Factor	0.08			0.69			0.68			0.59			

Intersection Peak Hour

Location: Tenth Line at Jeanne D'Arc, Ottawa
GPS Coordinates:
Date: 2017-09-14
Day of week: Thursday
Weather: Sunny
Analyst: Rani Nahas



Intersection Peak Hour

16:30 - 17:30

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	4	0	80	41	1	164	0	95	0	89	113	587
Factor	0.00	0.33	0.00	0.51	0.49	0.08	0.65	0.00	0.61	0.00	0.53	0.55	0.79
Approach Factor	0.33			0.68			0.80			0.67			

APPENDIX C

COLLISION DATA

Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	82	11	23	16	2	20	0	0	154	84%
Non-fatal injury	12	4	1	8	0	4	0	1	30	16%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**94**	**15**	**24**	**24**	**2**	**24**	**0**	**1**	**184**	100%
	#1 or 51%	#5 or 8%	#2 or 13%	#2 or 13%	#6 or 1%	#2 or 13%	#8 or 0%	#7 or 1%		

REGIONAL RD 174/TRIM RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	56	34,176	1825	**0.90**

Peds	Cyclists
0	**0**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	30	3	11	0	0	6	0	0	50	89%
Non-fatal injury	3	1	0	1	0	0	0	1	6	11%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**33**	**4**	**11**	**1**	**0**	**6**	**0**	**1**	**56**	100%
	59%	7%	20%	2%	0%	11%	0%	2%		

NORTH SERVICE RD/TRIM RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	2	3,080	1825	**0.36**

Peds	Cyclists
0	**0**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	1	0	0	0	0	0	0	0	1	50%
Non-fatal injury	0	0	0	0	0	1	0	0	1	50%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	100%
	50%	0%	0%	0%	0%	50%	0%	0%		

JEANNE D'ARC BLVD/NORTH SERVICE RD/TENTH LIN

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	5	7,904	1825	**0.35**

Peds	Cyclists
0	**1**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	2	0	0	0	0	0	0	0	2	40%
Non-fatal injury	1	1	0	0	0	1	0	0	3	60%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**3**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	100%
	60%	20%	0%	0%	0%	20%	0%	0%		

TENTH LINE RD/OR174 IC101 RAMP61

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	5	n/a	1825	**n/a**

Peds	Cyclists
0	**0**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	2	1	0	2	0	0	0	0	5	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**2**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**5**	100%
	40%	20%	0%	40%	0%	0%	0%	0%		

TENTH LINE RD/OR174 IC101 RAMP26

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	4	n/a	1825	**n/a**

Peds	Cyclists
0	**0**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	3	0	0	0	0	1	0	0	4	100%
Non-fatal injury	0	0	0	0	0	0	0	0	0	0%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**3**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**4**	100%
	75%	0%	0%	0%	0%	25%	0%	0%		

ST. JOSEPH BLVD/TENTH LINE RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	70	28,137	1825	**1.36**

Peds	Cyclists
0	**0**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	35	2	10	8	1	3	0	0	59	84%
Non-fatal injury	5	2	1	2	0	1	0	0	11	16%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**40**	**4**	**11**	**10**	**1**	**4**	**0**	**0**	**70**	100%
	57%	6%	16%	14%	1%	6%	0%	0%		

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

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	30	16,521	1825	**0.99**

Peds	Cyclists
0	**0**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	6	4	1	5	0	9	0	0	25	83%
Non-fatal injury	0	0	0	5	0	0	0	0	5	17%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**6**	**4**	**1**	**10**	**0**	**9**	**0**	**0**	**30**	100%
	20%	13%	3%	33%	0%	30%	0%	0%		

ROAD SEGMENTS

NORTH SERVICE RD, TENTH LINE to TRIM RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	2	n/a	1825	**n/a**

Peds	Cyclists
0	**0**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	0	0	0	0	1	0	0	0	1	50%
Non-fatal injury	0	0	0	0	0	1	0	0	1	50%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**2**	100%
	0%	0%	0%	0%	50%	50%	0%	0%		

TENTH LINE RD, OR174 IC101 RAMP36 to OR174 IC101 RAMP61

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	3	n/a	1825	**n/a**

Peds	Cyclists
0	**0**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	0	1	0	1	0	0	0	0	2	67%
Non-fatal injury	1	0	0	0	0	0	0	0	1	33%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**3**	100%
	33%	33%	0%	33%	0%	0%	0%	0%		

TENTH LINE RD, OR174 IC101 RAMP26 to ST. JOSEPH BLVD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	6	n/a	1825	**n/a**

Peds	Cyclists
0	**0**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	3	0	1	0	0	0	0	0	4	67%
Non-fatal injury	2	0	0	0	0	0	0	0	2	33%
Non-reportable	0	0	0	0	0	0	0	0	0	0%
Total	**5**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**6**	100%
	83%	0%	17%	0%	0%	0%	0%	0%		

ST. JOSEPH BLVD, OR174 IC101 RAMP63 to TENTH LINE RD

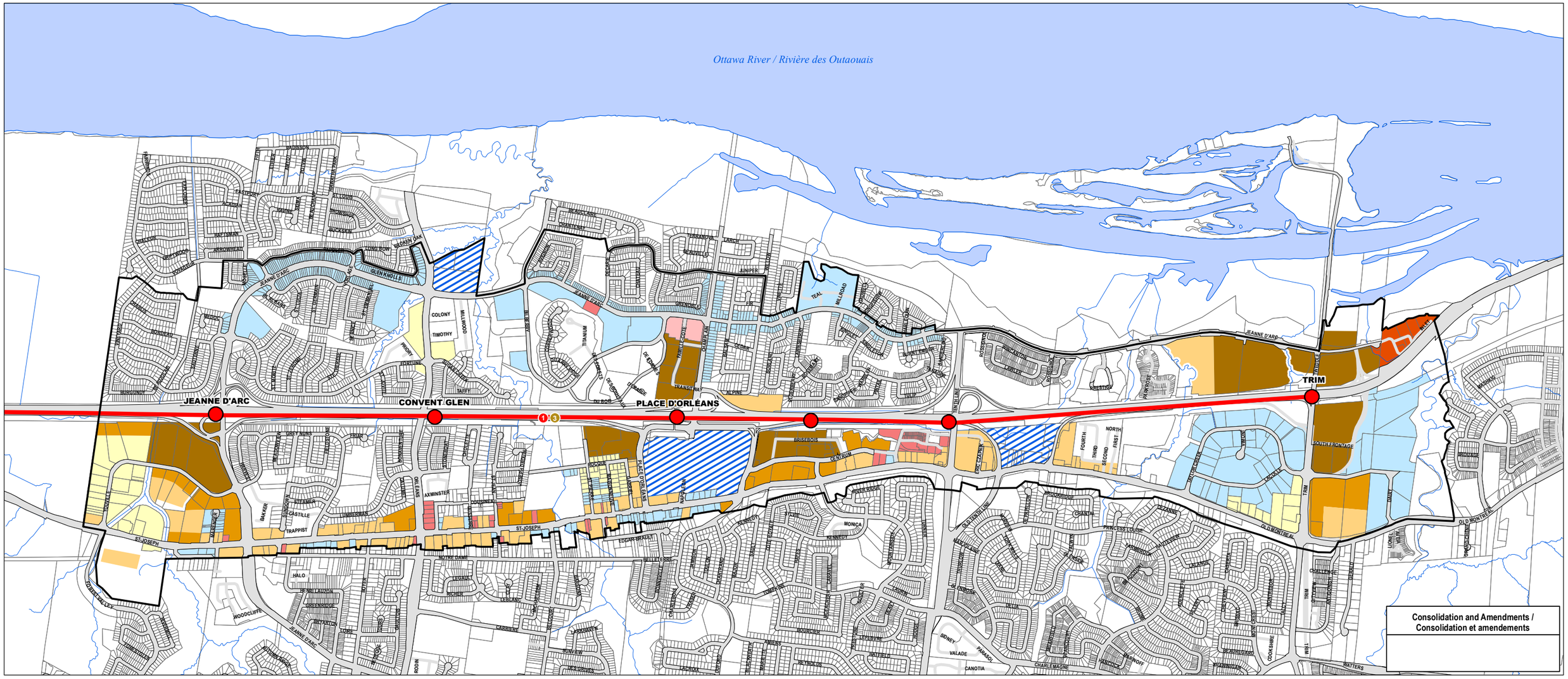
Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	1	n/a	1825	**n/a**

Peds	Cyclists
0	**0**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total	
P.D. only	0	0	0	0	0	1	0	0	1	100%

APPENDIX D

ORLEANS CORRIDOR SECONDARY PLAN – MOBILITY



MAXIMUM BUILDING HEIGHTS / HAUTEURS MAXIMALES DES IMMEUBLES

- 4 storeys / étages
- 6 storeys / étages
- 9 storeys / étages
- 18 storeys / étages
- 25 storeys / étages
- 32 storeys / étages - to reflect development approvals / pour refléter les approbations de développement
- 40 storeys / étages
- Conditional Height / Des hauteurs soumises à des conditions
- Height through Demonstration Plan / Les hauteurs seront identifiées par un plan de démonstration

- Secondary Plan Boundary / Limite du plan secondaire
- Light Rail Transit (LRT) / Transport en commun par train léger (TCTL)
- O-Train Lines / Lignes de l'O-Train

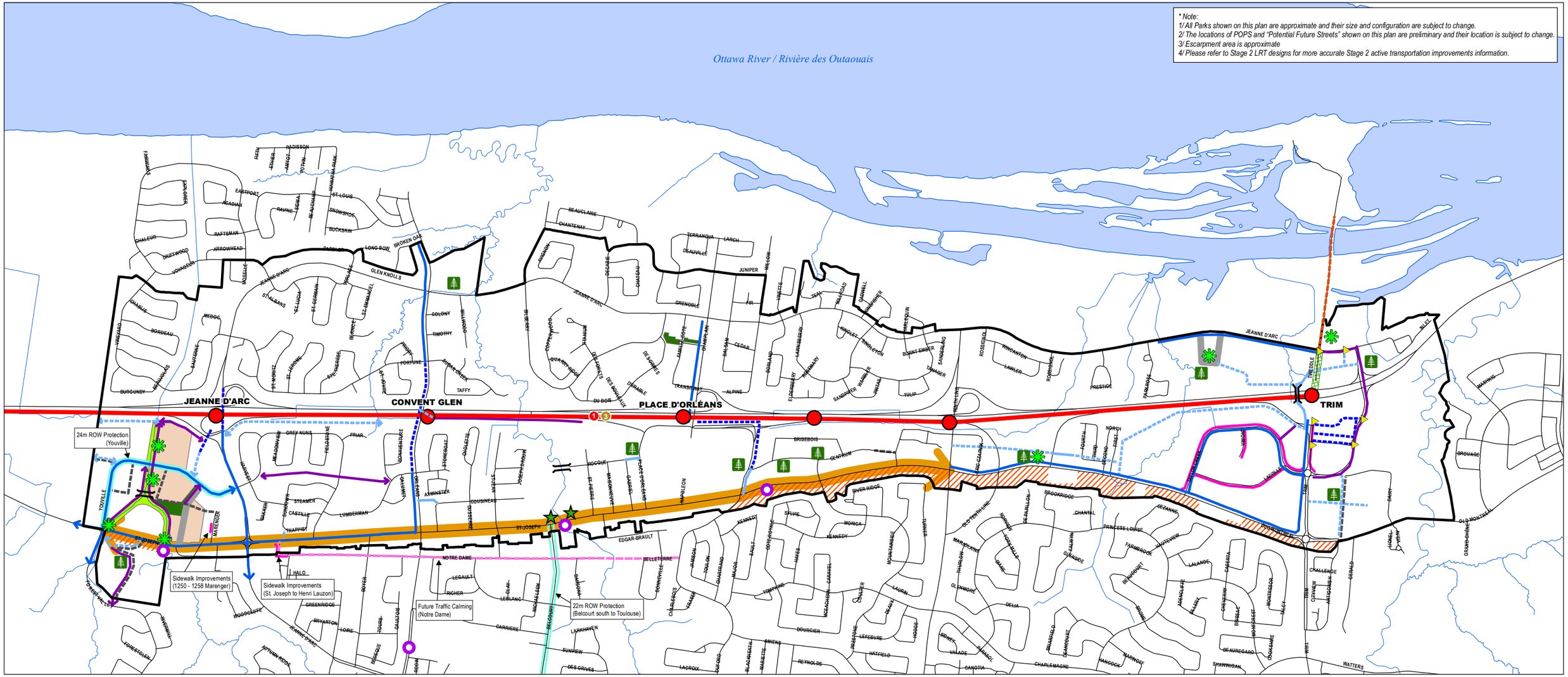
Orléans Corridor / Le couloir d'Orléans

SECONDARY PLAN - Volume 2
Schedule B - Maximum Building Heights

PLAN SECONDAIRE - Volume 2
Annexe B - Hauteurs maximales des immeubles

0 187.5 375 750 1,125 1,500 m

Planning, Infrastructure and Economic Development Department, Geospatial Analytics, Technology and Solutions
Services de la planification, de l'infrastructure et du développement économique, Analyse géospatiale, technologie et solutions



* Note:
1/ All Parks shown on this plan are approximate and their size and configuration are subject to change.
2/ The locations of POPS and "Potential Future Streets" shown on this plan are preliminary and their location is subject to change.
3/ Escarpment area is approximate
4/ Please refer to Stage 2 LRT designs for more accurate Stage 2 active transportation improvements information.

- Park / Parc
- Potential Park /
- Voyageur Creek Greenway Corridor
- Potential Privately-owned Public Space (POPS)
- Linear Park/Woonerf
- Lands Subject to Land Owner Agreements
- Escarpment Area (development prohibited)
- Potential Public Realm Improvement

- New Street
- Potential New Street (Public or Private)
- Road Improvements
- Future Traffice Calming
- 22m ROW Protection
- Sidewalk Improvements
- Pedestrian Crosswalk

- Active Transportation Bridge / Passerelle de mobilité active
- Active Transportation Connection
- Potential Active Transportation Connection
- Physically-separated Cycling Facility /
- Multi-Use Pathway (MUP) / Sentier polyvalent
- LRT Stage 2 Active Transportation Improvements

- St Joseph Boulevard Concept Plan (Annex B)
- Secondary Plan Boundary / Limite du plan secondaire
- LRT / TCTL
- 1 3 O-Train Lines / Lignes de l'O-Train

Orléans Corridor / Le couloir d'Orléans

SECONDARY PLAN - Volume 2
Schedule C - Public Realm and Mobility Improvements

PLAN SECONDAIRE - Volume 2
Annex C - Domaine public

0 187.5 375 750 1,125 1,500 m

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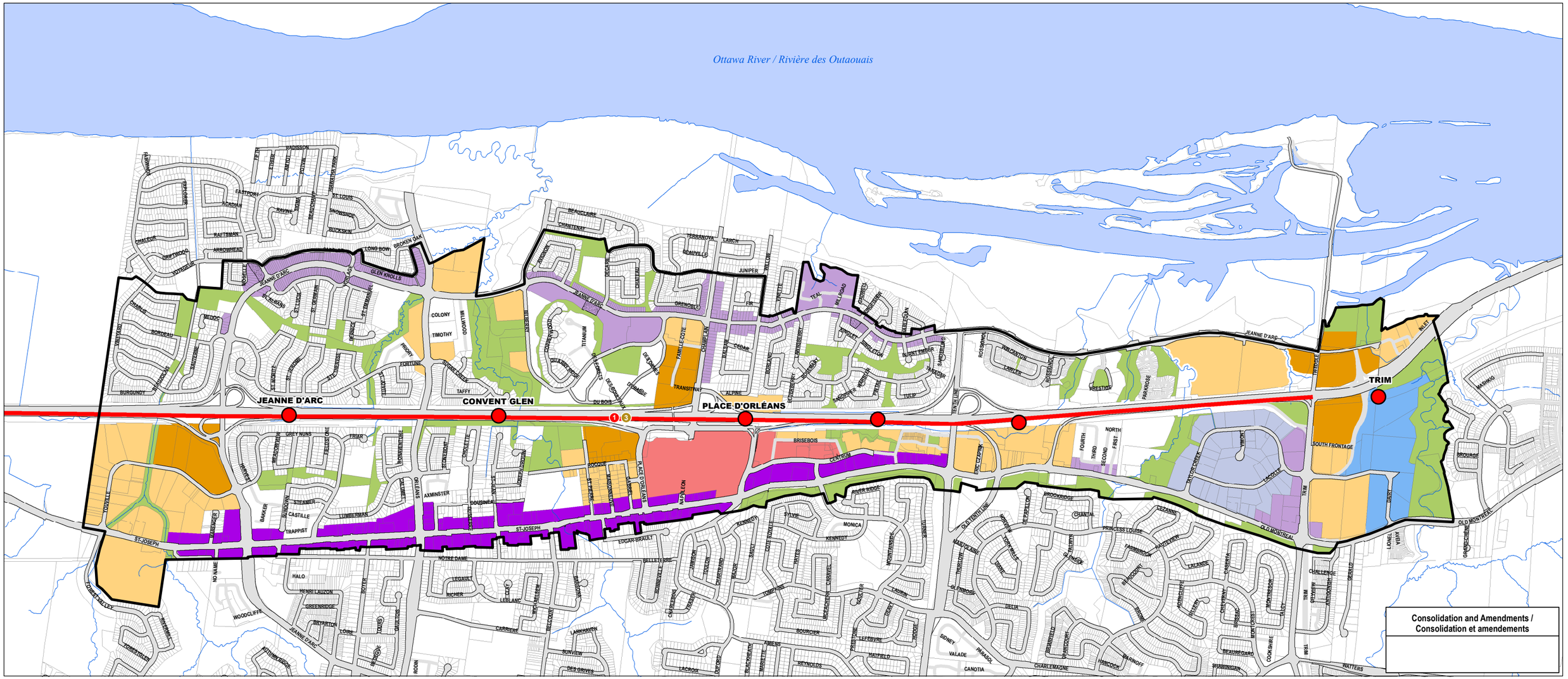

Orleans Town Centre / Centre-ville d'Orléans

Station Area - Core / Zone centrale de la station

Station Area - Periphery / Zone périphérique de la station

St Joseph Mainstreet / Rue principale Saint-Joseph

O-Train Minor Corridor / Couloir – Rue principale mineure de l'O-Train

Industrial and Logistics / Industrie et logistique

Local Production and Entertainment / Production et loisirs de la localité

Greenspace / Espaces verts

Neighbourhood / Quartier

OVERLAY / AFFECTATION SUPPLÉMENTAIRE

Local Commercial Anchor / Ancrage commercial local

Secondary Plan Boundary / Limite du plan secondaire

Light Rail Transit (LRT) / Transport en commun par train léger (TCTL)

O-Train Lines / Lignes de l'O-Train

Orléans Corridor / Le couloir d'Orléans

SECONDARY PLAN - Volume 2
Schedule A - Designation Plan

PLAN SECONDAIRE - Volume 2
Annexe A -Plan de désignation

0 187.5 375 750 1,125 1,500 m

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APPENDIX E

INTERNAL TRIP GENERATION REDUCTION CALCULATIONS

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Petrie's Landing III	**Organization:**	Parsons
Project Location:	8600 Jeanne D'Arc	**Performed By:**	
Scenario Description:	Scenario 2 - TOD	**Date:**	6/26/2023
Analysis Year:		**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				85	74	11
Retail				28	17	11
Restaurant				0		
Cinema/Entertainment				0		
Residential				457	142	315
Hotel				0		
All Other Land Uses[2]				0		
				570	233	337

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	0	0	0	0
Retail	3		0	0	2	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	3	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	570	233	337
Internal Capture Percentage	5%	6%	4%
External Vehicle-Trips[5]	544	220	324
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	7%	27%
Retail	35%	45%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	1%	2%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	Petrie's Landing III
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	74	74	1.00	11	11
Retail	1.00	17	17	1.00	11	11
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	142	142	1.00	315	315
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	7	0	0	0
Retail	3		1	0	2	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	6	3	63	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		5	0	0	0	0
Retail	3		0	0	3	0
Restaurant	10	1		0	7	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	3	0	0		0
Hotel	2	1	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	5	69	74	69	0	0
Retail	6	11	17	11	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	2	140	142	140	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	3	8	11	8	0	0
Retail	5	6	11	6	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	5	310	315	310	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Petrie's Landing III	**Organization:**	Parsons
Project Location:	8600 Jeanne D'Arc	**Performed By:**	
Scenario Description:	Scenario 2 - TOD	**Date:**	6/26/2023
Analysis Year:		**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				83	14	69
Retail				109	52	57
Restaurant				0		
Cinema/Entertainment				0		
Residential				455	264	191
Hotel				0		
All Other Land Uses[2]				0		
				647	330	317

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		150			150	
Retail					150	
Restaurant						
Cinema/Entertainment						
Residential		150				
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		4	0	0	1	0
Retail	1		0	0	15	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	8	5	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	647	330	317
Internal Capture Percentage	11%	10%	11%
External Vehicle-Trips[5]	579	296	283
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	64%	7%
Retail	17%	28%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	6%	7%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	Petrie's Landing III
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	14	14	1.00	69	69
Retail	1.00	52	52	1.00	57	57
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	264	264	1.00	191	191
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		14	3	0	1	0
Retail	1		17	2	15	3
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	8	80	40	0		6
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		4	0	0	11	0
Retail	4		0	0	121	0
Restaurant	4	26		0	42	0
Cinema/Entertainment	1	2	0		11	0
Residential	8	5	0	0		0
Hotel	0	1	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	9	5	14	5	0	0
Retail	9	43	52	43	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	16	248	264	248	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	5	64	69	64	0	0
Retail	16	41	57	41	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	13	178	191	178	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

APPENDIX F

PROJECTED BACKGROUND GROWTH

Trim/OR 174
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2010	Friday 9 July	744	722	5389	800	6433	6484	9542	10363	40477
2012	Friday 8 June	329	441	4696	800	5833	5818	8875	9044	35836
2017	Wednesday 19 April	590	518	4739	853	5522	5570	10003	9024	36819
2023	Tues, Feb 07	691	630	3020	780	5174	4942	4635	7168	27040
2024	Thurs, Jan 25	730	776	2708	759	4983	4865	4597	6618	26036

Summed all inbound movements except for EBR

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	722	744	1466	40477				
2012	441	329	770	35836	-38.9%	-55.8%	-47.5%	-11.5%
2017	518	590	1108	36819	17.5%	79.3%	43.9%	2.7%
2023	630	691	1321	27040	21.6%	17.1%	19.2%	-26.6%
2024	776	730	1506	26036	23.2%	5.6%	14.0%	-3.7%

Regression Estimate	2010	557	536	1093	40100
Regression Estimate	2024	675	693	1368	26764
Average Annual Change		**1.38%**	**1.86%**	**1.62%**	**-2.85%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	9542	10363	19905	40477				
2012	8875	9044	17919	35836	-7.0%	-12.7%	-10.0%	-11.5%
2017	10003	9024	19027	36819	12.7%	-0.2%	6.2%	2.7%
2023	4635	7168	11803	27040	-53.7%	-20.6%	-38.0%	-26.6%
2024	4597	6618	11215	26036	-0.8%	-7.7%	-5.0%	-3.7%

