

25 Pickering Place

Transportation Impact Assessment

September 2020

CIMA+ file number: A001043





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 licensed¹ or registered² 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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(Please Print)

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

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Stamp



City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	25 Pickering
Description of Location	Existing industrial site adjacent to the VIA rail station
Land Use Classification	Mixed Use
Development Size (units)	9 story hotel (approx. 119 units), a 12 story senior residence (approx. 164 units), and four 20-30 story towers anticipated to be for residential or commercial type land uses (approx. 1,060 units, or approximately 1M ft ² GFA) **Final development subject to change prior to final SPA**
Development Size (m ²)	Approximately 113,584 m ²
Number of Accesses and Locations	Four (4) to/from Tremblay Road
Phase of Development	2025, 2030
Buildout Year	2030

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

2. Trip Generation Trigger

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

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

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

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

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	✓	
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*	✓	

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

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

4. Safety Triggers

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

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

5. Summary

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

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

25 Pickering Place

Transportation Impact Assessment



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CIMA+ file number: A001043
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1. Step 1 – Screening Form

With respect to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines, the proposed development (described below in Section 2.1) triggered the trip generation, location and the safety criteria outlined in the City's TIA Step 1 – Screening form. Since all triggers were met, a formal TIA (i.e. completed Steps 1-5) must accompany the subject development application.

2. Step 2 – Scoping

2.1 Existing and Planned Conditions

Description of Proposed Development

The subject development lands are generally bound by Tremblay Road to the north, Avenue L to the east, and the VIA Rail Tremblay station/tracks to the west and south, respectively. Based on the available/provided information, the subject site is currently occupied by industrial type land uses, which is planned to be replaced by a 9-storey hotel (approx. 119 units), a 12-storey senior residence (approx. 164 units) and four 20-30 storey residential towers with ground floor retail (approx. 1,060 residential units or approximately 1M ft² GFA). Given the size of the proposed development, market demand will ultimately dictate the rate and type of development; however, for analysis purposes, it is estimated that the site will be built-out in the following phases:

Phase 1: approximate build-out year 2025

- + 9-storey Hotel, approx. 119 units
- + 12-storey Senior Residence, approx. 164 units
- + 20-storey Tower D, approx. 211 units

Phase 2: approximate build-out year 2030

- + 25-storey Tower A, approx. 270 units
- + 30-storey Tower B, approx. 322 units
- + 25-storey Tower C, approx. 257 units

The latest Concept Plan depicts five access points, including; a right-in/right-out connection to the VIA Rail station pick-up/drop-off loop, and full-movement connections via Pickering Place, Avenue J, Avenue K and Avenue L. All new internal streets will be designed to be slow speed and almost all parking will be provided in underground lots with access/egress generally located near the rear of each building.

Pedestrians will be provided sidewalks along both sides of internal streets to support active mobility, which will provide connectivity between on-site facilities, and will be fully integrated with the well-developed surrounding pedestrian network. This active network also provides convenient access to the highest order of public transit via the existing LRT Tremblay station, as well as OC Transpo bus service provided along Tremblay Road and Belfast Road.

The local context of the subject site is provided in **Figure 1**, the proposed Concept Plan is provided in **Figure 2**.

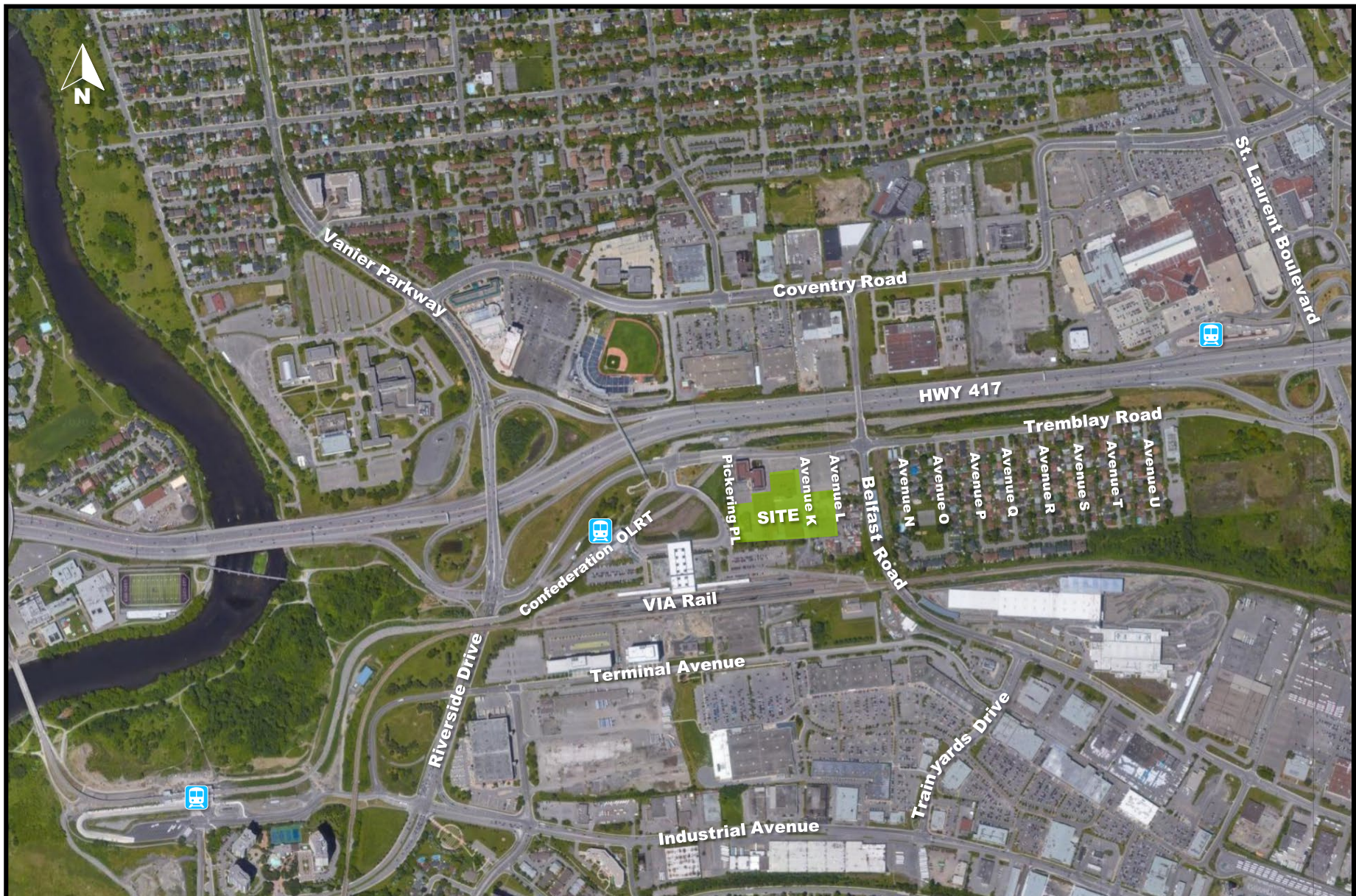




Figure 2: Proposed Development Concept Plan

Existing Conditions

Area Road Network

Tremblay Road is a four-lane major collector roadway (i.e. two travel lanes per direction) between Riverside Drive and Pickering Place. East of Pickering Place, Tremblay Road is two-lane major collector roadway (i.e. a single travel lane per direction) that extends to Triole Street, just east of St. Laurent Boulevard. Within the vicinity of the subject site, the posted speed limit is 50 km/h, and on-street parking is not permitted along either side of the roadway.

Belfast Road is a two-lane collector roadway within the vicinity of the subject development. It extends between Coventry Road in the north and Michael Street in the south-east. Within the vicinity of the subject site, the posted speed limit is 50 km/h, and on-street parking is not permitted along either side of the roadway.

Pickering Place, Avenue J, Avenue K and Avenue L are two-lane local roadways, which all provide full-movement connections to Tremblay Road and access/egress for adjacent land uses. The speed limit is unposted; however, given the surrounding context, the operating speed likely to be no more than 40 km/h (e.g. narrow and undefined lanes fosters a greater sense of awareness for drivers, and often results in slower speeds). On-street parking is also prohibited along both sides of these roadways.

Study Area Intersections

Belfast/Tremblay

The Belfast/Tremblay intersection is a signalized, four-legged intersection. All approaches consist of a single shared through/right-turn lane and a single left-turn lane.

All movements are permitted at this location.



Tremblay/Via Rail

The Tremblay/Via Rail intersection is a signalized four-legged intersection. The northbound approach consists of a single left-turn lane and a single right-turn lane. The southbound approach consists of a single lane that accommodates all movements. The westbound approach consists of two through lanes and a single left-turn lane. The eastbound approach consists of two through lanes, a single right-turn lane and a single unmarked left-turn lane, reserved for authorized vehicles only.

All movements are permitted at this location, with the exception of movements to/from the north leg, which are permitted for authorized vehicles only.



Tremblay/Pickering

The Tremblay/Pickering intersection is an unsignalized three-legged intersection with STOP control on the minor approach only. The northbound approach consists of a single lane that accommodates all movements. The westbound approach consists of two through lanes and a single left-turn lane. The eastbound approach consists of a single through lane and a single right-turn lane.

All movements are permitted at this location.



Tremblay/Avenue K

The Tremblay/Avenue K intersection is an unsignalized three-legged intersection with STOP control on the minor approach only. All approaches consist of a single lane that accommodates all possible movements.

All movements are permitted at this location.



Tremblay/Avenue L

The Tremblay/Avenue L intersection is an unsignalized three-legged intersection with STOP control on the minor approach only. All approaches consist of a single lane that accommodates all possible movements.

All movements are permitted at this location, with the exception of northbound left-turns are prohibited between 7:00-9:00AM and 3:30-5:30PM Mon-Fri.

It is noteworthy that this intersection is located approximately 40 m west of the Belfast/Tremblay intersection (i.e. it is in close proximity), and it is located within the auxiliary eastbound left-turn storage provided at the Belfast/Tremblay intersection.



Existing Driveways to Adjacent Developments

Within an approximate 200 m radius surrounding the site, there is a single full-movement driveway connection to Tremblay Road, located between Tremblay/Pickering and Tremblay/Avenue K. This driveway connection provides access/egress for an existing government land use (i.e. Professional Institute of the Public Service). It should be noted that this driveway is planned to be formalized as a local roadway (identified as “Avenue J” on the proposed Concept Plan). Additionally, there are a number of existing land uses along the east side of Avenue L with informal driveway connections that are not compliant with the City’s Private Approach By-Law. The following **Figure 3** depicts an example land use where the entire front and side yard property lines, that front onto City roadways, serve as vehicle access/egress.



Figure 3: Example Land Use with Informal Driveway Connections - 294 Tremblay Road

As described below, Tremblay Road and Avenue L are scheduled as infrastructure renewal projects. During the planning/design phases of these renewal projects, access/egress for properties like the one depicted in **Figure 3**, an Access Management Plan should be developed to consolidate driveways and to ensure driveway connections comply with By-Law requirements.

Pedestrian/Cycling Network

The network for active modes in the vicinity of the subject site is currently fairly well developed. Sidewalks on Tremblay Road are provided along the southside of the roadway, conveniently along the subject site’s frontage, and a multi-use pathway is provided along the north side of the roadway. Along Belfast Road, sidewalks are provided along both sides of the roadway, on the Belfast Bridge over the LRT and HWY 417 only. North of the Belfast Bridge, a sidewalk is provided along the east side of the roadway only. South of Tremblay Road, a bi-directional multi-use pathway is provided along the west side of Belfast Road.

The existing pedestrian/cycling network within the vicinity of the subject site, and how it connects to the greater network for active modes is depicted as **Figure 4** and **Figure 5**, as sourced from the City’s GeoOttawa map.

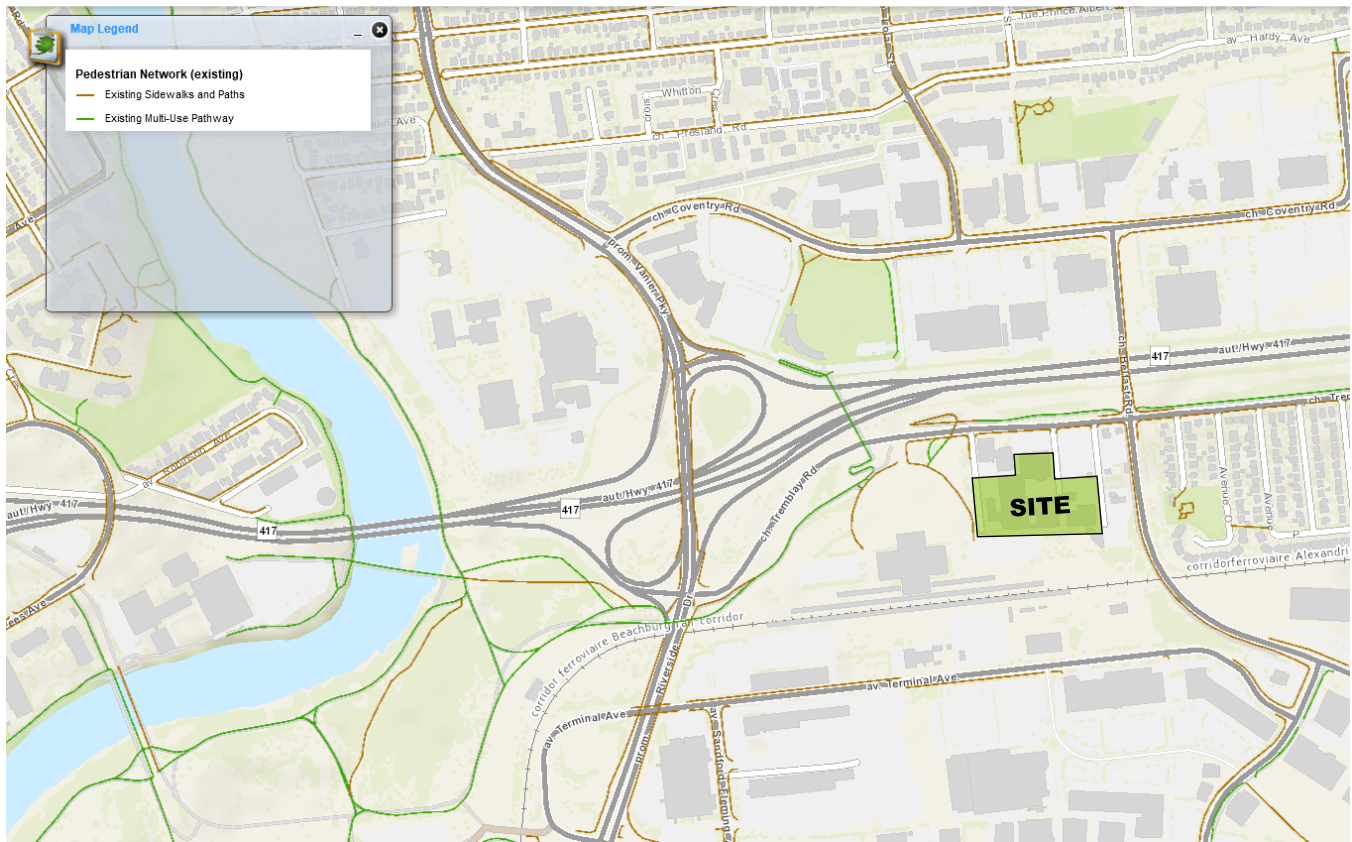


Figure 4: Existing Pedestrian Network

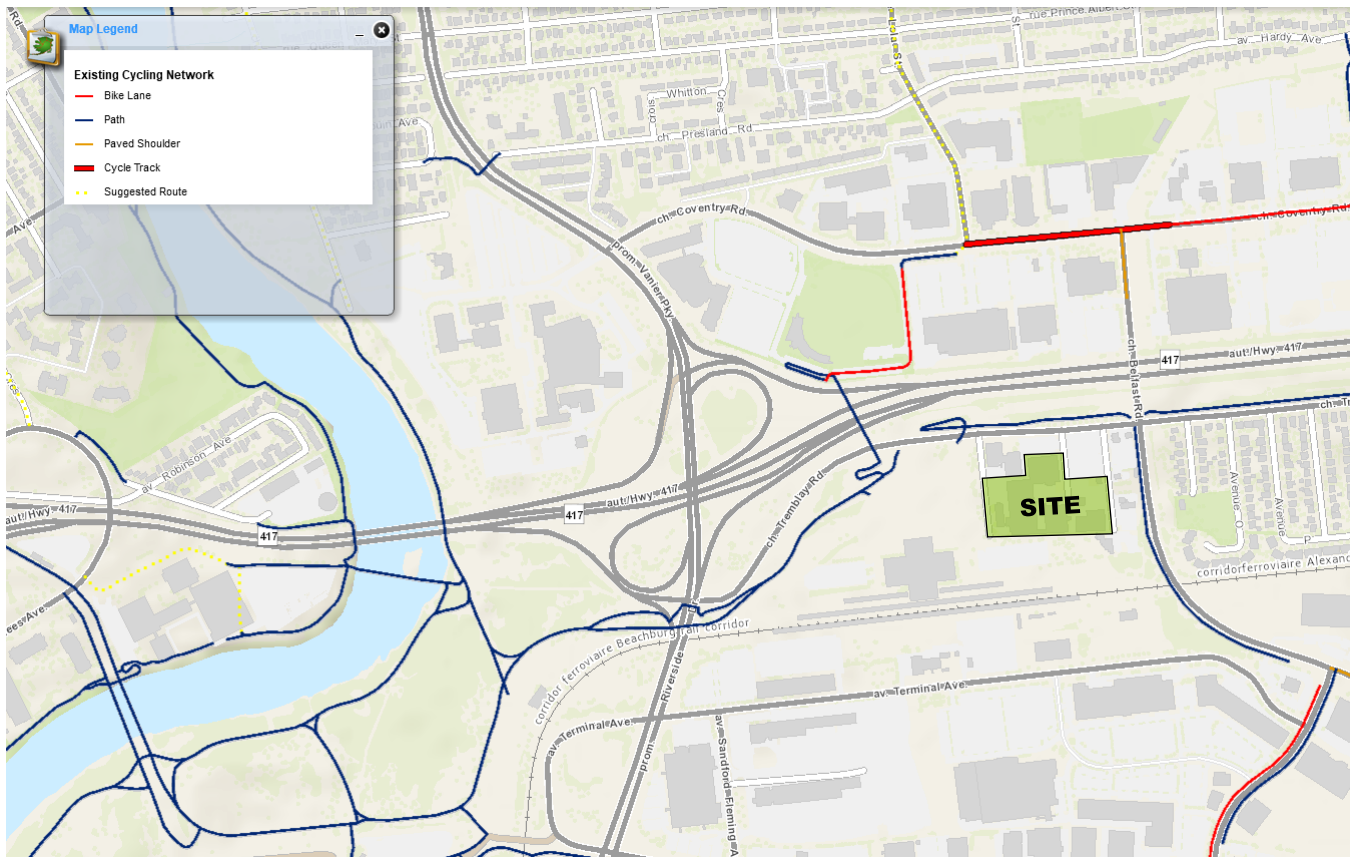


Figure 5: Existing Cycling Network

Transit Network

OC Transpo currently provides the highest order transit service within the vicinity of the subject site. The Tremblay LRT Station is located just west of the VIA Rail station and is an approximate 450 m walking distance to/from the heart of the proposed development site (i.e. the subject development will benefit from convenient access to/from OC Transpo's Confederation LRT line).

In addition to LRT service, there are 5 OC Transpo bus stops that are located within walking distance to/from the subject development site. The following **Table 1** summarizes existing bus stops, their associated routes and direction of travel.

Table 1: OC Transpo Stop Information

Stop #	Location	Route Identifier	Direction
#1371	Immediately northwest of Tremblay/Via Rail	39	Westbound
#1369	Immediately southeast of Tremblay/Via Rail	39	Eastbound
#1837	Immediately west of Tremblay/Avenue K	39	Eastbound
#1836	Immediately east of Tremblay/Belfast	18, 39	Westbound
#1849	Immediately west of Tremblay/Avenue P	18, 39	Eastbound
#3024	200m southwest of Tremblay/Via Rail	Confederation Line	East/Westbound

The following **Figure 6** depicts the OC Transpo routes within the vicinity of the development, and **Table 2** provides additional information with respect OC Transpo service identified in **Table 1**.

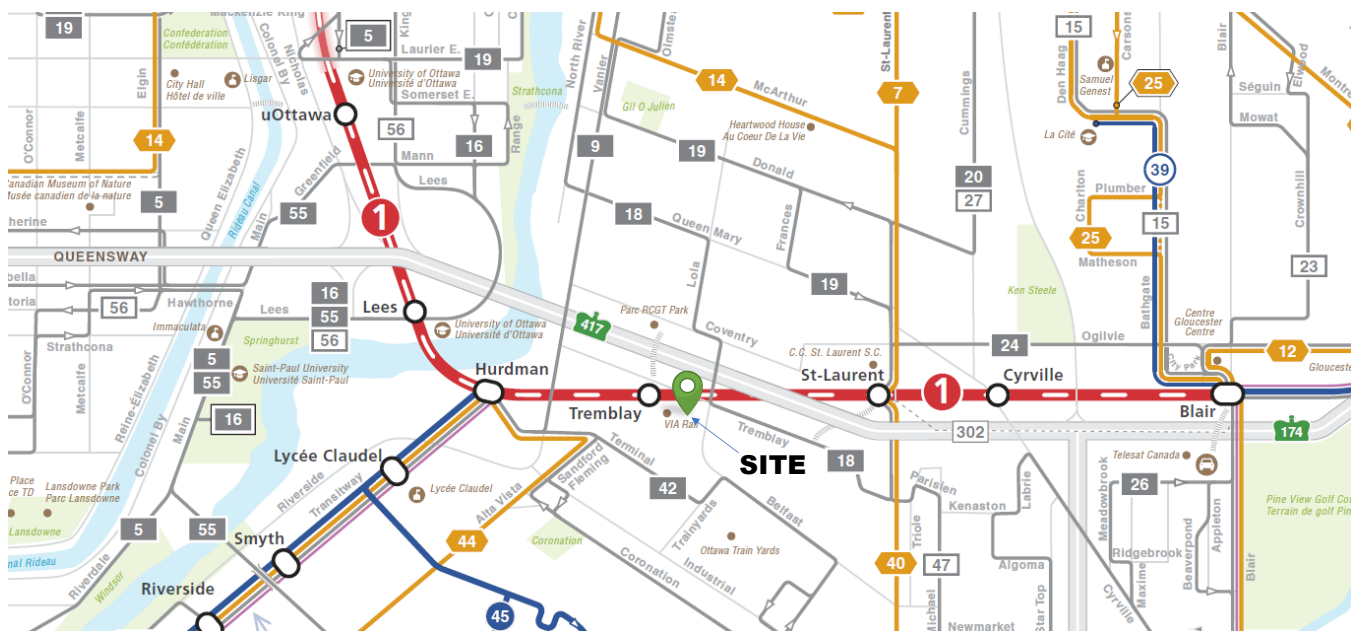


Figure 6: Transit Routes Within Study Area (Source: OC Transpo System Map)

Table 2: OC Transpo Route Information

Route	Origin/Destination	Service Type	Peak Hour Headway
18	St. Laurent ↔ Parliament	Local	30 min
39x & 39y	N Rideau ↔ Millennium	Night	30 min
Confederation Line	Tunney's Pasture ↔ Blair	LRT	4 min

Based on information provided by the City, it should be noted that the main transit service within the study area is provided by the OTrain Line 1 at Tremblay Station. The station is located across the VIA station loop roadway, approximately 250 m or 2-3 minute walk from the subject development site. The OTrain Line 1 service operates frequently all day with direct connections to Hurdman Station, uOttawa, Downtown, Bayview Station (a transfer point to connect with the OTrain Line 2), and Tunney's Pasture in the west, and to St-Laurent, Cyrville, and Blair Station in the east. Currently, Tremblay Station is one of the less busy stations along the Confederation Line; therefore, there is currently ample capacity available for growth.

Given the high level of service provided by the OTrain Line 1, bus stops in the immediate vicinity of the Tremblay Station are not served by regular bus routes. Stops 1369 and 1371 (Tremblay Road at VIA Station loop) are served by the bus Route #N39, which is the nighttime extension of regular the bus Rapid Route #39. This route is extended from its regular terminus at Blair Station to provide service between the OTrain Line 1 Stations overnight, when Line 1 is not operating. These stops are also served by the bus Route #R1, which is the replacement bus service when Line 1 is temporarily out of service during regular service hours.

The closest regular bus service within the vicinity of the subject site are stops 1836 and 1849 on Tremblay Road, east of Belfast Road, between 400-600m from the subject development site. Local Route #18 serves these stops every 15 minutes in the peak direction and every 30 minutes all day. In the eastbound direction, Route #18 continues along Tremblay Road and connects with the St-Laurent Transit Station. In the westbound direction, Route #18 travels through the Overbrook and Vanier neighbourhoods, linking to Rideau Street and ending at the Parliament Transit Station downtown.

Finally, a note regarding stop 3024. Following the major network service change in Fall 2019 and the opening of OTrain Line 1, this stop is no longer served by a regular bus route. As discussed above, bus Route #N39 and Route #R1 serve the stops on Tremblay Road at the VIA Station loop intersection, but not the stop at the front entrance. As with most things there is an exception: a special shuttle (one trip only) has been operating on Sunday nights from this stop to the Hurdman Transit Station to accommodate passengers on the last VIA train, which arrives at approximately 11:15PM on Sundays. This shuttle fills the gap between the end of OTrain Line 1 operating hours (which ends at 11:00PM) and the first bus Route #N39 trip, which would be a notable wait and walk out to Tremblay Road.

Area Traffic Management Measures

There are currently no traffic calming or area traffic management measures within the study area.

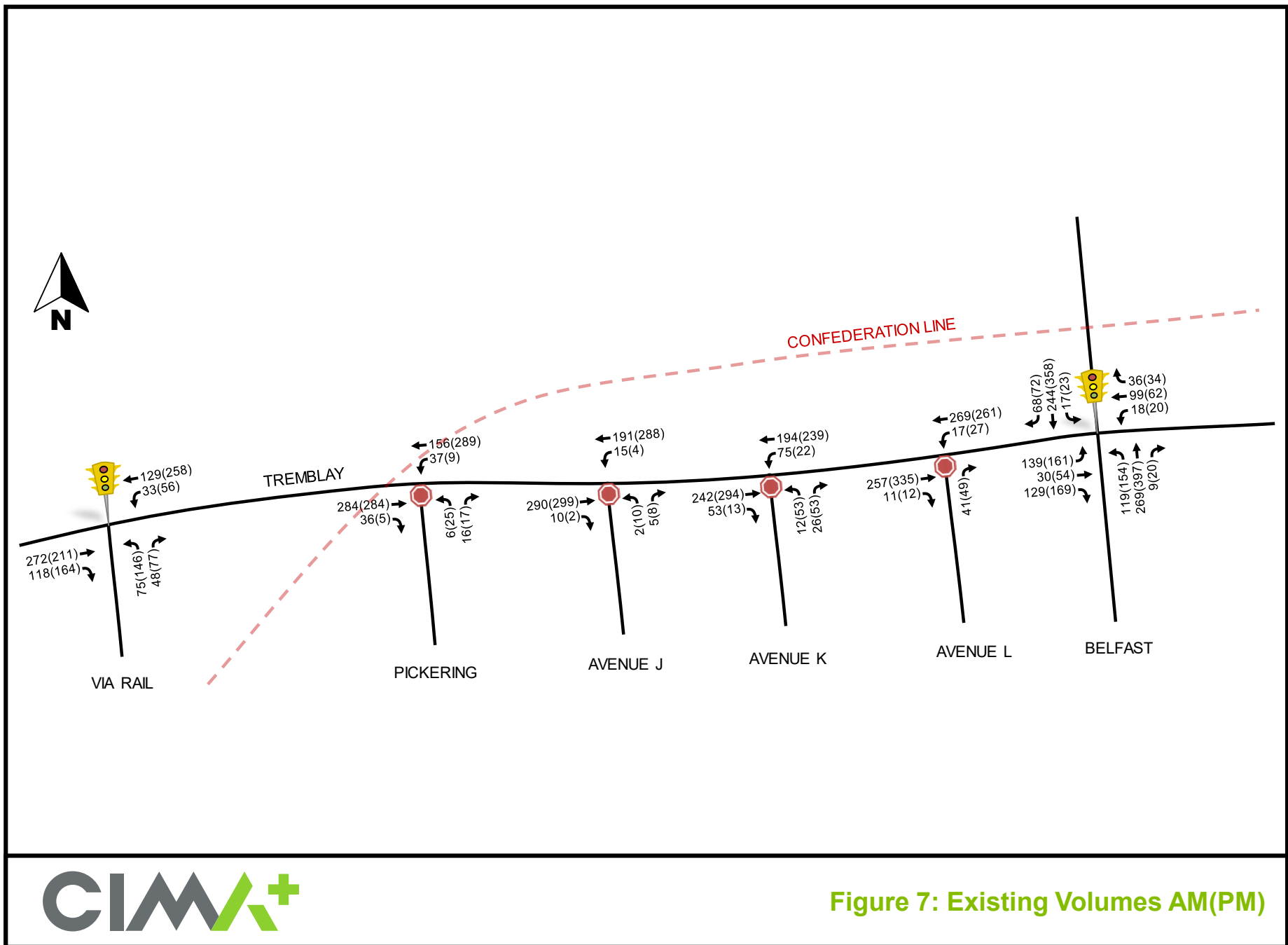
Peak Hour Travel Demands

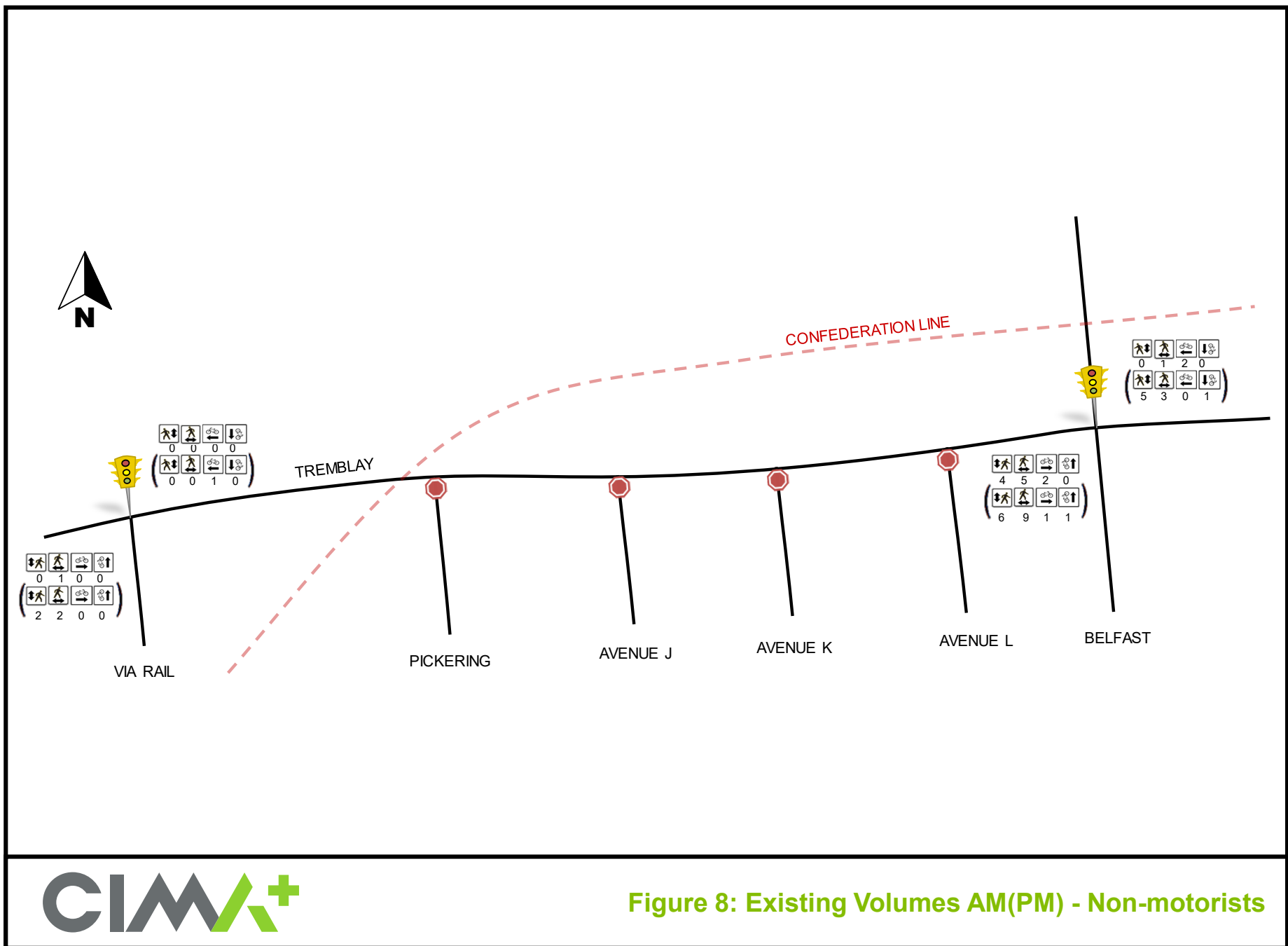
For the purpose of this assessment and based on discussions with City Staff, the following study area intersections have been identified for intersection capacity analysis:

- | | |
|----------------------|---------------------|
| + Tremblay/Via Rail | + Tremblay/Avenue K |
| + Tremblay/Pickering | + Tremblay/Avenue L |
| + Tremblay/Avenue J | + Tremblay/Belfast |

It should be noted that traffic count data is not available for the Tremblay/Pickering, Tremblay/Avenue K, Tremblay/Avenue L intersections, given unsignalized intersections are typically not included as part of the City's regular count program. Additionally, given the current state of affairs with respect to the COVID-19 pandemic, having historic impacts on Ottawa's transportation network (e.g. 70% to 90% reduction in transit ridership, 50% reduction in traffic volumes, etc.), collecting traffic count information at this time will not be an accurate representation of what is considered typical traffic conditions. As such, an estimate of typical traffic conditions (where traffic count information is not available) was developed by estimating vehicular trips generated by the existing land uses that have access to the unsignalized Tremblay/Pickering, Tremblay/Avenue K, Tremblay/Avenue L intersections. The detailed vehicular trip generation for existing land uses and the assignment of these trips to the study area network is further described in **Appendix A**.

The following **Figure 7** depicts observed weekday morning and afternoon peak hour vehicle volumes at the study area intersections and **Figure 8** illustrates pedestrian and cyclist volumes over the same peak hour periods. The source traffic volume data is provided as **Appendix B**.





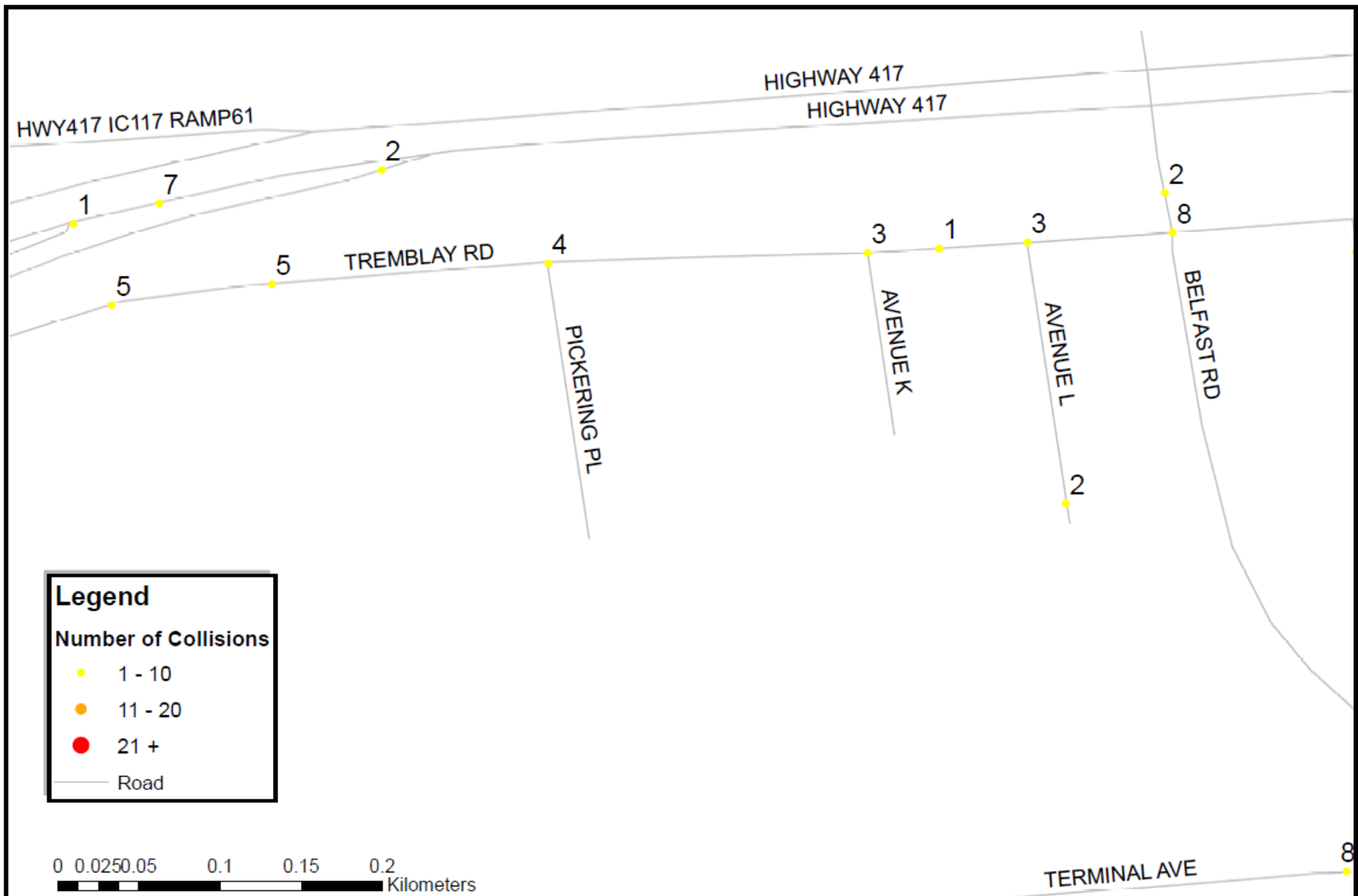
Existing Road Safety Conditions

The most recent collision history for the past five-years was obtained from the City (i.e. available collision data for the years 2014 – 2018, inclusive). The collision data includes all collisions occurring at intersections and roadway segments within the study area surrounding the subject development site (i.e. Belfast/Tremblay, and Belfast Road between Coventry and Tremblay, etc.).

Based on the most recent available historical collision data, the five-year total number of recorded collisions within the study area is 31. Most collisions within the study area (a total of 25 collisions, or 81%) resulted in property damage only, and the remaining collisions resulted in personal injuries (a total of 6 collisions, or 19%). The most frequent types of collisions, as cited by police, were angle (35%), turning movement (23%) and rear-end (19%) type collisions. The following **Figure 9** is a heat map that depicts the locations and total number of collisions within the study area.

It is also noteworthy that within the five-years of recorded collision data, there were no fatalities or collision involving pedestrians.

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



Planned Conditions

Study Area Transportation Network Changes

Transit Projects

With the recent completion of Ottawa's new Confederation LRT line, there are no proposed or ongoing transit related projects identified in the City's Transportation Master Plan (TMP), within the vicinity of the site.

Road Projects

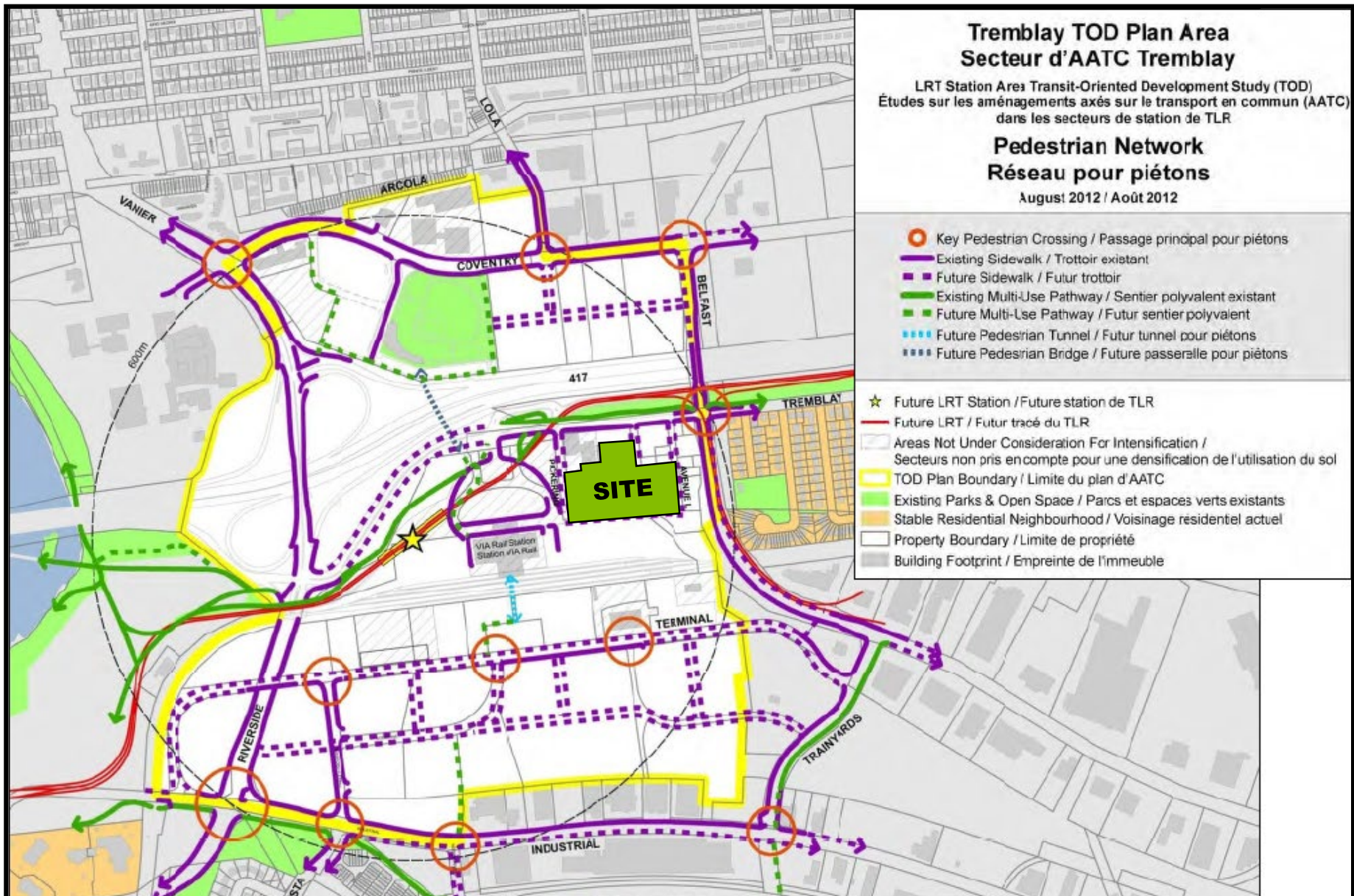
Referencing the City of Ottawa's Construction and Infrastructure Projects website, construction is anticipated to impact the following roadways within the study area. These construction projects may relate to road resurfacing, watermains, sewers, multi-use pathways, and bike facilities, which are all opportunities to change roadway characteristics/functionality:

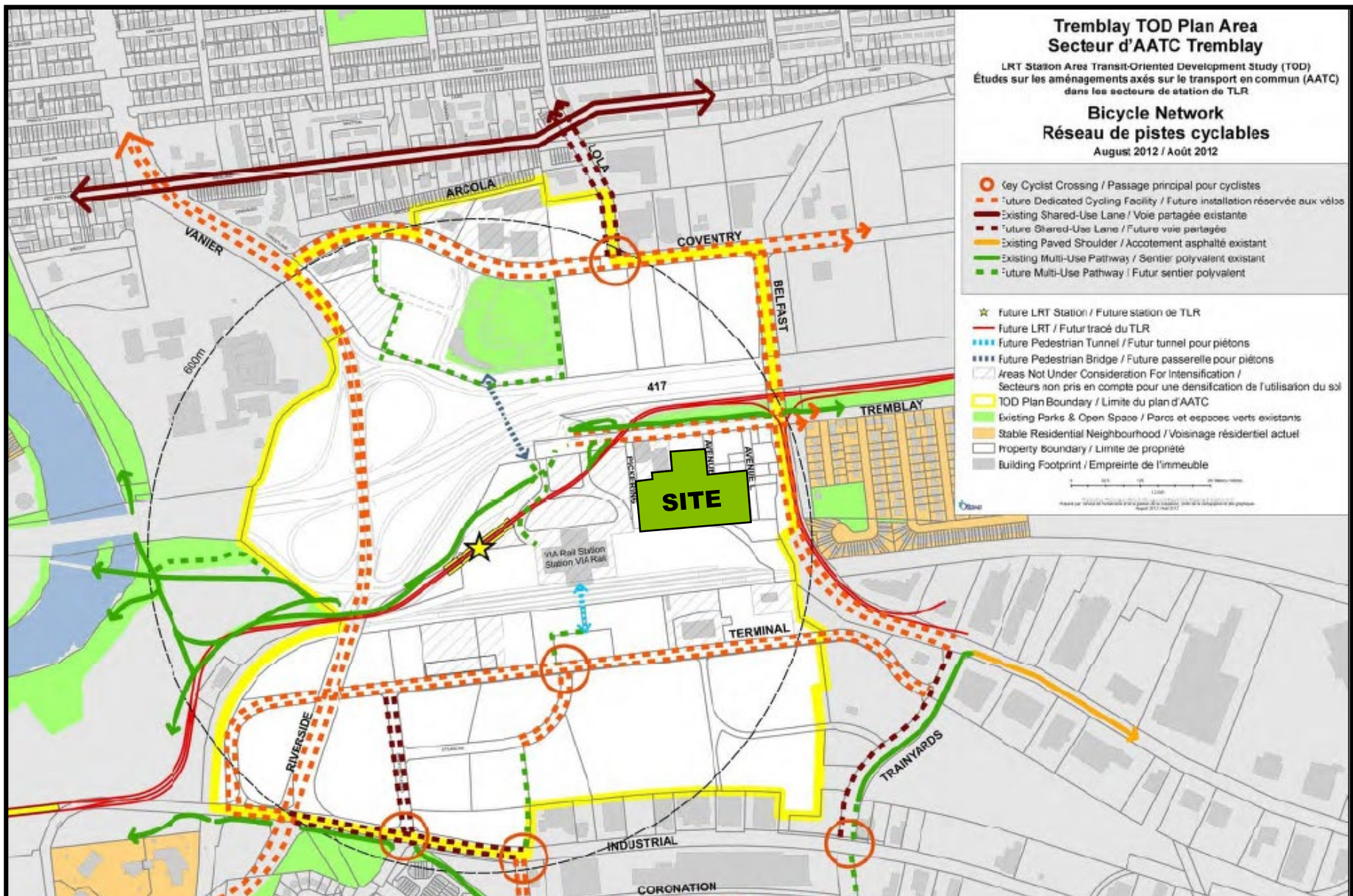
- + This year (2020)
 - Belfast Road, from Coventry to Trainyard
 - Trainyards Drive, from Belfast to Industrial
 - Avenue N
 - Avenue O
 - Avenue P
 - Avenue Q
 - Avenue R
 - Avenue S
 - Avenue T
 - Avenue U

The Belfast Road project, from Coventry Road to Trainyards Drive, is to improve the multi-use pathway (MUP) on the west side of Belfast Road. It includes adding a section of MUP from Coventry Road to the Highway 417 bridge, improving the MUP from the VIA Rail bridge to Trainyards Drive, and improvements to the Belfast Road and Trainyards Drive intersection (adding a bidirectional cross ride to the south leg of the intersection).

The projects on Avenues N to U are combined road, sewer, and water projects that will include the addition of sidewalks on at least one side of all these local roads.

With respect to the City's 2014 Transit-Oriented Development (TOD) Plans, the study area is planned to receive a number of dedicated pedestrian and cycling facilities, including a new pedestrian tunnel linking the VIA Rail Station to Terminal Avenue. The following **Figure 10** and **Figure 11** are excerpts from the City's 2014 Transit-Oriented Development (TOD) Plans, depicting planned pedestrian and cycling network improvements, respectively.





Other Area Development

Planned developments within the vicinity of the subject site have been identified using the City's Development Application Search Tool. The following **Table 3** below summarizes registered developments within the vicinity of the subject development lands.

Table 3: Area Development

Location	Description	Size	Type
530 Tremblay	Two Mid-rise apartment complex	122 unit apartment	Apartments
Adjacent to 530 Tremblay	Mixed used development proposed by Canada Lands Company, currently no TIA available	8,000 employee office 500 units apartment	Mixed-used development

It should be noted that the projected impact of the developments summarized in **Table 3** have been included in the subsequent analysis.

2.2 Study Area and Time Periods

Study Area

As previously mentioned, City staff confirmed the following study area intersections for the purpose of this assessment:

- + Tremblay/Via Rail
- + Tremblay/Pickering
- + Tremblay/Avenue J
- + Tremblay/Avenue K
- + Tremblay/Avenue L
- + Tremblay/Belfast

Time Periods

Given the surrounding road network (e.g. Tremblay Road, Belfast Road) typically experience the heaviest traffic volumes during the weekday morning and afternoon peak hours, this assessment considered weekday morning and afternoon peak hours for analysis purposes only.

Horizon Years

For the purpose of this assessment, the following development timelines were assumed, which are consistent with the City's TIA Guidelines:

- + **2025**: Phase 1 build-out
- + **2030**: Phase 2 build-out
- + **2035**: 5-years beyond full build-out

2.3 Exemptions Review

Given the size and nature of the proposed development lands, the following analysis summarized in **Table 4** (identified in the 2017 Transportation Impact Assessment Guidelines) can be exempt.

Table 4: Module Exemption Review

Module	Element	Exemption Criteria	Exemption Status
Design Review			
4.1 Development Design	4.1.2 Circulation and Access	Required for Site Plans	Not Exempt
	4.1.3 New Street Network	Required for Plans of Subdivision	Not Exempt
4.2 Parking	4.2.1 Parking Supply	Required for Site Plans	Not Exempt
	4.2.2 Spillover Parking	Required for Site Plans where parking supply will be 15% below unconstrained demand	Exempt
Network Impact			
4.5 Transportation Demand Management	All Elements	Not required for non-residential Site Plans expected to have fewer than 60 employees and/or students on location at any given time	Not Exempt
4.6 Neighbourhood Traffic Management	All Elements	Required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Not Exempt
4.8 Network Concept	All Elements	Required when development is projected to generate more than 200 person-trips during the peak hour, in excess of the equivalent volume permitted by the established zoning	Not Exempt

3. Step 3 – Forecasting

3.1 Development-Generated Travel Demand

Trip Generation

As previously described, the subject site is currently occupied by industrial type land uses, which is currently envisioned to be replaced by a 9-storey hotel (approx. 119 units), a 12-storey senior residence (approx. 164 units) and four 20-30 storey residential towers with ground floor retail (approx. 1,060 residential units or approximately 1M ft² GFA). The proposed development will be built in two phases, with an anticipated buildout year in 2025 and 2030, respectively. As previously noted, market demand will ultimately dictate the rate and type of development. If a development application is submitted for the construction of different land uses identified herein, a formal TIA or Addendum will be prepared for each subsequent application.

For the purpose of this assessment, projected site-generated traffic was estimated using appropriate trip generation rates from the 2017 10th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. Based on the location and type of the development envisioned, the following **Table 5** summarizes appropriate ITE trip generation rates for estimating projected site-generated traffic. It should be noted that the first listed equation is an average vehicle trip generation rate and the second equation is a “line of best fit” equation that more accurately represents the trend of vehicle trip generation based on land use size. Typical industry practice is the use the “line of best fit” equation for site-generated traffic projections, if available.

It should also be noted that based on correspondence with City staff, residential trip generation rates and directional splits used to estimate projected site-generated traffic were obtained from the 2009 TRANS Trip Generation Residential Trip Rates study, which are also summarized in the following **Table 5**.

Table 5: ITE Trip Generation Rates

Land Use	ITE Land Use Code	AM Peak Hour	PM Peak Hour
Hotel	ITE 310 General Urban/Suburban	$T = 0.47 (X)$; or $T = 0.5 (X) - 5.34$	$T = 0.60 (X)$; or $T = 0.75 (X) - 26.02$
Assisted Living	ITE 254 General Urban/Suburban	$T = 0.19 (X)$;	$T = 0.26 (X)$;
Apartment (High-Rise)	TRANS Table 6.3 & 3.13 Person Trip Rates	$T = 0.65 (X)$;	$T = 0.70 (X)$;
Ground Floor Retail	ITE 814 General Urban/Suburban	$T = 3.18 (X)$;	$T = 6.84 (X)$;
Notes: T = Average Vehicle Trip Ends X = 1,000 ft ² of Gross Floor Area			

With respect to ITE trip generation rates, the data used to develop these rates only include vehicle trips (i.e. walking, cycling or transit trips are not captured). To properly consider the multi-modal trips generated by the proposed development, projected site-generated traffic (estimated using ITE trip generation rates) is converted to projected site-generated person trips, which can then be subdivided into different modes based on area travel patterns and available facilities/network connections (e.g. the availability of transit, walking and cycling facilities).

To convert projected ITE vehicle trips to person trips, an auto occupancy factor and non-auto trip factor is applied to the ITE trip generation rates. With respect to the City's TIA Guidelines, and based on available American Census data, the typical modal share of non-auto person trips is approximately 10% and the typical auto occupancy is 1.15. Therefore, when combined, a factor of 1.28 is used to convert vehicle trips to person trips.

Based on the foregoing, the projected weekday morning and afternoon peak hour person trip generation for the proposed development is summarized in **Table 6**.

Table 6: Modified Person Site Trip Generation (Phase 1 & Phase 2)

Land Use	Units/Area (ft²)	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Phase 1 (2025 - 2030)							
Hotel	119 units	40	29	69	41	40	81
Assisted Living	164 units	25	15	40	20	35	55
Multifamily Housing (High-Rise)	211 units	33	105	138	90	58	148
Ground Floor Retail	2,250 ft²	5	4	9	10	10	20
Phase 1 Total		103	153	256	161	143	304
Phase 2 (2030+)							
Multifamily Housing (High-Rise)	849 units	132	419	551	362	232	594
Ground Floor Retail	6,750 ft²	16	12	28	31	28	59
Phase 2 Total		148	431	579	393	260	653
Total 'New' Person Trips		251	584	835	554	403	957

As summarized in **Table 6**, the proposed development is projected to generate an approximate two-way total of 835 and 957 person trips/h during weekday morning and afternoon peak hours, respectively. Directional distribution (i.e. inbound vs outbound trips) was obtained from the ITE trip generation manual and the TRANS Trip Generation Residential Trip Rates study.

Determining the number of person trips arriving/departing by travel mode, total projected person trips are subdivided by mode share values, derived from the 2011 TRANS National Capital Region (NCR) Origin-Destination (OD) survey data, the nature/context of the proposed development and our local area knowledge. Key factors that are taken into consideration, beyond NCR OD survey data, include; proximity and quality of transit, pedestrian and cycling facilities, purpose of trips, etc.

It should be noted that a percentage of projected site-generated trips can be attributed to 'pass-by' traffic (i.e. a quick diversion to/from the development on someone's normal daily commute). This does not impact overall network capacity, as 'pass-by' trips is traffic already using the adjacent transportation network; however, 'pass-by' trips do impact the performance of turning movements at intersections, typically where development site access/egress is provided.

Travel Mode Shares

Following discussions with City Staff regarding the subject site's proximity/connectivity to the highest order of transit (i.e. its proximity to LRT service) and with respect to the City's previously mentioned 2014 TOD Plans, the following summarizes the projected modal split of site-generated traffic for the subject development:

15% Auto Driver;
5% Auto Passenger;
65% Transit; and
+ 15% Walk and Cycling.
100%

Based on the foregoing, the vehicle trips generated by the proposed development was calculated, and summarized in **Table 7** below.

Table 7: Projected Site Trip Generation (Phase 1 & Phase 2)

Travel Mode	AM Peak (veh/h)			PM Peak (veh/h)		
	In	Out	Total	In	Out	Total
Phase 1 (2025 - 2030)						
Hotel	6	5	11	7	6	13
Assisted Living	4	3	7	3	6	9
Multifamily Housing (High-Rise)	6	17	23	15	10	25
Ground Floor Retail	1	1	2	2	2	4
Retail Pass-by (34%)	0	0	0	-1	-1	-2
<i>Phase 1 Total</i>	<i>17</i>	<i>26</i>	<i>43</i>	<i>26</i>	<i>23</i>	<i>49</i>
Phase 2 (2030+)						
Multifamily Housing (High-Rise)	22	64	86	57	37	94
Ground Floor Retail	3	2	5	5	4	9
Retail Pass-by (34%)	-1	-1	-2	-2	-2	-4
<i>Phase 2 Total</i>	<i>24</i>	<i>65</i>	<i>89</i>	<i>60</i>	<i>39</i>	<i>99</i>
Total 'New' Auto Trips	41	91	132	86	62	148

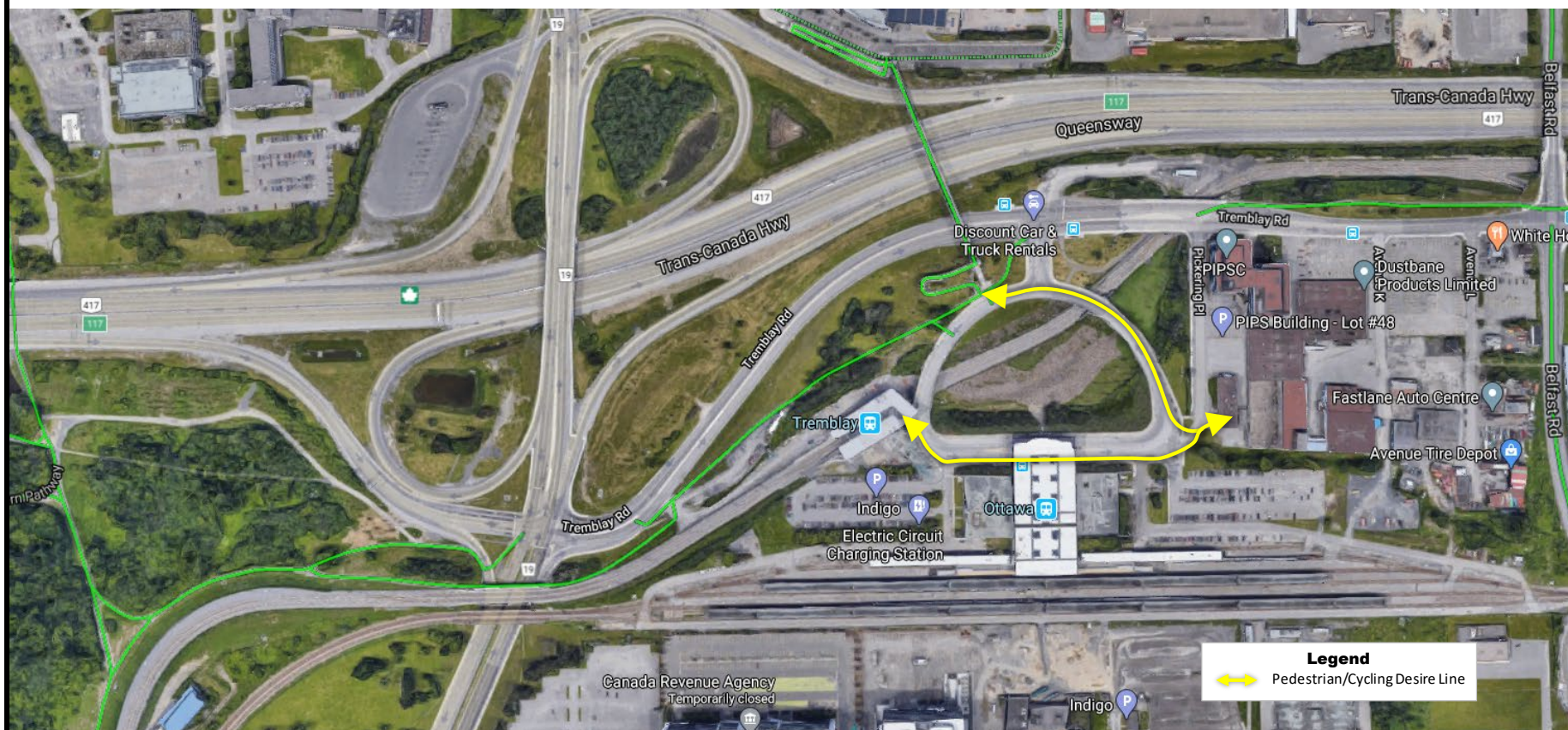
As shown in **Table 7**, the proposed development is projected to generate approximate two-way vehicle volumes of 132 veh/h and 148 veh/h during weekday morning and afternoon peak hours, respectively.

With regard to active modes, the proposed development is projected to generate approximate two-way person trips in the order of 122 trips/h and 141 trips/h, during weekday morning and afternoon peak hours, respectively.

With regard to transit trips during weekday morning and afternoon peak hours, the proposed development is projected to generate approximately two-way person trips in the order of 539 trips/h and 620 trips/h. It should be noted that given most transit trips begin or end as an active mode, it can be expected that approximately **661 trips/h** and **761 trips/h** will be made to/from/within the subject development **as an active mode** during weekday morning and afternoon peak hours, respectively.

Given the number of projected trips to/from the site as an active mode, it is anticipated that there will be a major desire line between the Tremblay LRT station, the multi-use pathway network adjacent to the Tremblay LRT station, and the subject development. As such, special consideration should be given to a new connection between the subject site and the VIA Rail station. Internal roadways should also be designed to encourage slow vehicular speeds and pedestrian/cycling crossings should be clearly marked to enhance driver awareness of vulnerable road users. It will be critical to follow AODA guidance and consult with a variety of users (e.g. those with vision challenges and other vulnerable road users - such as children, elderly, etc.).

The following **Figure 12** depicts anticipated major desire lines for active modes to/from the subject development site.



Trip Distribution

The projected distribution of site-generated traffic was derived based on existing travel patterns, the site's connections to/from the surrounding road network, and our local area knowledge. (e.g. the location and proximity of other area shopping, communities, recreational opportunities, etc.). For analysis purposes, the following approximate distribution of projected site-generated traffic was assumed:

70%	to/from the west via HWY 417 (via Tremblay);
10%	to/from the east via Tremblay Road;
10%	to/from the north via Belfast Road; and
+ 10%	to/from the south via Belfast Road.
<u>100%</u>	

Trip Assignment

Based on the above assumed distribution, projected 'new' site-generated traffic was assigned to the study area network and is depicted in the following **Figure 12** and **Figure 14** for phase 1 and phase 2, respectively. Similarly, projected 'pass-by' site-generated traffic, which represents existing traffic temporarily diverted to/from the subject site, is depicted in the following **Figure 13** and **Figure 15** for phase 1 and phase 2, respectively.

It should be noted that Avenue J is a private driveway owned by PIPSC (Professional Institute of the Public Service Canada) and there are currently no plans for this to be a connection to/from the subject development.

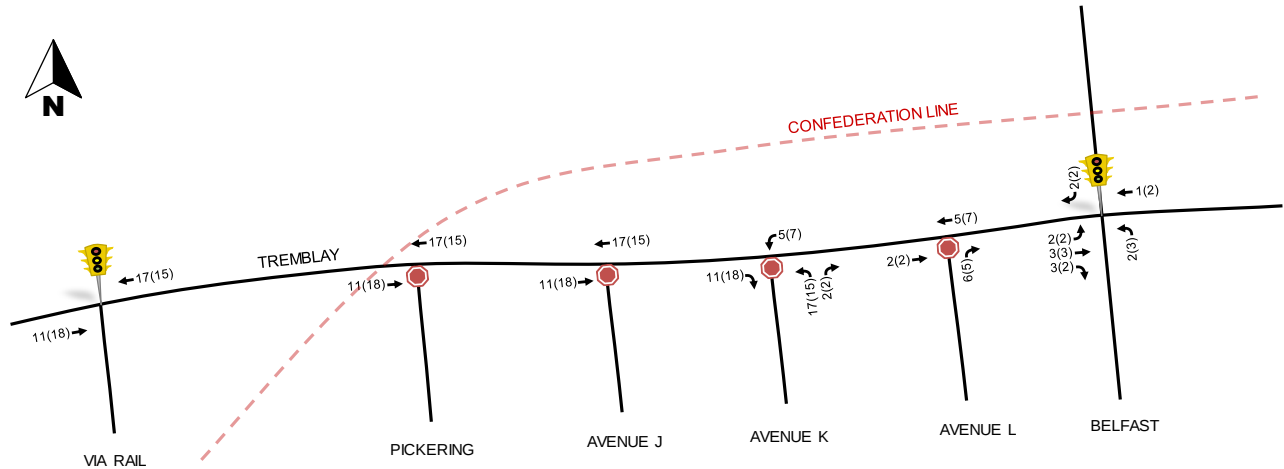


Figure 13: 'New' Projected Site-Generated Traffic - Phase 1

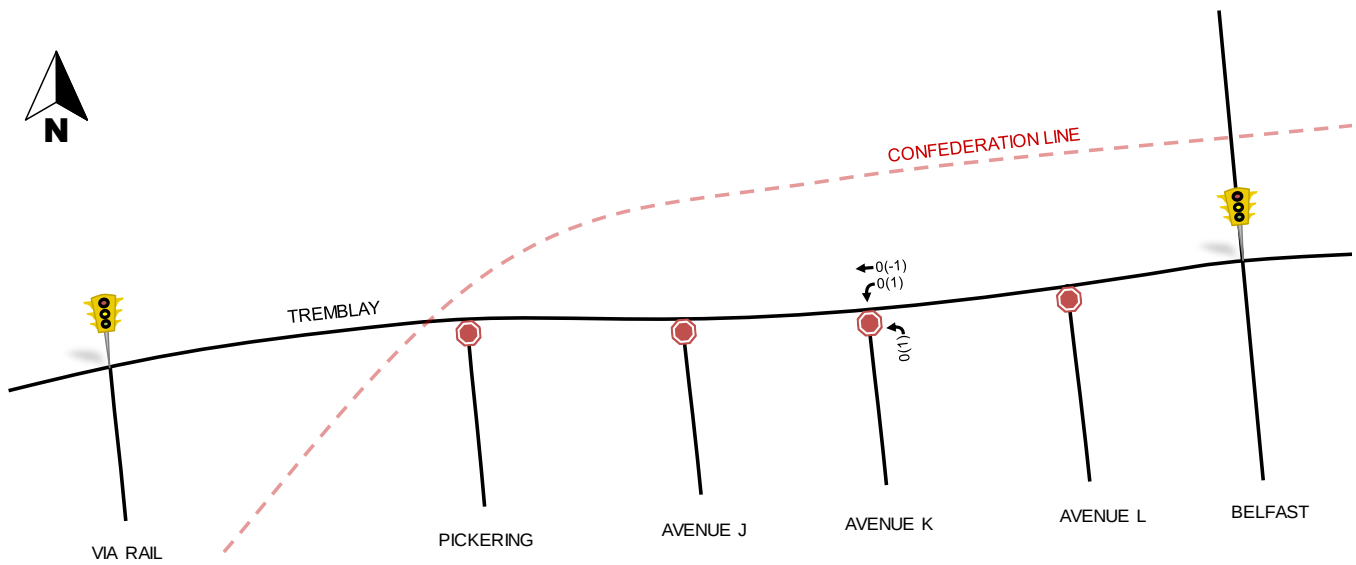


Figure 14: 'Pass-by' Projected Site-Generated Traffic - Phase 1

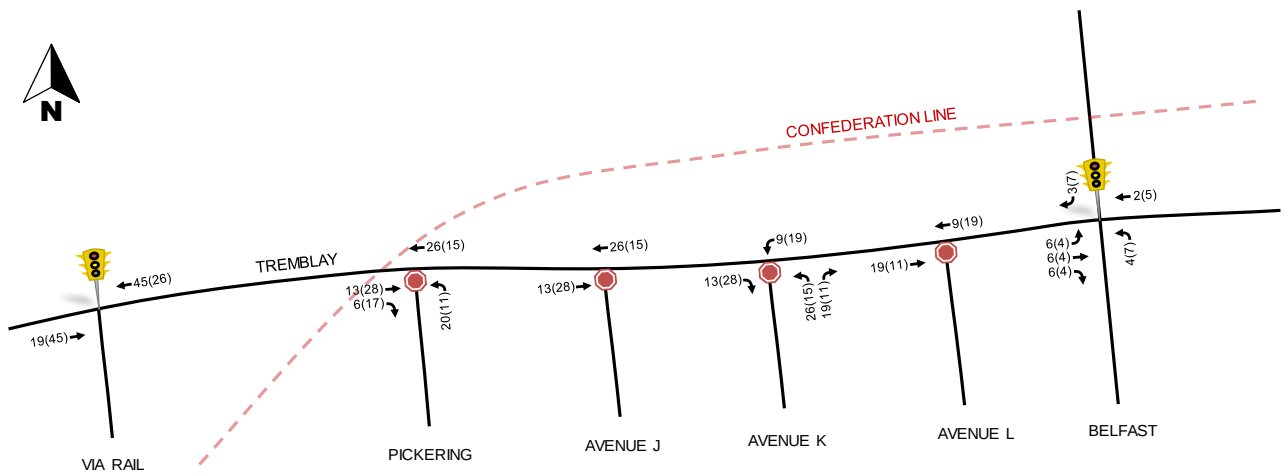


Figure 15: 'New' Projected Site-Generated Traffic - Phase 2

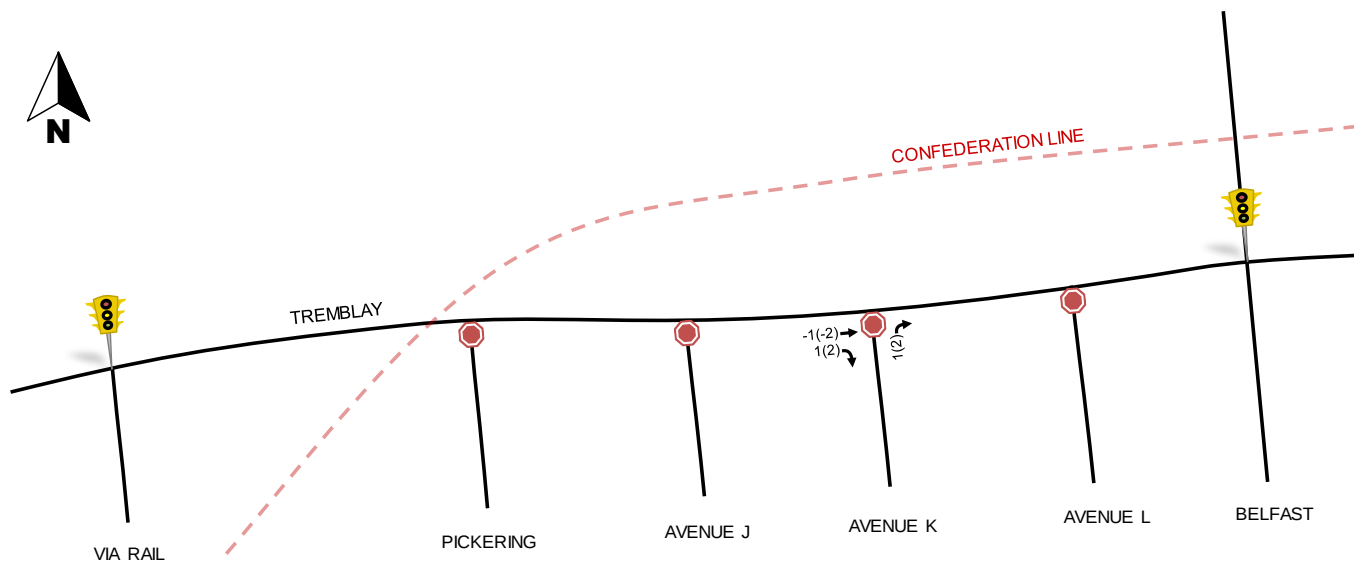


Figure 16: 'Pass-by' Projected Site-Generated Traffic - Phase 2

3.2 Background Network Travel Demands

Transportation Network Plans

At this time, and according to Ottawa's Transportation Master Plan (TMP), there will be two road reconstruction projects within the vicinity of the subject site, which include:

- + **Tremblay Road** – widened from two to four general purpose travel lanes between Pickering place and St. Laurent Boulevard; this project is included as a part of the City's Phase 3 (2026-2031) affordable road projects.
- + **Belfast Road** – widened from two to four general purpose travel lanes between Coventry Road and Tremblay Road; this project is included as a part of the City's ultimate network concept, which has no timeline for construction prior to the 2031 planning horizon year.