Regression Estimate	2010	10192	10115	20307	
Regression Estimate	2024	5016	6865	11881	
Average Annual Change		**-4.94%**	**-2.73%**	**-3.76%**	

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	6484	6433	12917	40477				
2012	5818	5833	11651	35836	-10.3%	-9.3%	-9.8%	-11.5%
2017	5570	5522	11092	36819	-4.3%	-5.3%	-4.8%	2.7%
2023	4942	5174	10116	27040	-11.3%	-6.3%	-8.8%	-26.6%
2024	4865	4983	9848	26036	-1.6%	-3.7%	-2.6%	-3.7%

Regression Estimate	2010	6275	6217	12493	
Regression Estimate	2024	4838	4995	9833	
Average Annual Change		**-1.84%**	**-1.55%**	**-1.70%**	

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	5389	800	6189	40477				
2012	4696	800	5496	35836	-12.9%	0.0%	-11.2%	-11.5%
2017	4739	853	5592	36819	0.9%	6.6%	1.7%	2.7%
2023	3020	780	3800	27040	-36.3%	-8.6%	-32.0%	-26.6%
2024	2708	759	3467	26036	-10.3%	-2.7%	-8.8%	-3.7%

Regression Estimate	2010	5391	817	6207	
Regression Estimate	2024	2901	781	3682	
Average Annual Change		**-4.33%**	**-0.32%**	**-3.66%**	

Trim/OR 174
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2010	Friday 9 July	42	46	819	100	1309	387	720	2003	5426
2012	Friday 8 June	62	64	875	100	1292	313	578	2016	5300
2017	Wednesday 19 April	48	51	807	116	1324	428	727	1890	5391
2023	Tues, Feb 07	53	88	592	98	1200	335	321	1645	4332
2024	Thurs, Jan 25	58	142	399	91	1101	268	260	1317	3636

Summed all inbound movements except for EBR

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	46	42	88	5426				
2012	64	62	126	5300	39.1%	47.6%	43.2%	-2.3%
2017	51	48	99	5391	-20.3%	-22.6%	-21.4%	1.7%
2023	88	53	141	4332	72.5%	10.4%	42.4%	-19.6%
2024	142	58	200	3636	61.4%	9.4%	41.8%	-16.1%

Regression Estimate	2010	42	50	91	5627
Regression Estimate	2024	113	55	168	4052
Average Annual Change		**7.32%**	**0.81%**	**4.45%**	**-2.32%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	720	2003	2723	5426				
2012	578	2016	2594	5300	-19.7%	0.6%	-4.7%	-2.3%
2017	727	1890	2617	5391	25.8%	-6.3%	0.9%	1.7%
2023	321	1645	1966	4332	-55.8%	-13.0%	-24.9%	-19.6%
2024	260	1317	1577	3636	-19.0%	-19.9%	-19.8%	-16.1%

Regression Estimate	2010	735	2082	2816
Regression Estimate	2024	320	1484	1803
Average Annual Change		**-5.77%**	**-2.39%**	**-3.13%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	387	1309	1696	5426				
2012	313	1292	1605	5300	-19.1%	-1.3%	-5.4%	-2.3%
2017	428	1324	1752	5391	36.7%	2.5%	9.2%	1.7%
2023	335	1200	1535	4332	-21.7%	-9.4%	-12.4%	-19.6%
2024	268	1101	1369	3636	-20.0%	-8.3%	-10.8%	-16.1%

Regression Estimate	2010	379	1334	1714
Regression Estimate	2024	315	1161	1476
Average Annual Change		**-1.33%**	**-0.99%**	**-1.06%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	819	100	919	5426				
2012	875	100	975	5300	6.8%	0.0%	6.1%	-2.3%
2017	807	116	923	5391	-7.8%	16.0%	-5.3%	1.7%
2023	592	98	690	4332	-26.6%	-15.5%	-25.2%	-19.6%
2024	399	91	490	3636	-32.6%	-7.1%	-29.0%	-16.1%

Regression Estimate	2010	901	104	1005
Regression Estimate	2024	507	98	605
Average Annual Change		**-4.02%**	**-0.47%**	**-3.56%**

Trim/OR 174
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2010	Friday 9 July	107	40	603	130	664	1334	2131	1124	6133
2012	Friday 8 June	94	69	634	130	624	1353	2024	1049	5977
2017	Wednesday 19 April	56	61	587	132	657	1284	1839	993	5609
2023	Tues, Feb 07	159	74	333	116	437	998	931	672	3720
2024	Thurs, Jan 25	165	90	359	125	487	1159	1082	719	4186

Summed all inbound movements except for EBR

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	40	107	147	6133				
2012	69	94	163	5977	72.5%	-12.1%	10.9%	-2.5%
2017	61	56	117	5609	-11.6%	-40.4%	-28.2%	-6.2%
2023	74	159	233	3720	21.3%	183.9%	99.1%	-33.7%
2024	90	165	255	4186	21.6%	3.8%	9.4%	12.5%

Regression Estimate	2010	49	81	131	6318
Regression Estimate	2024	83	149	233	3998
Average Annual Change		**3.78%**	**4.46%**	**4.21%**	**-3.22%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	2131	1124	3255	6133				
2012	2024	1049	3073	5977	-5.0%	-6.7%	-5.6%	-2.5%
2017	1839	993	2832	5609	-9.1%	-5.3%	-7.8%	-6.2%
2023	931	672	1603	3720	-49.4%	-32.3%	-43.4%	-33.7%
2024	1082	719	1801	4186	16.2%	7.0%	12.4%	12.5%

Regression Estimate	2010	2213	1136	3349	
Regression Estimate	2024	1024	699	1723	
Average Annual Change		**-5.35%**	**-3.41%**	**-4.63%**	

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2010	1334	664	1998	6133				
2012	1353	624	1977	5977	1.4%	-6.0%	-1.1%	-2.5%
2017	1284	657	1941	5609	-5.1%	5.3%	-1.8%	-6.2%
2023	998	437	1435	3720	-22.3%	-33.5%	-26.1%	-33.7%
2024	1159	487	1646	4186	16.1%	11.4%	14.7%	12.5%

Regression Estimate	2010	1372	679	2051	
Regression Estimate	2024	1087	475	1562	
Average Annual Change		**-1.65%**	**-2.52%**	**-1.92%**	

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2010	603	130	733	6133				
2012	634	130	764	5977	5.1%	0.0%	4.2%	-2.5%
2017	587	132	719	5609	-7.4%	1.5%	-5.9%	-6.2%
2023	333	116	449	3720	-43.3%	-12.1%	-37.6%	-33.7%
2024	359	125	484	4186	7.8%	7.8%	7.8%	12.5%

Regression Estimate	2010	657	132	788	
Regression Estimate	2024	358	122	480	
Average Annual Change		**-4.23%**	**-0.57%**	**-3.48%**	

APPENDIX G

GEOMETRIC ROAD DESIGN DRAWING

DRIVEWAY ACCESS CURB RETURN (SC7.1)

DRIVEWAY ACCESS CURB RETURN (SC7.1)

ASPHALT RAISED INTERSECTION (R15.1)

DRIVEWAY ACCESS CURB RETURN (SC7.1)

DRIVEWAY ACCESS CURB RETURN (SC7.1)

ASPHALT RAISED INTERSECTION (R15.1)

MIN. 15m PAINTED LINE (TYP.)

ASPHALT RAISED INTERSECTION (R15.1)

SPEED HUMP (R19)

PARSONS®

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

Legend

P

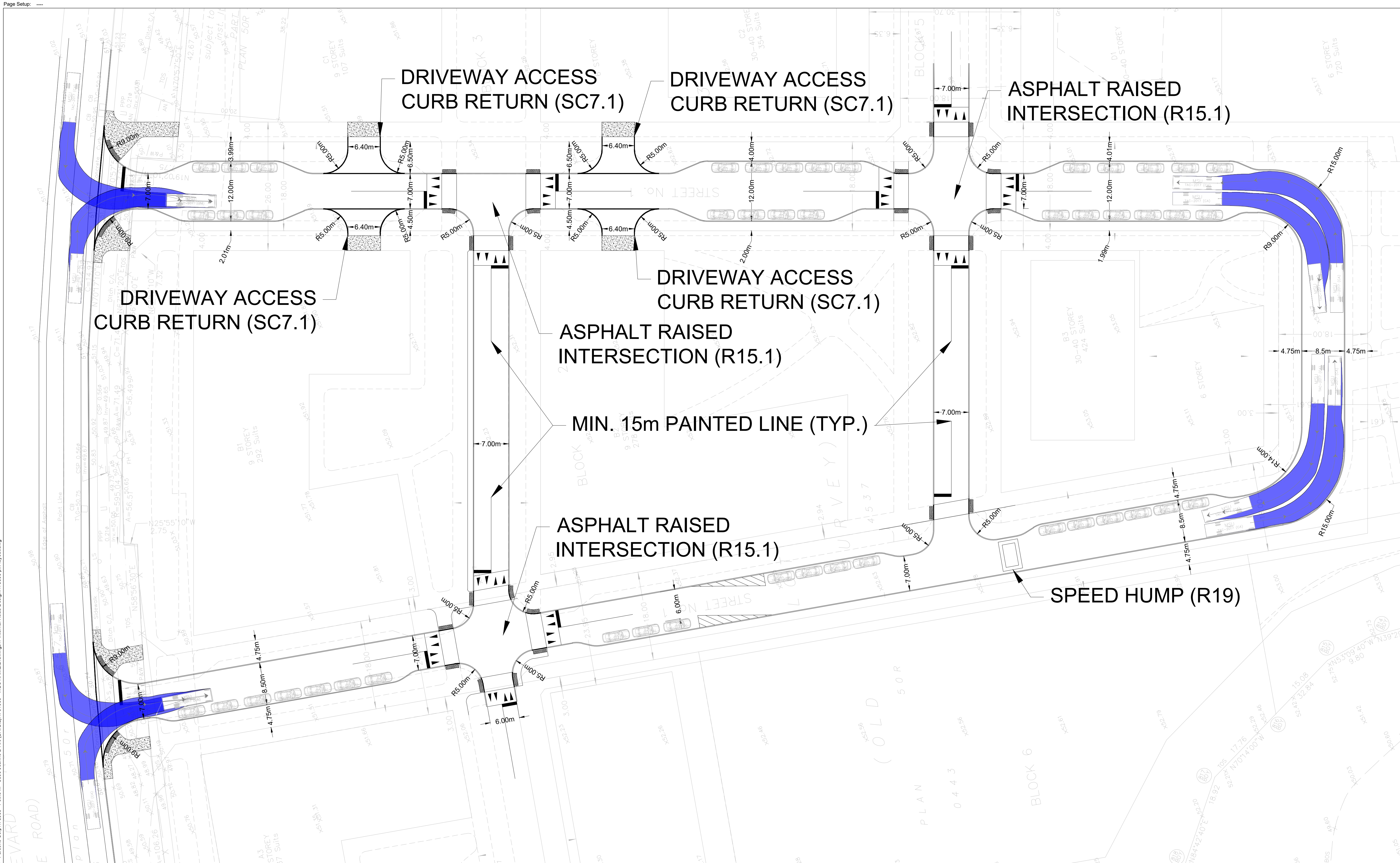
	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

HSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

Not to Scale

Drawing Description: 30 km/k Road Design Plan (HSU)		
Client	Date: DEC 18, 2024	Figure Number: 001
Project Number: 478566	Project Description: 8600 Jeanne d'Arc (Petrie III)	



PARSONS®

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

Legend

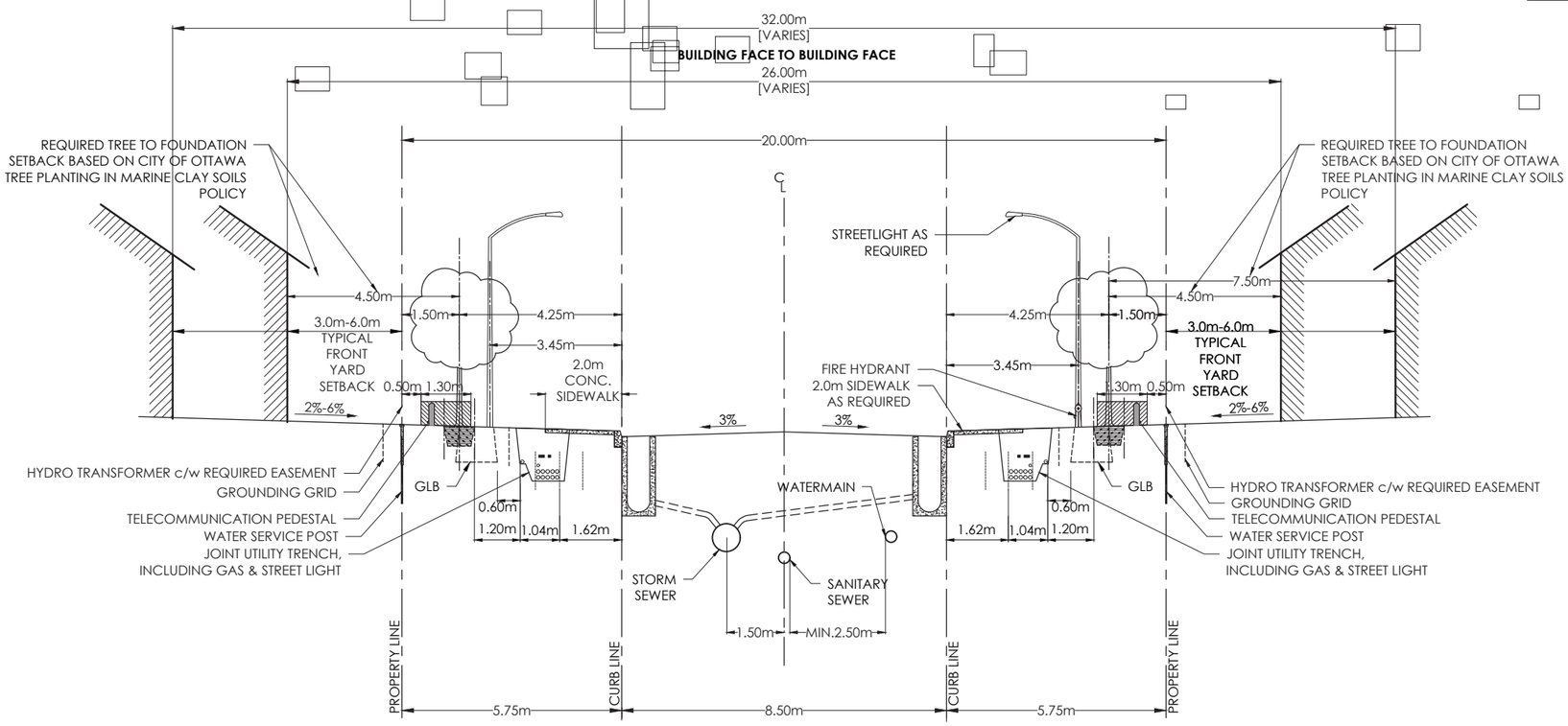
P — meters: Width : 2.00; Track : 2.00; Lock to Lock Time : 6.0; Steering Angle : 35.9

MSU — meters: Width : 2.60; Track : 2.60; Lock to Lock Time : 6.0; Steering Angle : 40.2

Not to Scale

Drawing Description	30 km/k Road Design Plan (MSU)
Client	
Date	DEC 18, 2024
Figure Number	002
Project Number	478566
Project Description	8600 Jeanne d'Arc (Petrie III)

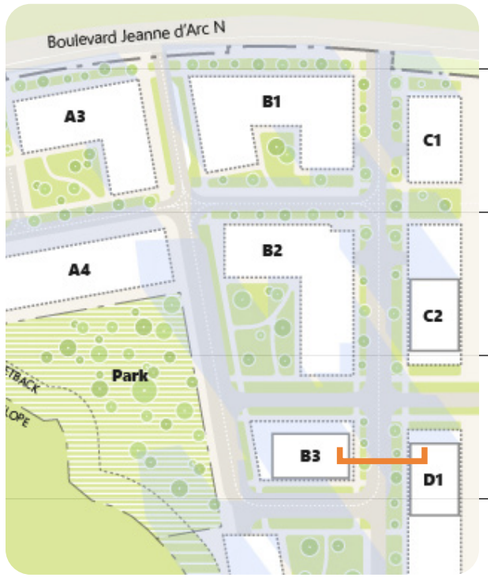
1. STANDARD CROSS-SECTIONS TO BE READ IN CONJUNCTION WITH THE GENERAL STANDARD CROSS-SECTION NOTES AND OTHER APPLICABLE CITY AND UTILITY PLANS AND DETAILS.
2. CONCRETE CURBS TO BE CONSTRUCTED AS PER CITY OF OTTAWA STANDARD DETAILS.
3. TYPICAL FRONT YARD SETBACK IS TO BE CLEAR AND UNENCUMBERED OF ANY SUBSURFACE BUILDING ENCROACHMENTS.
4. FIRE HYDRANTS TO BE LOCATED ON THE WATERMAIN SIDE OF THE STREET.
5. CATCH BASINS TO BE PER CITY OF OTTAWA DETAIL S2.
6. GAS MAIN SHALL HAVE A MINIMUM OF 0.6M CLEARANCE FROM STRUCTURES E.G.CATCH BASINS AND HYDRANTS) AND 1.2 M FROM TREE ROOT BALL.
7. STREETLIGHTS CAN BE LOCATED ON EITHER SIDE OF THE RIGHT-OF-WAY.
8. GAS MAIN SHALL HAVE A MINIMUM OF 0.6 M CLEARANCE FROM STRUCTURES E.G. CATCH BASINS AND HYDRANTS) AND 1.2 M FROM TREE ROOT BALL.
9. JOINT-USE UTILITY TRENCH (JUT) UNDER SIDEWALK AS PER DETAIL UDS0049 (REV 22) HELD BY OTTAWA HYDRO.
10. GRADE LEVEL BOX (GLB) AS DRAWN SHOWS GLB3660. EXACT LOCATION TO BE CONFIRMED.
    THIS CROSS SECTION TO BE USED IF CONCRETE ENCASED HYDRO DUCT OR ANOTHER SEPARATE UTILITY DUCT IS REQUIRED.
    IF CONCRETE ENCASED HYDRO DUCT IS UTILIZED, INSTALATION AS PER DETAIL UDS0051.
11. WHEN CONCRETE DUCT BANKS ARE REQUIRED, ADDITIONAL CLEARANCE IS REQUIRED FOR THE INSTALLATION OF A 2.2M X 4.0M MAINTENANCE HOLE PER OTTAWA HYDRO DETAIL UCS0014.
    LOCATIONS TO BE DETERMINED DURING DESIGN PHASE.
12. TREE CLEARANCES TO HYDRO OTTAWA PLANT SHALL FOLLOW GCS0038.
13. CLEARANCES SHOWN ARE MINIMUMS.



Ottawa	20.0m ROW CROSS SECTION	REV.DATE: AUG. 2022 DWG. No. ROW-20.0

Site Sections

5 | Massing - Height, Density & Transition



APPENDIX H

MMLOS ANALYSIS: ROAD SEGMENTS

Multi-Modal Level of Service - Segments Form

Consultant	**Parsons**	**Project**	**478566**
Scenario	**Petrie's Landing III**	**Date**	**28-Dec-23**
Comments	**All segments are Jeanne D'Arc**		

SEGMENTS		**Street A**	North Existing	South Existing	South Future	Section 4	N include MUP Existing	Mitigation 6	Section 7	Section 8	Section 9
Pedestrian	Sidewalk Width Boulevard Width	-	no sidewalk n/a	≥ 2 m 0.5 - 2 m	≥ 2 m 0.5 - 2 m		≥ 2 m > 2 m	≥ 2 m > 2 m			
	Avg Daily Curb Lane Traffic Volume		≤ 3000	≤ 3000	> 3000		≤ 3000	> 3000			
	Operating Speed On-Street Parking		> 60 km/h no	> 60 km/h no	> 60 km/h no		> 60 km/h no	≤ 30 km/h no			
	Exposure to Traffic PLoS		**F**	**B**	**E**	**-**	**B**	**A**	**-**	**-**	**-**
	Effective Sidewalk Width										
	Pedestrian Volume										
	Crowding PLoS		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Level of Service		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Bicycle	Type of Cycling Facility	C	Curbside Bike Lane	Curbside Bike Lane	Physically Separated			Curbside Bike Lane			
	Number of Travel Lanes		2 ea. dir. (no median)	2 ea. dir. (no median)				2 ea. dir. (no median)			
	Operating Speed		>50 to 70 km/h	>50 to 70 km/h				≤ 50 km/h			
	# of Lanes & Operating Speed LoS		**C**	**C**	**-**	**-**	**-**	**B**	**-**	**-**	**-**
	Bike Lane (+ Parking Lane) Width		≥1.5 to <1.8 m	≥1.5 to <1.8 m							
	Bike Lane Width LoS		**B**	**B**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Bike Lane Blockages		Rare	Rare							
	Blockage LoS		**A**	**A**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge							
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes							
	Sidestreet Operating Speed		>40 to 50 km/h	>40 to 50 km/h							
	Unsignalized Crossing - Lowest LoS		**B**	**B**	**A**	**-**	**-**	**-**	**-**	**-**	**-**
	Level of Service		**C**	**C**	**A**	**-**	**-**	**-**	**-**	**-**	**-**
Transit	Facility Type	D	Mixed Traffic	Mixed Traffic	Mixed Traffic						
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8						
	Level of Service		**D**	**D**	**D**	**-**	**-**	**-**	**-**	**-**	**-**
Truck	Truck Lane Width	C	≤ 3.5 m	≤ 3.5 m	≤ 3.5 m						
	Travel Lanes per Direction		1	1	1						
	Level of Service		**C**	**C**	**C**	**-**	**-**	**-**	**-**	**-**	**-**

APPENDIX I

DRAFT TDM 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	☑ parking underground
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)*	☑ anticipated MUP on north side of H174, connecting to a new bridge connection from Trim LRT Station to MUP on north side of H174.
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	☑ 30km/h streets envisioned
	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)*	☑ Anticipated. To be confirmed in SPA
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	☑ to be determined in SPA
	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)	☑ to be considered during SPA
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☑ to be considered during SPA
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	☑ To be confirmed during SPA
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☑
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☑
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☑

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

Legend

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

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

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

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

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

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

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

Legend

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

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

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

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

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

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

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

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: *Non-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	☑
	2.2	**Bicycle skills training**	
		Commuter travel	
BETTER ★	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	☑
	2.3	**Valet bike parking**	
		Visitor travel	
BETTER	2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

		TDM measures: *Non-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	☑
BASIC	3.1.2	Provide online links to OC Transpo and STO information	☑
BETTER	3.1.3	Provide real-time arrival information display at entrances	☐
		3.2 Transit fare incentives	
		Commuter travel	
BETTER	3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	☑
BETTER ★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	☐
		Visitor travel	
BETTER	3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
		3.3 Enhanced public transit service	
		Commuter travel	
BETTER	3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
		Visitor travel	
BETTER	3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
		3.4 Private transit service	
		Commuter travel	
BETTER	3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐
		Visitor travel	
BETTER	3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4. RIDESHARING	
		4.1 Ridematching service	
		Commuter travel	
BASIC	★ 4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☐
		4.2 Carpool parking price incentives	
		Commuter travel	
BETTER	4.2.1	Provide discounts on parking costs for registered carpools	☐
		4.3 Vanpool service	
		Commuter travel	
BETTER	4.3.1	Provide a vanpooling service for long-distance commuters	☐
		5. CARSHARING & BIKESHARING	
		5.1 Bikeshare stations & memberships	
BETTER	5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☑
		Commuter travel	
BETTER	5.1.2	Provide employees with bikeshare memberships for local business travel	☑
		5.2 Carshare vehicles & memberships	
		Commuter travel	
BETTER	5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☑
BETTER	5.2.2	Provide employees with carshare memberships for local business travel	☐
		6. PARKING	
		6.1 Priced parking	
		Commuter travel	
BASIC	★ 6.1.1	Charge for long-term parking (daily, weekly, monthly)	☐
BASIC	6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☑
		Visitor travel	
BETTER	6.1.3	Charge for short-term parking (hourly)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☑
			Visitor travel	
BETTER	★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐
		7.2	**Personalized trip planning**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	☑
		7.3	**Promotions**	
			Commuter travel	
BETTER		7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐
		8.	**OTHER INCENTIVES & AMENITIES**	
		8.1	**Emergency ride home**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	☐
		8.2	**Alternative work arrangements**	
			Commuter travel	
BASIC	★	8.2.1	Encourage flexible work hours	☐
BETTER		8.2.2	Encourage compressed workweeks	☐
BETTER	★	8.2.3	Encourage telework	☐
		8.3	**Local business travel options**	
			Commuter travel	
BASIC	★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☐
		8.4	**Commuter incentives**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5	**On-site amenities**	
			Commuter travel	
BETTER		8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☐

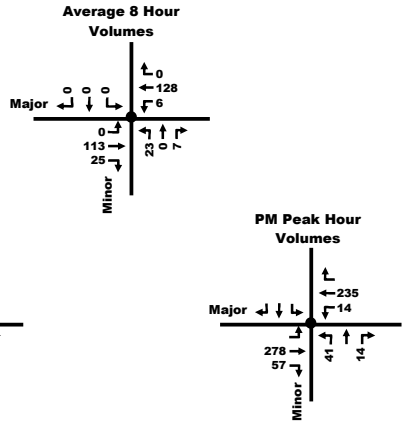
APPENDIX J

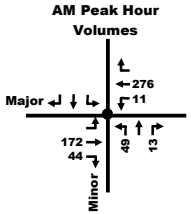
SIGNAL AND AWSC WARRANT ANALYSIS

West Site/Jeanne D'Arc - Existing

AWSC Warrant			Description	Minimum Requirement for a 'T' intersection	Compliance		
					Sectional %	Entire %	Warrant
Intersection	1. Minimum Volume Criterion	A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, or	200	151%	33%	**No**
		B	Vehicle Volume, All Approaches for the Heaviest Peak Hour, and	350	183%		
		C	Vehicle and pedestrian Volume, Along Minor Streets for Each of the Same 8 Hours, and	80	38%		
		D	The volume split between the major and minor streets	75/25	33%		
	2. Minimum Collision Criterion	A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	9	0%	0%	

Note: ***0*** *preventable by AWSC collisions (i.e. right angle and turning movement collisions) were reported during a 3 year time period*



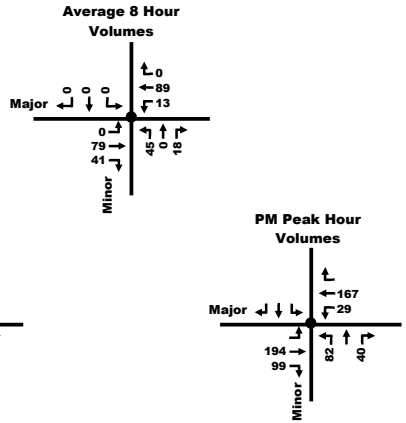


		Minor							Major				
		West Site							Jeanne D'Arc				
	Peak	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Existing	8 hr												
	AM	49		13					172	44	11	276	
	PM	41		14					278	57	14	235	
Site Generated	AM												
	PM												
	Avg. 8 hr	23	0	7	0	0	0	0	113	25	6	128	0

Central Site/Jeanne D'Arc - Existing

AWSC Warrant			Description	Minimum Requirement for a 'T' intersection	Compliance		
					Sectional %	Entire %	Warrant
Intersection	1. Minimum Volume Criterion	A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, or	200	143%	79%	No
		B	Vehicle Volume, All Approaches for the Heaviest Peak Hour, and	350	175%		
		C	Vehicle and pedestrian Volume, Along Minor Streets for Each of the Same 8 Hours, and	80	79%		
		D	The volume split between the major and minor streets	75/25	85%		
	2. Minimum Collision Criterion	A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	9	0%	0%	

Note: ***0*** *preventable by AWSC collisions (i.e. right angle and turning movement collisions) were reported during a 3 year time period*

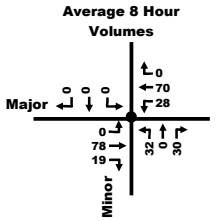


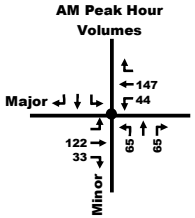
		Minor							Major				
		Central Site							Jeanne D'Arc				
	Peak	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Existing	8 hr												
	AM	97		32					122	66	22	190	
	PM	82		40					194	99	29	167	
Site Generated	AM												
	PM												
	Avg. 8 hr	45	0	18	0	0	0	0	79	41	13	89	0

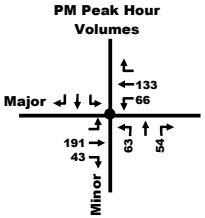
East Site/Jeanne D'Arc - Existing

AWSC Warrant			Description	Minimum Requirement for a 'T' intersection	Compliance		
					Sectional %	Entire %	Warrant
Intersection	1. Minimum Volume Criterion	A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, or	200	129%	78%	**No**
		B	Vehicle Volume, All Approaches for the Heaviest Peak Hour, and	350	157%		
		C	Vehicle and pedestrian Volume, Along Minor Streets for Each of the Same 8 Hours, and	80	78%		
		D	The volume split between the major and minor streets	75/25	95%		
	2. Minimum Collision Criterion	A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	9	0%	0%	

Note: ***0*** *preventable by AWSC collisions (i.e. right angle and turning movement collisions) were reported during a 3 year time period*







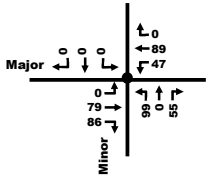
		Minor East Site						Major Jeanne D'Arc					
	Peak	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Existing	8 hr												
	AM	65		65					122	33	44	147	
	PM	63		54					191	43	66	133	
Site Generated	AM												
	PM												
	Avg. 8 hr	32	0	30	0	0	0	0	78	19	28	70	0

All combined/Jeanne D'Arc - Existing

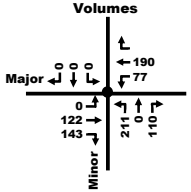
AWSC Warrant			Description	Minimum Requirement for a 'T' intersection	Compliance		
					Sectional %	Entire %	Warrant
Intersection	1. Minimum Volume Criterion	A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, or	200	228%	153%	**Yes**
		B	Vehicle Volume, All Approaches for the Heaviest Peak Hour, and	350	275%		
		C	Vehicle and pedestrian Volume, Along Minor Streets for Each of the Same 8 Hours, and	80	193%		
		D	The volume split between the major and minor streets	75/25	153%		
	2. Minimum Collision Criterion	A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	9	0%	0%	

Note: ***0*** *preventable by AWSC collisions (i.e. right angle and turning movement collisions) were reported during a 3 year time period*

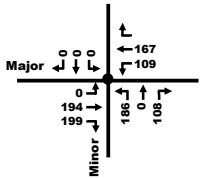
Average 8 Hour Volumes



AM Peak Hour Volumes



PM Peak Hour Volumes



		Minor							Major				
				All combined						Jeanne D'Arc			
	Peak	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Existing	8 hr												
	AM	211	0	110	0	0	0	0	122	143	77	190	
	PM	186	0	108	0	0	0	0	194	199	109	167	
Site Generated	AM												
	PM												
	Avg. 8 hr	99	0	55	0	0	0	0	79	86	47	89	0

West Site/Jeanne D'Arc - (peak hour signal warrant)

Signal Warrant			Description	Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	42%	12%	**31% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	12%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	38%	31%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	31%		

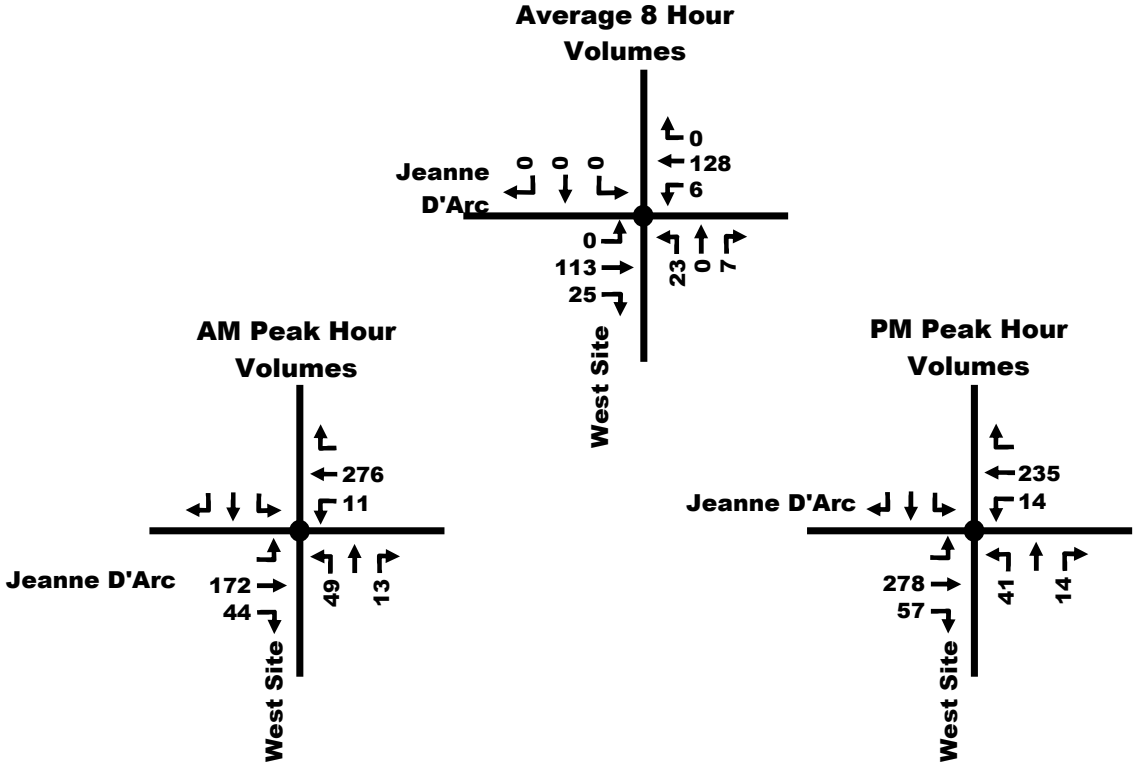
Notes

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

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

3 *The Lowest Sectional Percentage Governs the Entire Warrant*

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



Central Site/Jeanne D'Arc - (peak hour signal warrant)

Signal Warrant			Description	Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	40%	25%	**31% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	25%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	31%	31%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	60%		

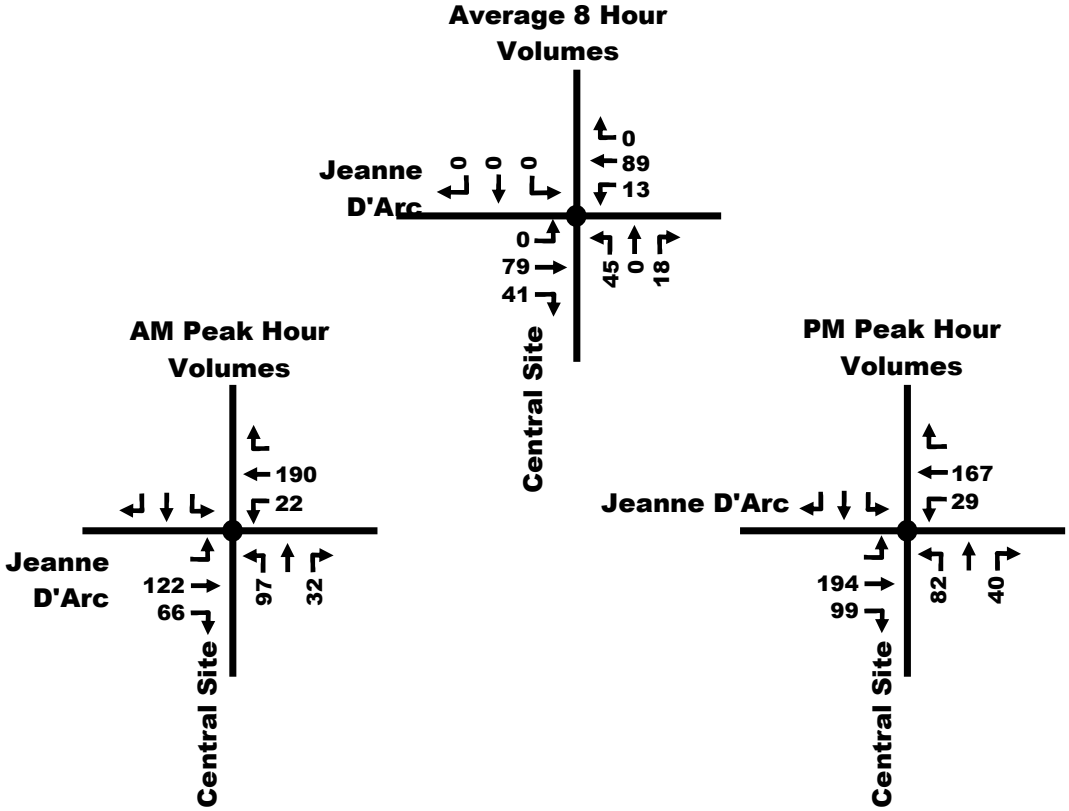
Notes

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

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

3 *The Lowest Sectional Percentage Governs the Entire Warrant*

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



East Site/Jeanne D'Arc - (peak hour signal warrant)

Signal Warrant		Description		Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	36%	24%	**27% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	24%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	27%	27%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	43%		

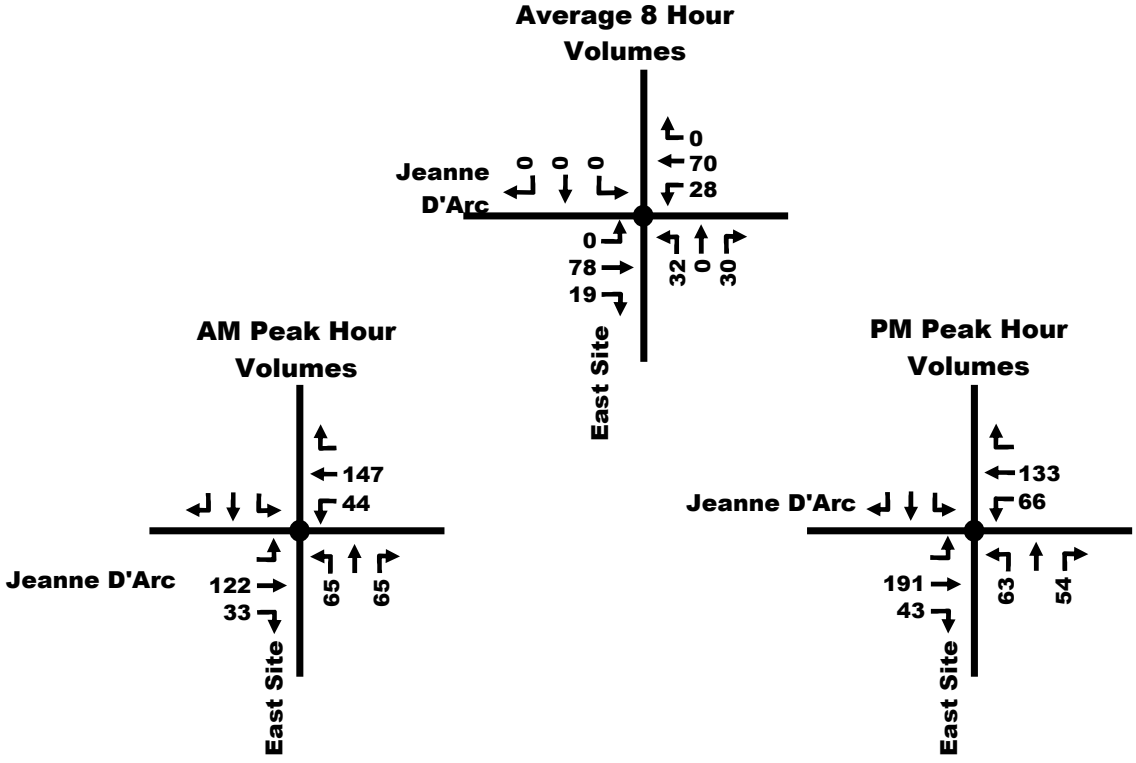
Notes

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

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

3 *The Lowest Sectional Percentage Governs the Entire Warrant*

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



All Combined Site/Jeanne D'Arc - (peak hour signal warrant)

Signal Warrant		Description		Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	63%	60%	**60% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	60%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	42%	42%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	132%		

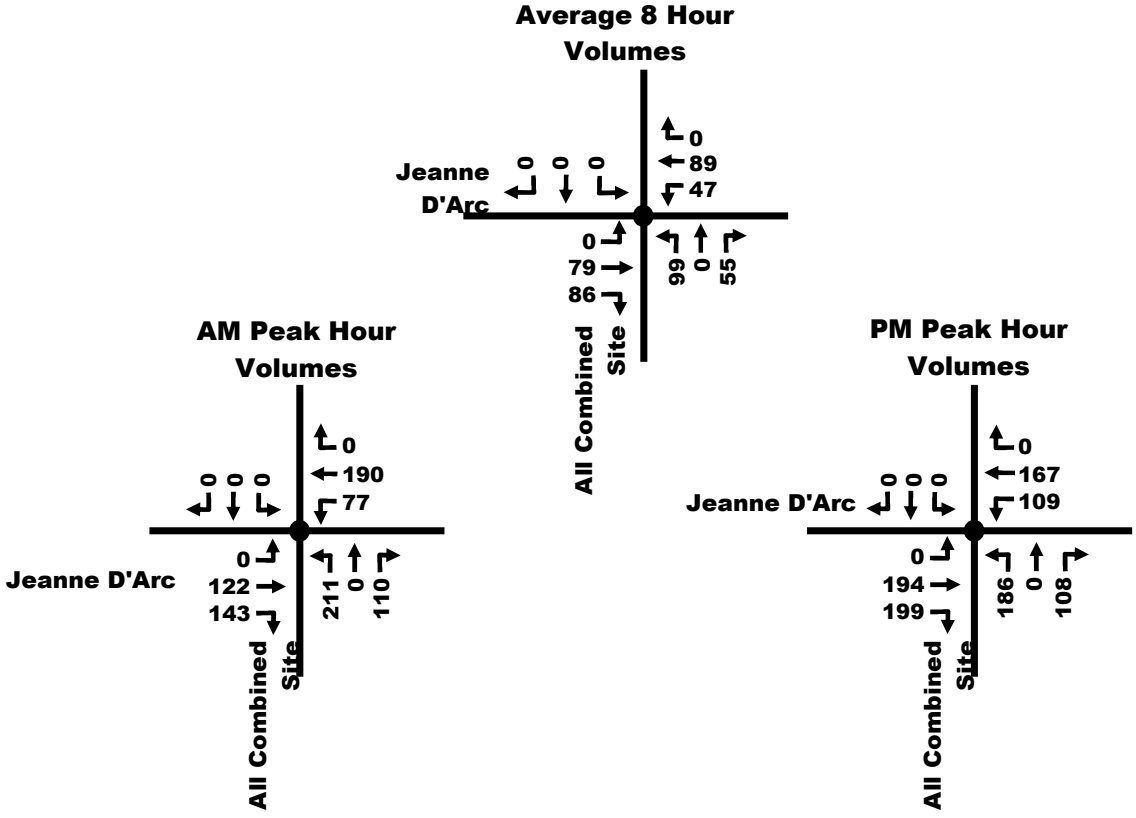
Notes

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

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

3 *The Lowest Sectional Percentage Governs the Entire Warrant*

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

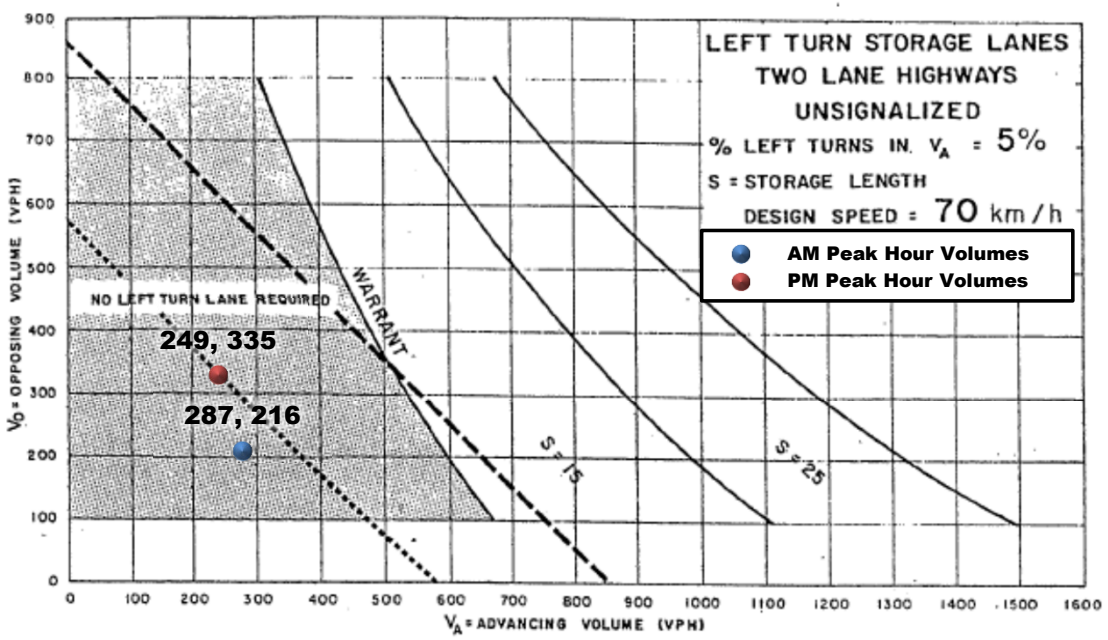


APPENDIX K

AUXILIARY LEFT-TURN LANE WARRANT

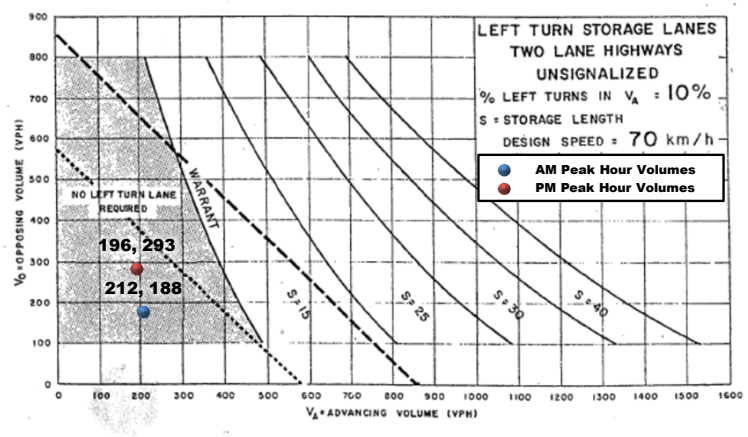
	Design Speed	Advancing Traffic Volume (V_A)		Opposing Traffic Volume (V_O)		Left Turn Traffic Volume (V_L)		% of Left Turning Traffic		Warrant Left Turn Lane
		AM	PM	AM	PM	AM	PM	AM	PM	
Existing										
West Access/Jeanne D'Arc	70	287	249	216	335	11	14	4%	6%	No