Background Growth

Reviewing available historic traffic count data, the Tremblay/Belfast intersection has experienced 0% growth between 2016 and 2020. As such, and given other area development will be explicitly accounted for in the subsequent analysis, an annual percent growth rate was not assumed. It should also be noted that Tremblay Road and Belfast Road are not considered typical commuter or cut-through routes, given their connectivity to the surrounding arterial network (i.e. new development beyond the study area will have little to no impact on the study area network).

Other Area Developments

Using the City's online Development Application Tool, there are proposed developments at 530 Tremblay Road and 'Adjacent to 530 Tremblay' identified as having potential impacts on the study area network. As such, the projected site-generated traffic for the 530 Tremblay Road development and the development 'Adjacent to 530 Tremblay' will be included in the subsequent analysis. These developments are proposed to be fully developed between the year 2021 and 2026, and for the purpose of this assessment, both developments have been assumed to be fully built-out by the horizon year 2025. Excerpts from both the 530 Tremblay and 'Adjacent to 530 Tremblay' TIA reports, depicting projected site-generated traffic, are included as **Appendix D**.

Given a 0% growth rate for general background traffic and given all area development is assumed to be fully built-out by the horizon year 2025, projected background traffic volumes for the horizon years 2030 and 2035 will be the same as the background traffic volumes for the 2025 horizon year. Therefore, the following **Figure 17** depicts projected background traffic volumes for the 2025 horizon year and beyond.

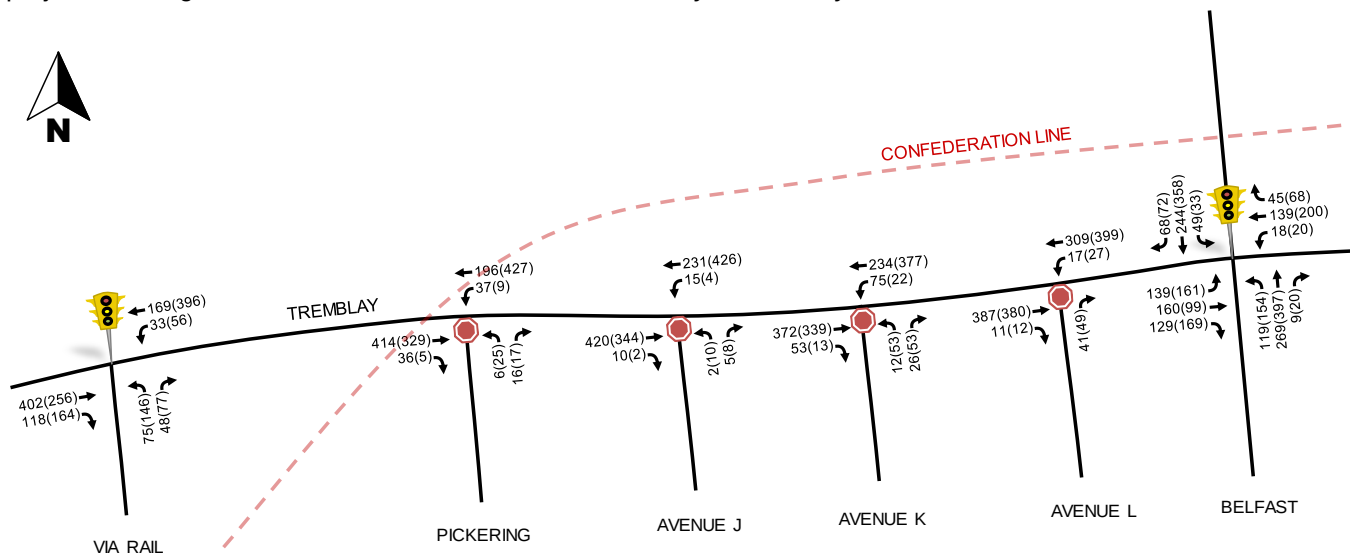


Figure 17: Background Traffic Volumes (2025, 2030, 2035)

3.3 Demand Rationalization

The following section summarizes the vehicular intersection capacity analysis of existing, future background and future total volume scenarios.

Using the intersection capacity analysis software Synchro (v9), study area intersections were assessed in terms of vehicle delay, 95th percentile queues, a volume-to-capacity ratio (v/c) and a corresponding Level of Service (LOS). It should be noted that the overall performance of a signalized intersection is calculated as a weighted v/c ratio and assigned a corresponding LOS, with critical movements assigned a LOS based on their respective v/c ratio. The overall performance of an unsignalized intersection is a LOS output from Synchro, which is based on an Intersection Capacity Utilization (ICU) method, and critical movements are assigned a LOS based on delay.

Existing and Background Conditions

The following **Table 8**, **Table 9** summarize existing and projected background conditions at study area intersections, in the absence of the proposed development. The objective of this analysis is to determine if network improvements are, or will be required to support background traffic. Detailed Synchro output data for existing and background conditions is provided as **Appendix E**.

Table 8: Study Area Intersection Operations - Existing Conditions

Movement	Lanes	AM Peak Hour				PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Via Rail/Tremblay Rd - Semi Act-Uncoord Signal									
EBT	2 T	0.11	3.7	A	10	0.11	5.9	A	11
EBR	1 R	0.11	1.2	A	5	0.18	1.9	A	7
WBL	1 L	0.05	4.1	A	4	0.09	6.5	A	8
WBT	2 T	0.05	3.7	A	5	0.14	5.9	A	13
NBL/R	1> L	0.35	17.5	A	21	0.50	16.4	A	31
Overall		0.15	5.8	A	-	0.33	7.8	A	-
Pickering Pl/Tremblay Rd - Unsignalized									
EBT	1 T	0.18	0.0	A	0	0.18	0.0	A	0
EBR	1 R	0.02	0.0	A	0	0.00	0.0	A	0
WBL	1 L	0.03	8.1	A	1	0.01	7.9	A	0
WBT	2 T	0.05	0.0	A	0	0.09	0.0	A	0
NBL/R	1> L	0.04	10.7	A	1	0.07	11.5	A	2
Overall		0.32	1.0	A	-	0.26	0.9	A	-
Avenue K/Tremblay Rd - Unsignalized									
EBT/R	1 T/R	0.18	0.0	A	0	0.19	0.0	A	0
WBT/L	1 T/L	0.06	2.7	A	2	0.02	0.8	A	1
NBL/R	1> L	0.07	11.5	A	2	0.20	13.2	A	6
Overall		0.45	1.9	A	-	0.46	2.4	A	-
Avenue L/Tremblay Rd - Unsignalized									
EBT/R	1 T/R	0.17	0.0	A	0	0.22	0.0	A	0
WBT/L	1 T/L	0.01	0.6	A	0	0.02	1.0	A	1
NBR	1 R	0.06	10.0	A	1	0.08	10.7	A	2
Overall		0.33	1.0	A	-	0.42	1.2	A	-
Belfast Rd/Tremblay Rd - Semi Act-Uncoord Signal									
EBL	1 L	0.28	18.1	A	33	0.38	26.6	A	48
EBT/R	1 T/R	0.22	5.8	A	16	0.35	9.9	A	30
WBL	1 L	0.04	15.7	A	6	0.06	23.0	A	9
WBT/R	1 T/R	0.18	13.9	A	26	0.16	17.3	A	23
NBL	1 L	0.51	39.3	A	38	0.60	45.4	A	53
NBT/R	1 T/R	0.38	13.7	A	41	0.52	18.9	A	92
SBL	1 L	0.06	19.4	A	7	0.14	40.8	A	13
SBT/R	1 T/R	0.66	28.9	B	67	0.78	34.9	C	105
Overall		0.47	19.9	A	-	0.60	25.8	A	-
Avenue J/Tremblay Rd - Unsignalized									
EBT	1 T/R	0.19	0.0	A	0	0.19	0.0	A	0
WBT	1 T/L	0.01	0.7	A	0	0.00	0.1	A	0
NBL/R	1> L	0.01	10.7	A	0	0.04	12.0	A	1
Overall		0.34	0.4	A	-	0.29	0.4	A	-

As shown in **Table 8**, study area intersections are currently operating with an overall LOS 'A' during weekday morning and afternoon peak hours. With the exception of the southbound through/right-turn movement at the Tremblay/Belfast intersection (operating with a LOS 'B' during the AM peak and 'C' during the PM peak), critical movements at study are intersections are currently operating with a LOS 'A'.

Estimated 95th percentile queues range between 1 to 15 vehicles (i.e. 7 m to 105 m in length) and are only considered problematic when they block Avenue L and the driveway connections to the properties municipally known as 294 and 300 Tremblay Road.

Table 9: Study Area Intersection Operations - 2025 and Beyond Background Conditions

Movement	Lanes	AM Peak Hour				PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Via Rail/Tremblay Rd - Semi Act-Uncoord Signal									
EBT	2 T	0.17	3.9	A	15	0.14	5.9	A	12
EBR	1 R	0.11	1.2	A	5	0.18	1.9	A	7
WBL	1 L	0.05	4.2	A	4	0.10	6.6	A	8
WBT	2 T	0.07	3.7	A	7	0.21	6.3	A	19
NBL/R	1> L	0.35	17.5	A	21	0.50	16.4	A	31
Overall		0.19	5.5	A	-	0.24	7.6	A	-
Pickering PI/Tremblay Rd - Unsignalized									
EBT	1 T	0.26	0.0	A	0	0.20	0.0	A	0
EBR	1 R	0.02	0.0	A	0	0.00	0.0	A	0
WBL	1 L	0.04	8.5	A	1	0.01	8.0	A	0
WBT	2 T	0.06	0.0	A	0	0.13	0.0	A	0
NBL/R	1> L	0.04	12.1	A	1	0.09	12.6	A	2
Overall		0.40	0.8	A	-	0.28	0.7	A	-
Avenue K/Tremblay Rd - Unsignalized									
EBT/R	1 T/R	0.26	0.0	A	0	0.22	0.0	A	0
WBT/L	1 T/L	0.07	2.6	A	2	0.02	0.6	A	1
NBL/R	1> L	0.08	13.2	A	2	0.25	15.4	A	8
Overall		0.55	1.7	A	-	0.53	2.2	A	-
Avenue L/Tremblay Rd - Unsignalized									
EBT/R	1 T/R	0.25	0.0	A	0	0.24	0.0	A	0
WBT/L	1 T/L	0.02	0.6	A	0	0.02	0.8	A	1
NBR	1 R	0.07	11.0	A	2	0.08	11.1	A	2
Overall		0.35	0.8	A	-	0.49	1.0	A	-
Belfast Rd/Tremblay Rd - Semi Act-Uncoord Signal									
EBL	1 L	0.30	18.7	A	33	0.57	35.2	A	60
EBT/R	1 T/R	0.40	15.5	A	54	0.44	18.7	A	57
WBL	1 L	0.05	15.9	A	7	0.07	23.2	A	9
WBT/R	1 T/R	0.25	15.1	A	36	0.45	24.8	A	71
NBL	1 L	0.51	39.3	A	38	0.60	45.4	A	53
NBT/R	1 T/R	0.38	13.7	A	41	0.55	21.7	A	94
SBL	1 L	0.18	21.5	A	14	0.19	40.8	A	16
SBT/R	1 T/R	0.66	28.9	B	67	0.78	34.9	C	105
Overall		0.52	20.7	A	-	0.63	28.7	B	-
Avenue J/Tremblay Rd - Unsignalized									
EBT	1 T/R	0.27	0.0	A	0	0.21	0.0	A	0
WBT	1 T/L	0.01	0.6	A	0	0.00	0.1	A	0
NBL/R	1> L	0.01	11.9	A	0	0.04	13.3	A	1
Overall		0.36	0.3	A	-	0.37	0.4	A	-

Assuming no signal timing plan or network modifications, **Table 9** summarizes how an increase in background traffic volumes is projected to result in similar operations, when compared to existing conditions.

Adjustments to Background Network Demands

Given study area intersections are projected to continue operating with notable spare capacity with an increase in background traffic volumes, adjusting background network demands is difficult to justify. However, with the recent opening of OC Transpo's Confederation LRT line, it is anticipated that there will be an increased number of transit users, which has the potential to alleviate the vehicular demand on study area intersections.

Total Projected Conditions

The following section summarizes the intersection capacity analysis of total projected volume scenarios for the 2025 and 2030 horizon years. It should be noted that since background traffic growth has been assumed to be 0%, total projected volumes for the 2035 horizon year is the same as the 2030 horizon year.

The following total projected volumes depicted in **Figure 18** and **Figure 19** were derived by superimposing site-generated traffic volumes onto projected background traffic volumes (e.g. summing volumes together from **Figure 12**, **Figure 13** and **Figure 17**, resulting in **Figure 18**).

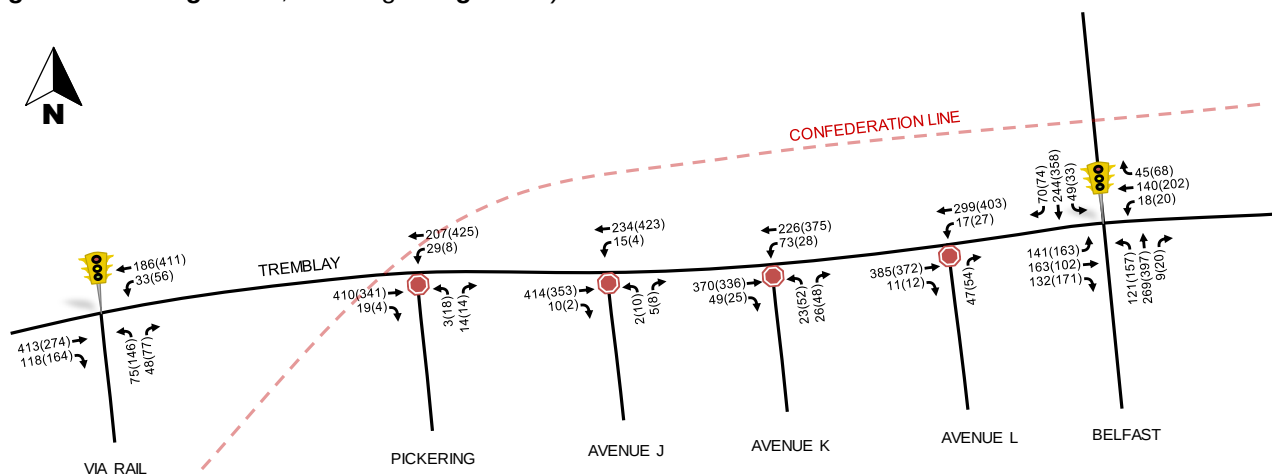


Figure 18: Total Project Traffic Volumes 2025

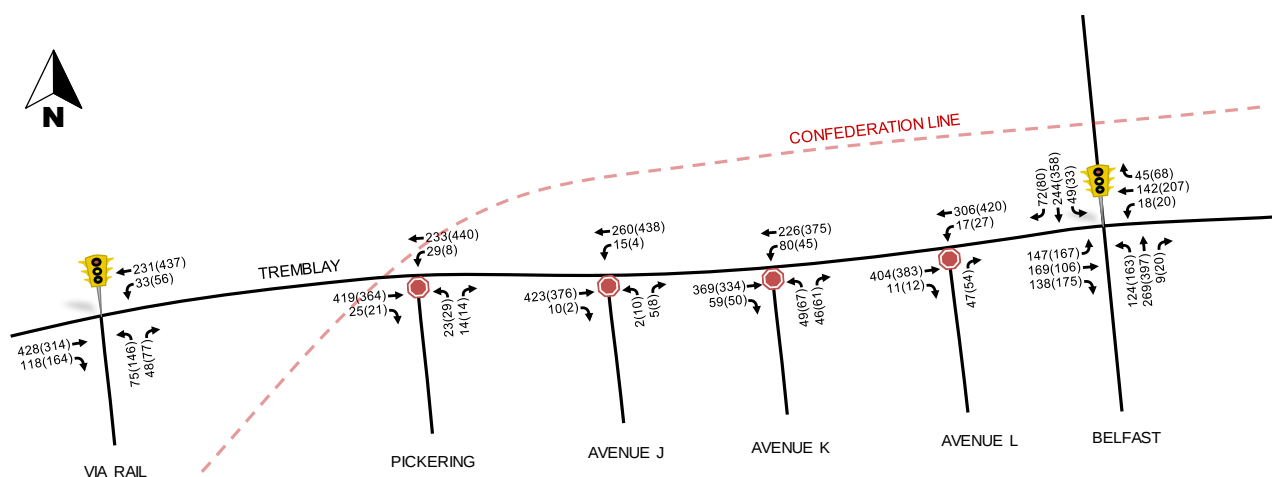


Figure 19: Total Projected Traffic Volumes 2030, 2035

Similar to existing baseline and background conditions, total projected conditions were assessed using the intersection capacity analysis software Synchro (v9), and using the same metrics such as v/c and delay. The following **Table 10** and **Table 11** summarize the projected performance of study area intersections for the 2025 and 2030/2035 horizon years, respectively. The objective of this analysis is to determine if network improvements will be required to support background traffic growth and the projected traffic generated by the subject development. Detailed Synchro output data for total projected conditions is provided as **Appendix F**.

Table 10: Study Area Intersection Operations - 2025 Total Projected Conditions

Movement	Lanes	AM Peak Hour				PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Via Rail/Tremblay Rd - Semi Act-Uncoord Signal									
EBT	2 T	0.17	3.9	A	15	0.15	6.0	A	13
EBR	1 R	0.11	1.2	A	5	0.18	1.9	A	7
WBL	1 L	0.05	4.2	A	4	0.10	6.6	A	8
WBT	2 T	0.08	3.7	A	7	0.22	6.3	A	19
NBL/R	1> L	0.35	17.5	A	21	0.50	16.4	A	31
Overall		0.19	5.4	A	-	0.25	7.6	A	-
Pickering PI/Tremblay Rd - Unsignalized									
EBT	1 T	0.25	0.0	A	0	0.21	0.0	A	0
EBR	1 R	0.01	0.0	A	0	0.00	0.0	A	0
WBL	1 L	0.03	8.4	A	1	0.01	8.0	A	0
WBT	2 T	0.06	0.0	A	0	0.13	0.0	A	0
NBL/R	1> L	0.03	11.6	A	1	0.07	12.4	A	2
Overall		0.35	0.7	A	-	0.29	0.6	A	-
Avenue K/Tremblay Rd - Unsignalized									
EBT/R	1 T/R	0.26	0.0	A	0	0.22	0.0	A	0
WBT/L	1 T/L	0.07	2.6	A	2	0.02	0.8	A	1
NBL/R	1> L	0.12	14.2	A	3	0.24	15.7	A	7
Overall		0.54	1.9	A	-	0.58	2.2	A	-
Avenue L/Tremblay Rd - Unsignalized									
EBT/R	1 T/R	0.25	0.0	A	0	0.24	0.0	A	0
WBT/L	1 T/L	0.02	0.6	A	0	0.02	0.8	A	1
NBR	1 R	0.08	11.1	A	2	0.09	11.1	A	2
Overall		0.35	0.9	A	-	0.49	1.1	A	-
Belfast Rd/Tremblay Rd - Semi Act-Uncoord Signal									
EBL	1 L	0.31	18.8	A	34	0.59	36.2	A	62
EBT/R	1 T/R	0.41	15.8	A	56	0.45	19.0	A	59
WBL	1 L	0.05	16.1	A	7	0.07	23.3	A	9
WBT/R	1 T/R	0.25	15.2	A	36	0.46	25.0	A	71
NBL	1 L	0.51	39.6	A	39	0.61	45.8	B	54
NBT/R	1 T/R	0.37	13.6	A	41	0.55	21.6	A	94
SBL	1 L	0.18	21.4	A	14	0.19	40.8	A	16
SBT/R	1 T/R	0.66	28.6	B	67	0.78	35.0	C	106
Overall		0.52	20.7	A	-	0.64	28.9	B	-
Avenue J/Tremblay Rd - Unsignalized									
EBT	1 T/R	0.26	0.0	A	0	0.22	0.0	A	0
WBT	1 T/L	0.01	0.6	A	0	0.00	0.1	A	0
NBL/R	1> L	0.01	11.8	A	0	0.04	13.6	A	1
Overall		0.36	0.3	A	-	0.37	0.4	A	-

As shown in **Table 10**, assuming no signal timing plan or network modifications for the 2025 horizon year, study area intersections are projected to continue operating similar to background conditions, only with relatively minor increases in volumes and delays. Most notable projected changes in LOS, which do not warrant network modifications, include:

- + Tremblay/Belfast - northbound left movement LOS A to LOS B

Based on total projected volumes depicted in **Figure 19** and the previously described affordable network changes (i.e. widening of Tremblay Road from two to four lanes), the following **Table 11** summarizes the projected performance of study area intersections for the 2030 horizon year, and beyond. It should be noted that the widening

of Tremblay Road was assumed to result in a 4-lane cross-section; however, would not result in additional through capacity for east and westbound general-purpose traffic at the Tremblay/Belfast intersection. For analysis purposes, the following **Figure 20** depicts the assumed widening of Tremblay Road, within the vicinity of the subject development.



Figure 20: Assumed Tremblay Road Widening

As shown in the following **Table 11**, study area intersections are projected to continue operating similar to background conditions for the 2030 horizon year and beyond, only with relatively minor increases in volumes and delays.

Based on an MTO left-turn lane warrant analysis, an auxiliary westbound left-turn lane may ultimately be warranted at the Tremblay/Avenue K intersection, and Avenue L may require turning restrictions to limit movements to right-in/right-out only. Given study area intersections are projected to operate with significant spare capacity, a road widening to accommodate an auxiliary westbound left-turn at Avenue K and/or a median to limit turning movements at Avenue L should only be considered if problematic operations can be observed. It should also be noted that there are a number of cost-effective traffic calming measures that can be explored prior to a road widening, if necessary. For example:

- + Signage to prohibit select turning movements, which can be limited to peak hours only;
- + Speed display devices;
- + Pavement marking to encourage slow speeds;
- + Vertical centerline treatments (e.g. flexible stake bollards), etc.

If necessary, any of the above measures can be implemented in a relatively short amount of time and their effectiveness can easily be measured, also in a relatively short amount of time. Multiple traffic calming measures can also be used in combination with one another, and may be necessary to achieve the desired effect. MTO left-turn lane warrant analysis and signal warrant analysis were attached in **Appendix G**.

Table 11: Study Area Intersection Operations - 2030,2035 Total Projected Conditions

Movement	Lanes	AM Peak Hour				PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Via Rail/Tremblay Rd - Semi Act-Uncoord Signal									
EBT	2 T	0.18	3.9	A	16	0.17	6.1	A	15
EBR	1 R	0.11	1.2	A	5	0.18	1.9	A	7
WBL	1 L	0.05	4.2	A	4	0.10	6.6	A	8
WBT	2 T	0.10	3.7	A	9	0.23	6.4	A	21
NBL/R	1> L	0.35	17.5	A	21	0.50	16.4	A	31
Overall		0.20	5.3	A	-	0.25	7.6	A	-
Pickering PI/Tremblay Rd - Unsignalized									
EBT	1 T	0.26	0.0	A	0	0.23	0.0	A	0
EBR	1 R	0.02	0.0	A	0	0.01	0.0	A	0
WBL	1 L	0.03	8.4	A	1	0.01	8.2	A	0
WBT	2 T	0.07	0.0	A	0	0.14	0.0	A	0
NBL/R	1> L	0.07	13.1	A	2	0.08	13.0	A	2
Overall		0.35	1.0	A	-	0.30	0.7	A	-
Avenue K/Tremblay Rd - Unsignalized									
EBT/R	1 T & 1 T/R	0.15	0.0	A	0	0.14	0.0	A	0
WBT/L	1 T & 1 T/L	0.09	0.0	A	0	0.15	0.0	A	0
NBL/R	1> L	0.21	14.8	A	6	0.27	14.8	A	9
Overall		0.38	2.6	A	-	0.42	2.5	A	-
Avenue L/Tremblay Rd - Unsignalized									
EBT/R	1 T & 1 T/R	0.17	0.0	A	0	0.16	0.0	A	0
WBT/L	1 T & 1 T/L	0.13	0.0	A	0	0.17	0.0	A	0
NBR	1 R	0.06	9.9	A	2	0.07	9.9	A	2
Overall		0.26	0.8	A	-	0.31	0.9	A	-
Belfast Rd/Tremblay Rd - Semi Act-Uncoord Signal									
EBL	1 L	0.32	19.1	A	35	0.62	38.0	B	66
EBT/R	1 T/R	0.43	16.1	A	58	0.47	19.8	A	62
WBL	1 L	0.05	16.1	A	7	0.08	23.5	A	9
WBT/R	1 T/R	0.26	15.3	A	37	0.47	25.5	A	73
NBL	1 L	0.53	40.2	A	42	0.63	46.8	B	57
NBT/R	1 T/R	0.37	13.6	A	41	0.55	21.5	A	94
SBL	1 L	0.18	21.4	A	14	0.20	41.1	A	16
SBT/R	1 T/R	0.66	28.6	B	67	0.78	35.3	C	108
Overall		0.53	20.9	A	-	0.65	29.4	B	-
Avenue J/Tremblay Rd - Unsignalized									
EBT	1 T & 1 T/R	0.17	0.0	A	0	0.16	0.0	A	0
WBT	1 T & 1 T/L	0.11	0.0	A	0	0.18	0.0	A	0
NBL/R	1> L	0.01	10.9	A	0	0.04	12.2	A	1
Overall		0.29	0.3	A	-	0.26	0.3	A	-

Adjustments to Site-Generated Demand

With respect to projected site-generated traffic for the subject development lands and other area developments, adjusting modal splits away from projected auto trips further, is difficult to justify, as certain individuals will ultimately be required to drive for one reason or another (e.g. distance between origin/destination is too great, travel is a requirement for employment, physical disabilities limit travel options to personal vehicle, etc.). Additionally, adjusting the auto modal share for site-generated traffic much lower will have a negligible affect on the performance of study area network (*note: study area intersections are projected to continue operating similar to background conditions, only with minor increases in volumes and delays*).

4. Step 4 – Analysis

With respect to the City of Ottawa TIA Guidelines, this module reviews the proposed transportation network elements within the development study area to ensure that they provide effective access for all users while creating an environment that encourages walking, cycling and transit use and prioritizes safety.

4.1 Development Design

Design for Sustainable Modes

The proposed draft Concept Plan for 25 Pickering looks to revitalize an industrial area to make way for new land uses with a mixed used designation. The development site, which includes Pickering Place, Avenue K and Avenue L, currently has very limited pedestrian infrastructure and no existing cycling infrastructure. The development looks to utilize and connect existing local roadways and improve pedestrian and cycling connections.

25 Pickering is located in close proximity to the Via Rail station in Ottawa, which will soon have an underground pedestrian connection to the retail/commercial area to the south of the existing VIA rail line. Currently, the only way to walk from the site to the shops south of the Via Rail station is along Belfast Road, which is more than triple the distance of what the new underground connection would be (0.4 km versus 1.2 km). The development site is currently served by a nearby LRT station along Ottawa's new O-Train network (Tremblay Station), making the development site an ideal location for transit and regional rail commuting. Additionally, residents and visitors to/from the subject development will have nearby access to amenities in the region such as a small central park, the Ottawa River Pathway, Ottawa Trainyards, and the St. Laurent Shopping Center.

Pedestrian Facilities: Continuous sidewalks will be provided throughout the development site, connecting to the existing sidewalks along the Tremblay Road. Additionally, sidewalks and pavement markings (e.g. high-visibility pedestrian crosswalks) will be provided on Avenue K and Avenue L, providing interconnectivity between on-site the buildings and amenities. There is no planned pedestrian access to Belfast Road, other than through existing the existing connection from Tremblay Road and there are no additional sidewalks planned along Pickering Place.

Bicycle Facilities: Multi-use pathways (MUP) are currently provided along north side of Tremblay Road and along the west side of Belfast Road. Cyclists that want to enter or exit the site may use the MUP or share the road with vehicles on Tremblay Road. On-site, cyclists will be required to travel in a shared street condition; however, measures are planned to be implemented to ensure slow vehicle speeds.

Transit Facilities: The following **Table 12** summarizes the approximate walking distances between main exterior access doors for the proposed development and the existing transit stops or stations, and the % of the stops within 400 m of walking distance (<5 min). The following **Table 13** summarizes available OC Transpo routes and their associated stop numbers and location, and the direction of each route.

Table 12: Approximate Transit Facility Walking Distance in Metres (m) to/from Building Entrances

Stop #	Hotel	Tower A	Tower B	Tower C	Tower D	Senior Res.	% of Stops within 400 m
#1371	340	325	295	365	433	448	66.7%
#1369	325	280	255	325	390	380	100%
#1837	110	175	235	165	185	170	100%
#1836	275	340	400	330	265	250	83.3%
#1849	430	495	555	485	420	405	0%
#3024	435	390	360	430	500	515	33.3%

Table 13: Existing Transit Facilities

Stop #	Location	Operating Route	Direction
#1371	Immediately northwest of Tremblay/Via Rail	39	Inbound
#1369	Immediately southeast of Tremblay/Via Rail	39	Outbound
#1837	Immediately west of Tremblay/Avenue K	39	Outbound
#1836	Immediately east of Tremblay/Belfast	18, 39	Inbound
#1849	Immediately west of Tremblay/Avenue P	18, 39	Outbound
#3024	200m southwest of Tremblay/Via Rail	Confederation Line	Inbound/Outbound

It should be noted that most transit stops listed in **Table 12** and **Table 13** are located within the OC Transpo's service design guideline of 400m. A review of Transportation Demand Management (TDM) strategies, which includes strategies to promote transit use, is provided as **Appendix H**.

Circulation and Access

The width of proposed site driveways is approximately 6.75m for the "Station Road", and 7m for the "Woonerf Road", which are sufficient for two-way vehicular traffic and is in accordance with Zoning By-Law requirements. Taxis, and other short-stay/delivery vehicles may be accommodated by laybys located along the frontage of each building located on Lot A, B and C. It should be noted that the driveway access to underground parking and facilities is proposed to be 6m, which satisfies Aisle and Driveway By-Law Provisions.

Based on current/available information, loading zones will be located within a layby or provided as an underground facility. With respect to emergency vehicle access, a clear 6m wide fire route will be provided, which satisfies Building Code requirements.

The planned development can be accessed through the existing Avenue K, Avenue L, and Pickering Place via Tremblay Road. There is no planned vehicular access to/from Belfast Road. The vehicular access located between Pickering Place and Via Rail, which is currently blocked, is planned to be re-opened as a right-in/right-out connection autos, pedestrians and cyclists; however, it may simply be a connection for active modes. Potential modifications for existing unsignalized study area intersections (e.g. Avenue L/Tremblay, Avenue K/Tremblay, etc.) were previously mentioned in the *Step 3 - Forecasting* section (i.e. signalization and/or additional turn lanes are not recommended).

New Street Networks

The proposed configuration of the new on-site street network was previously depicted in **Figure 2**.

For internal circulation, three roadway widths have been proposed:

- + 6.75m, including the “Station Road” connecting Avenue L extension and Pickering Place;
- + 7m, including the “Woonerf Road” and Avenue K extension; and
- + 8.5m, including Avenue L extension.

As previously described, and shown in **Figure 2**, sidewalks are provided along both sides of the new internal street network, with the exception of Pickering Place. Cyclists are proposed to be traveling under shared street conditions on-site, with slow motor vehicles. As such, traffic management features, such as shared route signage, speed signs, textured pavement (e.g. woonerf) and/or curb bulb-outs at crosswalks are recommended for the internal street network to reduce travel speeds, and provide a safe environment for both pedestrians and cyclists.

A total of four (4) ramps to underground parking are proposed, currently proposed to serve residential towers with ground floor commercial/retail. The grade of these ramps should not exceed 6% without a subsurface melting device sufficient to keep the ramps free of ice.