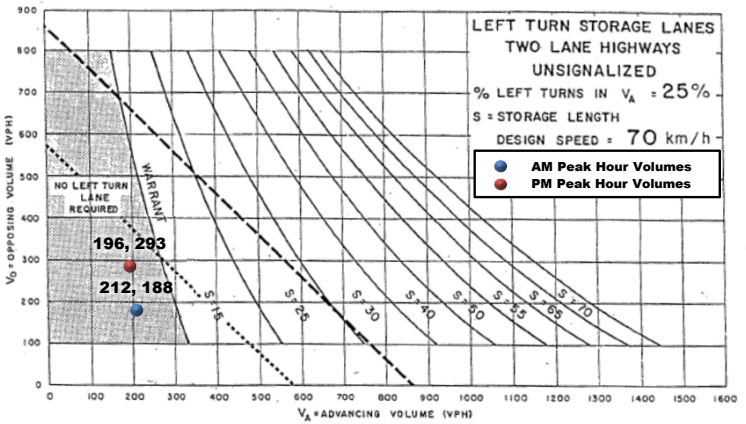
Peak	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
										Warrant?		
AM	49		13					172	44	11	276	
PM	41		14					278	57	14	235	



	Design Speed	Advancing Traffic Volume (V_A)		Opposing Traffic Volume (V_O)		Left Turn Traffic Volume (V_L)		% of Left Turning Traffic		Warrant Left Turn Lane
		AM	PM	AM	PM	AM	PM	AM	PM	
Existing										
Central Access/Jeanne D'Arc	70	212	196	188	293	22	29	10%	15%	Yes

Peak	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
										Warrant?		
AM	97		32					122	66	22	190	
PM	82		40					194	99	29	167	



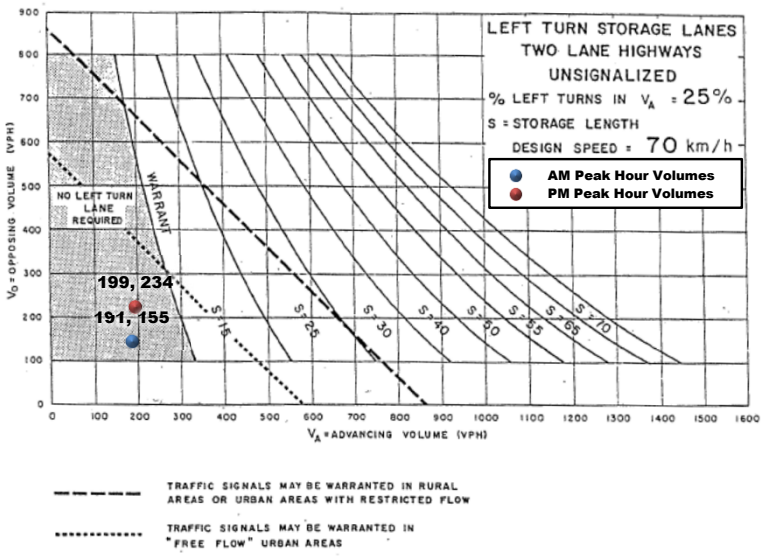


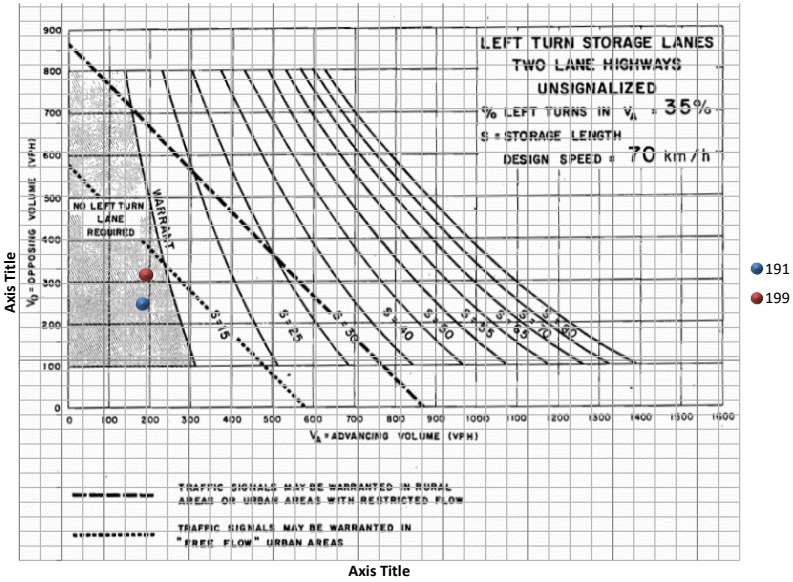
TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

	Design Speed	Advancing Traffic Volume (V_A)		Opposing Traffic Volume (V_O)		Left Turn Traffic Volume (V_L)		% of Left Turning Traffic		Warrant Left Turn Lane
		AM	PM	AM	PM	AM	PM	AM	PM	
Existing										
East Access/Jeanne D'Arc	70	191	199	155	234	44	66	23%	33%	Yes

Peak	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
										Warrant?		
AM	65		65					122	33	44	147	
PM	63		54					191	43	66	133	





APPENDIX L

PXO WARRANT TOOL

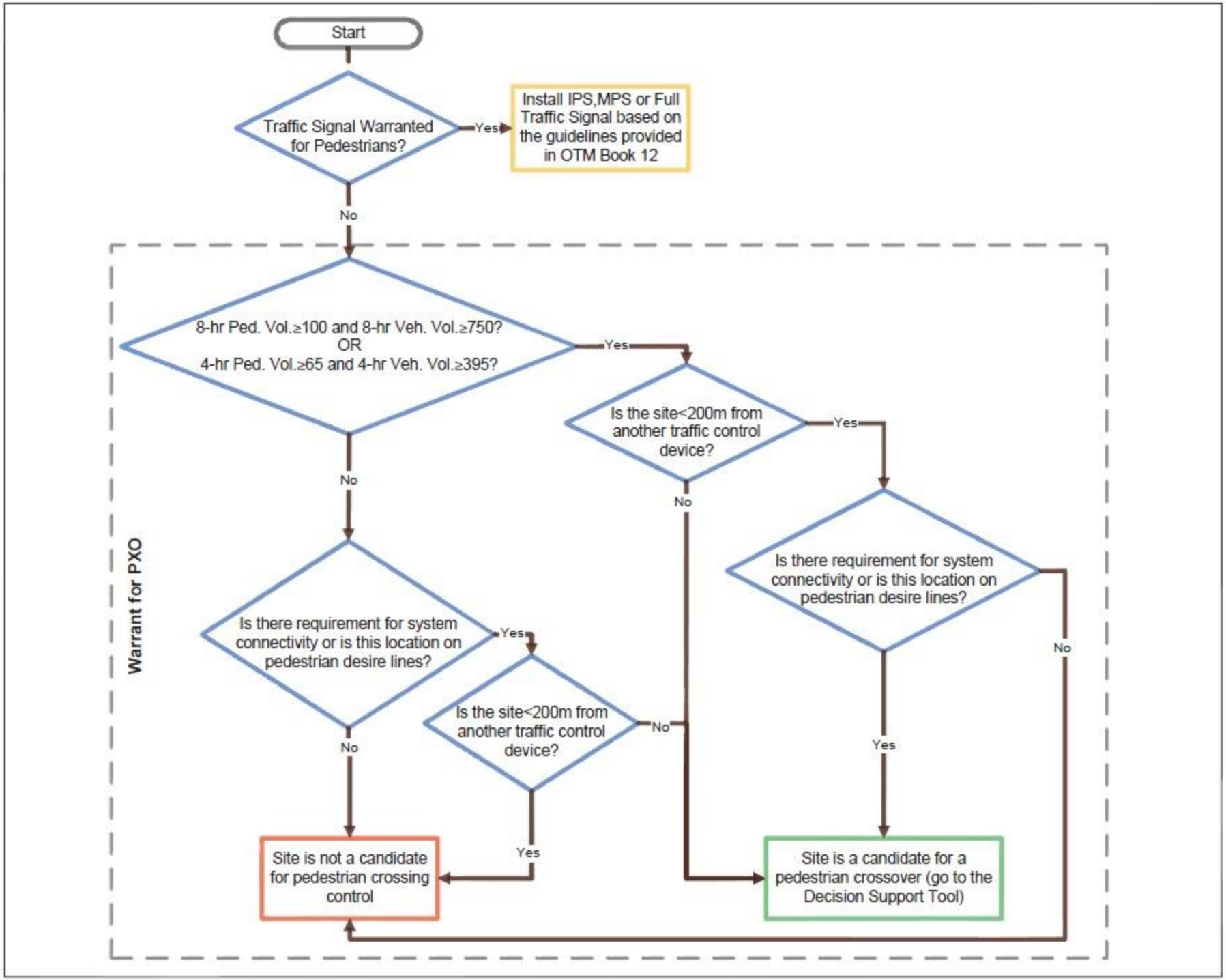


Figure 2: Decision Support Tool – Preliminary Assessment

Table 7: Pedestrian Crossover Selection Matrix

Two-way Vehicular Volume			Posted Speed Limit (km/h	Total Number of Lanes for the Roadway Cross Section[1]			
Time Period	Lower Bound	Upper Bound		1 or 2 Lanes	3 lanes	4 lanes w/raised refuge	4 lanes w/o raised refuge
8 Hour	750	2,250	≤50	Level 2 Type D	Level 2 Type C[3]	Level 2 Type D[2]	Level 2 Type B
4 Hour	395	1,185					
8 Hour	750	2,250	60	Level 2 Type C	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	395	1,185					
8 Hour	2,250	4,500	≤50	Level 2 Type D	Level 2 Type B	Level 2 Type D[2]	Level 2 Type B
4 Hour	1,185	2,370					
8 Hour	2,250	4,500	60	Level 2 Type C	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	1,185	2,370					
8 Hour	4,500	6,000	≤50	Level 2 Type C	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	2,370	3,155					
8 Hour	4,500	6,000	60	Level 2 Type B	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	2,370	3,155					
8 Hour	6,000	7,500	≤50	Level 2 Type B	Level 2 Type B	Level 2 Type C[2]	Level 1 Type A
4 Hour	3,155	3,950					
8 Hour	6,000	7,500	60	Level 2 Type B	Level 2 Type B		
4 Hour	3,155	3,950					
8 Hour	7,500	17,500	≤50	Level 2 Type B	Level 2 Type B		
4 Hour	3,950	9,215					
8 Hour	7,500	17,500	60	Level 2 Type B			
4 Hour	3,950	9,215					

Type A Type B Type C Type D

Approaches to roundabouts should be considered a separate roadways.

[1]The total number of lanes is representative of crossing distance. The width of these lanes is assumed to be between 3.0 m and 3.75 m according to MTO Geometric Design Standards for Ontario Highways (Chapter D.2). A cross sectional feature (e.g. bike lane or on-street parking) may extend the average crossing distance beyond this range of lane widths.

[2]Use of two sets of side mounted signs for each direction (one on the right side and one on the median)

[3] Use Level 2 Type B PXO up to 3 lanes total, cross section one-way.

The hatched cells in this table show that a PXO is not recommended for sites with these traffic and geometric conditions. Generally a traffic signal is warranted for such conditions.

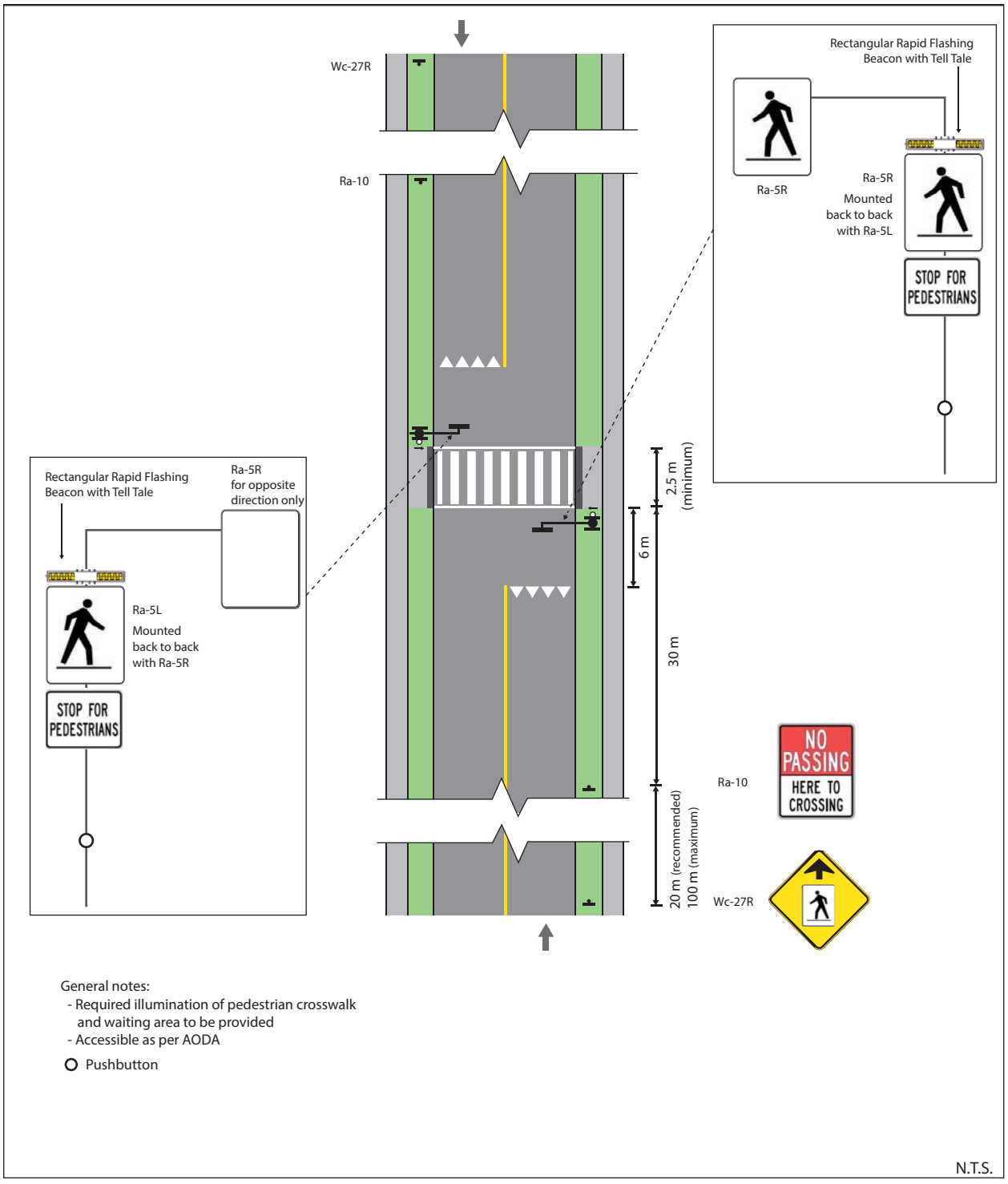


Figure 21: Pedestrian Crossover Level 2 Type B – Mid-block (2-lane, 2-way)

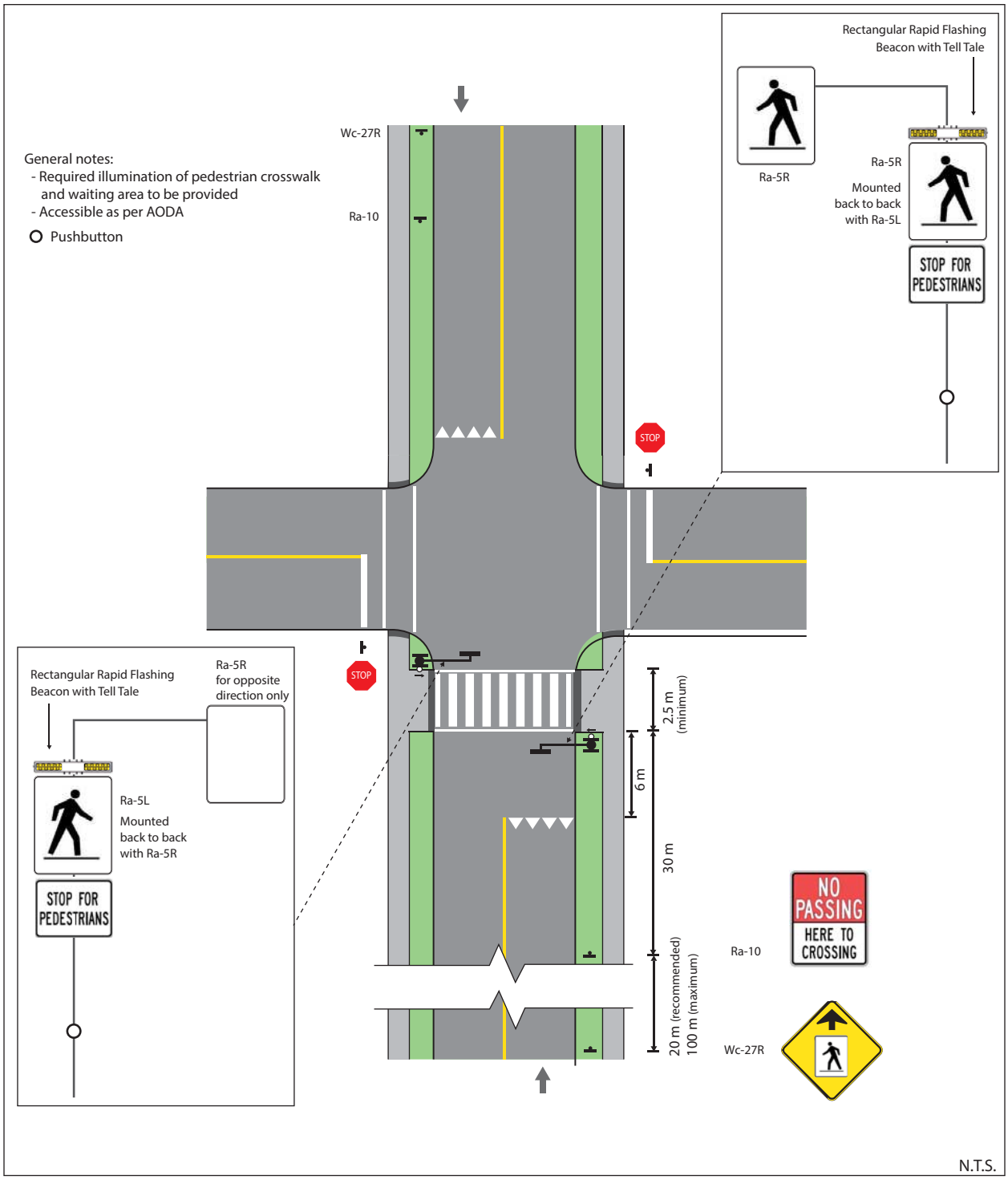


Figure 27: Pedestrian Crossover Level 2 Type B – Intersection (2-way)

APPENDIX M

MMLOS ANALYSIS: INTERSECTIONS

Multi-Modal Level of Service - Intersections Form

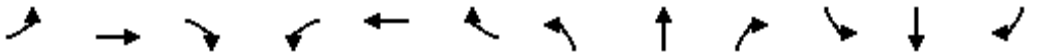
Consultant	**Parsons**	**Project**	**478566**
Scenario	**Petrie's Landing III**	**Date**	**4-Jul-23**
Comments			

Unlocked Rows for Replicating

INTERSECTIONS		Trim/H174				Tenth Line/St. Joseph				Old Tenth Line/St. Joseph			
	Crossing Side	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
Pedestrian	Lanes	8	8	10+		8	8	9	9	6	6		7
	Median	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m		No Median - 2.4 m
	Conflicting Left Turns	Protected	Protected	Protected		Protected	Protected	Protected/ Permissive	Protected/ Permissive	Protected	Protected		No left turn / Prohib.
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control		Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control		Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed		RTOR allowed	RTOR allowed	RTOR prohibited	RTOR allowed	RTOR allowed	RTOR allowed		RTOR allowed
	Ped Signal Leading Interval?	No	No	No		No	No	No	No	No	No		No
	Right Turn Channel	Conv'tl without Receiving Lane	Conv'tl without Receiving Lane	Conv'tl without Receiving Lane		Conv'tl without Receiving Lane	Conv'tl without Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	Conv'tl without Receiving Lane		No Channel
	Corner Radius	10-15m	10-15m	10-15m		>25m	>25m	>25m	>25m	>25m	>25m		3-5m
	Crosswalk Type	Std transverse markings	Textured/coloured pavement	Textured/coloured pavement		Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings		Std transverse markings
	PETSI Score	**0**	**3**	**-20**		**-3**	**-3**	**-28**	**-31**	**26**	**29**		**14**
	Ped. Exposure to Traffic LoS	**F**	**F**	**#N/A**	**-**	**F**	**F**	**#N/A**	**#N/A**	**F**	**F**	**-**	**F**
	Cycle Length												
	Effective Walk Time												
	Average Pedestrian Delay												
	Pedestrian Delay LoS	-	-	-	-	-	-	-	-	-	-	-	-
	Level of Service	**F**	**F**	**#N/A**	**-**	**F**	**F**	**#N/A**	**#N/A**	**F**	**F**	**-**	**F**
		#N/A				**#N/A**				**F**			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP		Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic		Mixed Traffic	Mixed Traffic	Mixed Traffic
	Right Turn Lane Configuration	≤ 50 m	≤ 50 m	Not Applicable		> 50 m	> 50 m	Not Applicable	> 50 m		≤ 50 m	≤ 50 m	≤ 50 m
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	Not Applicable		>25 km/h	>25 km/h	Not Applicable	>25 km/h		≤ 25 km/h	≤ 25 km/h	≤ 25 km/h
	Cyclist relative to RT motorists	**D**	**D**	**Not Applicable**	**-**	**F**	**F**	**Not Applicable**	**F**	**-**	**D**	**D**	**D**
	Separated or Mixed Traffic	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**-**	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Mixed Traffic**	**-**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**
	Left Turn Approach	No lane crossed	No lane crossed	No lane crossed		≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed		No lane crossed	One lane crossed	No lane crossed
	Operating Speed	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h		≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h		> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h
	Left Turning Cyclist	**C**	**C**	**C**	**-**	**F**	**F**	**F**	**F**	**-**	**C**	**E**	**C**
	Level of Service	**D**	**D**	**C**	**-**	**F**	**F**	**F**	**F**	**-**	**D**	**E**	**D**
		D				**F**				**E**			
Transit	Average Signal Delay	> 40 sec	> 40 sec			> 40 sec	≤ 40 sec		≤ 20 sec				
	Level of Service	**F**	**F**	**-**	**-**	**F**	**E**	**-**	**C**	**-**	**-**	**-**	**-**
		F				**F**				**-**			
Truck	Effective Corner Radius	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m		
	Number of Receiving Lanes on Departure from Intersection	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2		
	Level of Service	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**-**	**-**
		A				**A**				**A**			
Auto	Volume to Capacity Ratio												
	Level of Service	**-**				**-**				**-**			