Preliminary comments on the proposed Concept Plan from the City include:

- + All on-site crosswalks should be in-line sidewalks;
- + Corner sight-triangles of at least 3m should be provided, in accordance with Annex 1 of the City's Official Plan (Section 2.0, Policy 5);
- + Special consideration should be given to crossings for active modes between with subject site and the adjacent VIA Rail Station (i.e. the Pickering/Station intersection); and
- + Justification for All-Way STOP control should be provided for any proposed on-site intersections.

These recommendations will be given special consideration and will be determined during subsequent development applications, when greater site specific detail will be known.

4.2 Parking

With respect to the City's TIA guidelines, this module reviews the development's planned parking supply to ensure a balance between operational needs, the encouragement of sustainable travel modes, and the desire to minimize neighbourhood impacts.

Parking Supply

Vehicular parking

The proposed development is located in Area Z (Near Major LRT Stations), identified in Schedule 1A of the City's Zoning By-law, which identifies areas near specific rapid-transit stations.

Area Z in the City's Zoning By-laws general states that there is no minimum parking requirement other than visitor parking. Details regarding the number of parking spaces and loading requirements will be determined during subsequent development applications, when greater site specific detail will be known. At this stage, the concept plan only provides high-level direction with respect to traffic, access management and the location of future parking.

Bike Parking

The following **Table 14** summarizes the required minimum bike parking space rate, in accordance with the City's Zoning By-law, Section 101, Table 111A. At this stage, the concept plan only provides high-level direction of the bike parking requirement with respect to current Zoning By-Law. The number of bike parking spaces provided for

this development will be determined during the subsequent development applications, when greater site specific detail will be known.

Table 14: Parking Supply

Mode	Zoning Requirement	GFA	Minimum parking Requirement
Bike	0.25 per dwelling unit for Sen.Res 0.5 per dwelling unit for Apartment 1 per 250 m ² GFA for Retail 1 per 1000 m ² GFA for Hotel	164 units of Sen.Res 1060 units of Apartment 836 m ² GFA of Retail 9984 m ² GFA of Hotel	41 for Sen.Res 530 for Apartment 4 for Retail 10 for Hotel

Spillover parking

With respect to the City's TIA Guidelines, this module is exempt.

4.3 Boundary Street Design

With respect to the City's TIA guidelines, this module determines design elements of boundary streets required to accommodate the proposed development, consistent with the City's complete streets philosophy and its urban design objectives for the development area.

The identified boundary streets for the subject site is Tremblay Road, which is owned and maintained by the City of Ottawa. The subject site is designated as Mixed Used Center under the City of Ottawa Official Plan – Schedule B and is within the “Tremblay Area” identified in the City's 2014 TOD Plan.

Mobility

A Multi-Modal Level of Service (MMLOS) assessment was conducted for the subject site's boundary streets, which is a measure of risk, comfort and stress for active modes and a measure of impedance, delay and reliability for trucks/buses. With respect to the City of Ottawa's MMLOS guidelines, target MMLOS values were obtained from Exhibit 22 of the MMLOS guidelines and are identified in brackets in the following **Table 15** and **Table 16**. The detailed assessment is included as **Appendix I**.

Segment MMLOS Summary

The following **Figure 21** depicts the road classification from the City's Geo Ottawa website. It should be noted that Tremblay Road is a designated as a truck route.

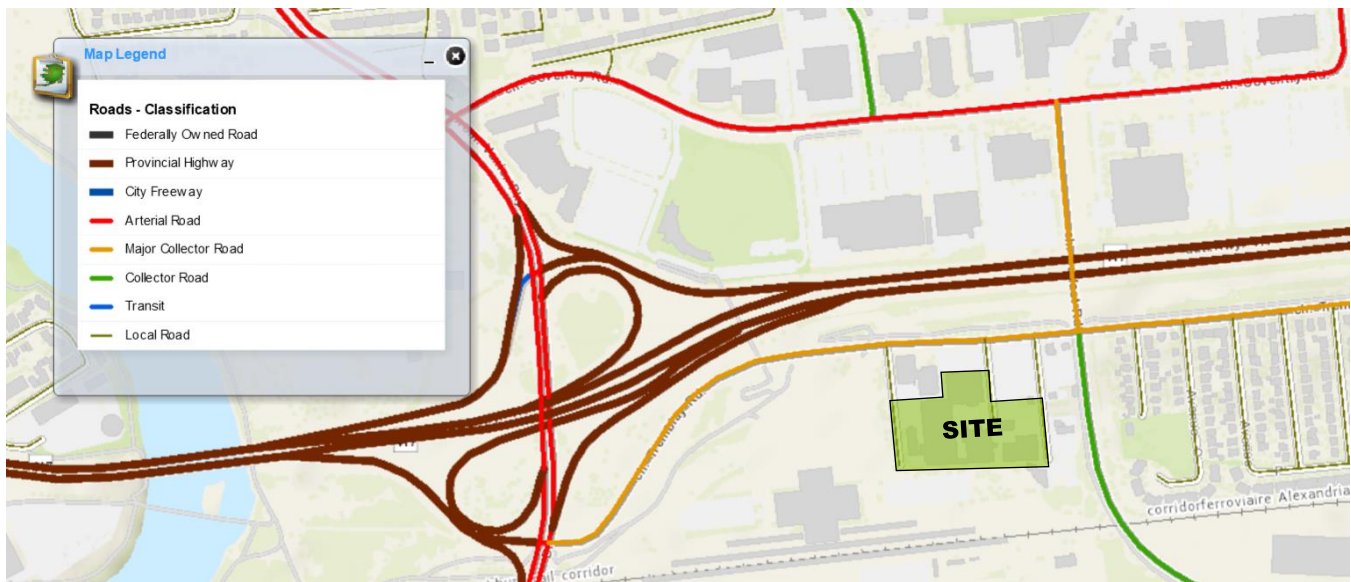


Figure 21: Road Classification

The following **Table 15** is a MMLOS summary for Phase 1 development for all modes (i.e. Pedestrian, Cycling, Transit and Truck) along the road segments described above. The following **Table 16** summarizes the projected segment MMLOS with planned network changes (i.e. Phase 2 development). LOS results highlighted in red indicate that the target MMLOS was not met for that segment.

It should be noted that MMLOS segment analysis focuses on local transit provided along the boundary streets only, as there is no mechanism to explicitly consider near-by LRT service within the City's MMLOS analysis tools.

Table 15: Segment MMLOS – Projected Phase 1 LOS(Target LOS)

No.	Road Name	Segment Between	PLOS	BLOS	TLOS	TkLOS
1	Tremblay Rd	Via Rail & Pickering Pl	B(A)	A(D)	D(D)	A(D)
2	Tremblay Rd	Pickering Pl & Avenue J	B(A)	A(D)	D(D)	B(D)
3	Tremblay Rd	Avenue J & Avenue K	B(A)	A(D)	D(D)	B(D)
4	Tremblay Rd	Avenue K & Avenue L	B(A)	A(D)	D(D)	B(D)
5	Tremblay Rd	Avenue L & Belfast Rd	B(A)	A(D)	D(D)	B(D)

Table 16: Segment MMLOS – Projected Phase 2 LOS(Target LOS)

No.	Road Name	Segment Between	PLOS	BLOS	TLOS	TkLOS
1	Tremblay Rd	Via Rail & Pickering Pl	B(A)	A(D)	D(D)	A(D)
2	Tremblay Rd	Pickering Pl & Avenue J	B(A)	A(D)	D(D)	B(D)
3	Tremblay Rd	Avenue J & Avenue K	B(A)	A(D)	D(D)	B(D)
4	Tremblay Rd	Avenue K & Avenue L	B(A)	A(D)	D(D)	B(D)
5	Tremblay Rd	Avenue L & Belfast Rd	B(A)	A(D)	D(D)	B(D)

Based on the foregoing, the following should be noted/considered:

Overall MMLOS

- + Bike, Transit and Truck modes on the boundary street will meet or exceeding MMLOS targets; and

Pedestrian LOS

- + All segments along Tremblay Road are projected to not quite meet PLOS targets;
- + Segments along Belfast Road fail to meet PLOS targets; and
- + Measures to improve PLOS include: sidewalk widening and the inclusion of a buffer between the sidewalk and adjacent roadway are recommended along boundary streets, and a mid-block Type B pedestrian crossover on Tremblay Road (between Pickering Place and Avenue L), complete with button activated lights to promote a safe crossing between the subject development and the MUP along the north side of Tremblay Road. Related Synchro analysis and results were attached in **Appendix J** (Assuming the PXO is located at Tremblay/Avenue K).

Bike LOS

- + Boundary street segments will meet or exceed BLOS targets after the implementation of the TOD Plan cycling infrastructure improvements, as identified in **Figure 11**.

Transit LOS

- + Boundary street segments meet TLOS targets in both Phase 1 and Phase 2 conditions.

Truck LOS

- + Boundary street segments are expected to exceed TkLOS targets in Phase 1 and Phase 2 conditions.

Road Safety

For the purpose of an engineering review, collision records for boundary streets are examined to determine if locations exhibit any collision trends that might be mitigated by engineering intervention. If there is a collision trend that is outside the norm of what is expected, then the potential exists to reduce the collision experience by addressing the over-represented collision trend. Whenever changes are being made to the road environment, it is an opportunity to examine whether a safety intervention could result in meaningful safety benefits. Where there are identifiable safety trends, it is worthwhile to mitigate those, such that the added traffic from a new development does not increase the risk of new collisions.

Based on a review of the most recent five (5) years of historical collision data (collected from January 1st, 2014 to December 31st, 2018), the following **Table 17** summarizes the number and rate (i.e. collisions per million vehicle kilometres) of collisions within the vicinity of the subject development lands, along road segments.

Table 17: Historical Collision Data Summary by Road Segment

Segment	Between	Total Collisions (5 Year Total)	Rate (C/MVK)	Classification		
				Property Damage	Non-fatal Injury	Fatal Injury
Tremblay	Riverside & Via Rail	5	0.36	5	0	0
Tremblay	Via Rail & Belfast	1	0.09	1	0	0
Avenue L	Tremblay & Road End	2	*	2	0	0
Total		8	-	8	0	0
Notes: (*) Denotes data was not available C/MVK = Collisions per Million Vehicle Kilometers						

As shown in **Table 17**, based on the available data, the collision rates for all road segments adjacent to the subject development site are considered to be low, and the severity of collisions along all section are also low (e.g. mostly rear end and single motor vehicle type collisions were cited).

It should be noted that, due to the COVID-19 pandemic, there has been a significant reduction of traffic in Ottawa's transportation network (e.g. 70% to 90% reduction in transit ridership, 50% reduction in traffic volumes, etc.). Collecting traffic information at this time is not an accurate representation of what is considered typical traffic conditions. As such, average annual daily traffic (AADT) count data was not available for the unsignalized study area intersections, and therefore, the rate of collisions were not calculated (in both road segments and intersection analysis).

Based on the same most recent five (5) years of historical collision data (collected from January 1st, 2014 to December 31st, 2018), the following **Table 18** summarizes the number and rate (i.e. collisions per million entering vehicles) of collisions within the vicinity of the subject development lands, at study area intersections.

Table 18: Historical Collision Data Summary by Intersection

Intersection	Total Collisions (5 Year Total)	Rate (C/MEK)	Classification		
			Property Damage	Non-fatal Injury	Fatal Injury
Tremblay @ Via Rail	5	0.29	4	1	0
Tremblay @ Pickering	4	*	4	0	0
Tremblay @ Avenue J	0	-	0	0	0
Tremblay @ Avenue K	3	*	2	1	0
Tremblay @ Avenue L	3	*	3	0	0
Tremblay @ Belfast	8	0.26	4	4	0
Total	23	-	17	6	0
Notes: (*) Denotes data was not available C/MEK = Collisions per Million Entering Vehicles					

As shown in **Table 18**, the two study area intersections with collision rates are the Tremblay/Via Rail and Tremblay/Belfast intersections, which both appear to have low collision rates.

A more detailed collision analysis for road segments and intersections within the study area are included in **Appendix K**. As previously mentioned, source collision data is included in **Appendix C**.

Neighbourhood Traffic Management (NTM)

The total projected traffic volumes along Tremblay Road are not expected to exceed the major collector classification thresholds (i.e. 600 veh/h during peak hours), even without considering the future road widening. Therefore, the potential for 'peak period spreading', the phenomenon where peak traffic volumes begin earlier than the peak hour and dissipate later, is low. As previously mentioned in the *Step 3 - Forecasting* section of this report, there are no projected operational concerns on the boundary streets for the full build-out horizon year. As such additional NTM measures are not recommended.

4.4 Access Intersection Design

With respect to the City's TIA guidelines, this module determines design elements of the points of access to the development, consistent with the City's complete streets philosophy, MMLOS guidelines, and its urban design objectives for the development area.

Location and Design of Access

The location of main access to/from 25 Pickering Place will be provided at the following existing unsignalized locations:

- + Tremblay/Pickering
- + Tremblay/Avenue L
- + Tremblay/Avenue K

In addition to these existing access locations, a new unsignalized access will be provided at Pickering Place and Station Road. On the south end of Pickering Place, there is an access road to Station Road, which used to give access to the Via Rail station, but it is currently blocked with concrete barriers. This access point may be modified as a new right-in/right-out connection. With respect to the City's Private Approach By-Law No. 2003-447, all new proposed driveway connections satisfy By-Law requirements in terms of number of driveways along the site's frontage, width and location.

Intersection Control

Main access points to/from 25 Pickering Place are proposed to be full movement and STOP controlled on the minor approaches only, and are projected to operate with significant spare capacity.

Intersection Design

the following is a MMLOS analysis for the planned signalized access intersections to/from the subject development. As previously mentioned, MMLOS is a measure of risk, comfort and stress for active modes and a measure of impedance, delay and reliability for trucks/buses. With respect to the City of Ottawa's MMLOS guidelines, target MMLOS values were obtained from Exhibit 22 of the MMLOS guidelines and are identified in brackets in the following **Table 19** and **Table 20**.

Intersection MMLOS Summary

Similar to the MMLOS analysis conducted for the Boundary Street Design, the following **Table 19** and **Table 20** summarize existing and projected MMLOS analysis completed for all modes, at study area signalized intersections. The detailed intersection MMLOS analysis is provided in **Appendix L**.

Table 19: Intersection MMLOS – Projected Phase 1 LOS (Target LOS)

No.	Intersection	PLOS	BLOS	TLOS	TkLOS	AutoLOS
1	Tremblay/Via Rail	E(A)	E(D)	C(D)	C(D)	A(E)
2	Tremblay/Belfast	C(A)	E(D)	D(D)	C(D)	B(E)

Table 20: Intersection MMLOS – Projected Phase 2 LOS (Target LOS)

No.	Intersection	PLOS	BLOS	TLOS	TkLOS	AutoLOS
1	Tremblay/Via Rail	E(A)	E(D)	C(D)	C(D)	A(E)
2	Tremblay/Belfast	D(A)	E(D)	D(D)	C(D)	B(E)

As shown in **Table 20**, study area intersections are projected to not meet LOS targets for active modes. Based on the foregoing, the following should be noted/considered:

Overall MMLOS

- + Transit, Truck and Auto LOS at signalized study area intersections are expected to meet or exceed all targets.

Pedestrian LOS

- + Both study intersections fail to meet the PLOS targets.
- + Beneficial pedestrian safety features that are currently provided include protected only left-turn phasing, and streetlighting.
- + Failing PLOS is mainly attributed to the size of study area intersections (e.g. the more vehicle travel lanes pedestrians have to cross increases their/exposure to potential collisions).
- + Possible measures to improve PLOS:
 - Implement pedestrian leading intervals (LPI);
 - “Zebra” pavement markings on all crosswalks;
 - Provide median pedestrian refuges; and
 - Prohibit right-turn-on-red.

Bike LOS

- + Both intersections fail to meet the BLOS targets.
- + Beneficial cycling features are not provided which can include, 2 stage bicycle left-turns or bike boxes.
- + Failing BLOS is mainly attributed to the number of lanes that are required to cross to perform a left-turn (without a 2-stage left turn or bike box).
- + Possible measures to improve BLOS:
 - Two stage left-turn bike boxes;

Transit LOS

- + Both intersections are expected to meet or exceed the TLOS targets.

Truck LOS

- + Both intersections are expected to meet or exceed TkLOS targets.

Auto LOS

- + Both intersections are expected to meet or exceed AutoLOS targets.

While the unsignalized access intersections do not require an MMLOS analysis; it is recommended that the pavement markings along the south E-W crosswalks of the unsignalized intersections are upgraded to “zebra” type pavement crosswalk markings to improve visibility of pedestrians crossing at these intersections.

4.5 Transportation Demand Management

With respect to the City’s TIA Guidelines, an analysis of Transportation Demand Management (TDM) measures is required for this development. As such, a formal TDM Checklist (provided by the City) was completed to determine if TDM measures should be implemented, based on the available information.

However, due to the lack of detailed design for each land use, it is expected that a TDM strategy will be established at the SPA stage of the development process. The TDM checklist is attached as **Appendix M**.

4.6 Neighbourhood Traffic Management

With respect to the City’s TIA guidelines, this module reviews significant access routes to/from the development and identifies any required neighbourhood traffic management (NTM) measures to mitigate impacts on collector and local roads.

As mentioned in the *Step 3 - Forecasting* section of this report, there are no expected operational concerns on the boundary streets for the full build-out horizon year. As such additional NTM measures are not recommended.

4.7 Transit

The transit stops that serve the development site were previously summarized in **Table 12** and **Table 13**. These tables include stop information, routes, and the distance to/from the development site. The transit route information, including peak hour headway and service type, were previously summarized in **Table 2** in the *Step 2 - Scoping* section of this report. Detailed transit maps are included in **Appendix N**.

Based on the foregoing and ridership data provided by the City, it is anticipated that the existing and planned expansion to transit services will have enough capacity to accommodate the development-generated demand. No additional transit priority measures are required for this development.

Route Capacity

Current transit ridership data for the bus stops listed in **Table 12** and **Table 13** was provided by the City and is included as **Appendix O**. Based on TOD plans, it is expected that 65 percent of the trips generated by the site will be accommodated by transit, and that the majority of transit usage for people accessing the development site will be completed by LRT.

Based upon the analysis provided in the *Step 3 - Forecasting* section, **Table 21** depicted that there will be approximately 539 additional transit trips for AM peak hour generated by the subject development full build out.

Table 21: Distribution of site-generated transit trips, AM peak hour

Development Phase	Eastbound			Westbound		
	In	Out	Total	In	Out	Total
Phase 1 (2025)	20	29	49	46	69	115
Phase 2 (2030)	29	84	113	67	195	262
Total	49	113	162	113	264	377

Table 22 compares the existing and projected background transit trips between 2020 and 2025 (provided by OC Transpo), with the additional transit trips generated by the Phase 1 development. From the table, the Phase 1 development would be a major transit trip generator to Tremblay LRT station in 2025, contributing to the total alighting by approximately 25% and the boardings by about 50%. It should be noted that the 2020-2025 growth values in **Table 22** are an estimated 50% of the total forecasted growth between 2020-2031, rounded up to the nearest whole person-trip.

Table 22: Tremblay Station activity 2020 (pre-pandemic) and 2025 (forecasted growth plus 25 Pickering site-generated demand)

	Eastbound		Westbound		Total	
	Alightings	Boardings	Alightings	Boardings	Alightings	Boardings
2020 AM Peak Hour	64	35	46	26	110	61
Phase 1 (2025) site-generated trips	20	29	46	69	66	98
Forecasted growth 2020-2025	104	9	59	23	163	32
Total 2025 AM Peak Hour	188	73	151	118	339	191

Table 23 compares the projected 2031 transit trips on Tremblay LRT station with both phases of the development. Similar to Table 22, 25 Pickering development will be comprising a significant part of the Tremblay station activity by the year 2031. 25 Pickering Place development will ultimately contribute 162 alightings and 377 boardings in AM peak hour, accounting for around 30% of the total alightings and 75% of the boardings.

Table 23: Tremblay Station activity 2031 (forecasted growth plus 25 Pickering site-generated demand)

	Eastbound		Westbound		Total	
	Alightings	Boardings	Alightings	Boardings	Alightings	Boardings
2031 AM Peak Hour	272	52	164	71	436	123
Phase 1 (2025) site-generated trips	20	29	46	69	66	98
Phase 2 (2030) site-generated trips	29	84	67	195	96	279
Total 2031 AM Peak Hour	321	165	277	335	598	500

Considering the City is expecting an increase in the current planned capacity of 21,400 passengers per hour to 36,000 by 2031 (which corresponds to Phase 1 of the development), and 48,000 passengers per hour at the ultimate build out¹. These additional trips will be accommodated for by the planned increases in the capacity of the LRT system.

With respect to local transit, routes 18 and 39 are serviced by single 40ft buses (which have a person capacity of approximately 50 passengers) with 30 min headways. There are approximately 10 to 20 passengers per bus that arrive/depart at the bus stops within the vicinity of the subject development, during the AM and PM peak hours. The residual capacity for these buses is approximately 30 additional passengers per bus, which is approximately 60 passengers per route per peak hour.

Transit Priority

Given the highest order LRT transit near the subject development lands, transit travel times should be unimpeded and therefore, additional transit priority measures will not be required.

Additionally, study area intersections are projected to operate with significant spare capacity, local bus routes will be unimpeded, and therefore, will not require transit priority measures.

¹ <https://www.octranspo.com/en/ready-for-rail/o-train-confederation-line-system-faqs>

4.8 Review of Network Concept

The purpose of this section is to outline any required changes to the TMP concepts for auto/transit networks as a result of added traffic from the new development. It is important to recognize that the existing road network serving the site is currently operating with spare capacity during the peak periods. Since the development is in an existing TOD zone, the trip generation analysis proposes the site will rely heavily on transit to service the community's transportation needs.

4.9 Intersection Design

With respect to the City's TIA Guidelines, this module determines the design elements of study area intersections required to accommodate the proposed development, consistent with the City's complete streets philosophy and MMLOS practices.

Intersection Control

All study area site access intersections are currently stop controlled on the minor street and are fully built-out. Based on intersection capacity analysis on the *Step 3 - Forecasting* section, and the consistent with City's policies, goals and objectives, additional signal control is not required at this time.

Intersection Design

Based on intersection capacity analysis on the *Step 3 - Forecasting* section, and the consistent with City's policies, goals and objectives, additional road widenings are not required at this time.

5. Findings and Recommendations

As is typical of infill developments, the introduction of mid- to high-density intensification will have impacts on the surrounding transportation network. CIMA+ has completed a high-level review of these impacts and summarized the findings within this transportation assessment, which follows the format of a Traffic Impact Assessment (TIA) Study, as requested by the City of Ottawa. Many of the details typically found within a TIA are not provided for this Concept planning stage, and are therefore, have not been included in this review. It is expected that these details will be included in any future development applications. Where relevant, CIMA+ has included guidance for future studies. At this stage, and with respect to the City's Transportation Impact Assessment Guidelines, the following findings and conclusions are offered:

- + Study area intersections are currently operating with significant spare capacity and there are no prevailing safety concerns, based on historical collision data.
- + Transit is assumed to be the primary mode of travel with a 65% mode share target for the proposed development, which is consistent with the City's 2014 TOD plan.
- + With additional traffic generated by area development and the subject development itself, both the local bus and nearby LRT routes, and study area intersections are projected to continue operating with spare capacity.
- + Given the development is located within a Transit Oriented Development zone, improving the active network between the site and the Tremblay LRT station will require special consideration, which can be assessed further during subsequent development applications, when greater site specific detail will be known. However at this time, there are a number of potential measures that can be implemented to improve the level of comfort for pedestrians and cyclists on boundary street segments and at study area intersections.

The proposed development fits well into the context of the surrounding area and it is projected to have a minimal impact on the surrounding transportation network. The design and location of the proposed development serves the City of Ottawa's policies, goals and objectives by providing facilities and connectivity to help promote active and transit modes.

Based on the foregoing, the proposed development located at 25 Pickering Place is recommended from a transportation perspective.

A

Appendix A

Detailed Vehicular Trip Generation for Existing Land Uses

MEMO

TO: File

CC:

FROM: Junshen Feng, B.Eng. CIMA+

REVIEWED BY Gordon Scobie, P.Eng. CIMA+

DATE: 27 May 2020

SUBJECT: Detailed Vehicular Trip Generation for Existing Land Uses

An estimate of typical traffic conditions (where traffic count information is not available) was developed by estimating vehicular trips generated by the existing land uses that have access to the following unsignalized intersections:

- + Tremblay/Pickering
- + Tremblay/Avenue J
- + Tremblay/Avenue K
- + Tremblay/Avenue L

For the purpose of this exercise, existing area land use traffic was estimated using appropriate trip generation rates from the 10th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. The following **Table 1** summarizes appropriate ITE trip generation rates for estimating projected site-generated traffic. It should be noted that the first listed equation is an average vehicle trip generation rate and the second equation is a “line of best fit” equation that more accurately represents the trend of vehicle trip generation based on land use size. Typical industry practice is the use the “line of best fit” equation for site-generated traffic projections, if available.

Table 1: ITE Trip Generation Rates

Land Use	ITE Land Use Code	AM Peak	PM Peak
General Office Building	ITE 710 General Urban/Suburban	$T = 1.16 (X)$; or $T = 0.94 (X) - 26.49$	$T = 1.15 (X)$; or $\ln (T) = 0.95 \ln (X) + 0.36$
Automotive Parts and Service Center	ITE 943 General Urban/Suburban	$T = 1.96 (X)$	$T = 2.26 (X)$
Warehousing	ITE 150 General Urban/Suburban	$T = 0.17 (X)$; or $T = 0.12 (X) - 25.32$	$T = 0.19 (X)$; or $T = 0.12 (X) + 27.82$
Fast Casual Restaurant	ITE 930 General Urban/Suburban	$T = 2.07 (X)$	$T = 14.13 (X)$
Notes: T = Average Vehicle Trip Ends X = 1,000 ft ² of Gross Floor Area			

With respect to ITE trip generation rates, the data used to develop these rates only include vehicle trips (i.e. walking, cycling or transit trips are not captured), and the data collection surveys are typically conducted in highly-suburban locations with limited access to transit and dedicated non-motorized facilities (e.g. sidewalks, bike lanes, etc. are generally limited). To properly consider the multi-modal trips generated by the proposed development, projected site-generated traffic (estimated using ITE trip generation rates) is converted to projected site-generated person trips, which can then be subdivided into different modes based on area travel patterns and available facilities/network connections (e.g. the availability of transit, walking and cycling facilities).

With respect to NCR OD survey data, the subject existing land uses are located in the Alta Vista district area Traffic Assessment Zone (TAZ). The average AM and PM modal split from/to/within this district indicates that trips person trips consist of 61% auto drivers, 16% auto passengers, 18% transit, 2% bicycle and walk, and 3% other. Considering NCR OD survey data and other key factors (e.g. proximity and quality of non-auto facilities, nature/context of the proposed development, etc.), the following summarizes the assumed modal split of estimated site-generated traffic.

60% Auto Driver;
15% Auto Passenger;
20% Transit; and
+ 5% Walk and Cycling.
100%

To convert projected ITE vehicle trips to person trips, an auto occupancy factor and non-auto trip factor is applied to the ITE trip generation rates. With respect to the City's TIA Guidelines, and based on available American Census data, the typical modal share of non-auto person trips is approximately 10% and the typical auto occupancy is 1.15. Therefore, when combined, a factor of 1.28 is used to convert vehicle trips to person trips.

Based on the foregoing and assuming the approximate size of existing area land uses, summarized in the following **Table 2** (developed using Google aerial and streetview photography), estimated vehicle trips generated by existing area land uses were calculated and summarized in **Table 3**.

As shown in **Table 3**, existing area land uses are estimated to generate approximate two-way vehicle volumes of approximately 190 veh/h during weekday morning and afternoon peak hours, respectively.

The distribution of this estimated site-generated traffic was derived based on existing travel patterns, the site's connections to/from the surrounding road network, and our local area knowledge. (e.g. the location and proximity of local residential communities, and the HWY 417). For analysis purposes, the following approximate distribution of projected site-generated traffic was assumed:

50% to/from the east/west via HWY 417 (via Riverside Ramp and Tremblay Road);
20% to/from the north/south via Riverside Drive/Vanier Parkway (via Tremblay Road);
10% to/from the east via Tremblay Road;
10% to/from the north via HWY 417 Belfast Road;
+ 10% to/from the south via Belfast Road.
100%

The resulting assignment of the estimated vehicle trips generated by existing area land uses is depicted as Figure 7 in the 25 Pickering Place Transportation Impact Assessment.

Table 2: Existing Land Uses

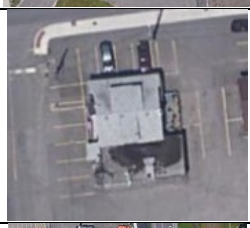
Existing Facility	Satellite Image	Approximate Floor Area (ft ²)
PISPC Office		122,709
Dustbane Warehouse		101,396
Dustbane Office		11,151
Casual Restaurant		1,421
Auto Facility		12,723

Table 3: Projected Site Trip Generation

Existing Facility	Travel Mode	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
PISPC Office	Auto	94	16	110	17	90	107
Dustbane Warehouse		22	8	30	8	23	31
Dustbane Office		24	5	29	2	10	12
Casual Restaurant		2	2	4	9	8	17
Auto Facility		14	6	20	9	14	23
Total 'New' Auto Trips		156	37	193	45	145	190

B

Appendix B Existing Traffic Volume Data

Survey Date: Wednesday, January 08, 2020

Start Time: 07:00

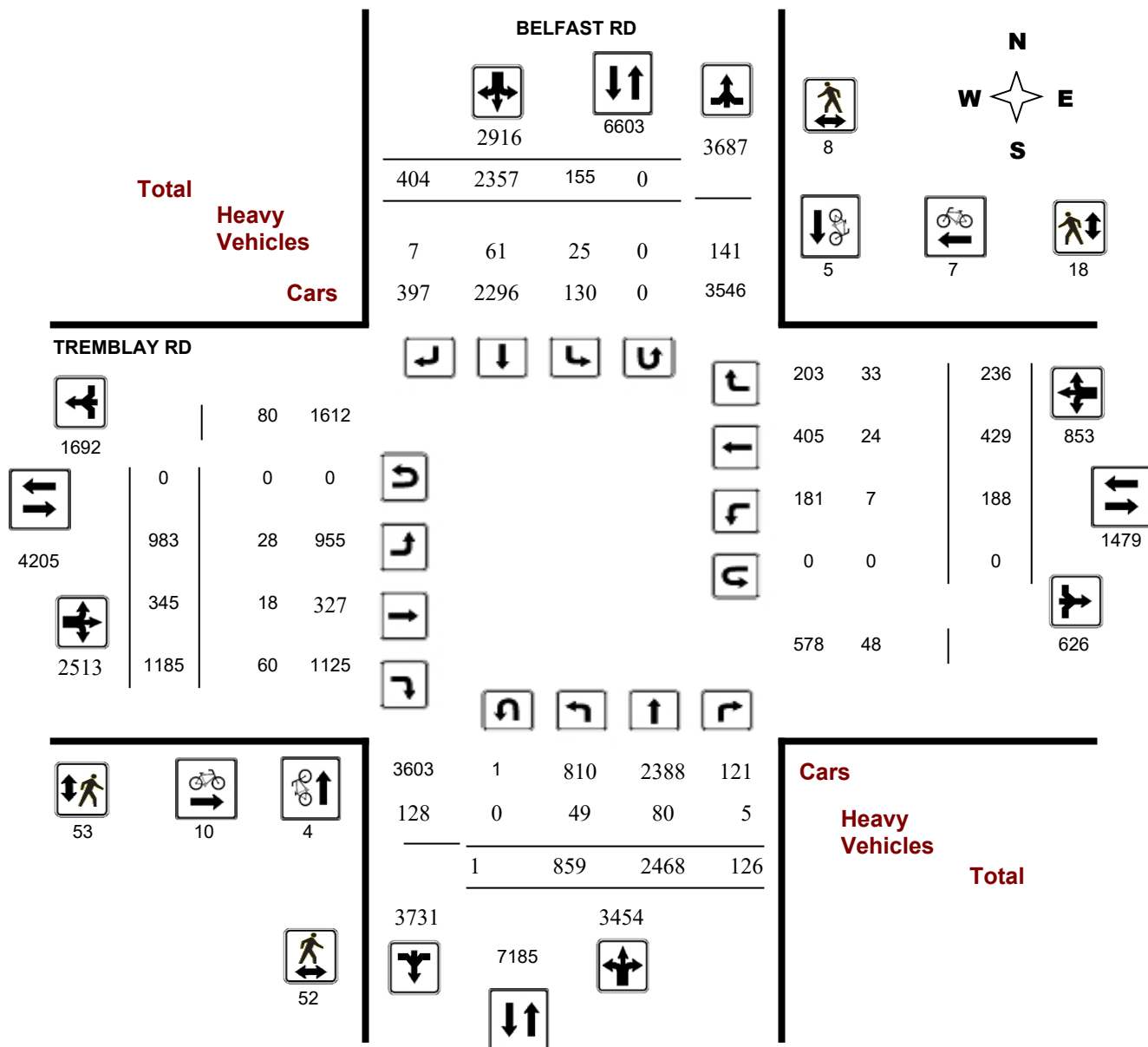
WO No:

39277

Device:

Miovision

Full Study Diagram



5469218 - WED JAN 08, 2020 - 8HRS - LORETTA

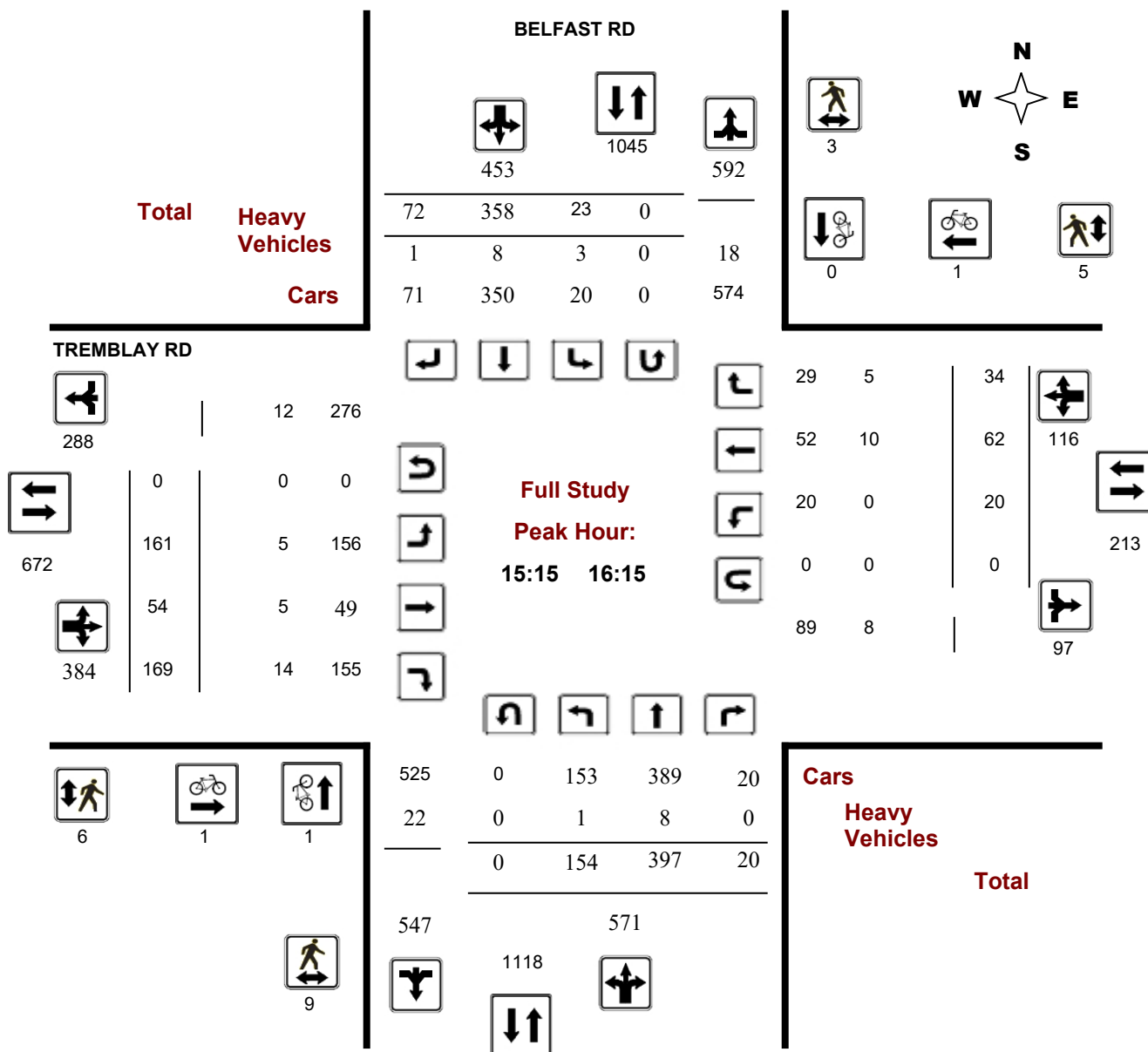
Survey Date: Wednesday, January 08, 2020

WO No: 39277

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

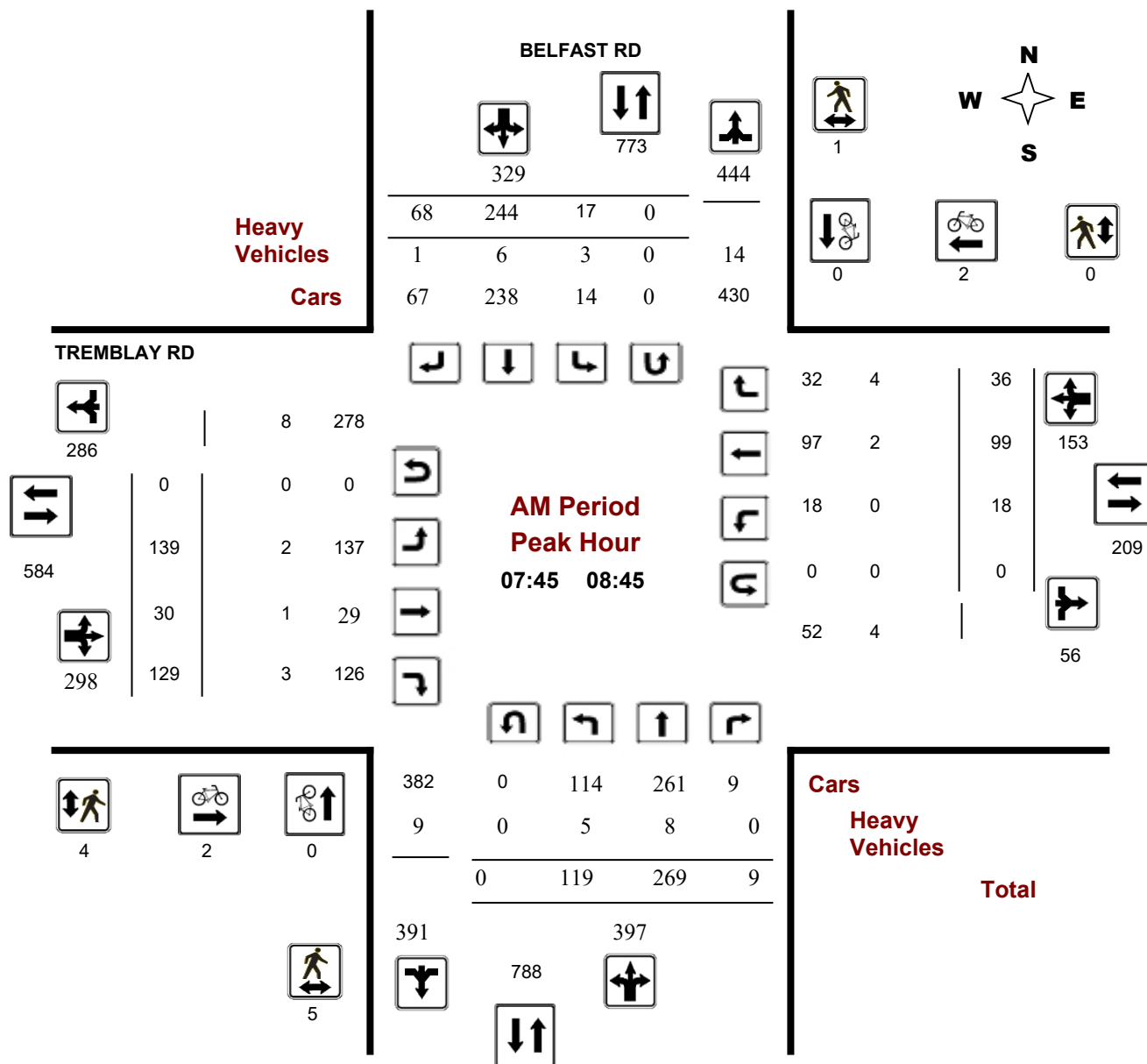
BELFAST RD @ TREMBLAY RD

Survey Date: Wednesday, January 08, 2020

Start Time: 07:00

WO No: 39277

Device: Miovision



Comments 5469218 - WED JAN 08, 2020 - 8HRS - LORETTA

Turning Movement Count - Peak Hour Diagram

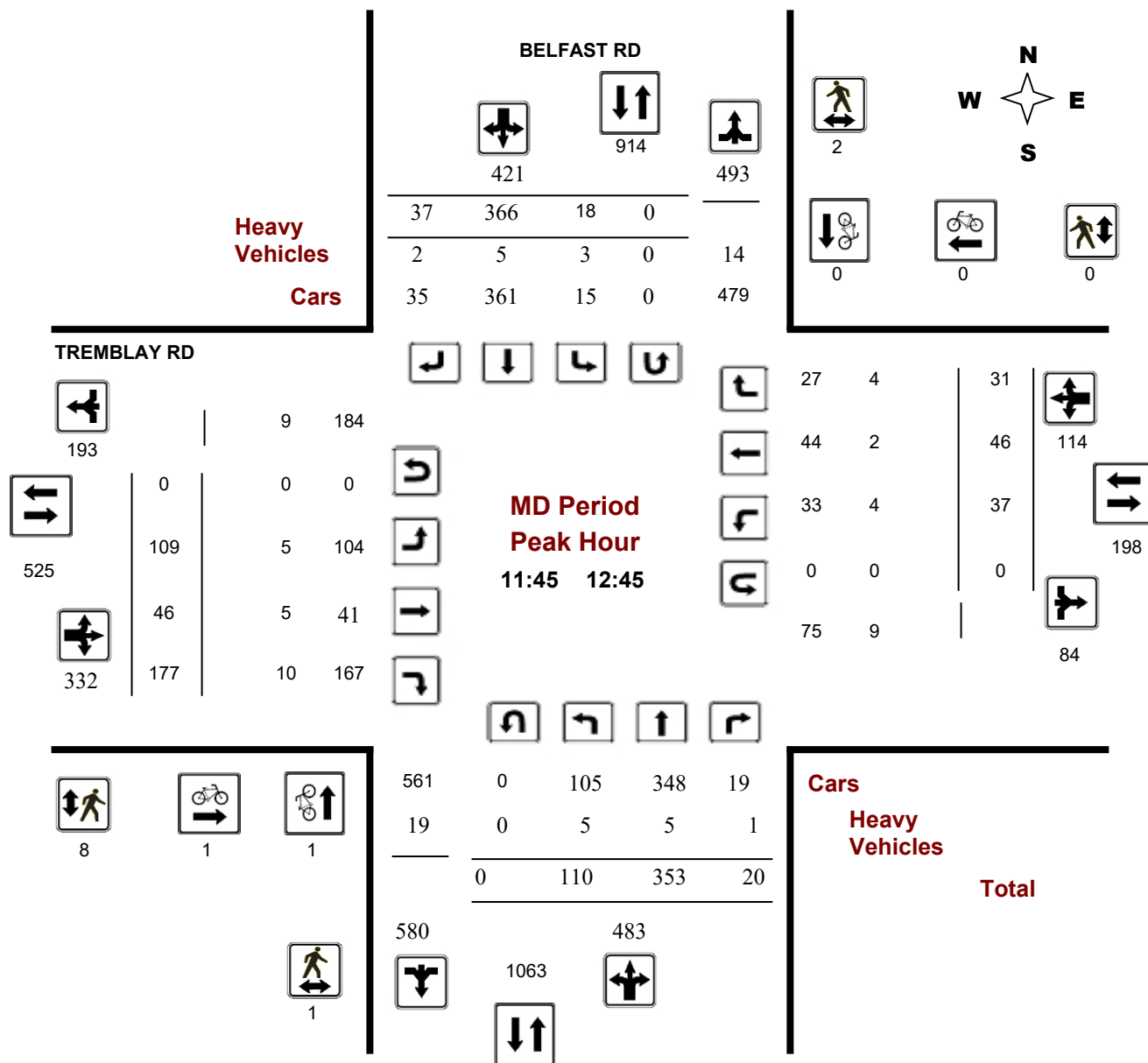
BELFAST RD @ TREMBLAY RD

Survey Date: Wednesday, January 08, 2020

Start Time: 07:00

WO No: 39277

Device: Miovision



Turning Movement Count - Peak Hour Diagram

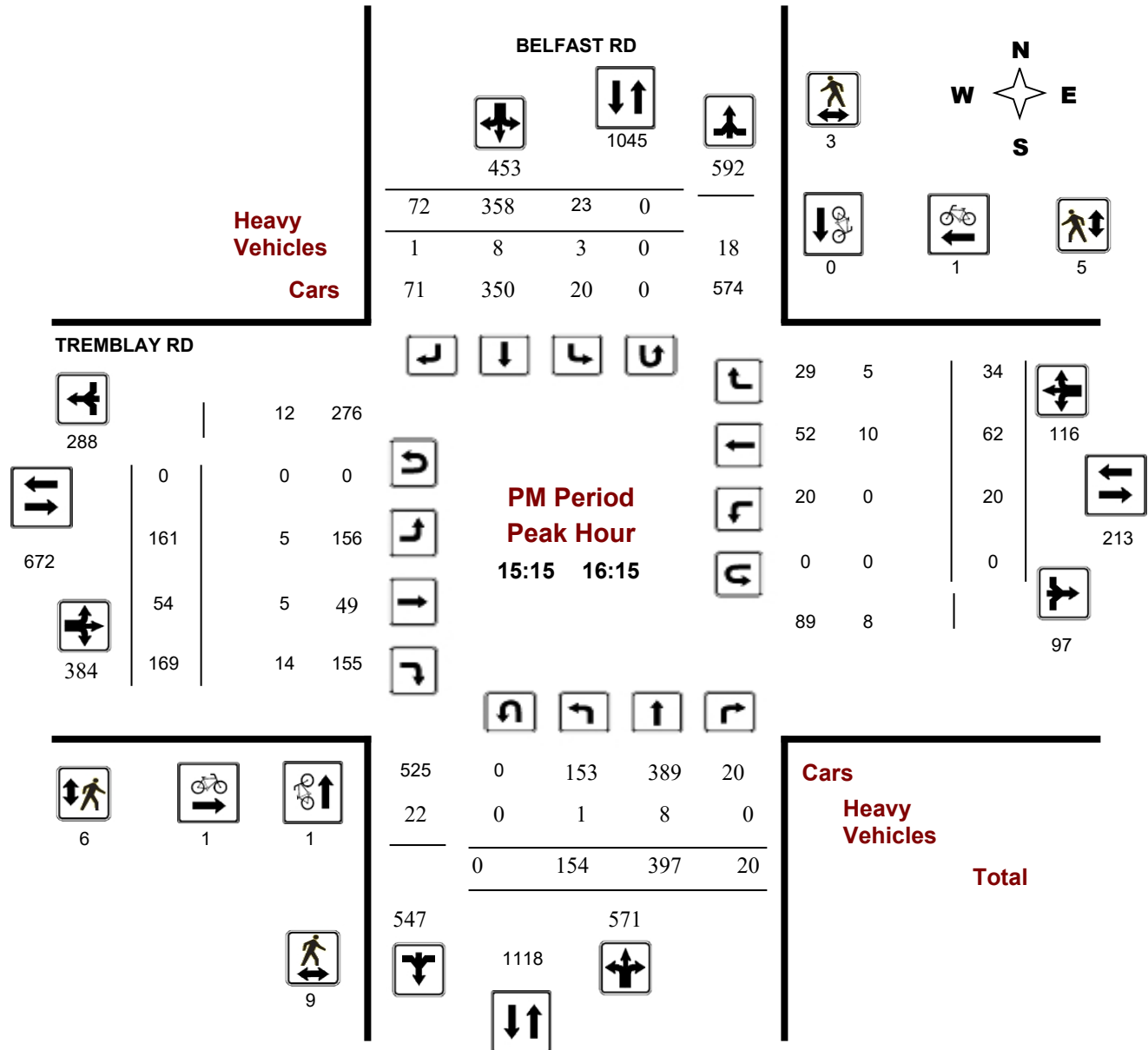
BELFAST RD @ TREMBLAY RD

Survey Date: Wednesday, January 08, 2020

Start Time: 07:00

WO No: 39277

Device: Miovision



Comments 5469218 - WED JAN 08, 2020 - 8HRS - LORETTA



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BELFAST RD @ TREMBLAY RD

Survey Date: Wednesday, January 08, 2020

WO No: 39277

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, January 08, 2020

Total Observed U-Turns

AADT Factor

Northbound: 1 Southbound: 0

1.00

Eastbound: 0 Westbound: 0

BELFAST RD

TREMBLAY RD

Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT		LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT		LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	92	200	6	298		16	193	45	254	552	122	31	126	279		21	71	30	122	401	953
08:00 09:00	119	275	11	405		17	263	65	345	750	114	32	117	263		19	91	36	146	409	1159
09:00 10:00	78	180	12	270		14	227	39	280	550	135	33	133	301		19	44	26	89	390	940
11:30 12:30	100	333	22	455		21	341	41	403	858	109	49	184	342		39	37	31	107	449	1307
12:30 13:30	115	346	18	479		13	334	43	390	869	88	30	156	274		27	48	22	97	371	1240
15:00 16:00	152	410	22	584		24	350	65	439	1023	137	54	151	342		20	52	26	98	440	1463
16:00 17:00	123	398	16	537		24	332	76	432	969	157	76	184	417		26	51	32	109	526	1495
17:00 18:00	80	326	19	425		26	317	30	373	798	121	40	134	295		17	35	33	85	380	1178
Sub Total	859	2468	126	3453		155	2357	404	2916	6369	983	345	1185	2513		188	429	236	853	3366	9735
U Turns				1					0	1				0					0	0	1
Total	859	2468	126	3454		155	2357	404	2916	6370	983	345	1185	2513		188	429	236	853	3366	9736
EQ 12Hr	1194	3431	175	4801		215	3276	562	4053	8854	1366	480	1647	3493		261	596	328	1186	4679	13533
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														1.39							
AVG 12Hr	1125	3233	165	4525		203	3088	529	3820	8854	1288	452	1552	3292		246	562	309	1117	4679	13533
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														1							
AVG 24Hr	1474	4235	216	5927		266	4045	693	5004	10931	1687	592	2034	4313		323	736	405	1464	5777	16708

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.

1.31

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BELFAST RD @ TREMBLAY RD

Survey Date: Wednesday, January 08, 2020

WO No: 39277

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

BELFAST RD

TREMBLAY RD

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total	
07:00	07:15	25	41	3	69	7	51	10	68	19	28	4	36	68	5	12	8	25	19	230
07:15	07:30	25	49	2	76	2	42	4	48	9	16	9	25	50	5	15	5	25	9	199
07:30	07:45	20	57	1	78	3	49	14	66	8	28	12	26	66	5	21	7	33	8	243
07:45	08:00	22	53	0	75	4	51	17	72	3	50	6	39	95	6	23	10	39	3	281
08:00	08:15	33	72	5	110	5	60	21	86	2	27	8	31	66	2	23	6	31	2	293
08:15	08:30	36	79	4	119	4	70	12	86	4	33	9	29	71	6	34	9	49	4	325
08:30	08:45	28	65	0	93	4	63	18	85	14	29	7	30	66	4	19	11	34	14	278
08:45	09:00	22	59	2	83	4	70	14	88	7	25	8	27	60	7	15	10	32	7	263
09:00	09:15	19	54	5	78	2	53	15	70	14	40	10	31	81	8	16	10	34	14	263
09:15	09:30	21	50	3	74	4	51	10	65	11	28	6	34	68	4	10	7	21	11	228
09:30	09:45	19	43	2	64	5	62	10	77	14	28	7	37	72	1	9	2	12	14	225
09:45	10:00	19	33	2	54	3	61	4	68	7	39	10	31	80	6	9	7	22	7	224
11:30	11:45	25	83	6	114	5	73	12	90	10	22	12	44	78	7	1	3	11	10	293
11:45	12:00	24	66	3	93	3	87	8	98	2	33	15	50	98	8	10	10	28	2	317
12:00	12:15	25	104	4	133	5	99	12	116	7	25	11	45	81	10	11	7	28	7	358
12:15	12:30	26	80	9	115	8	82	9	99	5	29	11	45	85	14	15	11	40	5	339
12:30	12:45	35	103	4	142	2	98	8	108	7	22	9	37	68	5	10	3	18	7	336
12:45	13:00	19	86	6	111	4	74	16	94	6	27	8	48	83	8	11	5	24	6	312
13:00	13:15	38	76	4	118	4	88	7	99	8	22	7	32	61	8	14	11	33	8	311
13:15	13:30	23	81	4	108	3	74	12	89	5	17	6	39	62	6	13	3	22	5	281
15:00	15:15	38	94	4	136	7	80	19	106	13	23	11	36	70	2	6	6	14	13	326
15:15	15:30	34	115	8	157	3	104	14	121	8	42	14	28	84	4	13	7	24	8	386
15:30	15:45	39	95	6	140	7	82	18	107	3	38	15	52	105	9	19	4	32	3	384
15:45	16:00	41	106	4	151	7	84	14	105	4	34	14	35	83	5	14	9	28	4	367
16:00	16:15	40	81	2	123	6	88	26	120	6	47	11	54	112	2	16	14	32	6	387
16:15	16:30	26	112	4	142	5	81	19	105	6	39	20	48	107	5	10	3	18	6	372
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17:00	17:15	26	100	7	134	6	101	13	120	5	37	15	45	97	5	11	13	29	5	380
17:15	17:30	17	93	5	115	7	70	9	86	3	26	13	40	79	4	11	9	24	3	304
17:30	17:45	22	66	4	92	10	66	7	83	2	30	10	31	71	4	5	5	14	2	260
17:45	18:00	15	67	3	85	3	80	1	84	2	28	2	18	48	4	8	6	18	2	235
Total:		859	2468	126	3454	155	2357	404	2916	227	983	345	1185	2513	188	429	236	853	227	9,736

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BELFAST RD @ TREMBLAY RD

Survey Date: Wednesday, January 08, 2020

WO No: 39277

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

		BELFAST RD			TREMBLAY RD			Grand Total
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00	07:15	0	0	0	2	0	2	2
07:15	07:30	0	0	0	0	0	0	0
07:30	07:45	0	0	0	1	0	1	1
07:45	08:00	0	0	0	0	0	0	0
08:00	08:15	0	0	0	0	0	0	0
08:15	08:30	0	0	0	2	1	3	3
08:30	08:45	0	0	0	0	1	1	1
08:45	09:00	0	0	0	0	0	0	0
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	0	2	2	0	0	0	2
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0
12:30	12:45	1	0	1	1	0	1	2
12:45	13:00	0	0	0	0	0	0	0
13:00	13:15	0	1	1	0	1	1	2
13:15	13:30	0	0	0	0	0	0	0
15:00	15:15	1	1	2	0	1	1	3
15:15	15:30	1	0	1	1	1	2	3
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	1	1	0	0	0	1
16:30	16:45	0	0	0	0	1	1	1
16:45	17:00	1	0	1	0	0	0	1
17:00	17:15	0	0	0	1	1	2	2
17:15	17:30	0	0	0	1	0	1	1
17:30	17:45	0	0	0	1	0	1	1
17:45	18:00	0	0	0	0	0	0	0
Total		4	5	9	10	7	17	26



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BELFAST RD @ TREMBLAY RD

Survey Date: Wednesday, January 08, 2020

WO No: 39277

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

BELFAST RD

TREMBLAY RD

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	1	0	1	0	0	0	1
07:15 07:30	5	0	5	2	1	3	8
07:30 07:45	1	0	1	0	1	1	2
07:45 08:00	3	0	3	1	0	1	4
08:00 08:15	0	0	0	1	0	1	1
08:15 08:30	1	1	2	2	0	2	4
08:30 08:45	1	0	1	0	0	0	1
08:45 09:00	1	1	2	2	1	3	5
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	2	0	2	1	0	1	3
09:30 09:45	2	0	2	3	1	4	6
09:45 10:00	1	0	1	1	0	1	2
11:30 11:45	2	1	3	3	1	4	7
11:45 12:00	0	1	1	4	0	4	5
12:00 12:15	1	0	1	0	0	0	1
12:15 12:30	0	0	0	1	0	1	1
12:30 12:45	0	1	1	3	0	3	4
12:45 13:00	4	0	4	1	2	3	7
13:00 13:15	0	0	0	1	0	1	1
13:15 13:30	1	0	1	4	0	4	5
15:00 15:15	2	0	2	1	1	2	4
15:15 15:30	3	0	3	0	0	0	3
15:30 15:45	1	1	2	2	1	3	5
15:45 16:00	2	2	4	2	3	5	9
16:00 16:15	3	0	3	2	1	3	6
16:15 16:30	3	0	3	1	0	1	4
16:30 16:45	2	0	2	2	0	2	4
16:45 17:00	3	0	3	3	3	6	9
17:00 17:15	4	0	4	1	0	1	5
17:15 17:30	0	0	0	3	1	4	4
17:30 17:45	1	0	1	1	0	1	2
17:45 18:00	2	0	2	5	1	6	8
Total	52	8	60	53	18	71	131

5469218 - WED JAN 08, 2020 - 8HRS - LORETTA



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BELFAST RD @ TREMBLAY RD

Survey Date: Wednesday, January 08, 2020

WO No: 39277

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

BELFAST RD

TREMBLAY RD

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	12	3	1	16	1	2	0	3	19	0	0	0	0	0	0	1	1	1	20
07:15 07:30	5	2	0	7	1	1	0	2	9	2	0	0	2	0	0	1	1	3	12
07:30 07:45	0	6	1	7	1	0	0	1	8	0	1	1	2	0	0	2	2	4	12
07:45 08:00	0	2	0	2	0	1	0	1	3	0	1	0	1	0	1	1	2	3	6
08:00 08:15	1	0	0	1	1	0	0	1	2	1	0	1	2	0	0	1	1	3	5
08:15 08:30	2	1	0	3	0	1	0	1	4	0	0	0	0	0	0	1	1	1	5
08:30 08:45	2	5	0	7	2	4	1	7	14	1	0	2	3	0	1	1	2	5	19
08:45 09:00	3	0	0	3	0	4	0	4	7	0	0	1	1	0	1	3	4	5	12
09:00 09:15	3	9	0	12	1	1	0	2	14	2	1	2	5	1	1	1	3	8	22
09:15 09:30	2	6	0	8	1	2	0	3	11	3	0	2	5	1	1	2	4	9	20
09:30 09:45	1	2	0	3	0	11	0	11	14	2	0	0	2	0	1	0	1	3	17
09:45 10:00	0	2	0	2	1	4	0	5	7	3	0	0	3	1	1	1	3	6	13
11:30 11:45	2	3	0	5	1	3	1	5	10	0	0	3	3	0	0	0	0	3	13
11:45 12:00	1	0	0	1	0	0	1	1	2	3	0	2	5	0	0	3	3	8	10
12:00 12:15	2	1	0	3	2	2	0	4	7	0	3	2	5	0	0	0	0	5	12
12:15 12:30	2	0	1	3	0	1	1	2	5	1	1	2	4	2	1	1	4	8	13
12:30 12:45	0	4	0	4	1	2	0	3	7	1	1	4	6	2	1	0	3	9	16
12:45 13:00	0	3	1	4	0	1	1	2	6	0	0	2	2	0	0	1	1	3	9
13:00 13:15	3	3	0	6	1	1	0	2	8	0	1	1	2	0	1	1	2	4	12
13:15 13:30	0	0	0	0	0	5	0	5	5	0	0	1	1	0	2	2	4	5	10
15:00 15:15	5	5	0	10	1	2	0	3	13	0	1	5	6	0	0	0	0	6	19
15:15 15:30	1	4	0	5	0	3	0	3	8	0	0	3	3	0	3	2	5	8	16
15:30 15:45	0	1	0	1	1	1	0	2	3	1	1	4	6	0	4	1	5	11	14
15:45 16:00	0	1	0	1	0	2	1	3	4	2	2	2	6	0	2	2	4	10	14
16:00 16:15	0	2	0	2	2	2	0	4	6	2	2	5	9	0	1	0	1	10	16
16:15 16:30	0	6	0	6	0	0	0	0	6	0	1	0	1	0	0	1	1	2	8
16:30 16:45	0	5	0	5	2	2	0	4	9	1	0	7	8	0	1	1	2	10	19
16:45 17:00	0	2	0	2	1	0	1	2	4	1	2	4	7	0	0	1	1	8	12
17:00 17:15	1	1	0	2	1	2	0	3	5	1	0	1	2	0	0	0	0	2	7
17:15 17:30	0	1	1	2	1	0	0	1	3	0	0	2	2	0	0	1	1	3	6
17:30 17:45	1	0	0	1	1	0	0	1	2	0	0	0	0	0	1	0	1	1	3
17:45 18:00	0	0	0	0	1	1	0	2	2	1	0	1	2	0	0	1	1	3	5
Total: None	49	80	5	134	25	61	7	93	227	28	18	60	106	7	24	33	64	170	397



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BELFAST RD @ TREMBLAY RD

Survey Date: Wednesday, January 08, 2020

WO No: 39277

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

BELFAST RD

TREMBLAY RD

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	1	0	0	0	1
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		1	0	0	0	1

Turning Movement Count - Study Results

TREMBLAY RD @ TRAIN STATION

Survey Date: Wednesday, January 30, 2019

Start Time: 07:00

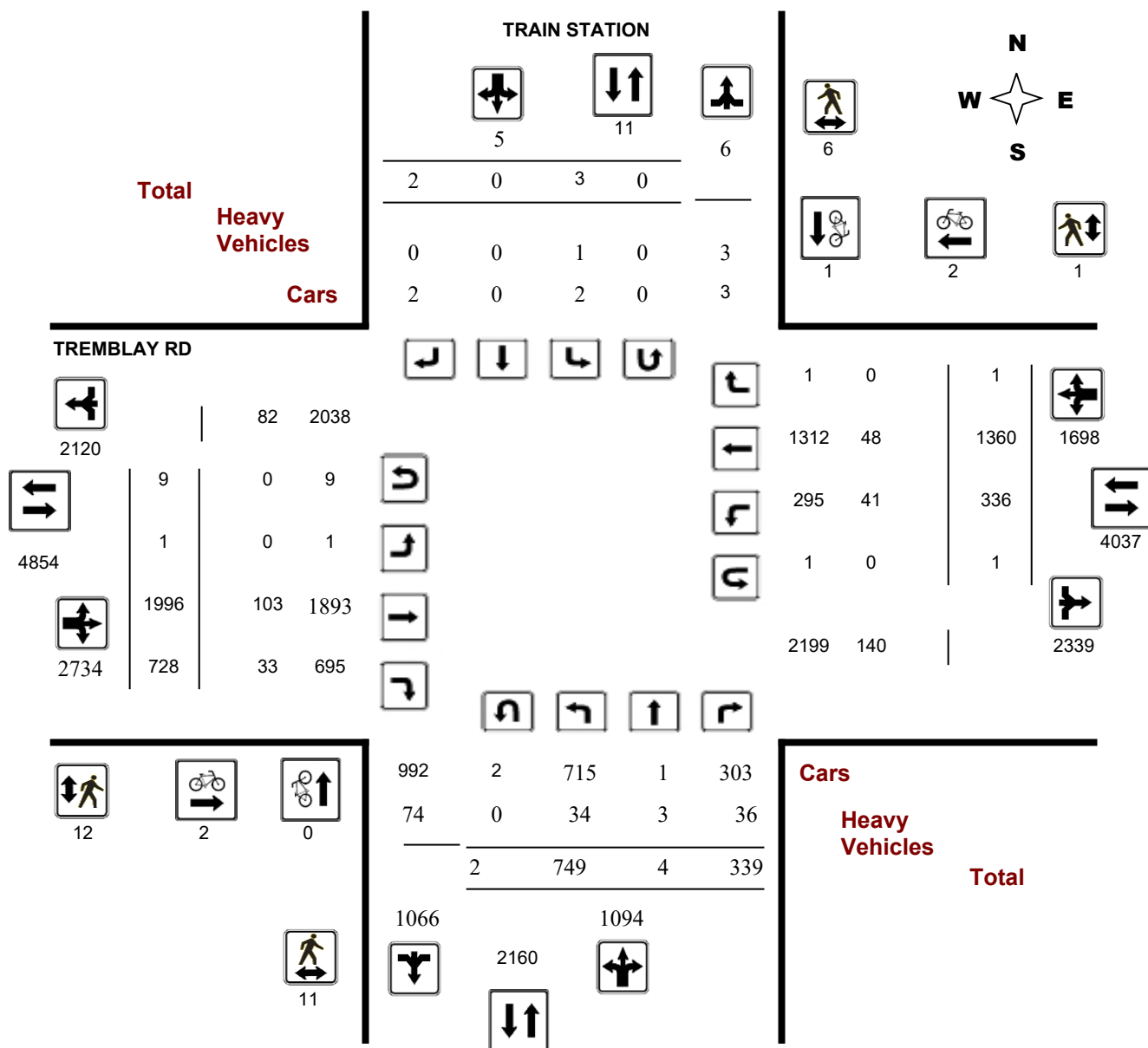
WO No:

38347

Device:

Miovision

Full Study Diagram



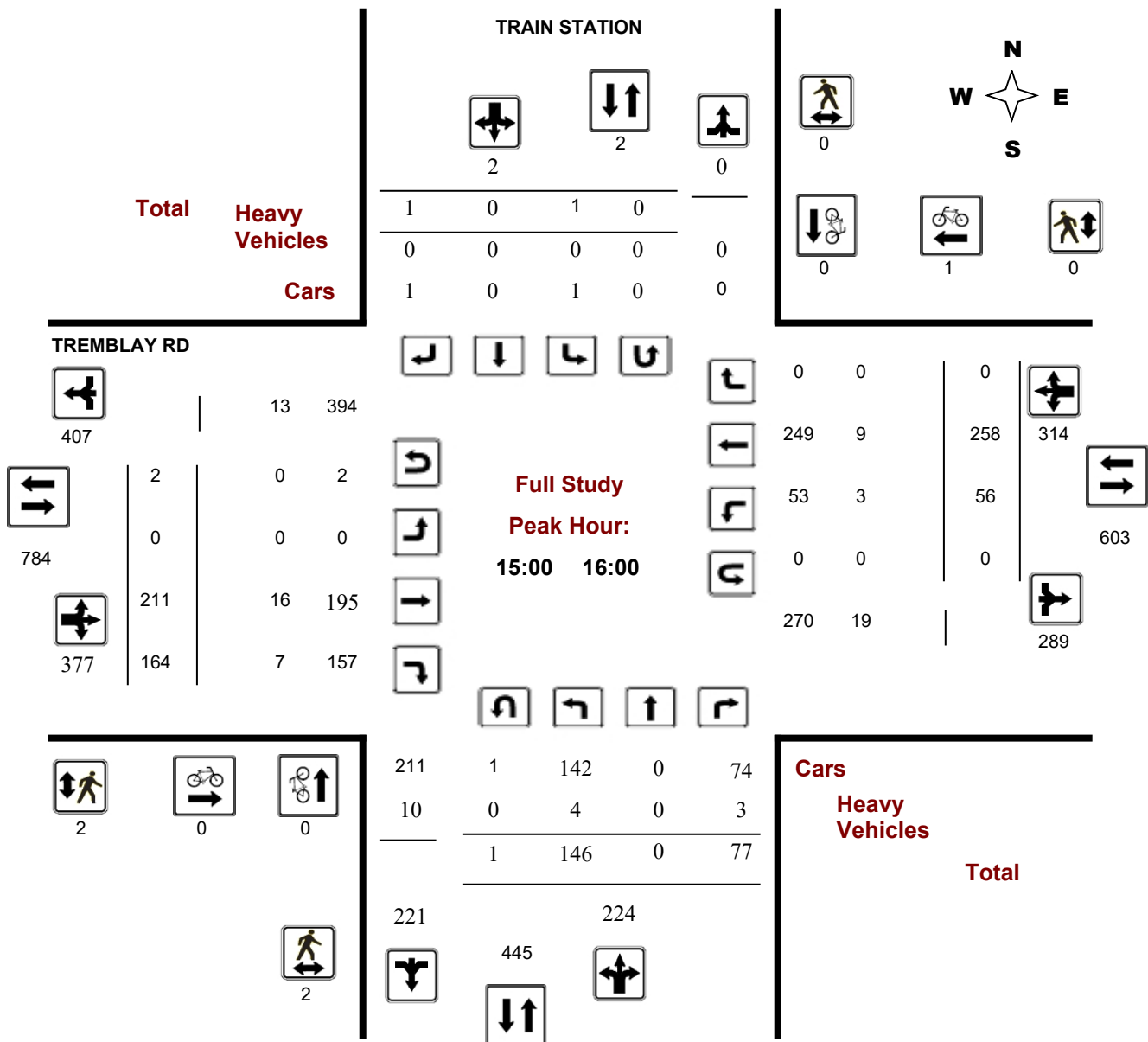
Survey Date: Wednesday, January 30, 2019

WO No: 38347

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



Turning Movement Count - Peak Hour Diagram

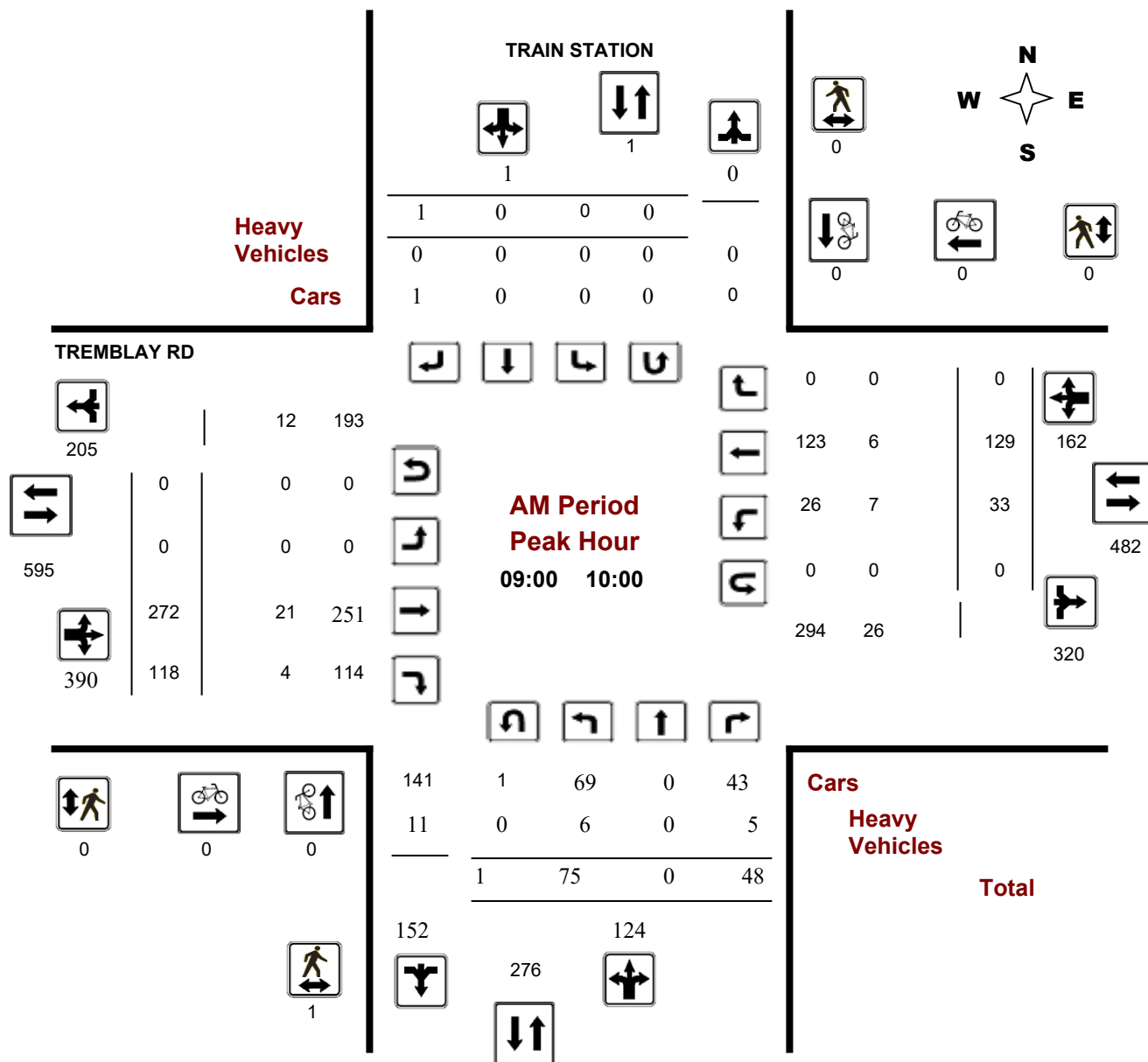
TREMBLAY RD @ TRAIN STATION

Survey Date: Wednesday, January 30, 2019

Start Time: 07:00

WO No: 38347

Device: Miovision



Turning Movement Count - Peak Hour Diagram

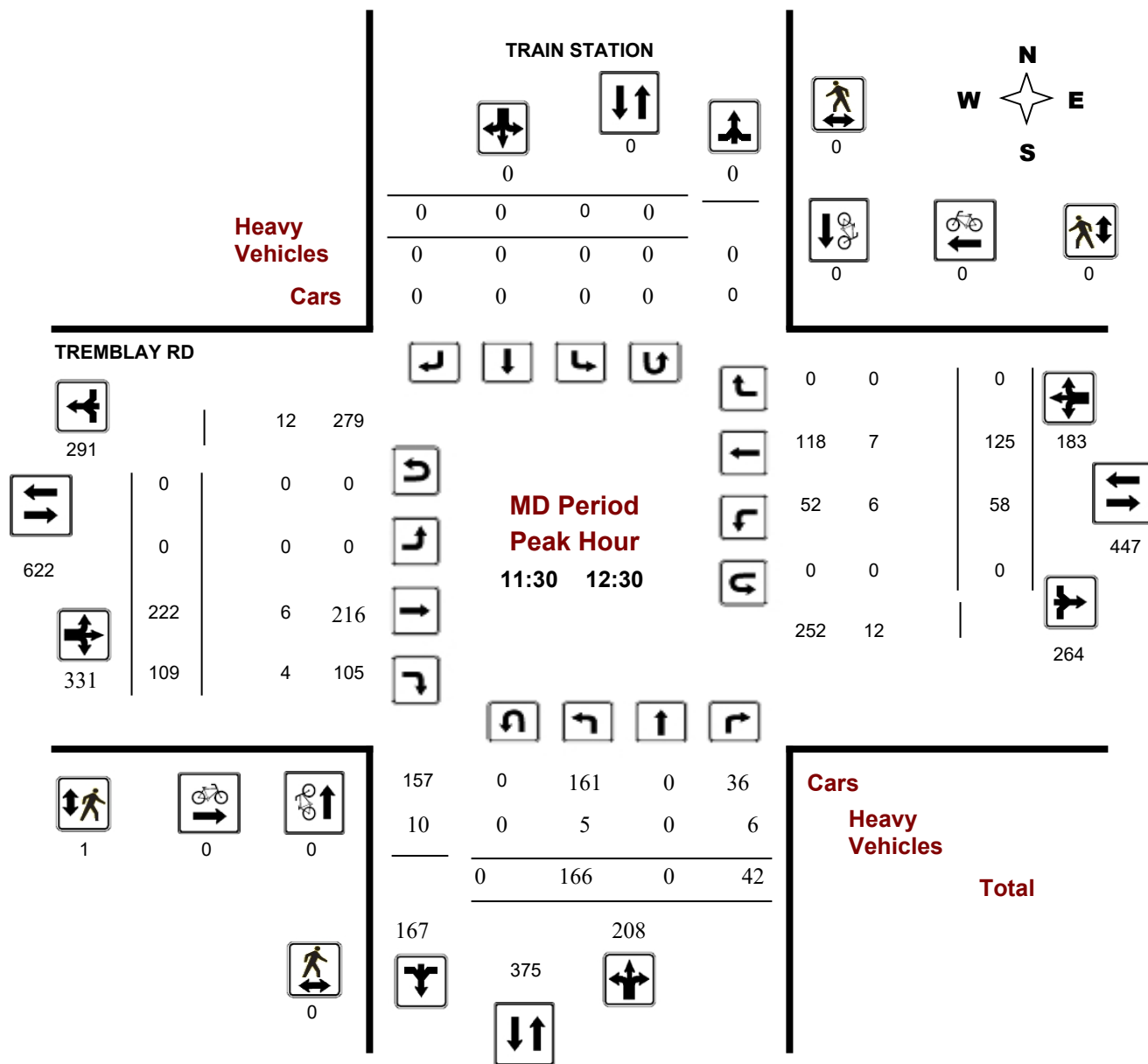
TREMBLAY RD @ TRAIN STATION

Survey Date: Wednesday, January 30, 2019

Start Time: 07:00

WO No: 38347

Device: Miovision



Turning Movement Count - Peak Hour Diagram

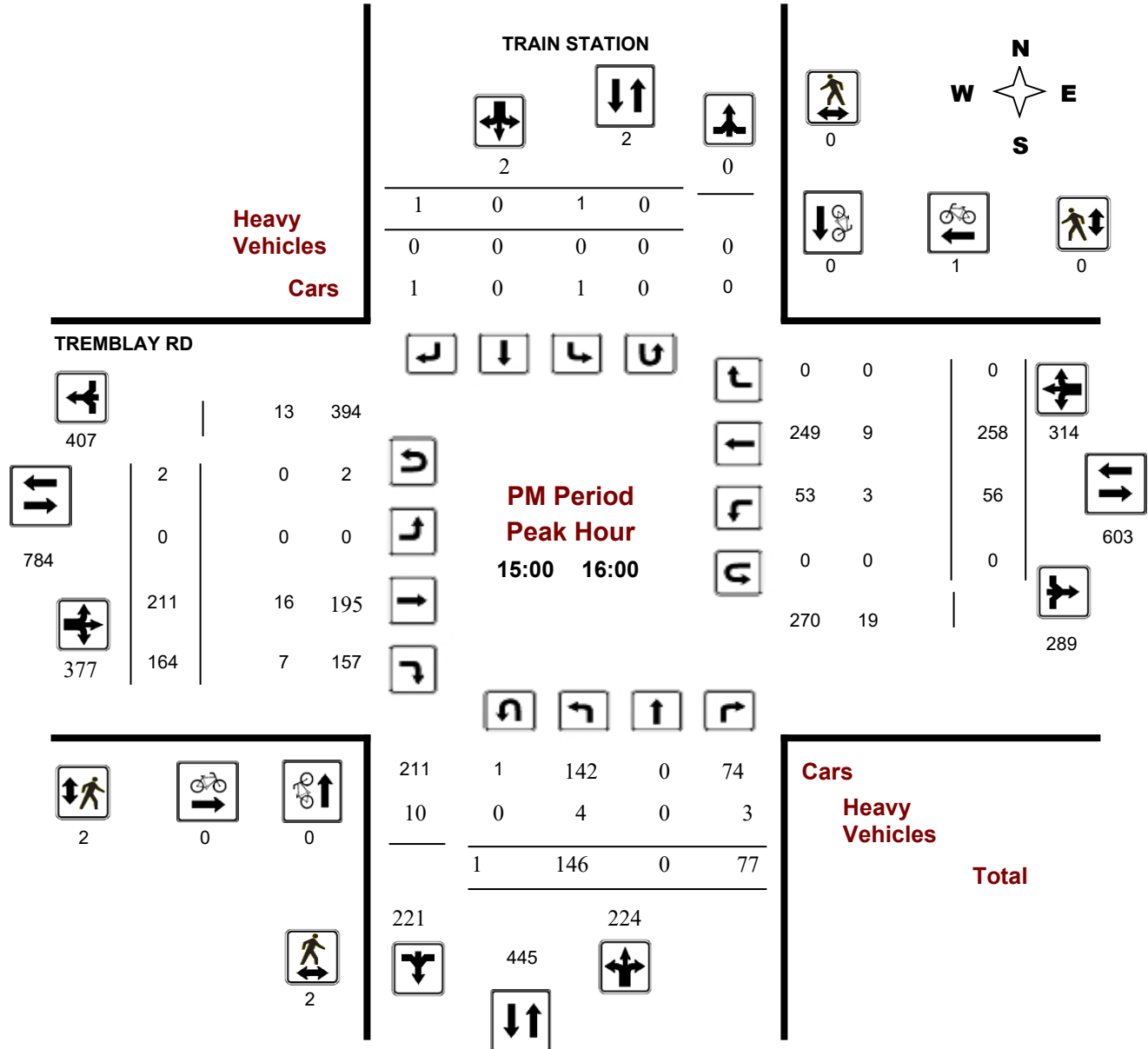
TREMBLAY RD @ TRAIN STATION

Survey Date: Wednesday, January 30, 2019

Start Time: 07:00

WO No: 38347

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

TREMBLAY RD @ TRAIN STATION

Survey Date: Wednesday, January 30, 2019

WO No: 38347

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, January 30, 201

Total Observed U-Turns

AADT Factor

Northbound: 2 Southbound: 0

1.00

Eastbound: 9 Westbound: 1

TRAIN STATION

TREMBLAY RD

Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT		LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT		LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	26	0	22	48		0	0	0	0	48	0	266	28	294		24	164	0	188	482	530
08:00 09:00	79	4	18	101		2	0	0	2	103	1	233	58	292		49	175	0	224	516	619
09:00 10:00	75	0	48	123		0	0	1	1	124	0	272	118	390		33	129	0	162	552	676
11:30 12:30	166	0	42	208		0	0	0	0	208	0	222	109	331		58	125	0	183	514	722
12:30 13:30	65	0	43	108		0	0	0	0	108	0	214	73	287		37	138	0	175	462	570
15:00 16:00	146	0	77	223		1	0	1	2	225	0	211	164	375		56	258	0	314	689	914
16:00 17:00	95	0	45	140		0	0	0	0	140	0	284	85	369		35	211	0	246	615	755
17:00 18:00	97	0	44	141		0	0	0	0	141	0	294	93	387		44	160	1	205	592	733
Sub Total	749	4	339	1092		3	0	2	5	1097	1	1996	728	2725		336	1360	1	1697	4422	5519
U Turns				2					0	2				9					1	10	12
Total	749	4	339	1094		3	0	2	5	1099	1	1996	728	2734		336	1360	1	1698	4432	5531
EQ 12Hr	1041	6	471	1521		4	0	3	7	1528	1	2774	1012	3800		467	1890	1	2360	6160	7688
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														1.39							
AVG 12Hr	981	5	444	1433		4	0	3	7	1528	1	2615	954	3582		440	1782	1	2224	6160	7688
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														1							
AVG 24Hr	1285	7	582	1877		5	0	3	9	1886	2	3425	1249	4692		577	2334	2	2914	7606	9492

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.

1.31

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

TREMBLAY RD @ TRAIN STATION

Survey Date: Wednesday, January 30, 2019

WO No: 38347

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

TRAIN STATION

TREMBLAY RD

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total	
07:00	07:15	10	0	10	20	0	0	0	0	1	0	56	11	67	6	25	0	31	1	118
07:15	07:30	8	0	3	11	0	0	0	0	3	0	54	6	60	2	36	0	38	3	109
07:30	07:45	4	0	6	10	0	0	0	0	4	0	76	3	79	9	50	0	59	4	148
07:45	08:00	4	0	3	7	0	0	0	0	2	0	80	8	88	7	53	0	60	2	155
08:00	08:15	2	0	3	5	1	0	0	1	2	1	69	14	84	4	41	0	45	2	135
08:15	08:30	7	1	2	10	1	0	0	1	1	0	58	13	71	7	49	0	56	1	138
08:30	08:45	45	3	6	54	0	0	0	0	6	0	44	18	62	24	45	0	69	6	185
08:45	09:00	25	0	7	32	0	0	0	0	0	0	62	13	75	14	40	0	55	0	162
09:00	09:15	12	0	4	16	0	0	0	0	2	0	78	14	92	6	38	0	44	2	152
09:15	09:30	20	0	11	31	0	0	0	0	4	0	66	24	90	10	28	0	38	4	159
09:30	09:45	15	0	15	31	0	0	1	1	3	0	64	31	95	11	33	0	44	3	171
09:45	10:00	28	0	18	46	0	0	0	0	2	0	64	49	113	6	30	0	36	2	195
11:30	11:45	18	0	9	27	0	0	0	0	4	0	70	30	100	9	29	0	38	4	165
11:45	12:00	47	0	10	57	0	0	0	0	4	0	51	27	78	23	30	0	53	4	188
12:00	12:15	39	0	16	55	0	0	0	0	1	0	45	26	71	11	35	0	46	1	172
12:15	12:30	62	0	7	69	0	0	0	0	2	0	56	26	82	15	31	0	46	2	197
12:30	12:45	21	0	8	29	0	0	0	0	2	0	45	21	66	10	35	0	45	2	140
12:45	13:00	16	0	9	25	0	0	0	0	5	0	64	10	75	10	32	0	42	5	142
13:00	13:15	12	0	9	21	0	0	0	0	1	0	64	14	78	9	36	0	45	1	144
13:15	13:30	16	0	17	33	0	0	0	0	4	0	41	28	69	8	35	0	43	4	145
15:00	15:15	28	0	19	48	0	0	0	0	1	0	58	39	98	10	66	0	76	1	222
15:15	15:30	27	0	17	44	0	0	0	0	4	0	47	42	89	10	64	0	74	4	207
15:30	15:45	20	0	17	37	1	0	0	1	1	0	57	46	103	13	75	0	88	1	229
15:45	16:00	71	0	24	95	0	0	1	1	1	0	49	37	87	23	53	0	76	1	259
16:00	16:15	18	0	7	25	0	0	0	0	3	0	62	15	79	5	61	0	66	3	170
16:15	16:30	12	0	6	18	0	0	0	0	3	0	61	25	86	6	54	0	60	3	164
16:30	16:45	7	0	9	16	0	0	0	0	1	0	68	17	88	13	55	0	68	1	172
16:45	17:00	58	0	23	81	0	0	0	0	3	0	93	28	121	11	41	0	52	3	254
17:00	17:15	46	0	14	60	0	0	0	0	1	0	109	22	131	25	45	0	70	1	261
17:15	17:30	21	0	8	29	0	0	0	0	1	0	88	22	110	4	50	0	54	1	193
17:30	17:45	8	0	9	17	0	0	0	0	1	0	46	16	63	9	31	0	40	1	120
17:45	18:00	22	0	13	35	0	0	0	0	1	0	51	33	84	6	34	1	41	1	160
Total:		749	4	339	1094	3	0	2	5	74	1	1996	728	2734	336	1360	1	1698	74	5,531

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

TREMBLAY RD @ TRAIN STATION

Survey Date: Wednesday, January 30, 2019

WO No: 38347

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

		TRAIN STATION			TREMBLAY RD			Grand Total
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
07:00	07:15	0	0	0	0	0	0	0
07:15	07:30	0	0	0	0	0	0	0
07:30	07:45	0	0	0	1	0	1	1
07:45	08:00	0	0	0	1	0	1	1
08:00	08:15	0	0	0	0	0	0	0
08:15	08:30	0	0	0	0	0	0	0
08:30	08:45	0	0	0	0	0	0	0
08:45	09:00	0	0	0	0	0	0	0
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	1	1	1
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	1	1	1
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	0	1	1	0	0	0	1
Total		0	1	1	2	2	4	5



Transportation Services - Traffic Services

Turning Movement Count - Study Results

TREMBLAY RD @ TRAIN STATION

Survey Date: Wednesday, January 30, 2019

WO No: 38347

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

TRAIN STATION

TREMBLAY RD

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	1	0	1	1
07:15 07:30	1	0	1	0	0	0	1
07:30 07:45	0	0	0	1	0	1	1
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	1	0	1	0	0	0	1
08:30 08:45	2	0	2	0	0	0	2
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	1	0	1	0	0	0	1
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	1	0	1	1
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	1	0	1	0	0	0	1
15:15 15:30	0	0	0	2	0	2	2
15:30 15:45	1	0	1	0	0	0	1
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	1	1	2	1	0	1	3
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	1	0	1	1	0	1	2
16:45 17:00	0	0	0	1	0	1	1
17:00 17:15	1	0	1	1	1	2	3
17:15 17:30	0	2	2	1	0	1	3
17:30 17:45	1	1	2	1	0	1	3
17:45 18:00	0	2	2	1	0	1	3
Total	11	6	17	12	1	13	30



Transportation Services - Traffic Services

Turning Movement Count - Study Results

TREMBLAY RD @ TRAIN STATION

Survey Date: Wednesday, January 30, 2019

WO No: 38347

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

TRAIN STATION

TREMBLAY RD

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	0	0	1	1	0	0	0	0	1	0	1	1	2	1	2	0	3	5	6
07:15 07:30	2	0	1	3	0	0	0	0	3	0	0	1	1	0	3	0	3	4	7
07:30 07:45	2	0	2	4	0	0	0	0	4	0	0	1	1	2	4	0	6	7	11
07:45 08:00	1	0	1	2	0	0	0	0	2	0	1	2	3	1	4	0	5	8	10
08:00 08:15	1	0	0	1	1	0	0	1	2	0	5	0	5	1	1	0	2	7	9
08:15 08:30	1	0	0	1	0	0	0	0	1	0	1	0	1	2	0	0	2	3	4
08:30 08:45	1	3	2	6	0	0	0	0	6	0	1	2	3	4	0	0	4	7	13
08:45 09:00	0	0	0	0	0	0	0	0	0	0	4	0	4	0	1	0	1	5	5
09:00 09:15	1	0	1	2	0	0	0	0	2	0	7	1	8	1	1	0	2	10	12
09:15 09:30	2	0	2	4	0	0	0	0	4	0	5	2	7	2	1	0	3	10	14
09:30 09:45	2	0	1	3	0	0	0	0	3	0	2	0	2	1	1	0	2	4	7
09:45 10:00	1	0	1	2	0	0	0	0	2	0	7	1	8	3	3	0	6	14	16
11:30 11:45	1	0	3	4	0	0	0	0	4	0	2	3	5	1	2	0	3	8	12
11:45 12:00	1	0	3	4	0	0	0	0	4	0	3	1	4	2	3	0	5	9	13
12:00 12:15	1	0	0	1	0	0	0	0	1	0	0	0	0	1	1	0	2	2	3
12:15 12:30	2	0	0	2	0	0	0	0	2	0	1	0	1	2	1	0	3	4	6
12:30 12:45	1	0	1	2	0	0	0	0	2	0	0	1	1	1	2	0	3	4	6
12:45 13:00	0	0	5	5	0	0	0	0	5	0	4	3	7	1	0	0	1	8	13
13:00 13:15	1	0	0	1	0	0	0	0	1	0	6	0	6	2	2	0	4	10	11
13:15 13:30	1	0	3	4	0	0	0	0	4	0	4	1	5	2	1	0	3	8	12
15:00 15:15	1	0	0	1	0	0	0	0	1	0	3	2	5	1	2	0	3	8	9
15:15 15:30	2	0	2	4	0	0	0	0	4	0	4	2	6	1	3	0	4	10	14
15:30 15:45	1	0	0	1	0	0	0	0	1	0	4	3	7	1	2	0	3	10	11
15:45 16:00	0	0	1	1	0	0	0	0	1	0	5	0	5	0	2	0	2	7	8
16:00 16:15	2	0	1	3	0	0	0	0	3	0	2	1	3	2	1	0	3	6	9
16:15 16:30	1	0	2	3	0	0	0	0	3	0	7	2	9	1	0	0	1	10	13
16:30 16:45	1	0	0	1	0	0	0	0	1	0	4	0	4	2	1	0	3	7	8
16:45 17:00	2	0	1	3	0	0	0	0	3	0	4	1	5	1	1	0	2	7	10
17:00 17:15	0	0	1	1	0	0	0	0	1	0	3	1	4	0	0	0	0	4	5
17:15 17:30	1	0	0	1	0	0	0	0	1	0	9	0	9	1	2	0	3	12	13
17:30 17:45	1	0	0	1	0	0	0	0	1	0	3	1	4	1	0	0	1	5	6
17:45 18:00	0	0	1	1	0	0	0	0	1	0	1	0	1	0	1	0	1	2	3
Total: None	34	3	36	73	1	0	0	1	74	0	103	33	136	41	48	0	89	225	299



Transportation Services - Traffic Services

Turning Movement Count - Study Results

TREMBLAY RD @ TRAIN STATION

Survey Date: Wednesday, January 30, 2019

WO No: 38347

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

TRAIN STATION

TREMBLAY RD

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	1	1
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	1	0	0	0	1
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	1	0	1
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	1	0	1	0	2
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	1	0	1
16:00	16:15	0	0	2	0	2
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	3	0	3
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	1	0	1
17:45	18:00	0	0	0	0	0
Total		2	0	9	1	12

C

Appendix C Collision Data

Total Area

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	9	5	3	4	2	2	0	25
02 - Non-fatal inj	0	2	1	0	3	0	0	0	6
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	11	6	3	7	2	2	0	31
	#7 or 0%	#1 or 35%	#3 or 19%	#4 or 10%	#2 or 23%	#5 or 6%	#5 or 6%	#7 or 0%	

81%
19%
0%
100%

BELFAST RD @ TREMBLAY RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	8	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	1	1	1	1	0	0	0	4
02 - Non-fatal inj	0	1	1	0	2	0	0	0	4
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	2	2	1	3	0	0	0	8
	0%	25%	25%	13%	38%	0%	0%	0%	

50%
50%
0%
100%

TREMBLAY RD @ TRAIN STATION

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	5	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	1	0	1	1	0	1	0	4
02 - Non-fatal inj	0	1	0	0	0	0	0	0	1
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	2	0	1	1	0	1	0	5
	0%	40%	0%	20%	20%	0%	20%	0%	

80%
20%
0%
100%

AVENUE L @ TREMBLAY RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	3	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	1	0	0	2	0	0	0	3
02 - Non-fatal inj	0	0	0	0	0	0	0	0	0
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	2	0	0	0	3
	0%	33%	0%	0%	67%	0%	0%	0%	

100%
0%
0%
100%

TREMBLAY RD btwn RIVERSIDE DR & TRAIN STATION

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	5	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	2	1	1	0	0	1	0	5
02 - Non-fatal inj	0	0	0	0	0	0	0	0	0
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	2	1	1	0	0	1	0	5
	0%	40%	20%	20%	0%	0%	20%	0%	

100%
0%
0%
100%

PICKERING PL @ TREMBLAY RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	4	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	4	0	0	0	0	0	0	4
02 - Non-fatal inj	0	0	0	0	0	0	0	0	0
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	4	0	0	0	0	0	0	4
	0%	100%	0%	0%	0%	0%	0%	0%	

100%
0%
0%
100%

AVENUE L btwn TREMBLAY RD & END

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	2	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	0	0	0	0	2	0	0	2
02 - Non-fatal inj	0	0	0	0	0	0	0	0	0
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	0	2
	0%	0%	0%	0%	0%	100%	0%	0%	

100%
0%
0%
100%

TREMBLAY RD btwn AVENUE K & AVENUE L

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	1	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	0	1	0	0	0	0	0	1
02 - Non-fatal inj	0	0	0	0	0	0	0	0	0
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	0	0	0	1
	0%	0%	100%	0%	0%	0%	0%	0%	

100%
0%
0%
100%

AVENUE K @ TREMBLAY RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	3	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	0	2	0	0	0	0	0	2
02 - Non-fatal inj	0	0	0	0	1	0	0	0	1
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	0	2	0	1	0	0	0	3
	0%	0%	67%	0%	33%	0%	0%	0%	

67%
33%
0%
100%

FID	Location	X	Y	Longitude	Latitude	Year	Date	Time	Classificat	Impact_Typ	Environmen	Light	Road_Surfa	Traffic_Co	Traffic__1	No_of_Peds
2187	BELFAST RD @ TREMBLAY RD	371558.744	5031320.507	-75.64699148	45.41863453	2018	6/27/2018 0:00	8:53:00 PM	02 - Non-fatal injury	03 - Rear end	99 - Other	05 - Dusk	02 - Wet	01 - Traffic signal	01 - Functioning	0
5991	TREMBLAY RD @ TRAIN STATION	371168.4496	5031284.46	-75.65198276	45.41834732	2018	2/12/2018 0:00	12:21:00 PM	02 - Non-fatal injury	02 - Angle	01 - Clear	01 - Daylight	02 - Wet	01 - Traffic signal	01 - Functioning	0
11499	BELFAST RD @ TREMBLAY RD	371558.744	5031320.747	-75.64699145	45.41863669	2018	11/16/2018 0:00	3:14:00 PM	03 - P.D. only	02 - Angle	03 - Snow	01 - Daylight	03 - Loose snow	01 - Traffic signal	01 - Functioning	0
13140	TREMBLAY RD @ TRAIN STATION	371168.2123	5031283.985	-75.65198586	45.41834307	2018	12/11/2018 0:00	12:55:00 PM	03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	02 - Wet	01 - Traffic signal	01 - Functioning	0
13246	AVENUE L @ TREMBLAY RD	371495.8956	5031313.616	-75.64779537	45.41857851	2018	11/22/2018 0:00	5:34:00 PM	03 - P.D. only	05 - Turning movement	01 - Clear	07 - Dark	03 - Loose snow	02 - Stop sign	00 - Unknown	0
15473	AVENUE L @ TREMBLAY RD	371495.375	5031313	-75.64780426	45.41857147	2017	4/3/2017 0:00	10:02 PM	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign		0
20585	BELFAST RD @ TREMBLAY RD	371558.1875	5031320	-75.64699554	45.41862869	2017	7/21/2017 0:00	10:00 PM	03 - P.D. only	04 - Sideswipe	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal		0
20592	BELFAST RD @ TREMBLAY RD	371559.1875	5031320	-75.64698792	45.41862869	2017	8/24/2017 0:00	10:56 PM	02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal		0
20595	BELFAST RD @ TREMBLAY RD	371557.625	5031321	-75.64700317	45.41863632	2017	10/18/2017 0:00	9:51 PM	03 - P.D. only	03 - Rear end	01 - Clear	05 - Dusk	01 - Dry	01 - Traffic signal		0
20598	BELFAST RD @ TREMBLAY RD	371558.25	5031321.5	-75.64699554	45.41864014	2017	12/31/2017 0:00	3:33 PM	03 - P.D. only	05 - Turning movement	01 - Clear	01 - Daylight	02 - Wet	01 - Traffic signal		0
28819	TREMBLAY RD @ TRAIN STATION	371168.4375	5031284.5	-75.65198517	45.41834641	2017	12/25/2017 0:00	12:17 PM	03 - P.D. only	07 - SMV other	03 - Snow	03 - Dawn	03 - Loose snow	01 - Traffic signal		0
28820	TREMBLAY RD btwn RIVERSIDE DR & TRAIN STATION	371099.3438	5031271	-75.65287018	45.41823196	2017	9/5/2017 0:00	11:00 PM	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	10 - No control		0
30861	TREMBLAY RD btwn RIVERSIDE DR & TRAIN STATION	370892.0313	5031043	-75.6555481	45.41619873	2016	9/15/2016 0:00	9:00:00 PM	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	10 - No control		0
31155	PICKERING PL @ TREMBLAY RD	371287.9375	5031298.5	-75.65045166	45.41846085	2016	1/21/2016 0:00	8:02:00 PM	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	02 - Wet	02 - Stop sign	01 - Functioning	0
32031	TREMBLAY RD btwn RIVERSIDE DR & TRAIN STATION	370853.6563	5031017.5	-75.65604401	45.41597386	2016	8/12/2016 0:00	9:15:00 PM	03 - P.D. only	07 - SMV other	02 - Rain	01 - Daylight	02 - Wet	10 - No control		0
33125	PICKERING PL @ TREMBLAY RD	371288.8438	5031299.5	-75.65044403	45.41847229	2016	7/12/2016 0:00	9:26:00 PM	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign	01 - Functioning	0
33139	PICKERING PL @ TREMBLAY RD	371286.5938	5031298	-75.65047455	45.41846085	2016	7/12/2016 0:00	10:11:00 PM	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign	01 - Functioning	0
33427	BELFAST RD @ TREMBLAY RD	371558.5	5031319.5	-75.64699554	45.41862869	2016	7/7/2016 0:00	4:58:00 PM	02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
33900	AVENUE L btwn TREMBLAY RD & END	371513.9375	5031153	-75.64758301	45.41713333	2016	7/12/2016 0:00	5:00:00 AM	03 - P.D. only	06 - SMV unattended vehicle	01 - Clear	00 - Unknown	01 - Dry	10 - No control		0
36498	TREMBLAY RD btwn AVENUE K & AVENUE L	371457.4688	5031309.5	-75.64826491	45.41854477	2016	4/14/2016 0:00	6:12:00 PM	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	01 - Dry	10 - No control		0
37815	BELFAST RD @ TREMBLAY RD	371551.3438	5031320.5	-75.6470871	45.41863632	2016	11/24/2016 0:00	1:28:00 PM	02 - Non-fatal injury	02 - Angle	02 - Rain	01 - Daylight	02 - Wet	01 - Traffic signal	01 - Functioning	0
38085	AVENUE L btwn TREMBLAY RD & END	371496.8125	5031307.5	-75.64778137	45.4185257	2016	10/14/2016 0:00	3:14:00 PM	03 - P.D. only	06 - SMV unattended vehicle	01 - Clear	01 - Daylight	01 - Dry	10 - No control		0
39574	PICKERING PL @ TREMBLAY RD	371287.9375	5031299	-75.65045166	45.41846466	2016	5/1/2016 0:00	4:08:00 PM	03 - P.D. only	02 - Angle	02 - Rain	01 - Daylight	02 - Wet	02 - Stop sign	01 - Functioning	0
49740	TREMBLAY RD btwn RIVERSIDE DR & TRAIN STATION	370825.9063	5031016	-75.65639496	45.41596222	2015	1/9/2015 0:00	11:24 PM	03 - P.D. only	04 - Sideswipe	01 - Clear	07 - Dark	01 - Dry	10 - No control		0
51492	TREMBLAY RD @ TRAIN STATION	371169.9063	5031286.5	-75.65196228	45.41836166	2015	10/6/2015 0:00	11:21 AM	03 - P.D. only	02 - Angle	01 - Clear	07 - Dark	01 - Dry	01 - Traffic signal	01 - Functioning	0
58314	AVENUE K @ TREMBLAY RD	371426.4375	5031307	-75.64868164	45.41852188	2014	1/3/2014 0:00	2:00 PM	03 - P.D. only	03 - Rear end	01 - Clear	01 - Daylight	06 - Ice	02 - Stop sign	00 - Unknown	0
59174	AVENUE K @ TREMBLAY RD	371426.6563	5031307	-75.64868164	45.4185257	2014	2/27/2014 0:00	11:50 AM	03 - P.D. only	03 - Rear end	03 - Snow	03 - Dawn	04 - Slush	02 - Stop sign	00 - Unknown	0
59484	AVENUE K @ TREMBLAY RD	371425.3125	5031305.5	-75.64868969	45.41851425	2014	2/20/2014 0:00	3:54 PM	02 - Non-fatal injury	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign	00 - Unknown	0
62442	TREMBLAY RD @ TRAIN STATION	371167.0313	5031283.5	-75.65200043	45.41833878	2014	3/26/2014 0:00	1:00 PM	03 - P.D. only	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	01 - Traffic signal	01 - Functioning	0
62890	AVENUE L @ TREMBLAY RD	371496.1875	5031314.5	-75.647789	45.41858673	2014	4/2/2014 0:00	2:24 PM	03 - P.D. only	05 - Turning movement	01 - Clear	01 - Daylight	01 - Dry	02 - Stop sign	00 - Unknown	0
63321	TREMBLAY RD btwn RIVERSIDE DR & TRAIN STATION	371127.75	5031278.5	-75.65250397	45.41829681	2014	7/24/2014 0:00	10:31 PM	03 - P.D. only	02 - Angle	01 - Clear	01 - Daylight	01 - Dry	10 - No control		0

D

Appendix D

Excerpts from 530 Tremblay and Adjacent to 530
Tremblay

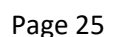
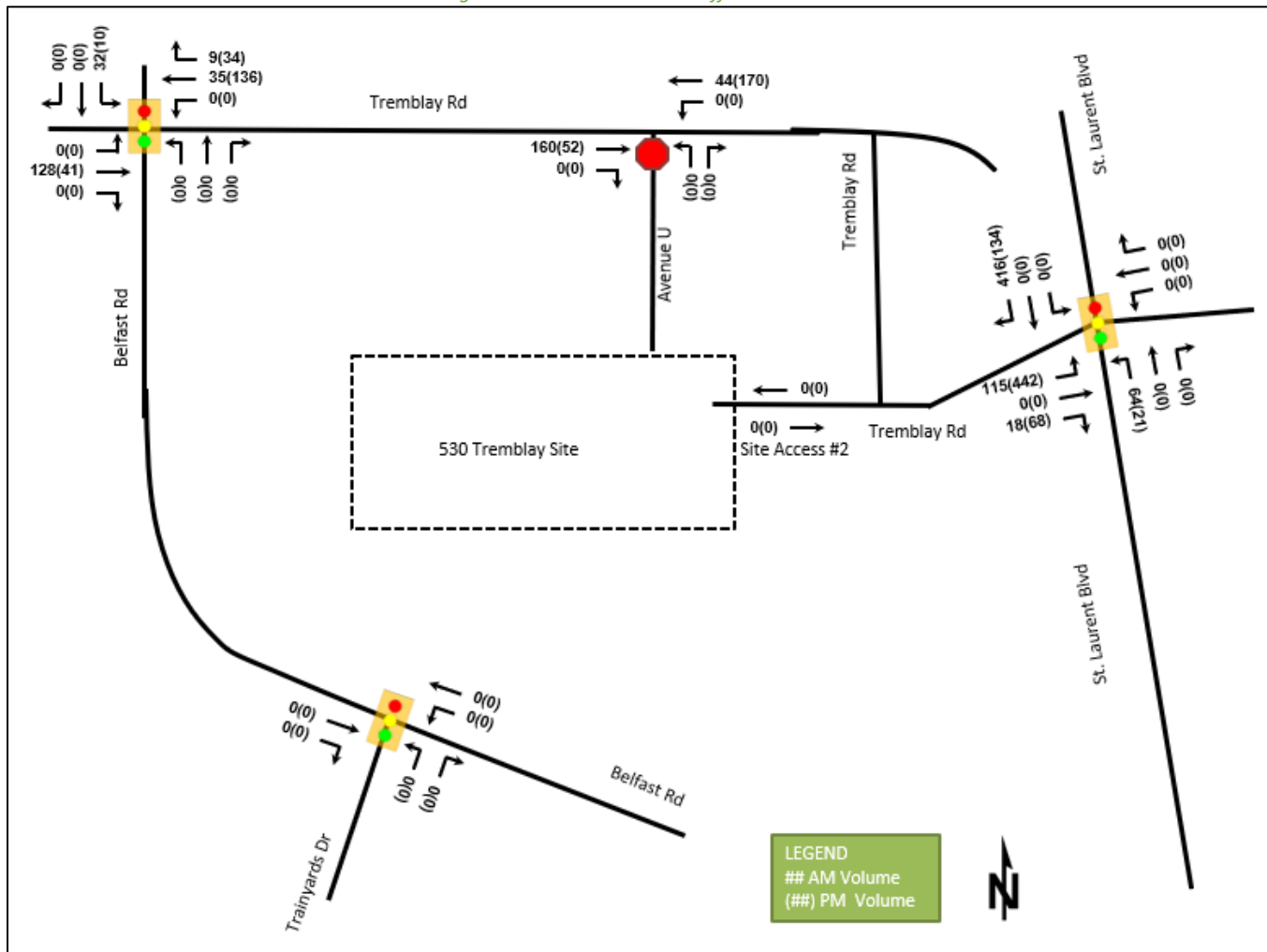


Figure 12: Site-Generated Traffic Volumes



Directly to the east of the proposed development is another property owned by CLV. The connection between the proposed development and the Canada Lands Company development will pass through this land parcel. The timing and use of this property is currently unknown.