APPENDIX N

SYCNHRO ANALYSIS: EXISTING CONDITIONS



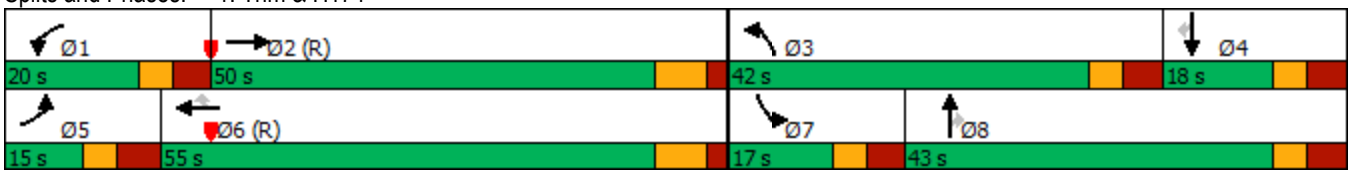
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	214	0	60	1000	41	300	55	44	10	31	17
Future Volume (vph)	46	214	0	60	1000	41	300	55	44	10	31	17
Satd. Flow (prot)	1695	3390	0	1695	4871	1517	4780	1784	1517	1695	1784	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1695	3390	0	1695	4871	1517	4780	1784	1517	1695	1784	1517
Satd. Flow (RTOR)						218			156			217
Lane Group Flow (vph)	51	238	0	67	1111	46	333	61	49	11	34	19
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Minimum Split (s)	8.5	41.2		8.5	41.2	41.2	8.2	42.4	42.4	7.9	12.4	12.4
Total Split (s)	15.0	50.0		20.0	55.0	55.0	42.0	43.0	43.0	17.0	18.0	18.0
Total Split (%)	11.5%	38.5%		15.4%	42.3%	42.3%	32.3%	33.1%	33.1%	13.1%	13.8%	13.8%
Yellow Time (s)	3.3	5.1		3.3	5.1	5.1	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	4.2	2.1		3.8	2.1	2.1	3.9	4.1	4.1	3.6	4.1	4.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.2		7.1	7.2	7.2	7.2	7.4	7.4	6.9	7.4	7.4
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	9.3	70.7		10.5	71.4	71.4	14.4	26.9	26.9	6.4	10.8	10.8
Actuated g/C Ratio	0.07	0.54		0.08	0.55	0.55	0.11	0.21	0.21	0.05	0.08	0.08
v/c Ratio	0.42	0.13		0.49	0.42	0.05	0.63	0.17	0.11	0.13	0.23	0.06
Control Delay	67.4	19.2		68.6	21.4	0.1	60.4	40.2	0.5	62.0	56.1	0.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.4	19.2		68.6	21.4	0.1	60.4	40.2	0.5	62.0	56.1	0.4
LOS	E	B		E	C	A	E	D	A	E	E	A
Approach Delay		27.7			23.1			51.0			40.6	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	12.7	15.8		16.7	61.0	0.0	29.3	12.6	0.0	2.8	8.5	0.0
Queue Length 95th (m)	25.5	33.1		30.9	103.5	0.0	38.7	23.3	0.0	9.0	16.6	0.0
Internal Link Dist (m)		686.1			478.0			348.7			179.7	
Turn Bay Length (m)	175.0			150.0		120.0	200.0		40.0	150.0		40.0
Base Capacity (vph)	125	1842		172	2695	936	1279	488	528	131	184	351
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.13		0.39	0.41	0.05	0.26	0.13	0.09	0.08	0.18	0.05

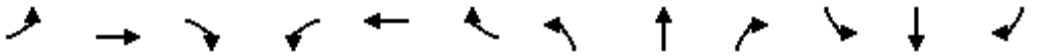
Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 54.5 (42%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 30.5	Intersection LOS: C
Intersection Capacity Utilization 54.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Trim & H174

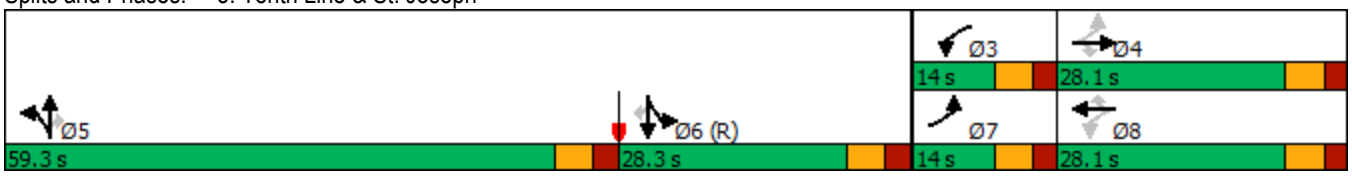


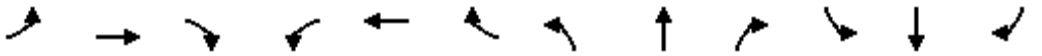


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	75	119	31	269	40	416	796	20	7	124	54
Future Volume (vph)	16	75	119	31	269	40	416	796	20	7	124	54
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1543	3241	1517	1695	3390	1517
Flt Permitted	0.460			0.700			0.950	0.998		0.950		
Satd. Flow (perm)	815	3390	1496	1247	3390	1481	1543	3241	1517	1695	3390	1517
Satd. Flow (RTOR)			132			131			130			130
Lane Group Flow (vph)	18	83	132	34	299	44	416	930	22	8	138	60
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		5	5		6	6	
Permitted Phases	4		4	8		8			5			6
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	28.1	28.1	14.0	28.1	28.1	59.3	59.3	59.3	28.3	28.3	28.3
Total Split (%)	10.8%	21.7%	21.7%	10.8%	21.7%	21.7%	45.7%	45.7%	45.7%	21.8%	21.8%	21.8%
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	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Act Effct Green (s)	30.1	22.0	22.0	30.1	22.0	22.0	53.0	53.0	53.0	22.0	22.0	22.0
Actuated g/C Ratio	0.23	0.17	0.17	0.23	0.17	0.17	0.41	0.41	0.41	0.17	0.17	0.17
v/c Ratio	0.07	0.14	0.36	0.11	0.52	0.12	0.66	0.70	0.03	0.03	0.24	0.16
Control Delay	35.2	46.7	10.6	35.7	52.7	0.7	37.2	35.3	0.1	45.4	47.9	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	35.2	46.7	10.6	35.7	52.7	0.7	37.2	35.3	0.1	45.4	47.9	1.0
LOS	D	D	B	D	D	A	D	D	A	D	D	A
Approach Delay		25.4			45.1			35.3			34.1	
Approach LOS		C			D			D			C	
Queue Length 50th (m)	3.4	9.6	0.0	6.4	37.0	0.0	93.5	106.9	0.0	1.7	16.2	0.0
Queue Length 95th (m)	9.5	17.2	17.4	14.9	51.8	0.0	133.9	131.8	0.0	6.6	26.0	0.0
Internal Link Dist (m)		434.4			241.4			325.6			408.6	
Turn Bay Length (m)	100.0		140.0	65.0			160.0		50.0	110.0		70.0
Base Capacity (vph)	243	575	363	317	575	359	630	1324	696	287	575	365
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	0.14	0.36	0.11	0.52	0.12	0.66	0.70	0.03	0.03	0.24	0.16

Intersection Summary		
Cycle Length: 129.7		
Actuated Cycle Length: 129.7		
Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green		
Natural Cycle: 105		
Control Type: Pretimed		
Maximum v/c Ratio: 0.70		
Intersection Signal Delay: 35.9	Intersection LOS: D	
Intersection Capacity Utilization 62.9%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 5: Tenth Line & St. Joseph





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
Satd. Flow (prot)	0	3390	0	1695	3390	0	1784	0	1517	3288	3390	1517
Flt Permitted				0.700						0.950		
Satd. Flow (perm)	0	3390	0	1249	3390	0	1784	0	1498	3288	3390	1517
Satd. Flow (RTOR)									878			241
Lane Group Flow (vph)	0	84	0	34	321	0	0	0	112	54	317	56
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Free
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			Free
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	
Total Split (s)		31.6		31.6	31.6		16.3			45.0	28.7	
Total Split (%)		41.3%		41.3%	41.3%		21.3%			58.7%	37.5%	
Yellow Time (s)		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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Act Effct Green (s)		25.0		25.0	25.0				76.6	38.0	21.7	76.6
Actuated g/C Ratio		0.33		0.33	0.33				1.00	0.50	0.28	1.00
v/c Ratio		0.08		0.08	0.29				0.07	0.03	0.33	0.04
Control Delay		18.1		18.7	20.1				0.1	10.0	22.9	0.0
Queue Delay		0.0		0.0	0.0				0.0	0.0	0.0	0.0
Total Delay		18.1		18.7	20.1				0.1	10.0	22.9	0.0
LOS		B		B	C				A	A	C	A
Approach Delay		18.1			20.0			0.1			18.3	
Approach LOS		B			B			A			B	
Queue Length 50th (m)		4.3		3.4	17.9				0.0	1.9	19.0	0.0
Queue Length 95th (m)		8.9		9.3	27.7				0.0	4.5	29.3	0.0
Internal Link Dist (m)		241.4			372.8			239.6			226.3	
Turn Bay Length (m)				60.0					10.0	90.0		
Base Capacity (vph)		1106		407	1106				1498	1631	960	1517
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		0.08		0.08	0.29				0.07	0.03	0.33	0.04

Intersection Summary			
Cycle Length: 76.6			
Actuated Cycle Length: 76.6			
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Pretimed			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 28.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Old Tenth Line & St. Joseph

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	3	63	20	5	0	85	0	7	0	0	0
Future Vol, veh/h	0	3	63	20	5	0	85	0	7	0	0	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	70	22	6	0	94	0	8	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	6.9	7.5	7.9	0
HCM LOS	A	A	A	-

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	92%	0%	80%	0%
Vol Thru, %	0%	5%	20%	100%
Vol Right, %	8%	95%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	92	66	25	0
LT Vol	85	0	20	0
Through Vol	0	3	5	0
RT Vol	7	63	0	0
Lane Flow Rate	102	73	28	0
Geometry Grp	1	1	1	1
Degree of Util (X)	0.121	0.073	0.033	0
Departure Headway (Hd)	4.248	3.561	4.331	4.189
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	843	994	819	0
Service Time	2.279	1.628	2.398	2.247
HCM Lane V/C Ratio	0.121	0.073	0.034	0
HCM Control Delay	7.9	6.9	7.5	7.2
HCM Lane LOS	A	A	A	N
HCM 95th-tile Q	0.4	0.2	0.1	0

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	57	2	5	70	20	2	0	5	9	0	3
Future Vol, veh/h	8	57	2	5	70	20	2	0	5	9	0	3
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	63	2	6	78	22	2	0	6	10	0	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.5	7.4	7	7.4
HCM LOS	A	A	A	A

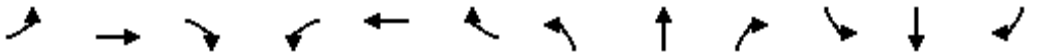
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	12%	5%	75%
Vol Thru, %	0%	85%	74%	0%
Vol Right, %	71%	3%	21%	25%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	67	95	12
LT Vol	2	8	5	9
Through Vol	0	57	70	0
RT Vol	5	2	20	3
Lane Flow Rate	8	74	106	13
Geometry Grp	1	1	1	1
Degree of Util (X)	0.008	0.084	0.115	0.016
Departure Headway (Hd)	3.882	4.056	3.911	4.25
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	909	883	916	833
Service Time	1.96	2.084	1.936	2.325
HCM Lane V/C Ratio	0.009	0.084	0.116	0.016
HCM Control Delay	7	7.5	7.4	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.3	0.4	0

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	32	97	89	77	131	38
Future Vol, veh/h	32	97	89	77	131	38
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	108	99	86	146	42
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	8.7	9.1	9.8
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	25%	0%	100%
Vol Right, %	0%	100%	75%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	131	38	129	89	77
LT Vol	131	0	0	89	0
Through Vol	0	0	32	0	77
RT Vol	0	38	97	0	0
Lane Flow Rate	146	42	143	99	86
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.236	0.054	0.185	0.156	0.123
Departure Headway (Hd)	5.837	4.631	4.637	5.692	5.189
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	614	771	773	630	690
Service Time	3.58	2.374	2.673	3.427	2.923
HCM Lane V/C Ratio	0.238	0.054	0.185	0.157	0.125
HCM Control Delay	10.4	7.6	8.7	9.5	8.7
HCM Lane LOS	B	A	A	A	A
HCM 95th-tile Q	0.9	0.2	0.7	0.5	0.4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	1039	5	53	422	12	243	40	76	44	67	54
Future Volume (vph)	38	1039	5	53	422	12	243	40	76	44	67	54
Satd. Flow (prot)	1695	3387	0	1695	4871	1517	4780	1784	1517	1695	1784	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1695	3387	0	1695	4871	1517	4780	1784	1517	1695	1784	1517
Satd. Flow (RTOR)						218			156			217
Lane Group Flow (vph)	42	1160	0	59	469	13	270	44	84	49	74	60
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Minimum Split (s)	8.5	41.2		8.5	41.2	41.2	8.2	42.4	42.4	7.9	12.4	12.4
Total Split (s)	16.0	54.0		16.0	54.0	54.0	33.0	43.0	43.0	17.0	27.0	27.0
Total Split (%)	12.3%	41.5%		12.3%	41.5%	41.5%	25.4%	33.1%	33.1%	13.1%	20.8%	20.8%
Yellow Time (s)	3.3	5.1		3.3	5.1	5.1	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	4.2	2.1		3.8	2.1	2.1	3.9	4.1	4.1	3.6	4.1	4.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.2		7.1	7.2	7.2	7.2	7.4	7.4	6.9	7.4	7.4
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	8.1	68.4		9.0	69.0	69.0	12.7	20.6	20.6	8.5	13.6	13.6
Actuated g/C Ratio	0.06	0.53		0.07	0.53	0.53	0.10	0.16	0.16	0.07	0.10	0.10
v/c Ratio	0.40	0.65		0.50	0.18	0.01	0.58	0.16	0.23	0.44	0.40	0.17
Control Delay	69.6	27.4		72.9	18.7	0.0	60.9	47.0	1.4	70.5	58.0	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
Total Delay	69.6	27.4		72.9	18.7	0.0	60.9	47.0	1.4	70.5	58.0	1.0
LOS	E	C		E	B	A	E	D	A	E	E	A
Approach Delay		28.9			24.2			46.8			42.7	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	10.5	110.1		14.7	22.1	0.0	23.8	10.4	0.0	12.2	18.5	0.0
Queue Length 95th (m)	22.5	#196.1		29.3	40.0	0.0	32.6	18.0	0.0	25.3	28.8	0.0
Internal Link Dist (m)		686.1			478.0			348.7			179.7	
Turn Bay Length (m)	175.0			150.0		120.0	200.0		40.0	150.0		40.0
Base Capacity (vph)	116	1782		126	2584	907	948	488	528	131	294	432
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.65		0.47	0.18	0.01	0.28	0.09	0.16	0.37	0.25	0.14

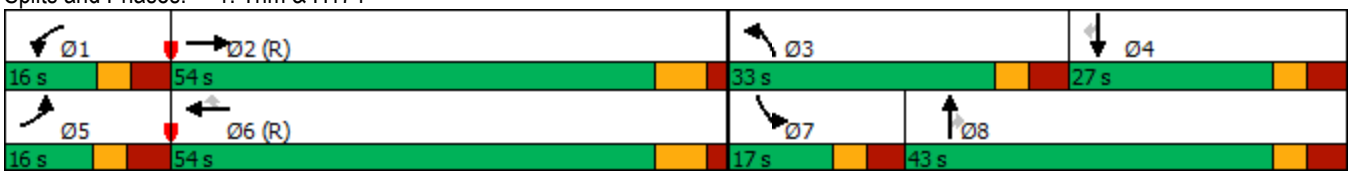
Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 54.5 (42%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

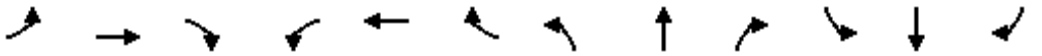
Maximum v/c Ratio: 0.65

Intersection Signal Delay: 32.0	Intersection LOS: C
Intersection Capacity Utilization 63.4%	ICU Level of Service B
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Trim & H174

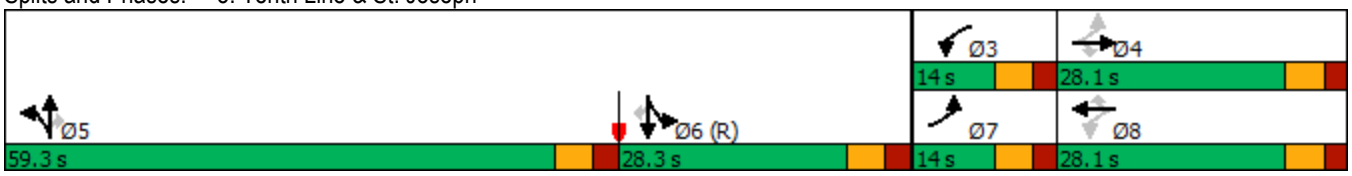


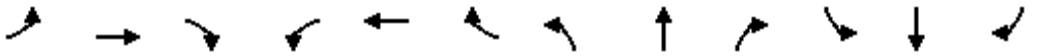


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	298	525	62	199	148	320	627	13	8	137	42
Future Volume (vph)	54	298	525	62	199	148	320	627	13	8	137	42
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1543	3241	1517	1695	3390	1517
Flt Permitted	0.576			0.415			0.950	0.998		0.950		
Satd. Flow (perm)	1017	3390	1496	740	3390	1476	1543	3241	1494	1693	3390	1517
Satd. Flow (RTOR)			583			164			130			130
Lane Group Flow (vph)	60	331	583	69	221	164	320	733	14	9	152	47
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		5	5		6	6	
Permitted Phases	4		4	8		8			5			6
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	28.1	28.1	14.0	28.1	28.1	59.3	59.3	59.3	28.3	28.3	28.3
Total Split (%)	10.8%	21.7%	21.7%	10.8%	21.7%	21.7%	45.7%	45.7%	45.7%	21.8%	21.8%	21.8%
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	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Act Effct Green (s)	30.1	22.0	22.0	30.1	22.0	22.0	53.0	53.0	53.0	22.0	22.0	22.0
Actuated g/C Ratio	0.23	0.17	0.17	0.23	0.17	0.17	0.41	0.41	0.41	0.17	0.17	0.17
v/c Ratio	0.22	0.58	0.79	0.30	0.38	0.42	0.51	0.55	0.02	0.03	0.26	0.13
Control Delay	37.4	54.1	12.6	39.1	50.1	10.4	32.1	31.3	0.1	45.5	48.2	0.7
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	37.4	54.1	12.6	39.1	50.1	10.4	32.1	31.3	0.1	45.5	48.2	0.7
LOS	D	D	B	D	D	B	C	C	A	D	D	A
Approach Delay		28.2			34.1			31.1			37.4	
Approach LOS		C			C			C			D	
Queue Length 50th (m)	11.5	41.4	0.0	13.3	26.7	0.0	66.1	77.7	0.0	1.9	18.0	0.0
Queue Length 95th (m)	22.6	57.1	39.3	25.4	39.2	19.2	97.1	97.6	0.0	7.0	28.3	0.0
Internal Link Dist (m)		434.4			241.4			325.6			408.6	
Turn Bay Length (m)	100.0		140.0	65.0			160.0		50.0	110.0		70.0
Base Capacity (vph)	277	575	737	230	575	386	630	1324	687	287	575	365
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	0.22	0.58	0.79	0.30	0.38	0.42	0.51	0.55	0.02	0.03	0.26	0.13

Intersection Summary		
Cycle Length: 129.7		
Actuated Cycle Length: 129.7		
Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green		
Natural Cycle: 105		
Control Type: Pretimed		
Maximum v/c Ratio: 0.79		
Intersection Signal Delay: 31.1	Intersection LOS: C	
Intersection Capacity Utilization 69.7%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 5: Tenth Line & St. Joseph

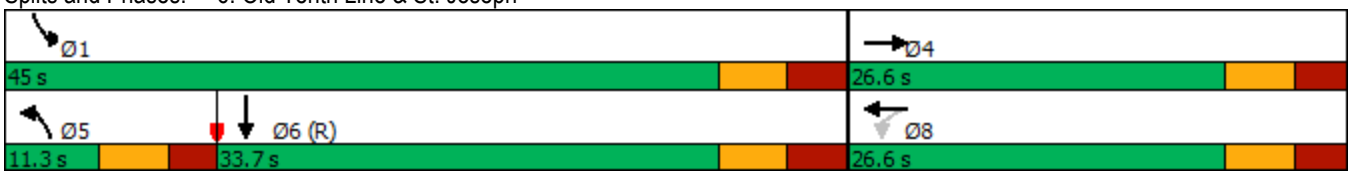




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	324	3	96	276	0	4	0	82	55	859	136
Future Volume (vph)	0	324	3	96	276	0	4	0	82	55	859	136
Satd. Flow (prot)	0	3387	0	1695	3390	0	1695	0	1517	3288	3390	1517
Flt Permitted				0.535			0.950			0.950		
Satd. Flow (perm)	0	3387	0	955	3390	0	1695	0	1498	3288	3390	1517
Satd. Flow (RTOR)		1							257			257
Lane Group Flow (vph)	0	363	0	107	307	0	4	0	91	61	954	151
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Free
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			Free
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	
Total Split (s)		26.6		26.6	26.6		11.3			45.0	33.7	
Total Split (%)		37.2%		37.2%	37.2%		15.8%			62.8%	47.1%	
Yellow Time (s)		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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Act Effct Green (s)		20.0		20.0	20.0		5.0		71.6	38.0	26.7	71.6
Actuated g/C Ratio		0.28		0.28	0.28		0.07		1.00	0.53	0.37	1.00
v/c Ratio		0.38		0.40	0.32		0.03		0.06	0.03	0.75	0.10
Control Delay		22.2		26.5	21.6		31.8		0.1	8.2	24.2	0.1
Queue Delay		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		22.2		26.5	21.6		31.8		0.1	8.2	24.2	0.1
LOS		C		C	C		C		A	A	C	A
Approach Delay		22.2			22.9			1.4			20.3	
Approach LOS		C			C			A			C	
Queue Length 50th (m)		20.5		11.6	17.1		0.5		0.0	1.8	57.4	0.0
Queue Length 95th (m)		31.5		25.2	27.0		3.1		0.0	4.2	78.5	0.0
Internal Link Dist (m)		241.4			372.8			239.6			226.3	
Turn Bay Length (m)				60.0					10.0	90.0		
Base Capacity (vph)		946		266	946		118		1498	1745	1264	1517
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		0.38		0.40	0.32		0.03		0.06	0.03	0.75	0.10