Additionally, a few development applications were available for the adjacent properties as listed on the City's Development Application Search tool:

- 500/525/535 Coventry Road & 1200 St. Laurent Boulevard – The City of Ottawa has received Zoning Bylaw Amendment applications to facilitate the potential expansion of the St. Laurent Shopping Centre. The plans for this area appear to be in the preliminary planning stages and as a result, the anticipated trip generation is currently unclear.
- 200/230/260 Steamline Street – seven apartment buildings totalling 1,845 units. 375 of these units are to be completed in 2019 as part of Phase 1, 865 units by 2025 as part of Phase 2 and 605 units in 2029 as part of phase 3. The Site Plan indicates 1,843 underground parking spaces and 189 surface parking spaces for tenants and visitors. The anticipated trip generation from this site can be seen in Figure 13, Figure 14, and Figure 15 for Phases 1, 2 and 3 respectively and are excerpts from OTY Residential Development 200, 230 & 260 Steamline Street – Transportation Impact Assessment prepared by D.J. Halpenny & Associates Ltd.

E

Appendix E

Existing and Background Conditions Output Data

Conditions

1: Via Rail & Tremblay Rd

2020 Existing AM.syn

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	272	118	33	129	75
Future Volume (vph)	272	118	33	129	75
Lane Group Flow (vph)	286	124	35	136	130
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	30.6
Total Split (s)	44.1	44.1	44.1	44.1	36.6
Total Split (%)	54.6%	54.6%	54.6%	54.6%	45.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	3.3
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.6
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	None
Act Effct Green (s)	48.2	48.2	48.2	48.2	13.2
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.20
v/c Ratio	0.11	0.11	0.05	0.05	0.35
Control Delay	3.7	1.2	4.1	3.7	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	1.2	4.1	3.7	17.5
LOS	A	A	A	A	B
Approach Delay	3.0			3.8	17.5
Approach LOS	A			A	B
Queue Length 50th (m)	5.3	0.0	1.2	2.4	9.1
Queue Length 95th (m)	10.2	4.5	4.1	5.4	21.0
Internal Link Dist (m)	89.5			96.8	14.3
Turn Bay Length (m)		55.0	50.0		
Base Capacity (vph)	2491	1146	754	2491	844
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.11	0.05	0.05	0.15

Intersection Summary

Cycle Length: 80.7

Actuated Cycle Length: 64.9

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 5.8

Intersection Capacity Utilization 35.0%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Via Rail & Tremblay Rd

↖ Ø2	→ Ø4
36.6 s	44.1 s
	↖ Ø8
	44.1 s

Conditions

1: Via Rail & Tremblay Rd

2020 Existing AM.syn

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	
Traffic Volume (vph)	272	118	33	129	75	48
Future Volume (vph)	272	118	33	129	75	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3353	1500	1676	3353	1622	
Flt Permitted	1.00	1.00	0.58	1.00	0.97	
Satd. Flow (perm)	3353	1500	1017	3353	1622	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	286	124	35	136	79	51
RTOR Reduction (vph)	0	35	0	0	40	0
Lane Group Flow (vph)	286	89	35	136	90	0
Turn Type	NA	Perm	Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	45.2	45.2	45.2	45.2	8.3	
Effective Green, g (s)	47.3	47.3	47.3	47.3	10.9	
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.16	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	2395	1071	726	2395	267	
v/s Ratio Prot	c0.09			0.04	c0.06	
v/s Ratio Perm		0.06	0.03			
v/c Ratio	0.12	0.08	0.05	0.06	0.34	
Uniform Delay, d1	2.9	2.9	2.8	2.8	24.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.2	0.1	0.0	0.8	
Delay (s)	3.1	3.0	2.9	2.9	25.2	
Level of Service	A	A	A	A	C	
Approach Delay (s)	3.0			2.9	25.2	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			7.1		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.16			
Actuated Cycle Length (s)			66.2		Sum of lost time (s)	8.0
Intersection Capacity Utilization			35.0%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

Conditions

2: Pickering PI & Tremblay Rd

2020 Existing AM.syn

					
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Traffic Volume (vph)	284	36	37	156	6
Future Volume (vph)	284	36	37	156	6
Lane Group Flow (vph)	299	38	39	164	23
Sign Control	Free			Free	Stop
Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 32.4%			ICU Level of Service A		
Analysis Period (min) 15					

Conditions

2: Pickering PI & Tremblay Rd

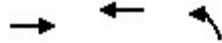
2020 Existing AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	284	36	37	156	6	16
Future Volume (Veh/h)	284	36	37	156	6	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	299	38	39	164	6	17
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	121			272		
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			337		459	299
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			303		429	264
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		99	98
cM capacity (veh/h)			1219		521	713
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	299	38	39	82	82	23
Volume Left	0	0	39	0	0	6
Volume Right	0	38	0	0	0	17
cSH	1700	1700	1219	1700	1700	651
Volume to Capacity	0.18	0.02	0.03	0.05	0.05	0.04
Queue Length 95th (m)	0.0	0.0	0.8	0.0	0.0	0.9
Control Delay (s)	0.0	0.0	8.1	0.0	0.0	10.7
Lane LOS			A			B
Approach Delay (s)	0.0		1.5			10.7
Approach LOS						B
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			32.4%		ICU Level of Service	A
Analysis Period (min)			15			

Conditions

3: Avenue K & Tremblay Rd

2020 Existing AM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	242	194	12
Future Volume (vph)	242	194	12
Lane Group Flow (vph)	311	283	40
Sign Control	Free	Free	Stop

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 45.3%

ICU Level of Service A

Analysis Period (min) 15

Conditions

3: Avenue K & Tremblay Rd

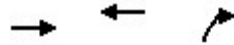
2020 Existing AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	242	53	75	194	12	26
Future Volume (Veh/h)	242	53	75	194	12	26
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	255	56	79	204	13	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	262			131		
pX, platoon unblocked						
vC, conflicting volume			311		645	283
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			311		645	283
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		97	96
cM capacity (veh/h)			1249		409	756
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	311	283	40			
Volume Left	0	79	13			
Volume Right	56	0	27			
cSH	1700	1249	593			
Volume to Capacity	0.18	0.06	0.07			
Queue Length 95th (m)	0.0	1.6	1.7			
Control Delay (s)	0.0	2.7	11.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.7	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			45.3%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

4: Avenue L & Tremblay Rd

2020 Existing AM.syn



Lane Group	EBT	WBT	NBR
Lane Configurations			
Traffic Volume (vph)	257	269	41
Future Volume (vph)	257	269	41
Lane Group Flow (vph)	283	301	43
Sign Control	Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 33.0%

ICU Level of Service A

Analysis Period (min) 15

Conditions

4: Avenue L & Tremblay Rd

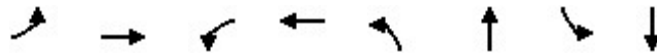
2020 Existing AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	257	11	17	269	0	41
Future Volume (Veh/h)	257	11	17	269	0	41
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	271	12	18	283	0	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	331			62		
pX, platoon unblocked					0.98	
vC, conflicting volume			283		596	277
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			283		582	277
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	94
cM capacity (veh/h)			1279		461	762
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	283	301	43			
Volume Left	0	18	0			
Volume Right	12	0	43			
cSH	1700	1279	762			
Volume to Capacity	0.17	0.01	0.06			
Queue Length 95th (m)	0.0	0.3	1.4			
Control Delay (s)	0.0	0.6	10.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	10.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			33.0%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

5: Belfast Rd & Tremblay Rd

2020 Existing AM.syn



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	139	30	18	99	119	269	17	244
Future Volume (vph)	139	30	18	99	119	269	17	244
Lane Group Flow (vph)	146	168	19	142	125	292	18	329
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		5		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	29.8	29.8	29.8	29.8	10.9	19.9	19.9	19.9
Total Split (s)	35.0	35.0	35.0	35.0	15.0	50.0	35.0	35.0
Total Split (%)	41.2%	41.2%	41.2%	41.2%	17.6%	58.8%	41.2%	41.2%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	3.5	3.5	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.8	-2.8	-2.8	-2.8	-1.9	-1.9	-1.9	-1.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	31.9	31.9	31.9	31.9	10.6	31.4	20.2	20.2
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.15	0.44	0.28	0.28
v/c Ratio	0.28	0.22	0.04	0.18	0.51	0.38	0.06	0.66
Control Delay	18.1	5.8	15.7	13.9	39.3	13.7	19.4	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	5.8	15.7	13.9	39.3	13.7	19.4	28.9
LOS	B	A	B	B	D	B	B	C
Approach Delay		11.5		14.1		21.4		28.4
Approach LOS		B		B		C		C
Queue Length 50th (m)	13.9	2.7	1.6	10.6	17.3	25.4	2.0	40.7
Queue Length 95th (m)	32.5	16.0	6.4	26.1	37.5	41.4	6.6	66.6
Internal Link Dist (m)		37.8		75.7		74.6		56.3
Turn Bay Length (m)			50.0		65.0		25.0	
Base Capacity (vph)	523	767	509	768	265	1163	457	771
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	0.28	0.22	0.04	0.18	0.47	0.25	0.04	0.43

Intersection Summary

Cycle Length: 85

Actuated Cycle Length: 71.6

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 19.9

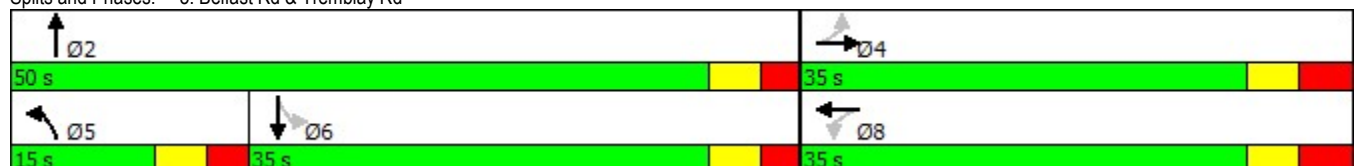
Intersection Capacity Utilization 56.6%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service B

Splits and Phases: 5: Belfast Rd & Tremblay Rd



Conditions

5: Belfast Rd & Tremblay Rd

2020 Existing AM.syn

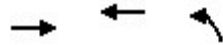
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	30	129	18	99	36	119	269	9	17	244	68
Future Volume (vph)	139	30	129	18	99	36	119	269	9	17	244	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.96		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1550		1676	1694		1676	1757		1676	1707	
Flt Permitted	0.67	1.00		0.65	1.00		0.95	1.00		0.58	1.00	
Satd. Flow (perm)	1176	1550		1141	1694		1676	1757		1026	1707	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	146	32	136	19	104	38	125	283	9	18	257	72
RTOR Reduction (vph)	0	77	0	0	14	0	0	2	0	0	14	0
Lane Group Flow (vph)	146	91	0	19	128	0	125	290	0	18	315	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)	29.0	29.0		29.0	29.0		6.8	31.0		18.3	18.3	
Effective Green, g (s)	31.8	31.8		31.8	31.8		8.7	32.9		20.2	20.2	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.12	0.45		0.28	0.28	
Clearance Time (s)	6.8	6.8		6.8	6.8		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	514	677		499	740		200	795		285	474	
v/s Ratio Prot		0.06			0.08		c0.07	0.17			c0.18	
v/s Ratio Perm	c0.12			0.02						0.02		
v/c Ratio	0.28	0.14		0.04	0.17		0.62	0.37		0.06	0.67	
Uniform Delay, d1	13.1	12.2		11.7	12.5		30.4	13.1		19.3	23.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.4		0.1	0.5		6.0	0.3		0.1	3.5	
Delay (s)	14.5	12.6		11.8	13.0		36.4	13.3		19.4	26.8	
Level of Service	B	B		B	B		D	B		B	C	
Approach Delay (s)		13.5			12.8			20.3			26.4	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.3		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			72.7		Sum of lost time (s)					12.0		
Intersection Capacity Utilization			56.6%		ICU Level of Service					B		
Analysis Period (min)			15									

c Critical Lane Group

Conditions

6: Avenue J & Tremblay Rd

2020 Existing AM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	290	191	2
Future Volume (vph)	290	191	2
Lane Group Flow (vph)	316	217	7
Sign Control	Free	Free	Stop

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 33.7%

ICU Level of Service A

Analysis Period (min) 15

Conditions

6: Avenue J & Tremblay Rd

2020 Existing AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	290	10	15	191	2	5
Future Volume (Veh/h)	290	10	15	191	2	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	305	11	16	201	2	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	192			201		
pX, platoon unblocked						
vC, conflicting volume			316		544	310
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			316		544	310
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1244		494	730
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	316	217	7			
Volume Left	0	16	2			
Volume Right	11	0	5			
cSH	1700	1244	642			
Volume to Capacity	0.19	0.01	0.01			
Queue Length 95th (m)	0.0	0.3	0.3			
Control Delay (s)	0.0	0.7	10.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.7	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			33.7%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

1: Via Rail & Tremblay Rd

2020 Existing PM.syn



Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑	↑↑	↑↑
Traffic Volume (vph)	211	164	56	258	146
Future Volume (vph)	211	164	56	258	146
Lane Group Flow (vph)	222	173	59	272	235
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	30.6
Total Split (s)	34.1	34.1	34.1	34.1	36.6
Total Split (%)	48.2%	48.2%	48.2%	48.2%	51.8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	3.3
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.6
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	None
Act Effct Green (s)	32.5	32.5	32.5	32.5	14.9
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.27
v/c Ratio	0.11	0.18	0.09	0.14	0.50
Control Delay	5.9	1.9	6.5	5.9	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	1.9	6.5	5.9	16.4
LOS	A	A	A	A	B
Approach Delay	4.1			6.0	16.4
Approach LOS	A			A	B
Queue Length 50th (m)	4.4	0.0	2.2	5.4	14.9
Queue Length 95th (m)	10.5	7.2	7.8	12.5	31.3
Internal Link Dist (m)	89.5			96.8	14.3
Turn Bay Length (m)		55.0	50.0		
Base Capacity (vph)	1965	950	634	1965	983
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.18	0.09	0.14	0.24

Intersection Summary

Cycle Length: 70.7

Actuated Cycle Length: 55.5

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 7.8

Intersection Capacity Utilization 40.2%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Via Rail & Tremblay Rd

 02 36.6 s	 04 34.1 s
 08 34.1 s	

Conditions

1: Via Rail & Tremblay Rd

2020 Existing PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	
Traffic Volume (vph)	211	164	56	258	146	77
Future Volume (vph)	211	164	56	258	146	77
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3353	1500	1676	3353	1629	
Flt Permitted	1.00	1.00	0.61	1.00	0.97	
Satd. Flow (perm)	3353	1500	1082	3353	1629	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	222	173	59	272	154	81
RTOR Reduction (vph)	0	72	0	0	37	0
Lane Group Flow (vph)	222	101	59	272	198	0
Turn Type	NA	Perm	Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	30.4	30.4	30.4	30.4	12.3	
Effective Green, g (s)	32.5	32.5	32.5	32.5	14.9	
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.27	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1967	879	634	1967	438	
v/s Ratio Prot	0.07			c0.08	c0.12	
v/s Ratio Perm		0.07	0.05			
v/c Ratio	0.11	0.12	0.09	0.14	0.45	
Uniform Delay, d1	5.1	5.1	5.0	5.2	16.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.3	0.3	0.1	0.7	
Delay (s)	5.2	5.3	5.3	5.3	17.6	
Level of Service	A	A	A	A	B	
Approach Delay (s)	5.3			5.3	17.6	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			8.3		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.24			
Actuated Cycle Length (s)			55.4		Sum of lost time (s)	8.0
Intersection Capacity Utilization			40.2%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

Conditions

2: Pickering PI & Tremblay Rd

2020 Existing PM.syn

					
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Traffic Volume (vph)	284	5	9	289	25
Future Volume (vph)	284	5	9	289	25
Lane Group Flow (vph)	299	5	9	304	44
Sign Control	Free			Free	Stop
Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 25.8%			ICU Level of Service A		
Analysis Period (min) 15					

Conditions

2: Pickering PI & Tremblay Rd

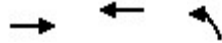
2020 Existing PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	284	5	9	289	25	17
Future Volume (Veh/h)	284	5	9	289	25	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	299	5	9	304	26	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	121			272		
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			304		469	299
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			260		431	255
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	97
cM capacity (veh/h)			1255		529	718
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	299	5	9	152	152	44
Volume Left	0	0	9	0	0	26
Volume Right	0	5	0	0	0	18
cSH	1700	1700	1255	1700	1700	593
Volume to Capacity	0.18	0.00	0.01	0.09	0.09	0.07
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.0	1.9
Control Delay (s)	0.0	0.0	7.9	0.0	0.0	11.6
Lane LOS			A			B
Approach Delay (s)	0.0		0.2			11.6
Approach LOS						B
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			25.8%		ICU Level of Service	A
Analysis Period (min)			15			

Conditions

3: Avenue K & Tremblay Rd

2020 Existing PM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	294	239	53
Future Volume (vph)	294	239	53
Lane Group Flow (vph)	323	275	112
Sign Control	Free	Free	Stop

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 45.7%

ICU Level of Service A

Analysis Period (min) 15

Conditions

3: Avenue K & Tremblay Rd

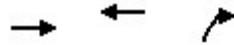
2020 Existing PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	294	13	22	239	53	53
Future Volume (Veh/h)	294	13	22	239	53	53
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	309	14	23	252	56	56
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	262			131		
pX, platoon unblocked						
vC, conflicting volume			323		614	316
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			323		614	316
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		87	92
cM capacity (veh/h)			1237		447	724
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	323	275	112			
Volume Left	0	23	56			
Volume Right	14	0	56			
cSH	1700	1237	553			
Volume to Capacity	0.19	0.02	0.20			
Queue Length 95th (m)	0.0	0.5	6.0			
Control Delay (s)	0.0	0.8	13.2			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.8	13.2			
Approach LOS			B			
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			45.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Conditions

4: Avenue L & Tremblay Rd

2020 Existing PM.syn



Lane Group	EBT	WBT	NBR
Lane Configurations			
Traffic Volume (vph)	335	261	49
Future Volume (vph)	335	261	49
Lane Group Flow (vph)	366	303	52
Sign Control	Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 41.6%

ICU Level of Service A

Analysis Period (min) 15

Conditions

4: Avenue L & Tremblay Rd

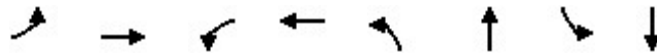
2020 Existing PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	335	12	27	261	0	49
Future Volume (Veh/h)	335	12	27	261	0	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	353	13	28	275	0	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	331			62		
pX, platoon unblocked						
vC, conflicting volume			366		690	360
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			366		690	360
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	92
cM capacity (veh/h)			1193		401	685
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	366	303	52			
Volume Left	0	28	0			
Volume Right	13	0	52			
cSH	1700	1193	685			
Volume to Capacity	0.22	0.02	0.08			
Queue Length 95th (m)	0.0	0.6	2.0			
Control Delay (s)	0.0	1.0	10.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			41.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Conditions

5: Belfast Rd & Tremblay Rd

2020 Existing PM.syn



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	161	54	20	62	154	397	23	358
Future Volume (vph)	161	54	20	62	154	397	23	358
Lane Group Flow (vph)	169	235	21	101	162	439	24	453
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		5		1	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	29.8	29.8	29.8	29.8	10.9	19.9	10.9	19.9
Total Split (s)	35.0	35.0	35.0	35.0	20.0	45.0	20.0	45.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	20.0%	45.0%	20.0%	45.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	3.5	3.5	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.8	-2.8	-2.8	-2.8	-1.9	-1.9	-1.9	-1.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	31.4	31.4	31.4	31.4	14.0	42.1	8.8	29.1
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.16	0.49	0.10	0.34
v/c Ratio	0.38	0.35	0.06	0.16	0.60	0.52	0.14	0.78
Control Delay	26.6	9.9	23.0	17.3	45.4	18.9	40.8	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.6	9.9	23.0	17.3	45.4	18.9	40.8	34.9
LOS	C	A	C	B	D	B	D	C
Approach Delay		16.8		18.3		26.0		35.2
Approach LOS		B		B		C		D
Queue Length 50th (m)	22.3	8.6	2.5	8.5	26.5	42.6	4.0	69.8
Queue Length 95th (m)	47.9	30.3	8.8	23.3	53.1	92.2	12.5	105.3
Internal Link Dist (m)		37.8		75.7		74.6		56.3
Turn Bay Length (m)			50.0		65.0		25.0	
Base Capacity (vph)	442	670	331	624	313	893	313	831
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	0.35	0.06	0.16	0.52	0.49	0.08	0.55

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 86.7

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 25.8

Intersection Capacity Utilization 61.1%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service B

Splits and Phases: 5: Belfast Rd & Tremblay Rd

20 s	45 s	35 s	35 s
20 s	45 s	35 s	35 s

Conditions

5: Belfast Rd & Tremblay Rd

2020 Existing PM.syn

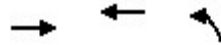
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	54	169	20	62	34	154	397	20	23	358	72
Future Volume (vph)	161	54	169	20	62	34	154	397	20	23	358	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.95		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1564		1676	1670		1676	1752		1676	1720	
Flt Permitted	0.69	1.00		0.52	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1221	1564		914	1670		1676	1752		1676	1720	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	169	57	178	21	65	36	162	418	21	24	377	76
RTOR Reduction (vph)	0	106	0	0	19	0	0	2	0	0	8	0
Lane Group Flow (vph)	169	129	0	21	82	0	162	437	0	24	445	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	28.6	28.6		28.6	28.6		12.1	40.1		3.0	31.0	
Effective Green, g (s)	31.4	31.4		31.4	31.4		14.0	42.0		4.9	32.9	
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.16	0.47		0.05	0.36	
Clearance Time (s)	6.8	6.8		6.8	6.8		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	424	543		317	580		259	814		90	626	
v/s Ratio Prot		0.08			0.05		c0.10	0.25		0.01	c0.26	
v/s Ratio Perm	c0.14			0.02								
v/c Ratio	0.40	0.24		0.07	0.14		0.63	0.54		0.27	0.71	
Uniform Delay, d1	22.3	20.9		19.7	20.2		35.7	17.2		41.0	24.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.8	1.0		0.4	0.5		4.7	0.7		1.6	3.8	
Delay (s)	25.1	22.0		20.1	20.7		40.4	17.9		42.6	28.4	
Level of Service	C	C		C	C		D	B		D	C	
Approach Delay (s)		23.3			20.6			24.0			29.2	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			25.1		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			90.3		Sum of lost time (s)					12.0		
Intersection Capacity Utilization			61.1%		ICU Level of Service					B		
Analysis Period (min)			15									

c Critical Lane Group

Conditions

6: Avenue J & Tremblay Rd

2020 Existing PM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	299	288	10
Future Volume (vph)	299	288	10
Lane Group Flow (vph)	317	307	19
Sign Control	Free	Free	Stop

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 29.4%

ICU Level of Service A

Analysis Period (min) 15

Conditions

6: Avenue J & Tremblay Rd

2020 Existing PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	299	2	4	288	10	8
Future Volume (Veh/h)	299	2	4	288	10	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	315	2	4	303	11	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	192			201		
pX, platoon unblocked			1.00		1.00	1.00
vC, conflicting volume			317		627	316
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			315		625	314
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1243		446	725
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	317	307	19			
Volume Left	0	4	11			
Volume Right	2	0	8			
cSH	1700	1243	532			
Volume to Capacity	0.19	0.00	0.04			
Queue Length 95th (m)	0.0	0.1	0.9			
Control Delay (s)	0.0	0.1	12.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	12.0			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			29.4%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

1: Via Rail & Tremblay Rd

2025 Background AM.syn

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↖
Traffic Volume (vph)	402	118	33	169	75
Future Volume (vph)	402	118	33	169	75
Lane Group Flow (vph)	423	124	35	178	130
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	30.6
Total Split (s)	44.1	44.1	44.1	44.1	36.6
Total Split (%)	54.6%	54.6%	54.6%	54.6%	45.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	3.3
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.6
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	None
Act Effct Green (s)	48.2	48.2	48.2	48.2	13.2
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.20
v/c Ratio	0.17	0.11	0.05	0.07	0.35
Control Delay	3.9	1.2	4.2	3.7	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.9	1.2	4.2	3.7	17.5
LOS	A	A	A	A	B
Approach Delay	3.3			3.8	17.5
Approach LOS	A			A	B
Queue Length 50th (m)	8.3	0.0	1.2	3.2	9.1
Queue Length 95th (m)	14.8	4.5	4.2	6.7	21.0
Internal Link Dist (m)	89.5			96.8	14.3
Turn Bay Length (m)		55.0	50.0		
Base Capacity (vph)	2491	1146	662	2491	844
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.11	0.05	0.07	0.15

Intersection Summary

Cycle Length: 80.7

Actuated Cycle Length: 64.9

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 5.5

Intersection Capacity Utilization 38.4%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Via Rail & Tremblay Rd

↖ Ø2	→ Ø4
36.6 s	44.1 s
	↖ Ø8
	44.1 s

Conditions

1: Via Rail & Tremblay Rd

2025 Background AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	
Traffic Volume (vph)	402	118	33	169	75	48
Future Volume (vph)	402	118	33	169	75	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3353	1500	1676	3353	1622	
Flt Permitted	1.00	1.00	0.51	1.00	0.97	
Satd. Flow (perm)	3353	1500	891	3353	1622	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	423	124	35	178	79	51
RTOR Reduction (vph)	0	35	0	0	40	0
Lane Group Flow (vph)	423	89	35	178	90	0
Turn Type	NA	Perm	Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	45.2	45.2	45.2	45.2	8.3	
Effective Green, g (s)	47.3	47.3	47.3	47.3	10.9	
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.16	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	2395	1071	636	2395	267	
v/s Ratio Prot	c0.13			0.05	c0.06	
v/s Ratio Perm		0.06	0.04			
v/c Ratio	0.18	0.08	0.06	0.07	0.34	
Uniform Delay, d1	3.1	2.9	2.8	2.8	24.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.2	0.2	0.1	0.8	
Delay (s)	3.2	3.0	3.0	2.9	25.2	
Level of Service	A	A	A	A	C	
Approach Delay (s)	3.2			2.9	25.2	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			6.3		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.21			
Actuated Cycle Length (s)			66.2		Sum of lost time (s)	8.0
Intersection Capacity Utilization			38.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

					
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations				 	 
Traffic Volume (vph)	414	36	37	196	6
Future Volume (vph)	414	36	37	196	6
Lane Group Flow (vph)	436	38	39	206	23
Sign Control	Free			Free	Stop
Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 39.7%			ICU Level of Service A		
Analysis Period (min) 15					

Conditions

2: Pickering PI & Tremblay Rd

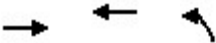
2025 Background AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	414	36	37	196	6	16
Future Volume (Veh/h)	414	36	37	196	6	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	436	38	39	206	6	17
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	121			272		
pX, platoon unblocked			0.94		0.94	0.94
vC, conflicting volume			474		617	436
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			404		557	364
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		99	97
cM capacity (veh/h)			1078		415	593
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	436	38	39	103	103	23
Volume Left	0	0	39	0	0	6
Volume Right	0	38	0	0	0	17
cSH	1700	1700	1078	1700	1700	533
Volume to Capacity	0.26	0.02	0.04	0.06	0.06	0.04
Queue Length 95th (m)	0.0	0.0	0.9	0.0	0.0	1.1
Control Delay (s)	0.0	0.0	8.5	0.0	0.0	12.1
Lane LOS			A			B
Approach Delay (s)	0.0		1.3			12.1
Approach LOS						B
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			39.7%		ICU Level of Service	A
Analysis Period (min)			15			

Conditions

3: Avenue K & Tremblay Rd

2025 Background AM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	372	234	12
Future Volume (vph)	372	234	12
Lane Group Flow (vph)	448	325	40
Sign Control	Free	Free	Stop

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 54.8%		ICU Level of Service A
Analysis Period (min) 15		

Conditions

3: Avenue K & Tremblay Rd

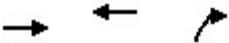
2025 Background AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	372	53	75	234	12	26
Future Volume (Veh/h)	372	53	75	234	12	26
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	392	56	79	246	13	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	262			131		
pX, platoon unblocked			0.98		0.98	0.98
vC, conflicting volume			448		824	420
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			425		809	397
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		96	96
cM capacity (veh/h)			1110		318	639
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	448	325	40			
Volume Left	0	79	13			
Volume Right	56	0	27			
cSH	1700	1110	481			
Volume to Capacity	0.26	0.07	0.08			
Queue Length 95th (m)	0.0	1.8	2.2			
Control Delay (s)	0.0	2.6	13.2			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.6	13.2			
Approach LOS			B			
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			54.8%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

4: Avenue L & Tremblay Rd

2025 Background AM.syn



Lane Group	EBT	WBT	NBR
Lane Configurations			
Traffic Volume (vph)	387	309	41
Future Volume (vph)	387	309	41
Lane Group Flow (vph)	419	343	43
Sign Control	Free	Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 35.1%	ICU Level of Service A
Analysis Period (min) 15	

Conditions

4: Avenue L & Tremblay Rd

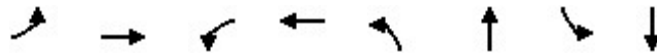
2025 Background AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	387	11	17	309	0	41
Future Volume (Veh/h)	387	11	17	309	0	41
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	407	12	18	325	0	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	331			62		
pX, platoon unblocked					0.96	
vC, conflicting volume			419		774	413
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			419		742	413
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	93
cM capacity (veh/h)			1140		361	639
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	419	343	43			
Volume Left	0	18	0			
Volume Right	12	0	43			
cSH	1700	1140	639			
Volume to Capacity	0.25	0.02	0.07			
Queue Length 95th (m)	0.0	0.4	1.7			
Control Delay (s)	0.0	0.6	11.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	11.0			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			35.1%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

5: Belfast Rd & Tremblay Rd

2025 Background AM.syn



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	139	160	18	139	119	269	49	244
Future Volume (vph)	139	160	18	139	119	269	49	244
Lane Group Flow (vph)	146	304	19	193	125	292	52	329
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		5		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	29.8	29.8	29.8	29.8	10.9	19.9	19.9	19.9
Total Split (s)	35.0	35.0	35.0	35.0	15.0	50.0	35.0	35.0
Total Split (%)	41.2%	41.2%	41.2%	41.2%	17.6%	58.8%	41.2%	41.2%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	3.5	3.5	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.8	-2.8	-2.8	-2.8	-1.9	-1.9	-1.9	-1.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	31.9	31.9	31.9	31.9	10.6	31.4	20.2	20.2
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.15	0.44	0.28	0.28
v/c Ratio	0.30	0.40	0.05	0.25	0.51	0.38	0.18	0.66
Control Delay	18.7	15.5	15.9	15.1	39.3	13.7	21.5	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	15.5	15.9	15.1	39.3	13.7	21.5	28.9
LOS	B	B	B	B	D	B	C	C
Approach Delay		16.5		15.2		21.4		27.9
Approach LOS		B		B		C		C
Queue Length 50th (m)	14.1	24.7	1.6	16.0	17.3	25.4	5.9	40.7
Queue Length 95th (m)	33.2	54.0	6.5	35.9	37.5	41.4	14.1	66.6
Internal Link Dist (m)		37.8		75.7		74.6		56.3
Turn Bay Length (m)			50.0		65.0		25.0	
Base Capacity (vph)	486	764	391	769	265	1163	457	771
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	0.30	0.40	0.05	0.25	0.47	0.25	0.11	0.43