Intersection Summary			
Cycle Length: 71.6			
Actuated Cycle Length: 71.6			
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Pretimed			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 20.3		Intersection LOS: C	
Intersection Capacity Utilization 57.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Old Tenth Line & St. Joseph



Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	98	8	2	0	59	0	8	0	0	0
Future Vol, veh/h	0	5	98	8	2	0	59	0	8	0	0	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	109	9	2	0	66	0	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	7.4	7.7	0
HCM LOS	A	A	A	-

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	88%	0%	80%	0%
Vol Thru, %	0%	5%	20%	100%
Vol Right, %	12%	95%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	67	103	10	0
LT Vol	59	0	8	0
Through Vol	0	5	2	0
RT Vol	8	98	0	0
Lane Flow Rate	74	114	11	0
Geometry Grp	1	1	1	1
Degree of Util (X)	0.088	0.111	0.013	0
Departure Headway (Hd)	4.257	3.501	4.312	4.211
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	842	1016	825	0
Service Time	2.28	1.547	2.365	2.254
HCM Lane V/C Ratio	0.088	0.112	0.013	0
HCM Control Delay	7.7	7	7.4	7.3
HCM Lane LOS	A	A	A	N
HCM 95th-tile Q	0.3	0.4	0	0

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	91	2	5	53	8	2	0	5	12	0	4
Future Vol, veh/h	7	91	2	5	53	8	2	0	5	12	0	4
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	101	2	6	59	9	2	0	6	13	0	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	7.4	7	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	7%	8%	75%
Vol Thru, %	0%	91%	80%	0%
Vol Right, %	71%	2%	12%	25%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	100	66	16
LT Vol	2	7	5	12
Through Vol	0	91	53	0
RT Vol	5	2	8	4
Lane Flow Rate	8	111	73	18
Geometry Grp	1	1	1	1
Degree of Util (X)	0.008	0.125	0.082	0.021
Departure Headway (Hd)	3.893	4.036	4.005	4.257
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	905	888	892	830
Service Time	1.98	2.062	2.039	2.34
HCM Lane V/C Ratio	0.009	0.125	0.082	0.022
HCM Control Delay	7	7.6	7.4	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.4	0.3	0.1

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

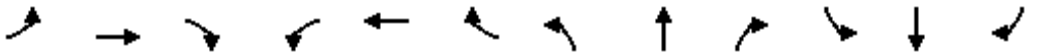
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	96	113	99	46	164	126
Future Vol, veh/h	96	113	99	46	164	126
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	107	126	110	51	182	140
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	10.6	9.9	10.3
HCM LOS	B	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	46%	0%	100%
Vol Right, %	0%	100%	54%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	164	126	209	99	46
LT Vol	164	0	0	99	0
Through Vol	0	0	96	0	46
RT Vol	0	126	113	0	0
Lane Flow Rate	182	140	232	110	51
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.306	0.188	0.326	0.187	0.08
Departure Headway (Hd)	6.04	4.832	5.057	6.132	5.627
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	592	736	706	581	632
Service Time	3.813	2.605	3.124	3.911	3.406
HCM Lane V/C Ratio	0.307	0.19	0.329	0.189	0.081
HCM Control Delay	11.5	8.7	10.6	10.3	8.9
HCM Lane LOS	B	A	B	B	A
HCM 95th-tile Q	1.3	0.7	1.4	0.7	0.3

APPENDIX O

SYCNHRO ANALYSIS: BACKGROUND CONDITIONS



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	288	0	76	1236	48	439	78	60	26	79	184
Future Volume (vph)	123	288	0	76	1236	48	439	78	60	26	79	184
Satd. Flow (prot)	1695	3390	0	1695	4871	1517	4780	1784	1517	1695	1784	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1695	3390	0	1695	4871	1517	4780	1784	1517	1695	1784	1517
Satd. Flow (RTOR)						218			156			217
Lane Group Flow (vph)	123	288	0	76	1236	48	439	78	60	26	79	184
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Minimum Split (s)	8.5	41.2		8.5	41.2	41.2	8.2	42.4	42.4	7.9	12.4	12.4
Total Split (s)	15.0	50.0		20.0	55.0	55.0	42.0	43.0	43.0	17.0	18.0	18.0
Total Split (%)	11.5%	38.5%		15.4%	42.3%	42.3%	32.3%	33.1%	33.1%	13.1%	13.8%	13.8%
Yellow Time (s)	3.3	5.1		3.3	5.1	5.1	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	4.2	2.1		3.8	2.1	2.1	3.9	4.1	4.1	3.6	4.1	4.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.2		7.1	7.2	7.2	7.2	7.4	7.4	6.9	7.4	7.4
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	17.6	63.1		10.8	53.1	53.1	17.3	27.9	27.9	7.5	12.7	12.7
Actuated g/C Ratio	0.14	0.49		0.08	0.41	0.41	0.13	0.21	0.21	0.06	0.10	0.10
v/c Ratio	0.54	0.18		0.54	0.62	0.06	0.69	0.20	0.13	0.27	0.45	0.53
Control Delay	62.6	22.4		71.1	32.7	0.2	59.5	43.2	0.6	64.7	61.9	9.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	22.4		71.1	32.7	0.2	59.5	43.2	0.6	64.7	61.9	9.0
LOS	E	C		E	C	A	E	D	A	E	E	A
Approach Delay		34.5			33.7			51.2			28.5	
Approach LOS		C			C			D			C	
Queue Length 50th (m)	29.5	21.8		19.0	90.0	0.0	38.6	17.7	0.0	6.5	19.7	0.0
Queue Length 95th (m)	#76.1	40.0		34.5	114.2	0.0	48.6	28.3	0.0	15.8	32.2	11.9
Internal Link Dist (m)		686.1			478.0			348.7			179.7	
Turn Bay Length (m)	175.0			150.0		120.0	200.0		40.0	150.0		40.0
Base Capacity (vph)	229	1645		170	1990	748	1279	488	528	131	188	354
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.18		0.45	0.62	0.06	0.34	0.16	0.11	0.20	0.42	0.52

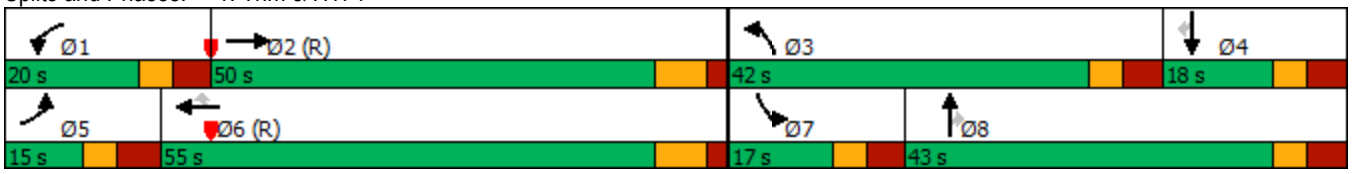
Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 54.5 (42%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

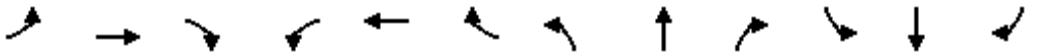
Maximum v/c Ratio: 0.69

Intersection Signal Delay: 37.1	Intersection LOS: D
Intersection Capacity Utilization 66.3%	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: 1: Trim & H174

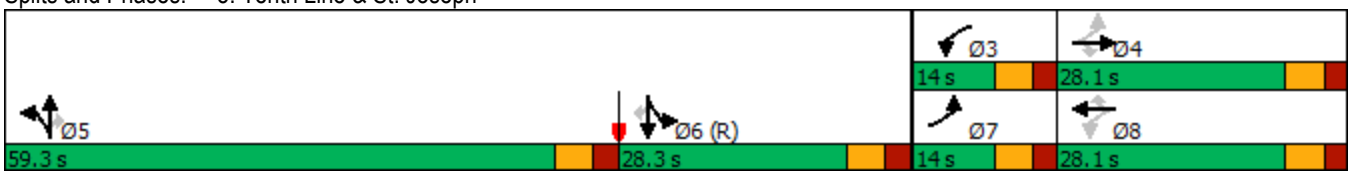


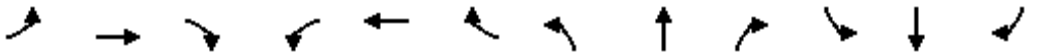


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	79	159	31	275	51	441	796	20	7	124	55
Future Volume (vph)	16	79	159	31	275	51	441	796	20	7	124	55
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1543	3238	1517	1695	3390	1517
Flt Permitted	0.495			0.703			0.950	0.997		0.950		
Satd. Flow (perm)	877	3390	1496	1252	3390	1481	1543	3238	1517	1695	3390	1517
Satd. Flow (RTOR)			159			131			130			130
Lane Group Flow (vph)	16	79	159	31	275	51	397	840	20	7	124	55
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		5	5		6	6	
Permitted Phases	4		4	8		8			5			6
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	28.1	28.1	14.0	28.1	28.1	59.3	59.3	59.3	28.3	28.3	28.3
Total Split (%)	10.8%	21.7%	21.7%	10.8%	21.7%	21.7%	45.7%	45.7%	45.7%	21.8%	21.8%	21.8%
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	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Act Effct Green (s)	30.1	22.0	22.0	30.1	22.0	22.0	53.0	53.0	53.0	22.0	22.0	22.0
Actuated g/C Ratio	0.23	0.17	0.17	0.23	0.17	0.17	0.41	0.41	0.41	0.17	0.17	0.17
v/c Ratio	0.06	0.14	0.41	0.10	0.48	0.14	0.63	0.63	0.03	0.02	0.22	0.15
Control Delay	35.0	46.6	10.4	35.5	51.8	0.8	36.0	33.3	0.1	45.4	47.6	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	46.6	10.4	35.5	51.8	0.8	36.0	33.3	0.1	45.4	47.6	0.9
LOS	C	D	B	D	D	A	D	C	A	D	D	A
Approach Delay		23.2			43.1			33.6			33.7	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	3.0	9.1	0.0	5.9	33.8	0.0	87.6	93.0	0.0	1.5	14.5	0.0
Queue Length 95th (m)	8.7	16.5	18.6	13.7	47.9	0.0	126.2	115.5	0.0	5.9	23.8	0.0
Internal Link Dist (m)		434.4			241.4			325.6			408.6	
Turn Bay Length (m)	100.0		140.0	65.0			160.0		50.0	110.0		70.0
Base Capacity (vph)	253	575	385	317	575	359	630	1323	696	287	575	365
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	0.06	0.14	0.41	0.10	0.48	0.14	0.63	0.63	0.03	0.02	0.22	0.15

Intersection Summary		
Cycle Length: 129.7		
Actuated Cycle Length: 129.7		
Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green		
Natural Cycle: 105		
Control Type: Pretimed		
Maximum v/c Ratio: 0.63		
Intersection Signal Delay: 34.0	Intersection LOS: C	
Intersection Capacity Utilization 63.4%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 5: Tenth Line & St. Joseph





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	80	0	31	294	0	0	0	101	49	285	58
Future Volume (vph)	0	80	0	31	294	0	0	0	101	49	285	58
Satd. Flow (prot)	0	3390	0	1695	3390	0	1784	0	1517	3288	3390	1517
Flt Permitted				0.702						0.950		
Satd. Flow (perm)	0	3390	0	1253	3390	0	1784	0	1498	3288	3390	1517
Satd. Flow (RTOR)									890			241
Lane Group Flow (vph)	0	80	0	31	294	0	0	0	101	49	285	58
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Free
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			Free
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	
Total Split (s)		31.6		31.6	31.6		16.3			45.0	28.7	
Total Split (%)		41.3%		41.3%	41.3%		21.3%			58.7%	37.5%	
Yellow Time (s)		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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Act Effct Green (s)		25.0		25.0	25.0				76.6	38.0	21.7	76.6
Actuated g/C Ratio		0.33		0.33	0.33				1.00	0.50	0.28	1.00
v/c Ratio		0.07		0.08	0.27				0.07	0.03	0.30	0.04
Control Delay		18.1		18.6	19.8				0.1	10.0	22.5	0.1
Queue Delay		0.0		0.0	0.0				0.0	0.0	0.0	0.0
Total Delay		18.1		18.6	19.8				0.1	10.0	22.5	0.1
LOS		B		B	B				A	A	C	A
Approach Delay		18.1			19.7			0.1			17.6	
Approach LOS		B			B			A			B	
Queue Length 50th (m)		4.1		3.1	16.3				0.0	1.7	16.9	0.0
Queue Length 95th (m)		8.6		8.8	25.4				0.0	4.2	26.6	0.0
Internal Link Dist (m)		241.4			372.8			239.6			226.3	
Turn Bay Length (m)				60.0					10.0	90.0		
Base Capacity (vph)		1106		408	1106				1498	1631	960	1517
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		0.07		0.08	0.27				0.07	0.03	0.30	0.04

Intersection Summary	
Cycle Length: 76.6	
Actuated Cycle Length: 76.6	
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 16.5	Intersection LOS: B
Intersection Capacity Utilization 28.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Old Tenth Line & St. Joseph

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	3	89	151	5	0	97	40	61	0	73	4
Future Vol, veh/h	3	3	89	151	5	0	97	40	61	0	73	4
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	3	89	151	5	0	97	40	61	0	73	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	9.2	9.1	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	49%	3%	97%	0%
Vol Thru, %	20%	3%	3%	95%
Vol Right, %	31%	94%	0%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	198	95	156	77
LT Vol	97	3	151	0
Through Vol	40	3	5	73
RT Vol	61	89	0	4
Lane Flow Rate	198	95	156	77
Geometry Grp	1	1	1	1
Degree of Util (X)	0.249	0.111	0.211	0.101
Departure Headway (Hd)	4.531	4.218	4.875	4.728
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	792	847	735	756
Service Time	2.562	2.256	2.91	2.766
HCM Lane V/C Ratio	0.25	0.112	0.212	0.102
HCM Control Delay	9.1	7.8	9.2	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.4	0.8	0.3

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	64	2	5	74	31	2	0	5	31	0	6
Future Vol, veh/h	10	64	2	5	74	31	2	0	5	31	0	6
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	64	2	5	74	31	2	0	5	31	0	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.5	7.5	7	7.6
HCM LOS	A	A	A	A

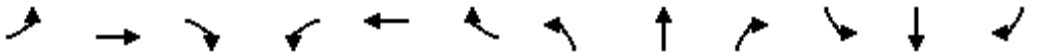
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	13%	5%	84%
Vol Thru, %	0%	84%	67%	0%
Vol Right, %	71%	3%	28%	16%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	76	110	37
LT Vol	2	10	5	31
Through Vol	0	64	74	0
RT Vol	5	2	31	6
Lane Flow Rate	7	76	110	37
Geometry Grp	1	1	1	1
Degree of Util (X)	0.008	0.087	0.119	0.045
Departure Headway (Hd)	3.912	4.104	3.908	4.331
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	900	869	913	817
Service Time	2	2.15	1.952	2.409
HCM Lane V/C Ratio	0.008	0.087	0.12	0.045
HCM Control Delay	7	7.5	7.5	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.3	0.4	0.1

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	36	97	108	86	131	44
Future Vol, veh/h	36	97	108	86	131	44
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	97	108	86	131	44
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	8.6	9.1	9.6
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	27%	0%	100%
Vol Right, %	0%	100%	73%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	131	44	133	108	86
LT Vol	131	0	0	108	0
Through Vol	0	0	36	0	86
RT Vol	0	44	97	0	0
Lane Flow Rate	131	44	133	108	86
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.212	0.057	0.171	0.169	0.123
Departure Headway (Hd)	5.836	4.63	4.62	5.64	5.137
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	614	771	775	636	697
Service Time	3.578	2.371	2.655	3.373	2.87
HCM Lane V/C Ratio	0.213	0.057	0.172	0.17	0.123
HCM Control Delay	10.2	7.7	8.6	9.5	8.6
HCM Lane LOS	B	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.6	0.6	0.4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	1271	5	114	575	26	329	87	132	55	99	169
Future Volume (vph)	198	1271	5	114	575	26	329	87	132	55	99	169
Satd. Flow (prot)	1695	3387	0	1695	4871	1517	4780	1784	1517	1695	1784	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1695	3387	0	1695	4871	1517	4780	1784	1517	1695	1784	1517
Satd. Flow (RTOR)						278			216			276
Lane Group Flow (vph)	198	1276	0	114	575	26	329	87	132	55	99	169
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Minimum Split (s)	8.5	41.2		8.5	41.2	41.2	8.2	42.4	42.4	7.9	12.4	12.4
Total Split (s)	31.0	55.6		18.0	42.6	42.6	21.3	42.4	42.4	14.0	35.1	35.1
Total Split (%)	23.8%	42.8%		13.8%	32.8%	32.8%	16.4%	32.6%	32.6%	10.8%	27.0%	27.0%
Yellow Time (s)	3.3	5.1		3.3	5.1	5.1	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	4.2	2.1		3.8	2.1	2.1	3.9	4.1	4.1	3.6	4.1	4.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.2		7.1	7.2	7.2	7.2	7.4	7.4	6.9	7.4	7.4
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	19.5	60.1		13.1	53.3	53.3	13.2	23.9	23.9	6.9	14.6	14.6
Actuated g/C Ratio	0.15	0.46		0.10	0.41	0.41	0.10	0.18	0.18	0.05	0.11	0.11
v/c Ratio	0.78	0.82		0.67	0.29	0.03	0.68	0.27	0.29	0.62	0.49	0.41
Control Delay	73.5	36.8		75.0	28.3	0.1	63.7	46.8	1.6	88.3	60.7	2.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.5	36.8		75.0	28.3	0.1	63.7	46.8	1.6	88.3	60.7	2.9
LOS	E	D		E	C	A	E	D	A	F	E	A
Approach Delay		41.7			34.7			46.0			35.2	
Approach LOS		D			C			D			D	
Queue Length 50th (m)	49.1	147.2		28.1	35.4	0.0	29.0	20.1	0.0	14.0	24.7	0.0
Queue Length 95th (m)	73.6	#223.1		#60.6	56.5	0.0	39.5	31.0	0.0	#32.3	37.5	0.0
Internal Link Dist (m)		686.1			478.0			348.7			179.7	
Turn Bay Length (m)	175.0			150.0		120.0	200.0		40.0	150.0		40.0
Base Capacity (vph)	306	1565		174	1997	786	518	480	566	92	380	540
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.82		0.66	0.29	0.03	0.64	0.18	0.23	0.60	0.26	0.31

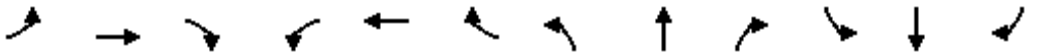
Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 54.5 (42%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 40.2	Intersection LOS: D
Intersection Capacity Utilization 75.3%	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.

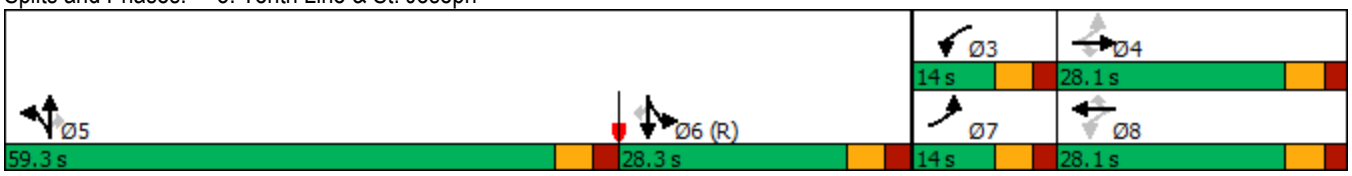
Splits and Phases: 1: Trim & H174

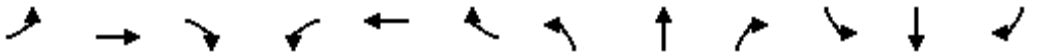


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	302	561	62	210	155	359	627	13	8	137	43
Future Volume (vph)	54	302	561	62	210	155	359	627	13	8	137	43
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1543	3238	1517	1695	3390	1517
Flt Permitted	0.594			0.456			0.950	0.997		0.950		
Satd. Flow (perm)	1048	3390	1496	813	3390	1476	1543	3238	1494	1693	3390	1517
Satd. Flow (RTOR)			561			155			130			130
Lane Group Flow (vph)	54	302	561	62	210	155	320	666	13	8	137	43
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		5	5		6	6	
Permitted Phases	4		4	8		8			5			6
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	28.1	28.1	14.0	28.1	28.1	59.3	59.3	59.3	28.3	28.3	28.3
Total Split (%)	10.8%	21.7%	21.7%	10.8%	21.7%	21.7%	45.7%	45.7%	45.7%	21.8%	21.8%	21.8%
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	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Act Effct Green (s)	30.1	22.0	22.0	30.1	22.0	22.0	53.0	53.0	53.0	22.0	22.0	22.0
Actuated g/C Ratio	0.23	0.17	0.17	0.23	0.17	0.17	0.41	0.41	0.41	0.17	0.17	0.17
v/c Ratio	0.19	0.53	0.78	0.26	0.37	0.41	0.51	0.50	0.02	0.03	0.24	0.12
Control Delay	37.0	52.8	12.4	38.2	49.8	10.4	32.1	30.2	0.1	45.4	47.9	0.7
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	37.0	52.8	12.4	38.2	49.8	10.4	32.1	30.2	0.1	45.4	47.9	0.7
LOS	D	D	B	D	D	B	C	C	A	D	D	A
Approach Delay		27.2			33.8			30.4			37.0	
Approach LOS		C			C			C			D	
Queue Length 50th (m)	10.3	37.4	0.0	11.9	25.3	0.0	66.1	68.7	0.0	1.7	16.1	0.0
Queue Length 95th (m)	20.9	52.4	37.8	23.3	37.4	18.7	97.1	87.4	0.0	6.6	25.8	0.0
Internal Link Dist (m)		434.4			241.4			325.6			408.6	
Turn Bay Length (m)	100.0		140.0	65.0			160.0		50.0	110.0		70.0
Base Capacity (vph)	283	575	719	243	575	379	630	1323	687	287	575	365
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	0.53	0.78	0.26	0.37	0.41	0.51	0.50	0.02	0.03	0.24	0.12

Intersection Summary		
Cycle Length: 129.7		
Actuated Cycle Length: 129.7		
Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green		
Natural Cycle: 105		
Control Type: Pretimed		
Maximum v/c Ratio: 0.78		
Intersection Signal Delay: 30.3	Intersection LOS: C	
Intersection Capacity Utilization 69.7%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 5: Tenth Line & St. Joseph

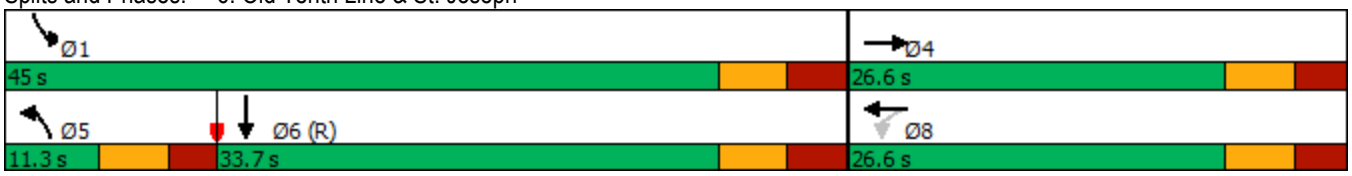




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	327	3	96	286	0	4	0	82	55	859	152
Future Volume (vph)	0	327	3	96	286	0	4	0	82	55	859	152
Satd. Flow (prot)	0	3387	0	1695	3390	0	1695	0	1517	3288	3390	1517
Flt Permitted				0.553			0.950			0.950		
Satd. Flow (perm)	0	3387	0	987	3390	0	1695	0	1498	3288	3390	1517
Satd. Flow (RTOR)		1							257			257
Lane Group Flow (vph)	0	330	0	96	286	0	4	0	82	55	859	152
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Free
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			Free
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	
Total Split (s)		26.6		26.6	26.6		11.3			45.0	33.7	
Total Split (%)		37.2%		37.2%	37.2%		15.8%			62.8%	47.1%	
Yellow Time (s)		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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Act Effct Green (s)		20.0		20.0	20.0		5.0		71.6	38.0	26.7	71.6
Actuated g/C Ratio		0.28		0.28	0.28		0.07		1.00	0.53	0.37	1.00
v/c Ratio		0.35		0.35	0.30		0.03		0.05	0.03	0.68	0.10
Control Delay		21.8		25.0	21.4		31.8		0.1	8.1	22.2	0.1
Queue Delay		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		21.8		25.0	21.4		31.8		0.1	8.1	22.2	0.1
LOS		C		C	C		C		A	A	C	A
Approach Delay		21.8			22.3			1.5			18.3	
Approach LOS		C			C			A			B	
Queue Length 50th (m)		18.4		10.3	15.8		0.5		0.0	1.7	49.7	0.0
Queue Length 95th (m)		28.8		22.5	25.2		3.1		0.0	4.0	68.6	0.0
Internal Link Dist (m)		241.4			372.8			239.6			226.3	
Turn Bay Length (m)				60.0					10.0	90.0		
Base Capacity (vph)		946		275	946		118		1498	1745	1264	1517
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		0.35		0.35	0.30		0.03		0.05	0.03	0.68	0.10

Intersection Summary			
Cycle Length: 71.6			
Actuated Cycle Length: 71.6			
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Pretimed			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 19.0		Intersection LOS: B	
Intersection Capacity Utilization 57.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Old Tenth Line & St. Joseph



Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	5	111	107	2	0	79	65	144	0	47	5
Future Vol, veh/h	6	5	111	107	2	0	79	65	144	0	47	5
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	5	111	107	2	0	79	65	144	0	47	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	9	9.6	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	27%	5%	98%	0%
Vol Thru, %	23%	4%	2%	90%
Vol Right, %	50%	91%	0%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	288	122	109	52
LT Vol	79	6	107	0
Through Vol	65	5	2	47
RT Vol	144	111	0	5
Lane Flow Rate	288	122	109	52
Geometry Grp	1	1	1	1
Degree of Util (X)	0.344	0.146	0.152	0.068
Departure Headway (Hd)	4.294	4.303	5.033	4.741
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	838	831	711	753
Service Time	2.323	2.342	3.075	2.783
HCM Lane V/C Ratio	0.344	0.147	0.153	0.069
HCM Control Delay	9.6	8.1	9	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.5	0.5	0.5	0.2

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	96	2	5	60	26	2	0	5	25	0	6
Future Vol, veh/h	10	96	2	5	60	26	2	0	5	25	0	6
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	96	2	5	60	26	2	0	5	25	0	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.4	7.1	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	9%	5%	81%
Vol Thru, %	0%	89%	66%	0%
Vol Right, %	71%	2%	29%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	108	91	31
LT Vol	2	10	5	25
Through Vol	0	96	60	0
RT Vol	5	2	26	6
Lane Flow Rate	7	108	91	31
Geometry Grp	1	1	1	1
Degree of Util (X)	0.008	0.122	0.099	0.037
Departure Headway (Hd)	3.929	4.077	3.921	4.326
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	895	877	909	817
Service Time	2.021	2.114	1.965	2.412
HCM Lane V/C Ratio	0.008	0.123	0.1	0.038
HCM Control Delay	7.1	7.7	7.4	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.4	0.3	0.1

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

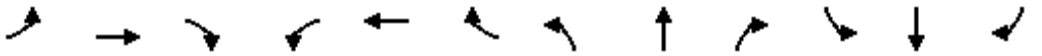
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	105	113	112	52	164	147
Future Vol, veh/h	105	113	112	52	164	147
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	113	112	52	164	147
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	10.3	9.8	10
HCM LOS	B	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	48%	0%	100%
Vol Right, %	0%	100%	52%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	164	147	218	112	52
LT Vol	164	0	0	112	0
Through Vol	0	0	105	0	52
RT Vol	0	147	113	0	0
Lane Flow Rate	164	147	218	112	52
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.274	0.196	0.305	0.189	0.08
Departure Headway (Hd)	6.011	4.803	5.034	6.073	5.568
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	595	741	708	587	639
Service Time	3.779	2.571	3.098	3.847	3.342
HCM Lane V/C Ratio	0.276	0.198	0.308	0.191	0.081
HCM Control Delay	11.1	8.8	10.3	10.3	8.8
HCM Lane LOS	B	A	B	B	A
HCM 95th-tile Q	1.1	0.7	1.3	0.7	0.3

APPENDIX P

SYCNHRO ANALYSIS: FUTURE BUILDOUT CONDITIONS



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	288	0	76	1236	59	439	89	60	42	95	265
Future Volume (vph)	178	288	0	76	1236	59	439	89	60	42	95	265
Satd. Flow (prot)	1695	3390	0	1695	4871	1517	4780	1784	1517	1695	1784	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1689	3390	0	1261	4871	1458	4780	1784	1151	1361	1784	1517
Satd. Flow (RTOR)						278			216			276
Lane Group Flow (vph)	178	288	0	76	1236	59	439	89	60	42	95	265
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Minimum Split (s)	8.5	41.2		8.5	41.2	41.2	8.2	42.4	42.4	7.9	12.4	12.4
Total Split (s)	30.0	60.8		12.8	43.6	43.6	28.4	42.4	42.4	14.0	28.0	28.0
Total Split (%)	23.1%	46.8%		9.8%	33.5%	33.5%	21.8%	32.6%	32.6%	10.8%	21.5%	21.5%
Yellow Time (s)	3.3	5.1		3.3	5.1	5.1	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	4.2	2.1		3.8	2.1	2.1	3.9	4.1	4.1	3.6	4.1	4.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.2		7.1	7.2	7.2	7.2	7.4	7.4	6.9	7.4	7.4
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	18.2	56.5		6.9	44.9	44.9	17.2	33.6	33.6	6.8	20.5	20.5
Actuated g/C Ratio	0.14	0.43		0.05	0.35	0.35	0.13	0.26	0.26	0.05	0.16	0.16
v/c Ratio	0.75	0.20		0.84	0.74	0.09	0.70	0.19	0.13	0.48	0.34	0.56
Control Delay	72.7	24.0		119.6	42.5	0.3	59.9	38.2	0.6	77.8	51.2	9.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.7	24.0		119.6	42.5	0.3	59.9	38.2	0.6	77.8	51.2	9.7
LOS	E	C		F	D	A	E	D	A	E	D	A
Approach Delay		42.6			45.0			50.6			26.6	
Approach LOS		D			D			D			C	
Queue Length 50th (m)	44.2	24.6		~20.7	107.4	0.0	38.6	17.6	0.0	10.6	21.1	0.0
Queue Length 95th (m)	67.0	34.6		#52.6	#137.2	0.0	48.7	31.7	0.0	22.9	38.5	20.9
Internal Link Dist (m)		686.1			478.0			348.7			179.7	
Turn Bay Length (m)	175.0			150.0		120.0	200.0		40.0	150.0		40.0
Base Capacity (vph)	293	1474		90	1680	685	779	480	467	92	316	496
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.20		0.84	0.74	0.09	0.56	0.19	0.13	0.46	0.30	0.53

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 54.5 (42%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

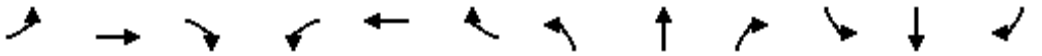
Maximum v/c Ratio: 0.84

Intersection Signal Delay: 43.1	Intersection LOS: D
Intersection Capacity Utilization 86.3%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

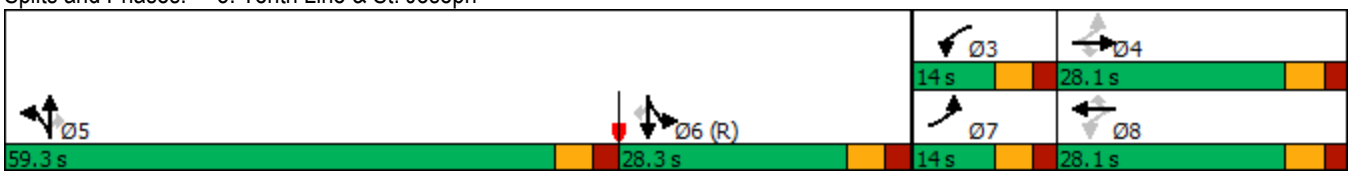
Splits and Phases: 1: Trim & H174

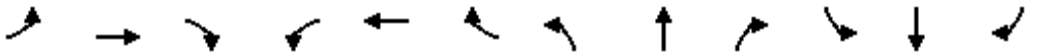


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	79	159	31	275	150	441	829	20	7	173	71
Future Volume (vph)	27	79	159	31	275	150	441	829	20	7	173	71
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1543	3238	1517	1695	3390	1517
Flt Permitted	0.495			0.703			0.950	0.997		0.950		
Satd. Flow (perm)	874	3390	1476	1245	3390	1464	1533	3237	1483	1691	3390	1478
Satd. Flow (RTOR)			159			150			130			130
Lane Group Flow (vph)	27	79	159	31	275	150	397	873	20	7	173	71
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		5	5		6	6	
Permitted Phases	4		4	8		8			5			6
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	28.1	28.1	14.0	28.1	28.1	59.3	59.3	59.3	28.3	28.3	28.3
Total Split (%)	10.8%	21.7%	21.7%	10.8%	21.7%	21.7%	45.7%	45.7%	45.7%	21.8%	21.8%	21.8%
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	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Act Effct Green (s)	30.1	22.0	22.0	30.1	22.0	22.0	53.0	53.0	53.0	22.0	22.0	22.0
Actuated g/C Ratio	0.23	0.17	0.17	0.23	0.17	0.17	0.41	0.41	0.41	0.17	0.17	0.17
v/c Ratio	0.11	0.14	0.42	0.10	0.48	0.40	0.63	0.66	0.03	0.02	0.30	0.20
Control Delay	35.7	46.6	10.4	35.5	51.8	10.6	36.0	34.0	0.1	45.4	48.8	1.2
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	35.7	46.6	10.4	35.5	51.8	10.6	36.0	34.0	0.1	45.4	48.8	1.2
LOS	D	D	B	D	D	B	D	C	A	D	D	A
Approach Delay		23.8			37.2			34.1			35.2	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	5.1	9.1	0.0	5.9	33.8	0.0	87.6	98.0	0.0	1.5	20.5	0.0
Queue Length 95th (m)	12.5	16.5	18.7	13.7	47.9	18.2	126.2	121.4	0.0	5.9	31.5	0.0
Internal Link Dist (m)		434.4			241.4			325.6			408.6	
Turn Bay Length (m)	100.0		140.0	65.0			160.0		50.0	110.0		70.0
Base Capacity (vph)	253	575	382	316	575	372	630	1323	682	287	575	358
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	0.42	0.10	0.48	0.40	0.63	0.66	0.03	0.02	0.30	0.20

Intersection Summary		
Cycle Length: 129.7		
Actuated Cycle Length: 129.7		
Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green		
Natural Cycle: 105		
Control Type: Pretimed		
Maximum v/c Ratio: 0.66		
Intersection Signal Delay: 33.6	Intersection LOS: C	
Intersection Capacity Utilization 86.1%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 5: Tenth Line & St. Joseph





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	80	0	31	294	0	0	0	101	49	285	157
Future Volume (vph)	0	80	0	31	294	0	0	0	101	49	285	157
Satd. Flow (prot)	0	3390	0	1695	3390	0	1784	0	1517	3288	3390	1517
Flt Permitted				0.702						0.950		
Satd. Flow (perm)	0	3390	0	1246	3390	0	1784	0	1495	3288	3390	1517
Satd. Flow (RTOR)									877			241
Lane Group Flow (vph)	0	80	0	31	294	0	0	0	101	49	285	157
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Free
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			Free
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	
Total Split (s)		31.6		31.6	31.6		16.3			45.0	28.7	
Total Split (%)		41.3%		41.3%	41.3%		21.3%			58.7%	37.5%	
Yellow Time (s)		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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Act Effct Green (s)		25.0		25.0	25.0				76.6	38.0	21.7	76.6
Actuated g/C Ratio		0.33		0.33	0.33				1.00	0.50	0.28	1.00
v/c Ratio		0.07		0.08	0.27				0.07	0.03	0.30	0.10
Control Delay		18.1		18.6	19.8				0.1	10.0	22.5	0.1
Queue Delay		0.0		0.0	0.0				0.0	0.0	0.0	0.0
Total Delay		18.1		18.6	19.8				0.1	10.0	22.5	0.1
LOS		B		B	B				A	A	C	A
Approach Delay		18.1			19.7			0.1			14.1	
Approach LOS		B			B			A			B	
Queue Length 50th (m)		4.1		3.1	16.3				0.0	1.7	16.9	0.0
Queue Length 95th (m)		8.6		8.8	25.4				0.0	4.2	26.6	0.0
Internal Link Dist (m)		241.4			372.8			239.6			226.3	
Turn Bay Length (m)				60.0					10.0	90.0		
Base Capacity (vph)		1106		406	1106				1495	1631	960	1517
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		0.07		0.08	0.27				0.07	0.03	0.30	0.10

Intersection Summary	
Cycle Length: 76.6	
Actuated Cycle Length: 76.6	
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 38.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Old Tenth Line & St. Joseph

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	172	44	11	276	49	16
Future Vol, veh/h	172	44	11	276	49	16
Conflicting Peds, #/hr	0	15	15	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	172	44	11	276	49	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	231	0	512	214
Stage 1	-	-	-	-	209	-
Stage 2	-	-	-	-	303	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1337	-	522	826
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	749	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1318	-	507	811
Mov Cap-2 Maneuver	-	-	-	-	507	-
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	738	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	559	-	-	1318	-
HCM Lane V/C Ratio	0.116	-	-	0.008	-
HCM Control Delay (s)	12.3	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	122	66	22	190	97	32
Future Vol, veh/h	122	66	22	190	97	32
Conflicting Peds, #/hr	0	25	25	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	122	66	22	190	97	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	213	0	424	190
Stage 1	-	-	-	-	180	-
Stage 2	-	-	-	-	244	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1357	-	587	852
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	797	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1326	-	558	825
Mov Cap-2 Maneuver	-	-	-	-	558	-
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	775	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	607	-	-	1326	-
HCM Lane V/C Ratio	0.213	-	-	0.017	-
HCM Control Delay (s)	12.5	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	122	33	44	147	65	65
Future Vol, veh/h	122	33	44	147	65	65
Conflicting Peds, #/hr	0	60	60	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	122	33	44	147	65	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	215	0	444	209
Stage 1	-	-	-	-	199	-
Stage 2	-	-	-	-	245	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1355	-	571	831
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	796	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1280	-	515	778
Mov Cap-2 Maneuver	-	-	-	-	515	-
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	759	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	620	-	-	1280	-
HCM Lane V/C Ratio	0.21	-	-	0.034	-
HCM Control Delay (s)	12.3	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	3	202	151	5	0	174	40	61	0	73	4
Future Vol, veh/h	3	3	202	151	5	0	174	40	61	0	73	4
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	3	202	151	5	0	174	40	61	0	73	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.1	9.9	10.9	8.9
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	63%	1%	97%	0%
Vol Thru, %	15%	1%	3%	95%
Vol Right, %	22%	97%	0%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	275	208	156	77
LT Vol	174	3	151	0
Through Vol	40	3	5	73
RT Vol	61	202	0	4
Lane Flow Rate	275	208	156	77
Geometry Grp	1	1	1	1
Degree of Util (X)	0.373	0.257	0.227	0.11
Departure Headway (Hd)	4.883	4.441	5.246	5.127
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	732	801	679	691
Service Time	2.957	2.512	3.327	3.221
HCM Lane V/C Ratio	0.376	0.26	0.23	0.111
HCM Control Delay	10.9	9.1	9.9	8.9
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.7	1	0.9	0.4

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	177	2	5	151	31	2	0	5	31	0	6
Future Vol, veh/h	10	177	2	5	151	31	2	0	5	31	0	6
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	177	2	5	151	31	2	0	5	31	0	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	8.2	7.5	8.1
HCM LOS	A	A	A	A

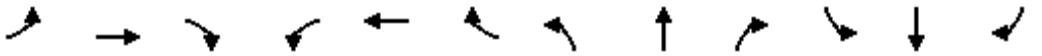
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	5%	3%	84%
Vol Thru, %	0%	94%	81%	0%
Vol Right, %	71%	1%	17%	16%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	189	187	37
LT Vol	2	10	5	31
Through Vol	0	177	151	0
RT Vol	5	2	31	6
Lane Flow Rate	7	189	187	37
Geometry Grp	1	1	1	1
Degree of Util (X)	0.009	0.218	0.211	0.05
Departure Headway (Hd)	4.42	4.156	4.059	4.823
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	814	852	871	747
Service Time	2.422	2.235	2.142	2.824
HCM Lane V/C Ratio	0.009	0.222	0.215	0.05
HCM Control Delay	7.5	8.4	8.2	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.8	0.8	0.2

Intersection	
Intersection Delay, s/veh	12.3
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	36	97	319	86	131	187
Future Vol, veh/h	36	97	319	86	131	187
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	97	319	86	131	187
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	9.7	14.5	10.6
HCM LOS	A	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	27%	0%	100%
Vol Right, %	0%	100%	73%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	131	187	133	319	86
LT Vol	131	0	0	319	0
Through Vol	0	0	36	0	86
RT Vol	0	187	97	0	0
Lane Flow Rate	131	187	133	319	86
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.239	0.278	0.199	0.542	0.134
Departure Headway (Hd)	6.563	5.351	5.374	6.118	5.618
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	550	675	669	590	640
Service Time	4.265	3.053	3.4	3.84	3.335
HCM Lane V/C Ratio	0.238	0.277	0.199	0.541	0.134
HCM Control Delay	11.3	10.1	9.7	15.9	9.2
HCM Lane LOS	B	B	A	C	A
HCM 95th-tile Q	0.9	1.1	0.7	3.2	0.5



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	269	1271	5	114	575	40	329	101	132	69	113	237
Future Volume (vph)	269	1271	5	114	575	40	329	101	132	69	113	237
Satd. Flow (prot)	1695	3382	0	1695	4871	1517	4780	1784	1517	1695	1784	1517
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1681	3382	0	1585	4871	1458	4780	1784	1155	1367	1784	1517
Satd. Flow (RTOR)						278			216			276
Lane Group Flow (vph)	269	1276	0	114	575	40	329	101	132	69	113	237
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	1.0	5.0		1.0	5.0	5.0	1.0	5.0	5.0	1.0	5.0	5.0
Minimum Split (s)	8.5	41.2		8.5	41.2	41.2	8.2	42.4	42.4	7.9	12.4	12.4
Total Split (s)	33.0	57.6		17.0	41.6	41.6	21.3	42.4	42.4	13.0	34.1	34.1
Total Split (%)	25.4%	44.3%		13.1%	32.0%	32.0%	16.4%	32.6%	32.6%	10.0%	26.2%	26.2%
Yellow Time (s)	3.3	5.1		3.3	5.1	5.1	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	4.2	2.1		3.8	2.1	2.1	3.9	4.1	4.1	3.6	4.1	4.1
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.2		7.1	7.2	7.2	7.2	7.4	7.4	6.9	7.4	7.4
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	23.6	54.5		10.1	40.6	40.6	13.2	30.3	30.3	6.5	23.3	23.3
Actuated g/C Ratio	0.18	0.42		0.08	0.31	0.31	0.10	0.23	0.23	0.05	0.18	0.18
v/c Ratio	0.88	0.90		0.87	0.38	0.06	0.68	0.24	0.30	0.81	0.35	0.48
Control Delay	79.3	46.1		109.1	37.6	0.2	63.7	40.0	1.8	116.9	48.5	5.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.3	46.1		109.1	37.6	0.2	63.7	40.0	1.8	116.9	48.5	5.8
LOS	E	D		F	D	A	E	D	A	F	D	A
Approach Delay		51.9			46.8			44.9			35.6	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	66.5	167.6		29.5	45.1	0.0	29.0	20.1	0.0	17.9	24.8	0.0
Queue Length 95th (m)	#108.5	#216.1		#64.1	57.1	0.0	39.5	35.1	0.0	#46.4	42.4	12.2
Internal Link Dist (m)		686.1			478.0			348.7			179.7	
Turn Bay Length (m)	175.0			150.0		120.0	200.0		40.0	150.0		40.0
Base Capacity (vph)	332	1418		131	1520	646	518	480	468	85	369	532
Starvation Cap Reductn	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
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.90		0.87	0.38	0.06	0.64	0.21	0.28	0.81	0.31	0.45

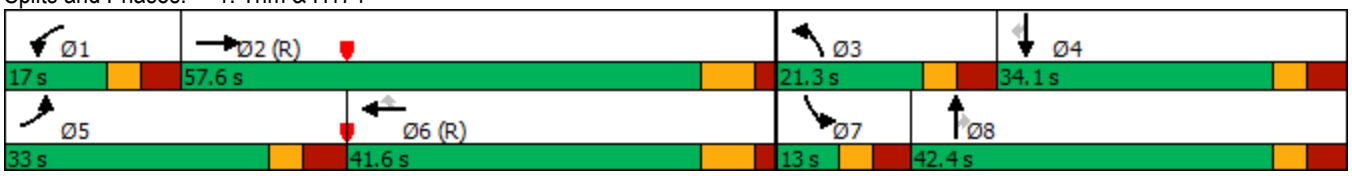
Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 54.5 (42%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

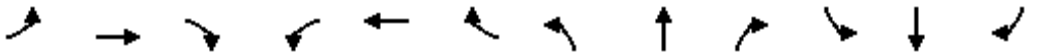
Maximum v/c Ratio: 0.90

Intersection Signal Delay: 47.4	Intersection LOS: D
Intersection Capacity Utilization 91.6%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Trim & H174

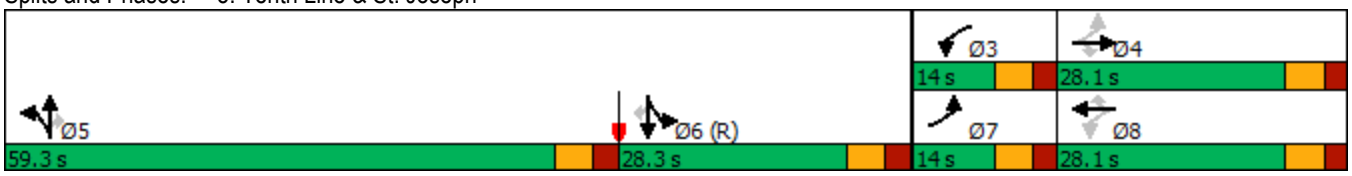


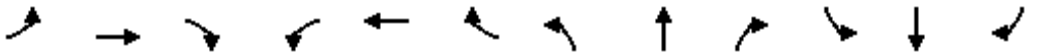


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	302	561	62	210	283	359	670	13	8	178	57
Future Volume (vph)	68	302	561	62	210	283	359	670	13	8	178	57
Satd. Flow (prot)	1695	3390	1517	1695	3390	1517	1543	3238	1517	1695	3390	1517
Flt Permitted	0.594			0.456			0.950	0.997		0.950		
Satd. Flow (perm)	1040	3390	1476	810	3390	1451	1534	3237	1483	1690	3390	1478
Satd. Flow (RTOR)			561			283			130			130
Lane Group Flow (vph)	68	302	561	62	210	283	323	706	13	8	178	57
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		5	5		6	6	
Permitted Phases	4		4	8		8			5			6
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	28.1	28.1	14.0	28.1	28.1	59.3	59.3	59.3	28.3	28.3	28.3
Total Split (%)	10.8%	21.7%	21.7%	10.8%	21.7%	21.7%	45.7%	45.7%	45.7%	21.8%	21.8%	21.8%
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	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Act Effct Green (s)	30.1	22.0	22.0	30.1	22.0	22.0	53.0	53.0	53.0	22.0	22.0	22.0
Actuated g/C Ratio	0.23	0.17	0.17	0.23	0.17	0.17	0.41	0.41	0.41	0.17	0.17	0.17
v/c Ratio	0.24	0.53	0.78	0.26	0.37	0.59	0.51	0.53	0.02	0.03	0.31	0.16
Control Delay	37.8	52.8	12.6	38.2	49.8	10.7	32.3	30.8	0.1	45.4	48.9	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	52.8	12.6	38.2	49.8	10.7	32.3	30.8	0.1	45.4	48.9	0.9
LOS	D	D	B	D	D	B	C	C	A	D	D	A
Approach Delay		27.5			28.6			30.9			37.5	
Approach LOS		C			C			C			D	
Queue Length 50th (m)	13.1	37.4	0.0	11.9	25.3	0.0	67.0	74.0	0.0	1.7	21.2	0.0
Queue Length 95th (m)	25.0	52.4	38.3	23.3	37.4	25.3	98.1	93.3	0.0	6.6	32.5	0.0
Internal Link Dist (m)		434.4			241.4			325.6			408.6	
Turn Bay Length (m)	100.0		140.0	65.0			160.0		50.0	110.0		70.0
Base Capacity (vph)	281	575	716	242	575	481	630	1323	682	287	575	358
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	0.53	0.78	0.26	0.37	0.59	0.51	0.53	0.02	0.03	0.31	0.16

Intersection Summary		
Cycle Length: 129.7		
Actuated Cycle Length: 129.7		
Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green		
Natural Cycle: 105		
Control Type: Pretimed		
Maximum v/c Ratio: 0.78		
Intersection Signal Delay: 29.9	Intersection LOS: C	
Intersection Capacity Utilization 87.3%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 5: Tenth Line & St. Joseph

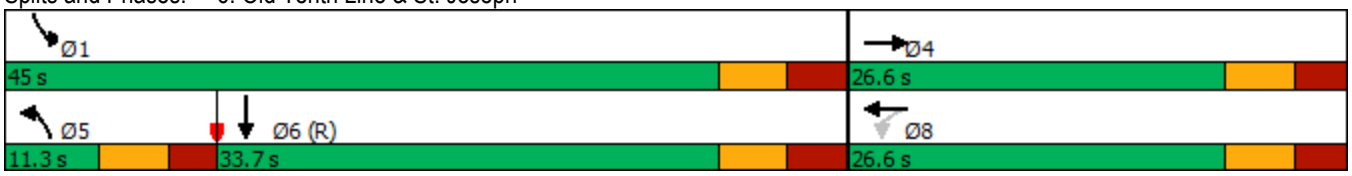




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	327	3	96	286	0	4	0	82	55	859	280
Future Volume (vph)	0	327	3	96	286	0	4	0	82	55	859	280
Satd. Flow (prot)	0	3386	0	1695	3390	0	1695	0	1517	3288	3390	1517
Flt Permitted				0.553			0.950			0.950		
Satd. Flow (perm)	0	3386	0	983	3390	0	1693	0	1495	3288	3390	1517
Satd. Flow (RTOR)		1							257			280
Lane Group Flow (vph)	0	330	0	96	286	0	4	0	82	55	859	280
Turn Type		NA		Perm	NA		Prot		Free	Prot	NA	Free
Protected Phases		4			8		5			1	6	
Permitted Phases				8					Free			Free
Minimum Split (s)		25.6		25.6	25.6		11.3			12.0	30.0	
Total Split (s)		26.6		26.6	26.6		11.3			45.0	33.7	
Total Split (%)		37.2%		37.2%	37.2%		15.8%			62.8%	47.1%	
Yellow Time (s)		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	
Lost Time Adjust (s)		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	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Act Effct Green (s)		20.0		20.0	20.0		5.0		71.6	38.0	26.7	71.6
Actuated g/C Ratio		0.28		0.28	0.28		0.07		1.00	0.53	0.37	1.00
v/c Ratio		0.35		0.35	0.30		0.03		0.05	0.03	0.68	0.18
Control Delay		21.8		25.1	21.4		31.8		0.1	8.1	22.2	0.3
Queue Delay		0.0		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		21.8		25.1	21.4		31.8		0.1	8.1	22.2	0.3
LOS		C		C	C		C		A	A	C	A
Approach Delay		21.8			22.3			1.5			16.4	
Approach LOS		C			C			A			B	
Queue Length 50th (m)		18.4		10.3	15.8		0.5		0.0	1.7	49.7	0.0
Queue Length 95th (m)		28.8		22.5	25.2		3.1		0.0	4.0	68.6	0.0
Internal Link Dist (m)		241.4			372.8			239.6			226.3	
Turn Bay Length (m)				60.0					10.0	90.0		
Base Capacity (vph)		946		274	946		118		1495	1745	1264	1517
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		0.35		0.35	0.30		0.03		0.05	0.03	0.68	0.18

Intersection Summary			
Cycle Length: 71.6			
Actuated Cycle Length: 71.6			
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Pretimed			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 17.8		Intersection LOS: B	
Intersection Capacity Utilization 63.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Old Tenth Line & St. Joseph



Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	278	57	14	235	41	14
Future Vol, veh/h	278	57	14	235	41	14
Conflicting Peds, #/hr	0	15	15	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	278	57	14	235	41	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	350	0	590	327
Stage 1	-	-	-	-	322	-
Stage 2	-	-	-	-	268	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1209	-	470	714
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	777	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1192	-	454	701
Mov Cap-2 Maneuver	-	-	-	-	454	-
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	762	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	499	-	-	1192	-
HCM Lane V/C Ratio	0.11	-	-	0.012	-
HCM Control Delay (s)	13.1	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	194	99	29	167	82	40
Future Vol, veh/h	194	99	29	167	82	40
Conflicting Peds, #/hr	0	35	35	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	194	99	29	167	82	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	328	0	514	289
Stage 1	-	-	-	-	279	-
Stage 2	-	-	-	-	235	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1232	-	521	750
Stage 1	-	-	-	-	768	-
Stage 2	-	-	-	-	804	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1192	-	486	719
Mov Cap-2 Maneuver	-	-	-	-	486	-
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	775	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	544	-	-	1192	-
HCM Lane V/C Ratio	0.224	-	-	0.024	-
HCM Control Delay (s)	13.5	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	191	43	66	133	63	54
Future Vol, veh/h	191	43	66	133	63	54
Conflicting Peds, #/hr	0	65	65	0	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	191	43	66	133	63	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	299	0	553	288
Stage 1	-	-	-	-	278	-
Stage 2	-	-	-	-	275	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1262	-	494	751
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	771	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1186	-	433	699
Mov Cap-2 Maneuver	-	-	-	-	433	-
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	718	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	13.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	525	-	-	1186	-
HCM Lane V/C Ratio	0.223	-	-	0.056	-
HCM Control Delay (s)	13.8	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.2	-

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	5	206	107	2	0	179	65	144	0	47	5
Future Vol, veh/h	6	5	206	107	2	0	179	65	144	0	47	5
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	5	206	107	2	0	179	65	144	0	47	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.4	9.6	12.4	8.7
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	46%	3%	98%	0%
Vol Thru, %	17%	2%	2%	90%
Vol Right, %	37%	95%	0%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	388	217	109	52
LT Vol	179	6	107	0
Through Vol	65	5	2	47
RT Vol	144	206	0	5
Lane Flow Rate	388	217	109	52
Geometry Grp	1	1	1	1
Degree of Util (X)	0.501	0.276	0.165	0.074
Departure Headway (Hd)	4.648	4.577	5.457	5.147
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	768	777	651	687
Service Time	2.715	2.65	3.544	3.244
HCM Lane V/C Ratio	0.505	0.279	0.167	0.076
HCM Control Delay	12.4	9.4	9.6	8.7
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2.8	1.1	0.6	0.2

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	191	2	5	160	26	2	0	5	25	0	6
Future Vol, veh/h	10	191	2	5	160	26	2	0	5	25	0	6
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	191	2	5	160	26	2	0	5	25	0	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.5	8.3	7.5	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	5%	3%	81%
Vol Thru, %	0%	94%	84%	0%
Vol Right, %	71%	1%	14%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	203	191	31
LT Vol	2	10	5	25
Through Vol	0	191	160	0
RT Vol	5	2	26	6
Lane Flow Rate	7	203	191	31
Geometry Grp	1	1	1	1
Degree of Util (X)	0.009	0.234	0.216	0.042
Departure Headway (Hd)	4.45	4.149	4.077	4.835
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	809	857	869	745
Service Time	2.452	2.222	2.157	2.837
HCM Lane V/C Ratio	0.009	0.237	0.22	0.042
HCM Control Delay	7.5	8.5	8.3	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.9	0.8	0.1

Intersection	
Intersection Delay, s/veh	14
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	105	113	289	52	164	332
Future Vol, veh/h	105	113	289	52	164	332
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	113	289	52	164	332
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	12.3	16	13.3
HCM LOS	B	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	48%	0%	100%
Vol Right, %	0%	100%	52%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	164	332	218	289	52
LT Vol	164	0	0	289	0
Through Vol	0	0	105	0	52
RT Vol	0	332	113	0	0
Lane Flow Rate	164	332	218	289	52
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.306	0.508	0.359	0.542	0.09
Departure Headway (Hd)	6.719	5.504	5.928	6.749	6.241
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	535	654	606	535	574
Service Time	4.461	3.246	3.973	4.493	3.986
HCM Lane V/C Ratio	0.307	0.508	0.36	0.54	0.091
HCM Control Delay	12.4	13.8	12.3	17.2	9.6
HCM Lane LOS	B	B	B	C	A
HCM 95th-tile Q	1.3	2.9	1.6	3.2	0.3

APPENDIX Q

SIMTRAFFIC QUEUEING ANALYSIS

Intersection: 1: Trim & H174

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	TR	L	T	T	T	L	L	L	T	R
Maximum Queue (m)	81.6	42.9	48.3	41.6	107.2	106.2	102.7	55.1	77.6	82.9	35.8	8.9
Average Queue (m)	42.0	21.5	22.6	18.6	79.6	77.7	67.0	16.3	44.9	52.5	14.5	0.3
95th Queue (m)	71.2	36.5	40.2	37.5	103.9	102.4	93.5	48.7	66.1	73.0	30.2	6.3
Link Distance (m)		697.7	697.7		488.1	488.1	488.1			360.3	360.3	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	175.0			150.0				200.0	200.0			40.0
Storage Blk Time (%)											0	0
Queuing Penalty (veh)											0	0

Intersection: 1: Trim & H174

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (m)	30.3	48.4	42.5
Average Queue (m)	11.2	20.1	4.1
95th Queue (m)	24.2	38.5	24.8
Link Distance (m)		179.2	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	150.0		40.0
Storage Blk Time (%)		1	0
Queuing Penalty (veh)		3	0

Intersection: 2: Trim & Jeanne D'Arc

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	37.2	31.5	78.1	20.6
Average Queue (m)	15.7	14.8	26.1	9.1
95th Queue (m)	27.1	24.9	53.5	16.3
Link Distance (m)	185.0	134.8	179.2	79.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Tweddle & Jeanne D'Arc

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	22.9	22.2	9.2	15.5
Average Queue (m)	12.3	11.1	1.9	7.1
95th Queue (m)	18.7	16.9	7.9	14.3
Link Distance (m)	457.6	185.0	165.8	181.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Tenth Line & Jeanne D'Arc

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (m)	22.6	28.8	20.4	17.1	19.5
Average Queue (m)	11.6	17.2	10.1	8.6	8.8
95th Queue (m)	18.4	25.0	16.6	14.0	15.3
Link Distance (m)	181.9				
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)		145.0			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Tenth Line & St. Joseph

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	T	L	T	T	L	LT	T	R	L	T
Maximum Queue (m)	18.7	29.3	19.6	20.5	54.2	54.1	111.1	130.3	119.3	57.4	10.7	49.4
Average Queue (m)	6.2	10.8	4.9	5.1	27.5	31.0	70.6	92.9	82.6	5.7	1.7	27.2
95th Queue (m)	15.5	22.2	14.4	14.5	46.8	49.0	103.5	120.2	109.7	33.7	7.3	43.5
Link Distance (m)		446.7	446.7		230.4	230.4		337.3	337.3			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	100.0			65.0			160.0			50.0	110.0	
Storage Blk Time (%)									25	0		
Queuing Penalty (veh)									5	0		

Intersection: 5: Tenth Line & St. Joseph

Movement	SB
Directions Served	T
Maximum Queue (m)	40.9
Average Queue (m)	15.9
95th Queue (m)	36.7
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Old Tenth Line & St. Joseph

Movement	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R	L	L	T	T
Maximum Queue (m)	18.2	23.3	14.2	36.5	35.1	12.1	6.6	17.8	46.7	34.5
Average Queue (m)	4.6	6.2	3.8	17.6	17.9	0.9	0.4	4.7	23.3	8.9
95th Queue (m)	12.4	16.7	10.4	30.8	31.4	6.8	3.0	13.5	39.6	24.0
Link Distance (m)	230.4	230.4		388.9	388.9				237.7	237.7
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)			60.0			10.0	90.0	90.0		
Storage Blk Time (%)						0				
Queuing Penalty (veh)						0				

Intersection: 7: Tenth Line & H174 WB on-off

Movement	SB
Directions Served	R
Maximum Queue (m)	4.8
Average Queue (m)	0.2
95th Queue (m)	3.4
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	50.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: West Access & Jeanne D'Arc

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	5.4	7.4	20.9
Average Queue (m)	0.2	0.8	9.2
95th Queue (m)	2.2	5.2	16.6
Link Distance (m)		135.3	85.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: Center Access & Jeanne D'Arc

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	5.5	18.0	22.8
Average Queue (m)	0.2	1.4	10.7
95th Queue (m)	2.6	8.4	18.0
Link Distance (m)	135.3	119.9	103.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: West Access & Jeanne D'Arc

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	6.5	16.4	19.3
Average Queue (m)	0.4	3.3	10.7
95th Queue (m)	3.7	11.4	16.8
Link Distance (m)	119.9	457.6	99.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Jeanne D'Arc

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 8

Intersection: 1: Trim & H174

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	TR	L	T	T	T	L	L	L	T	R
Maximum Queue (m)	137.6	243.3	243.2	67.7	70.4	71.8	59.2	47.4	56.5	65.6	45.4	19.0
Average Queue (m)	77.8	150.6	152.7	29.6	44.1	40.4	26.0	9.0	36.8	44.7	18.4	1.8
95th Queue (m)	153.9	295.6	290.8	57.3	62.2	61.6	52.5	35.4	57.7	61.8	36.8	16.6
Link Distance (m)		697.7	697.7		488.1	488.1	488.1			360.3	360.3	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	175.0			150.0				200.0	200.0			40.0
Storage Blk Time (%)	0	6									1	0
Queuing Penalty (veh)	0	17									1	0

Intersection: 1: Trim & H174

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (m)	42.1	63.1	47.5
Average Queue (m)	17.8	22.7	4.4
95th Queue (m)	36.3	45.8	26.8
Link Distance (m)		179.2	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	150.0		40.0
Storage Blk Time (%)		2	0
Queuing Penalty (veh)		7	0

Intersection: 2: Trim & Jeanne D'Arc

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	31.6	20.2	74.3	15.4
Average Queue (m)	14.4	11.2	37.0	7.2
95th Queue (m)	24.4	17.9	61.9	13.6
Link Distance (m)	185.0	134.8	179.2	79.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Tweddle & Jeanne D'Arc

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	23.2	23.1	9.2	17.7
Average Queue (m)	13.4	11.6	1.6	5.9
95th Queue (m)	20.5	18.1	7.1	14.5
Link Distance (m)	457.6	185.0	165.8	181.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Tenth Line & Jeanne D'Arc

Movement	EB	WB	WB	NB	NB
Directions Served	TR	L	T	L	R
Maximum Queue (m)	28.2	32.6	16.0	21.9	28.5
Average Queue (m)	14.5	17.6	8.2	10.8	14.0
95th Queue (m)	23.4	26.6	14.8	18.4	23.6
Link Distance (m)	181.9				
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)		145.0			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Tenth Line & St. Joseph

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	T	L	T	T	L	LT	T	R	L	T
Maximum Queue (m)	35.2	57.8	56.2	31.6	40.1	48.8	103.2	122.1	104.3	57.4	14.6	48.9
Average Queue (m)	13.6	36.3	31.5	11.4	19.1	24.2	53.9	78.7	67.8	4.2	2.1	28.4
95th Queue (m)	28.1	53.2	50.6	24.8	35.4	40.4	89.2	106.8	94.9	28.7	8.9	45.5
Link Distance (m)		446.7	446.7		230.4	230.4		337.3	337.3			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	100.0			65.0			160.0			50.0	110.0	
Storage Blk Time (%)									14	0		
Queuing Penalty (veh)									2	0		

Intersection: 5: Tenth Line & St. Joseph

Movement	SB
Directions Served	T
Maximum Queue (m)	45.1
Average Queue (m)	15.9
95th Queue (m)	38.1
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Old Tenth Line & St. Joseph

Movement	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R	L	L	T	T	R
Maximum Queue (m)	56.0	61.2	36.4	35.0	48.1	4.0	6.6	15.3	78.9	66.1	3.3
Average Queue (m)	25.4	30.9	14.2	15.3	23.2	0.1	0.5	4.9	47.9	37.5	0.1
95th Queue (m)	50.6	57.4	28.9	29.0	41.6	2.2	3.5	12.9	69.7	59.8	2.4
Link Distance (m)	230.4	230.4		388.9	388.9				237.7	237.7	237.7
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)			60.0			10.0	90.0	90.0			
Storage Blk Time (%)						0			0		
Queuing Penalty (veh)						0			0		

Intersection: 7: Tenth Line & H174 WB on-off

Movement	SB
Directions Served	R
Maximum Queue (m)	4.3
Average Queue (m)	0.1
95th Queue (m)	3.0
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	50.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: West Access & Jeanne D'Arc

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	6.5	12.0	17.6
Average Queue (m)	0.4	1.6	8.5
95th Queue (m)	3.8	8.0	15.9
Link Distance (m)		135.3	85.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: Center Access & Jeanne D'Arc

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	10.4	18.6	23.3
Average Queue (m)	0.8	2.8	10.4
95th Queue (m)	5.3	11.2	17.7
Link Distance (m)	135.3	119.9	103.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: West Access & Jeanne D'Arc

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	6.7	19.8	29.1
Average Queue (m)	0.3	5.0	11.7
95th Queue (m)	3.0	15.3	20.6
Link Distance (m)	119.9	457.6	99.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Jeanne D'Arc

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 28

Intersection: 1: Trim & H174

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	TR	L	T	T	T	L	L	L	T	R
Maximum Queue (m)	182.4	288.0	278.2	63.4	62.6	64.1	56.3	49.7	63.4	71.6	42.3	9.0
Average Queue (m)	131.2	175.2	174.7	30.3	44.6	42.0	25.9	9.7	39.9	49.0	16.4	0.6
95th Queue (m)	203.8	293.8	285.8	53.5	61.2	60.5	53.1	37.6	62.1	67.6	31.7	9.1
Link Distance (m)		697.7	697.7		488.1	488.1	488.1			360.3	360.3	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	175.0			150.0				200.0	200.0			40.0
Storage Blk Time (%)	7	11									0	0
Queuing Penalty (veh)	41	36									0	0

Intersection: 1: Trim & H174

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (m)	44.9	58.8	37.5
Average Queue (m)	20.5	22.6	4.0
95th Queue (m)	40.7	45.8	25.5
Link Distance (m)		179.2	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	150.0		40.0
Storage Blk Time (%)		3	0
Queuing Penalty (veh)		8	0

Intersection: 2: Trim & Jeanne D'Arc

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	43.3	25.0	83.3	20.9
Average Queue (m)	18.8	14.2	53.3	9.3
95th Queue (m)	33.6	22.6	76.8	16.7
Link Distance (m)	185.0	134.8	179.2	79.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 85