Intersection Summary

Cycle Length: 85

Actuated Cycle Length: 71.6

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 20.7

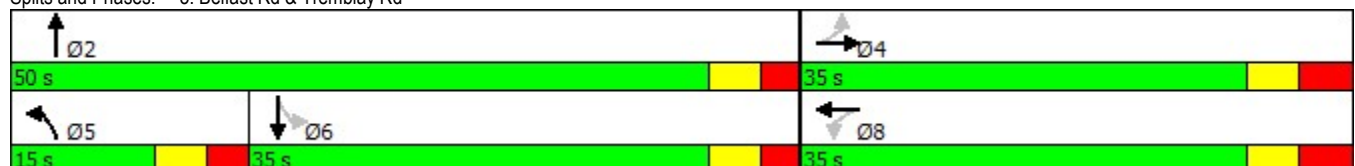
Intersection Capacity Utilization 63.8%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service B

Splits and Phases: 5: Belfast Rd & Tremblay Rd



Conditions

5: Belfast Rd & Tremblay Rd

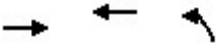
2025 Background AM.syn

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	160	129	18	139	45	119	269	9	49	244	68
Future Volume (vph)	139	160	129	18	139	45	119	269	9	49	244	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.96		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1646		1676	1700		1676	1757		1676	1707	
Flt Permitted	0.62	1.00		0.50	1.00		0.95	1.00		0.58	1.00	
Satd. Flow (perm)	1091	1646		877	1700		1676	1757		1026	1707	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	146	168	136	19	146	47	125	283	9	52	257	72
RTOR Reduction (vph)	0	30	0	0	12	0	0	2	0	0	14	0
Lane Group Flow (vph)	146	274	0	19	181	0	125	290	0	52	315	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)	29.0	29.0		29.0	29.0		6.8	31.0		18.3	18.3	
Effective Green, g (s)	31.8	31.8		31.8	31.8		8.7	32.9		20.2	20.2	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.12	0.45		0.28	0.28	
Clearance Time (s)	6.8	6.8		6.8	6.8		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	477	719		383	743		200	795		285	474	
v/s Ratio Prot		c0.17			0.11		c0.07	0.17			c0.18	
v/s Ratio Perm	0.13			0.02						0.05		
v/c Ratio	0.31	0.38		0.05	0.24		0.62	0.37		0.18	0.67	
Uniform Delay, d1	13.3	13.8		11.8	12.9		30.4	13.1		20.0	23.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	1.5		0.2	0.8		6.0	0.3		0.3	3.5	
Delay (s)	14.9	15.3		12.0	13.7		36.4	13.3		20.3	26.8	
Level of Service	B	B		B	B		D	B		C	C	
Approach Delay (s)		15.2			13.5			20.3			25.9	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.2									
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			72.7									
Intersection Capacity Utilization			63.8%									
Analysis Period (min)			15									
c Critical Lane Group												

Conditions

6: Avenue J & Tremblay Rd

2025 Background AM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	420	231	2
Future Volume (vph)	420	231	2
Lane Group Flow (vph)	453	259	7
Sign Control	Free	Free	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 35.8%	ICU Level of Service A
Analysis Period (min) 15	

Conditions

6: Avenue J & Tremblay Rd

2025 Background AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	420	10	15	231	2	5
Future Volume (Veh/h)	420	10	15	231	2	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	442	11	16	243	2	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	192			201		
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			453		722	448
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			398		682	392
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1103		389	624
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	453	259	7			
Volume Left	0	16	2			
Volume Right	11	0	5			
cSH	1700	1103	532			
Volume to Capacity	0.27	0.01	0.01			
Queue Length 95th (m)	0.0	0.4	0.3			
Control Delay (s)	0.0	0.6	11.9			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	11.9			
Approach LOS			B			
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			35.8%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

1: Via Rail & Tremblay Rd

2025 Background PM.syn

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	256	164	56	396	146
Future Volume (vph)	256	164	56	396	146
Lane Group Flow (vph)	269	173	59	417	235
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	30.6
Total Split (s)	34.1	34.1	34.1	34.1	36.6
Total Split (%)	48.2%	48.2%	48.2%	48.2%	51.8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	3.3
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.6
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	None
Act Effct Green (s)	32.5	32.5	32.5	32.5	14.9
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.27
v/c Ratio	0.14	0.18	0.10	0.21	0.50
Control Delay	5.9	1.9	6.6	6.3	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	1.9	6.6	6.3	16.4
LOS	A	A	A	A	B
Approach Delay	4.3			6.3	16.4
Approach LOS	A			A	B
Queue Length 50th (m)	5.4	0.0	2.2	8.7	14.9
Queue Length 95th (m)	12.4	7.2	7.9	18.8	31.3
Internal Link Dist (m)	89.5			96.8	14.3
Turn Bay Length (m)		55.0	50.0		
Base Capacity (vph)	1965	950	606	1965	983
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.18	0.10	0.21	0.24

Intersection Summary

Cycle Length: 70.7

Actuated Cycle Length: 55.5

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 7.6

Intersection Capacity Utilization 40.2%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Via Rail & Tremblay Rd

↖ Ø2	→ Ø4
36.6 s	34.1 s
	↖ Ø8
	34.1 s

Conditions

1: Via Rail & Tremblay Rd

2025 Background PM.syn

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓
Traffic Volume (vph)	256	164	56	396	146	77
Future Volume (vph)	256	164	56	396	146	77
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3353	1500	1676	3353	1629	
Flt Permitted	1.00	1.00	0.59	1.00	0.97	
Satd. Flow (perm)	3353	1500	1034	3353	1629	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	269	173	59	417	154	81
RTOR Reduction (vph)	0	72	0	0	37	0
Lane Group Flow (vph)	269	101	59	417	198	0
Turn Type	NA	Perm	Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	30.4	30.4	30.4	30.4	12.3	
Effective Green, g (s)	32.5	32.5	32.5	32.5	14.9	
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.27	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1967	879	606	1967	438	
v/s Ratio Prot	0.08			c0.12	c0.12	
v/s Ratio Perm		0.07	0.06			
v/c Ratio	0.14	0.12	0.10	0.21	0.45	
Uniform Delay, d1	5.1	5.1	5.0	5.4	16.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.3	0.3	0.2	0.7	
Delay (s)	5.3	5.3	5.3	5.7	17.6	
Level of Service	A	A	A	A	B	
Approach Delay (s)	5.3			5.6	17.6	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			7.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.29			
Actuated Cycle Length (s)			55.4		Sum of lost time (s)	8.0
Intersection Capacity Utilization			40.2%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

Conditions
2: Pickering PI & Tremblay Rd

2025 Background PM.syn

					
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations				 	 
Traffic Volume (vph)	329	5	9	427	25
Future Volume (vph)	329	5	9	427	25
Lane Group Flow (vph)	346	5	9	449	44
Sign Control	Free			Free	Stop
Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 28.3%			ICU Level of Service A		
Analysis Period (min) 15					

Conditions

2: Pickering PI & Tremblay Rd

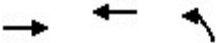
2025 Background PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	329	5	9	427	25	17
Future Volume (Veh/h)	329	5	9	427	25	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	346	5	9	449	26	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	121			272		
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			351		588	346
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			288		539	283
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1205		445	677
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	346	5	9	224	224	44
Volume Left	0	0	9	0	0	26
Volume Right	0	5	0	0	0	18
cSH	1700	1700	1205	1700	1700	517
Volume to Capacity	0.20	0.00	0.01	0.13	0.13	0.09
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.0	2.2
Control Delay (s)	0.0	0.0	8.0	0.0	0.0	12.6
Lane LOS			A			B
Approach Delay (s)	0.0		0.2			12.6
Approach LOS						B
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			28.3%		ICU Level of Service	A
Analysis Period (min)			15			

Conditions

3: Avenue K & Tremblay Rd

2025 Background PM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	339	377	53
Future Volume (vph)	339	377	53
Lane Group Flow (vph)	371	420	112
Sign Control	Free	Free	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

Conditions

3: Avenue K & Tremblay Rd

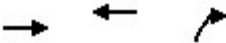
2025 Background PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	339	13	22	377	53	53
Future Volume (Veh/h)	339	13	22	377	53	53
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	357	14	23	397	56	56
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	262			131		
pX, platoon unblocked					0.93	
vC, conflicting volume			371		807	364
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			371		755	364
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		84	92
cM capacity (veh/h)			1188		343	681
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	371	420	112			
Volume Left	0	23	56			
Volume Right	14	0	56			
cSH	1700	1188	457			
Volume to Capacity	0.22	0.02	0.25			
Queue Length 95th (m)	0.0	0.5	7.6			
Control Delay (s)	0.0	0.6	15.4			
Lane LOS		A	C			
Approach Delay (s)	0.0	0.6	15.4			
Approach LOS			C			
Intersection Summary						
Average Delay		2.2				
Intersection Capacity Utilization		53.1%	ICU Level of Service	A		
Analysis Period (min)		15				

Conditions

4: Avenue L & Tremblay Rd

2025 Background PM.syn



Lane Group	EBT	WBT	NBR
Lane Configurations			
Traffic Volume (vph)	380	399	49
Future Volume (vph)	380	399	49
Lane Group Flow (vph)	413	448	52
Sign Control	Free	Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 48.9%	ICU Level of Service A
Analysis Period (min) 15	

Conditions

4: Avenue L & Tremblay Rd

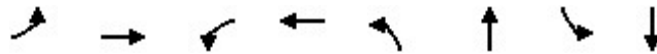
2025 Background PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	380	12	27	399	0	49
Future Volume (Veh/h)	380	12	27	399	0	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	400	13	28	420	0	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	331			62		
pX, platoon unblocked					0.90	
vC, conflicting volume			413		882	406
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			413		810	406
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	92
cM capacity (veh/h)			1146		305	644
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	413	448	52			
Volume Left	0	28	0			
Volume Right	13	0	52			
cSH	1700	1146	644			
Volume to Capacity	0.24	0.02	0.08			
Queue Length 95th (m)	0.0	0.6	2.1			
Control Delay (s)	0.0	0.8	11.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.8	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			48.9%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

5: Belfast Rd & Tremblay Rd

2025 Background PM.syn



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	161	99	20	200	154	397	33	358
Future Volume (vph)	161	99	20	200	154	397	33	358
Lane Group Flow (vph)	169	282	21	283	162	439	35	453
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		5		1	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	29.8	29.8	29.8	29.8	10.9	19.9	10.9	19.9
Total Split (s)	35.0	35.0	35.0	35.0	20.0	45.0	20.0	45.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	20.0%	45.0%	20.0%	45.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	3.5	3.5	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.8	-2.8	-2.8	-2.8	-1.9	-1.9	-1.9	-1.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	31.4	31.4	31.4	31.4	14.0	39.1	9.3	29.1
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.16	0.45	0.11	0.34
v/c Ratio	0.57	0.44	0.07	0.45	0.60	0.55	0.19	0.78
Control Delay	35.2	18.7	23.2	24.8	45.4	21.7	40.8	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	18.7	23.2	24.8	45.4	21.7	40.8	34.9
LOS	D	B	C	C	D	C	D	C
Approach Delay		24.9		24.7		28.1		35.3
Approach LOS		C		C		C		D
Queue Length 50th (m)	24.2	25.1	2.5	35.7	26.5	59.6	5.8	69.8
Queue Length 95th (m)	#60.3	57.2	8.9	70.6	53.1	94.3	16.1	105.3
Internal Link Dist (m)		37.8		75.7		74.6		56.3
Turn Bay Length (m)			50.0		65.0		25.0	
Base Capacity (vph)	294	635	295	626	313	857	313	831
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	0.57	0.44	0.07	0.45	0.52	0.51	0.11	0.55

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 86.7

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 28.7

Intersection LOS: C

Intersection Capacity Utilization 71.7%

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: 5: Belfast Rd & Tremblay Rd



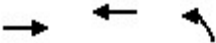
Conditions

5: Belfast Rd & Tremblay Rd

2025 Background PM.syn

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	99	169	20	200	68	154	397	20	33	358	72
Future Volume (vph)	161	99	169	20	200	68	154	397	20	33	358	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1598		1676	1697		1676	1752		1676	1720	
Flt Permitted	0.46	1.00		0.46	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	811	1598		814	1697		1676	1752		1676	1720	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	169	104	178	21	211	72	162	418	21	35	377	76
RTOR Reduction (vph)	0	58	0	0	12	0	0	2	0	0	8	0
Lane Group Flow (vph)	169	224	0	21	271	0	162	437	0	35	445	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	28.6	28.6		28.6	28.6		12.1	37.2		4.7	29.8	
Effective Green, g (s)	31.4	31.4		31.4	31.4		14.0	39.1		6.6	31.7	
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.16	0.44		0.07	0.36	
Clearance Time (s)	6.8	6.8		6.8	6.8		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	285	563		286	598		263	768		124	611	
v/s Ratio Prot		0.14			0.16		c0.10	0.25		0.02	c0.26	
v/s Ratio Perm	c0.21			0.03								
v/c Ratio	0.59	0.40		0.07	0.45		0.62	0.57		0.28	0.73	
Uniform Delay, d1	23.6	21.7		19.2	22.2		35.0	18.7		39.0	25.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.8	2.1		0.5	2.5		4.2	1.0		1.3	4.3	
Delay (s)	32.4	23.8		19.7	24.7		39.3	19.7		40.3	29.3	
Level of Service	C	C		B	C		D	B		D	C	
Approach Delay (s)		27.0			24.4			25.0			30.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.7			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			89.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			71.7%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	344	426	10
Future Volume (vph)	344	426	10
Lane Group Flow (vph)	364	452	19
Sign Control	Free	Free	Stop

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

Conditions

6: Avenue J & Tremblay Rd

2025 Background PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	344	2	4	426	10	8
Future Volume (Veh/h)	344	2	4	426	10	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	362	2	4	448	11	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	192			201		
pX, platoon unblocked			0.97		0.98	0.97
vC, conflicting volume			364		819	363
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			333		772	332
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1194		360	691
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	364	452	19			
Volume Left	0	4	11			
Volume Right	2	0	8			
cSH	1700	1194	451			
Volume to Capacity	0.21	0.00	0.04			
Queue Length 95th (m)	0.0	0.1	1.1			
Control Delay (s)	0.0	0.1	13.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	13.3			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			37.0%	ICU Level of Service		A
Analysis Period (min)			15			

F

Appendix F

Total Projected Conditions Output Data

Conditions

1: Via Rail & Tremblay Rd

2025 Phase 1 AM.syn

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	413	118	33	186	75
Future Volume (vph)	413	118	33	186	75
Lane Group Flow (vph)	435	124	35	196	130
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	30.6
Total Split (s)	44.1	44.1	44.1	44.1	36.6
Total Split (%)	54.6%	54.6%	54.6%	54.6%	45.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	3.3
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.6
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	None
Act Effct Green (s)	48.2	48.2	48.2	48.2	13.2
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.20
v/c Ratio	0.17	0.11	0.05	0.08	0.35
Control Delay	3.9	1.2	4.2	3.7	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.9	1.2	4.2	3.7	17.5
LOS	A	A	A	A	B
Approach Delay	3.3			3.8	17.5
Approach LOS	A			A	B
Queue Length 50th (m)	8.5	0.0	1.2	3.5	9.1
Queue Length 95th (m)	15.2	4.5	4.2	7.3	21.0
Internal Link Dist (m)	89.5			96.8	14.3
Turn Bay Length (m)		55.0	50.0		
Base Capacity (vph)	2491	1146	654	2491	844
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.11	0.05	0.08	0.15

Intersection Summary

Cycle Length: 80.7

Actuated Cycle Length: 64.9

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 5.4

Intersection Capacity Utilization 38.7%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Via Rail & Tremblay Rd

↖ Ø2	→ Ø4
36.6 s	44.1 s
	↖ Ø8
	44.1 s

Conditions

1: Via Rail & Tremblay Rd

2025 Phase 1 AM.syn

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	
Traffic Volume (vph)	413	118	33	186	75	48
Future Volume (vph)	413	118	33	186	75	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3353	1500	1676	3353	1622	
Flt Permitted	1.00	1.00	0.50	1.00	0.97	
Satd. Flow (perm)	3353	1500	881	3353	1622	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	435	124	35	196	79	51
RTOR Reduction (vph)	0	35	0	0	40	0
Lane Group Flow (vph)	435	89	35	196	90	0
Turn Type	NA	Perm	Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	45.2	45.2	45.2	45.2	8.3	
Effective Green, g (s)	47.3	47.3	47.3	47.3	10.9	
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.16	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	2395	1071	629	2395	267	
v/s Ratio Prot	c0.13			0.06	c0.06	
v/s Ratio Perm		0.06	0.04			
v/c Ratio	0.18	0.08	0.06	0.08	0.34	
Uniform Delay, d1	3.1	2.9	2.8	2.9	24.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.2	0.2	0.1	0.8	
Delay (s)	3.3	3.0	3.0	2.9	25.2	
Level of Service	A	A	A	A	C	
Approach Delay (s)	3.2			2.9	25.2	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			6.3		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.21			
Actuated Cycle Length (s)			66.2		Sum of lost time (s)	8.0
Intersection Capacity Utilization			38.7%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

Conditions

2: Pickering PI & Tremblay Rd

2025 Phase 1 AM.syn

					
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations				 	 
Traffic Volume (vph)	410	19	29	207	3
Future Volume (vph)	410	19	29	207	3
Lane Group Flow (vph)	432	20	31	218	18
Sign Control	Free			Free	Stop
Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 35.4%			ICU Level of Service A		
Analysis Period (min) 15					

Conditions

2: Pickering PI & Tremblay Rd

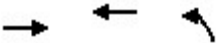
2025 Phase 1 AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	410	19	29	207	3	14
Future Volume (Veh/h)	410	19	29	207	3	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	432	20	31	218	3	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	121			272		
pX, platoon unblocked			0.94		0.94	0.94
vC, conflicting volume			452		603	432
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			381		542	360
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		99	97
cM capacity (veh/h)			1100		428	597
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	432	20	31	109	109	18
Volume Left	0	0	31	0	0	3
Volume Right	0	20	0	0	0	15
cSH	1700	1700	1100	1700	1700	560
Volume to Capacity	0.25	0.01	0.03	0.06	0.06	0.03
Queue Length 95th (m)	0.0	0.0	0.7	0.0	0.0	0.8
Control Delay (s)	0.0	0.0	8.4	0.0	0.0	11.6
Lane LOS			A			B
Approach Delay (s)	0.0		1.0			11.6
Approach LOS						B
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			35.4%		ICU Level of Service	A
Analysis Period (min)			15			

Conditions

3: Avenue K & Tremblay Rd

2025 Phase 1 AM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	370	226	23
Future Volume (vph)	370	226	23
Lane Group Flow (vph)	441	315	51
Sign Control	Free	Free	Stop

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 53.8%		ICU Level of Service A
Analysis Period (min) 15		

Conditions

3: Avenue K & Tremblay Rd

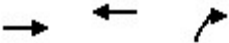
2025 Phase 1 AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	370	49	73	226	23	26
Future Volume (Veh/h)	370	49	73	226	23	26
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	389	52	77	238	24	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	262			131		
pX, platoon unblocked			0.98		0.98	0.98
vC, conflicting volume			441		807	415
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			420		793	393
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		93	96
cM capacity (veh/h)			1117		326	643
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	441	315	51			
Volume Left	0	77	24			
Volume Right	52	0	27			
cSH	1700	1117	441			
Volume to Capacity	0.26	0.07	0.12			
Queue Length 95th (m)	0.0	1.8	3.1			
Control Delay (s)	0.0	2.6	14.2			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.6	14.2			
Approach LOS			B			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			53.8%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

4: Avenue L & Tremblay Rd

2025 Phase 1 AM.syn



Lane Group	EBT	WBT	NBR
Lane Configurations			
Traffic Volume (vph)	385	299	47
Future Volume (vph)	385	299	47
Lane Group Flow (vph)	417	333	49
Sign Control	Free	Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 34.6%	ICU Level of Service A
Analysis Period (min) 15	

Conditions

4: Avenue L & Tremblay Rd

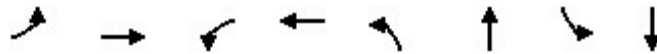
2025 Phase 1 AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	385	11	17	299	0	47
Future Volume (Veh/h)	385	11	17	299	0	47
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	405	12	18	315	0	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	331			62		
pX, platoon unblocked					0.96	
vC, conflicting volume			417		762	411
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			417		733	411
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	92
cM capacity (veh/h)			1142		367	641
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	417	333	49			
Volume Left	0	18	0			
Volume Right	12	0	49			
cSH	1700	1142	641			
Volume to Capacity	0.25	0.02	0.08			
Queue Length 95th (m)	0.0	0.4	2.0			
Control Delay (s)	0.0	0.6	11.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			34.6%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

5: Belfast Rd & Tremblay Rd

2025 Phase 1 AM.syn



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	141	163	18	140	121	269	49	244
Future Volume (vph)	141	163	18	140	121	269	49	244
Lane Group Flow (vph)	148	311	19	194	127	292	52	331
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		5		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	29.8	29.8	29.8	29.8	10.9	19.9	19.9	19.9
Total Split (s)	35.0	35.0	35.0	35.0	15.0	50.0	35.0	35.0
Total Split (%)	41.2%	41.2%	41.2%	41.2%	17.6%	58.8%	41.2%	41.2%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	3.5	3.5	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.8	-2.8	-2.8	-2.8	-1.9	-1.9	-1.9	-1.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead		Lag	
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	31.8	31.8	31.8	31.8	10.6	32.0	20.7	20.7
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.15	0.44	0.29	0.29
v/c Ratio	0.31	0.41	0.05	0.25	0.51	0.37	0.18	0.66
Control Delay	18.8	15.8	16.1	15.2	39.6	13.6	21.4	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	15.8	16.1	15.2	39.6	13.6	21.4	28.6
LOS	B	B	B	B	D	B	C	C
Approach Delay		16.7		15.3		21.5		27.6
Approach LOS		B		B		C		C
Queue Length 50th (m)	14.3	25.6	1.6	16.1	17.6	25.4	5.9	41.0
Queue Length 95th (m)	33.7	55.6	6.6	36.2	#38.9	41.4	14.1	67.1
Internal Link Dist (m)		37.8		75.7		74.6		56.3
Turn Bay Length (m)			50.0		65.0		25.0	
Base Capacity (vph)	480	757	380	763	262	1152	453	764
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	0.31	0.41	0.05	0.25	0.48	0.25	0.11	0.43

Intersection Summary

Cycle Length: 85

Actuated Cycle Length: 72

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 20.7

Intersection LOS: C

Intersection Capacity Utilization 64.4%

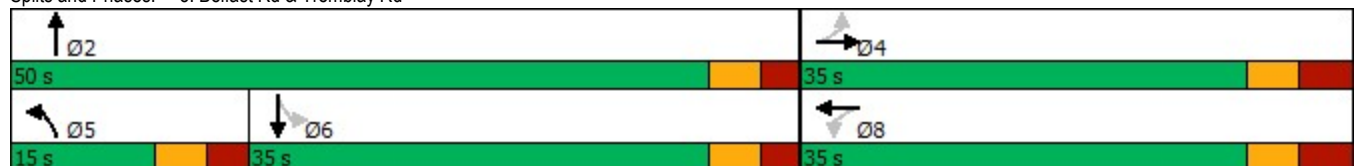
ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Belfast Rd & Tremblay Rd



Conditions

5: Belfast Rd & Tremblay Rd

2025 Phase 1 AM.syn

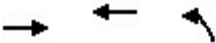
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	163	132	18	140	45	121	269	9	49	244	70
Future Volume (vph)	141	163	132	18	140	45	121	269	9	49	244	70
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.96		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1646		1676	1701		1676	1757		1676	1706	
Flt Permitted	0.62	1.00		0.49	1.00		0.95	1.00		0.58	1.00	
Satd. Flow (perm)	1087	1646		861	1701		1676	1757		1026	1706	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	148	172	139	19	147	47	127	283	9	52	257	74
RTOR Reduction (vph)	0	31	0	0	12	0	0	2	0	0	14	0
Lane Group Flow (vph)	148	280	0	19	182	0	127	290	0	52	317	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)	28.9	28.9		28.9	28.9		6.8	31.4		18.7	18.7	
Effective Green, g (s)	31.7	31.7		31.7	31.7		8.7	33.3		20.6	20.6	
Actuated g/C Ratio	0.43	0.43		0.43	0.43		0.12	0.46		0.28	0.28	
Clearance Time (s)	6.8	6.8		6.8	6.8		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	472	714		373	738		199	801		289	481	
v/s Ratio Prot		c0.17			0.11		c0.08	0.17			c0.19	
v/s Ratio Perm	0.14			0.02						0.05		
v/c Ratio	0.31	0.39		0.05	0.25		0.64	0.36		0.18	0.66	
Uniform Delay, d1	13.5	14.1		11.9	13.1		30.6	12.9		19.8	23.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	1.6		0.3	0.8		6.6	0.3		0.3	3.3	
Delay (s)	15.3	15.7		12.2	13.9		37.2	13.2		20.1	26.4	
Level of Service	B	B		B	B		D	B		C	C	
Approach Delay (s)		15.6			13.7			20.5			25.5	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			73.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			64.4%			ICU Level of Service				C		
Analysis Period (min)			15									

c Critical Lane Group

Conditions

6: Avenue J & Tremblay Rd

2025 Phase 1 AM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	414	234	2
Future Volume (vph)	414	234	2
Lane Group Flow (vph)	447	262	7
Sign Control	Free	Free	Stop

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 36.0%		ICU Level of Service A
Analysis Period (min) 15		

Conditions

6: Avenue J & Tremblay Rd

2025 Phase 1 AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	414	10	15	234	2	5
Future Volume (Veh/h)	414	10	15	234	2	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	436	11	16	246	2	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	192			201		
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			447		720	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			393		679	387
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1109		391	629
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	447	262	7			
Volume Left	0	16	2			
Volume Right	11	0	5			
cSH	1700	1109	536			
Volume to Capacity	0.26	0.01	0.01			
Queue Length 95th (m)	0.0	0.4	0.3			
Control Delay (s)	0.0	0.6	11.8			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	11.8			
Approach LOS			B			
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			36.0%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

1: Via Rail & Tremblay Rd

2025 Phase 1 PM.syn

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	274	164	56	411	146
Future Volume (vph)	274	164	56	411	146
Lane Group Flow (vph)	288	173	59	433	235
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	30.6
Total Split (s)	34.1	34.1	34.1	34.1	36.6
Total Split (%)	48.2%	48.2%	48.2%	48.2%	51.8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	3.3
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.6
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	None
Act Effct Green (s)	32.5	32.5	32.5	32.5	14.9
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.27
v/c Ratio	0.15	0.18	0.10	0.22	0.50
Control Delay	6.0	1.9	6.6	6.3	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	1.9	6.6	6.3	16.4
LOS	A	A	A	A	B
Approach Delay	4.4			6.3	16.4
Approach LOS	A			A	B
Queue Length 50th (m)	5.8	0.0	2.2	9.2	14.9
Queue Length 95th (m)	13.2	7.2	7.9	19.4	31.3
Internal Link Dist (m)	89.5			96.8	14.3
Turn Bay Length (m)		55.0	50.0		
Base Capacity (vph)	1965	950	594	1965	983
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.15	0.18	0.10	0.22	0.24

Intersection Summary

Cycle Length: 70.7

Actuated Cycle Length: 55.5

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 7.6

Intersection Capacity Utilization 40.2%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Via Rail & Tremblay Rd

↖ Ø2	→ Ø4
36.6 s	34.1 s
	↖ Ø8
	34.1 s

Conditions

1: Via Rail & Tremblay Rd

2025 Phase 1 PM.syn

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓
Traffic Volume (vph)	274	164	56	411	146	77
Future Volume (vph)	274	164	56	411	146	77
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3353	1500	1676	3353	1629	
Flt Permitted	1.00	1.00	0.58	1.00	0.97	
Satd. Flow (perm)	3353	1500	1015	3353	1629	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	288	173	59	433	154	81
RTOR Reduction (vph)	0	72	0	0	37	0
Lane Group Flow (vph)	288	101	59	433	198	0
Turn Type	NA	Perm	Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	30.4	30.4	30.4	30.4	12.3	
Effective Green, g (s)	32.5	32.5	32.5	32.5	14.9	
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.27	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1967	879	595	1967	438	
v/s Ratio Prot	0.09			c0.13	c0.12	
v/s Ratio Perm		0.07	0.06			
v/c Ratio	0.15	0.12	0.10	0.22	0.45	
Uniform Delay, d1	5.2	5.1	5.0	5.4	16.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.3	0.3	0.3	0.7	
Delay (s)	5.3	5.3	5.4	5.7	17.6	
Level of Service	A	A	A	A	B	
Approach Delay (s)	5.3			5.7	17.6	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			7.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.29			
Actuated Cycle Length (s)			55.4		Sum of lost time (s)	8.0
Intersection Capacity Utilization			40.2%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Conditions
2: Pickering PI & Tremblay Rd

2025 Phase 1 PM.syn

					
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Traffic Volume (vph)	341	4	8	425	18
Future Volume (vph)	341	4	8	425	18
Lane Group Flow (vph)	359	4	8	447	34
Sign Control	Free			Free	Stop
Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 28.9%			ICU Level of Service A		
Analysis Period (min) 15					

Conditions

2: Pickering PI & Tremblay Rd

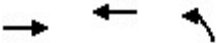
2025 Phase 1 PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	341	4	8	425	18	14
Future Volume (Veh/h)	341	4	8	425	18	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	359	4	8	447	19	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	121			272		
pX, platoon unblocked			0.94		0.94	0.94
vC, conflicting volume			363		598	359
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			294		544	290
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		96	98
cM capacity (veh/h)			1192		439	666
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	359	4	8	224	224	34
Volume Left	0	0	8	0	0	19
Volume Right	0	4	0	0	0	15
cSH	1700	1700	1192	1700	1700	517
Volume to Capacity	0.21	0.00	0.01	0.13	0.13	0.07
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.0	1.7
Control Delay (s)	0.0	0.0	8.0	0.0	0.0	12.5
Lane LOS			A			B
Approach Delay (s)	0.0		0.1			12.5
Approach LOS						B
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			28.9%		ICU Level of Service	A
Analysis Period (min)			15			

Conditions

3: Avenue K & Tremblay Rd

2025 Phase 1 PM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	336	375	52
Future Volume (vph)	336	375	52
Lane Group Flow (vph)	380	424	106
Sign Control	Free	Free	Stop

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 58.0%		ICU Level of Service B
Analysis Period (min) 15		

Conditions

3: Avenue K & Tremblay Rd

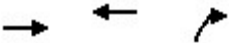
2025 Phase 1 PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	336	25	28	375	52	48
Future Volume (Veh/h)	336	25	28	375	52	48
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	354	26	29	395	55	51
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	262			131		
pX, platoon unblocked					0.93	
vC, conflicting volume			380		820	367
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			380		768	367
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		84	92
cM capacity (veh/h)			1178		335	678
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	380	424	106			
Volume Left	0	29	55			
Volume Right	26	0	51			
cSH	1700	1178	443			
Volume to Capacity	0.22	0.02	0.24			
Queue Length 95th (m)	0.0	0.6	7.4			
Control Delay (s)	0.0	0.8	15.7			
Lane LOS		A	C			
Approach Delay (s)	0.0	0.8	15.7			
Approach LOS			C			
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization			58.0%	ICU Level of Service		B
Analysis Period (min)			15			

Conditions

4: Avenue L & Tremblay Rd

2025 Phase 1 PM.syn



Lane Group	EBT	WBT	NBR
Lane Configurations			
Traffic Volume (vph)	372	403	54
Future Volume (vph)	372	403	54
Lane Group Flow (vph)	405	452	57
Sign Control	Free	Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 49.1%	ICU Level of Service A
Analysis Period (min) 15	

Conditions

4: Avenue L & Tremblay Rd

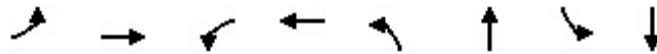
2025 Phase 1 PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	372	12	27	403	0	54
Future Volume (Veh/h)	372	12	27	403	0	54
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	392	13	28	424	0	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	331			62		
pX, platoon unblocked					0.89	
vC, conflicting volume			405		878	398
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			405		805	398
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	91
cM capacity (veh/h)			1154		307	651
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	405	452	57			
Volume Left	0	28	0			
Volume Right	13	0	57			
cSH	1700	1154	651			
Volume to Capacity	0.24	0.02	0.09			
Queue Length 95th (m)	0.0	0.6	2.3			
Control Delay (s)	0.0	0.8	11.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.8	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			49.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Conditions

5: Belfast Rd & Tremblay Rd

2025 Phase 1 PM.syn



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	163	102	20	202	157	397	33	358
Future Volume (vph)	163	102	20	202	157	397	33	358
Lane Group Flow (vph)	172	287	21	285	165	439	35	455
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		5		1	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	29.8	29.8	29.8	29.8	10.9	19.9	10.9	19.9
Total Split (s)	35.0	35.0	35.0	35.0	20.0	45.0	20.0	45.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	20.0%	45.0%	20.0%	45.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	3.5	3.5	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.8	-2.8	-2.8	-2.8	-1.9	-1.9	-1.9	-1.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	31.4	31.4	31.4	31.4	14.1	39.3	9.3	29.2
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.16	0.45	0.11	0.34
v/c Ratio	0.59	0.45	0.07	0.46	0.61	0.55	0.19	0.78
Control Delay	36.2	19.0	23.3	25.0	45.8	21.6	40.8	35.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	19.0	23.3	25.0	45.8	21.6	40.8	35.0
LOS	D	B	C	C	D	C	D	C
Approach Delay		25.5		24.9		28.2		35.4
Approach LOS		C		C		C		D
Queue Length 50th (m)	24.9	26.2	2.5	36.3	27.1	59.6	5.8	70.2
Queue Length 95th (m)	#62.4	58.9	8.9	71.3	54.1	94.3	16.1	105.7
Internal Link Dist (m)		37.8		75.7		74.6		56.3
Turn Bay Length (m)			50.0		65.0		25.0	
Base Capacity (vph)	291	634	289	625	313	857	313	829
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	0.59	0.45	0.07	0.46	0.53	0.51	0.11	0.55

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 86.9

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 28.9

Intersection Capacity Utilization 72.3%

Intersection LOS: C

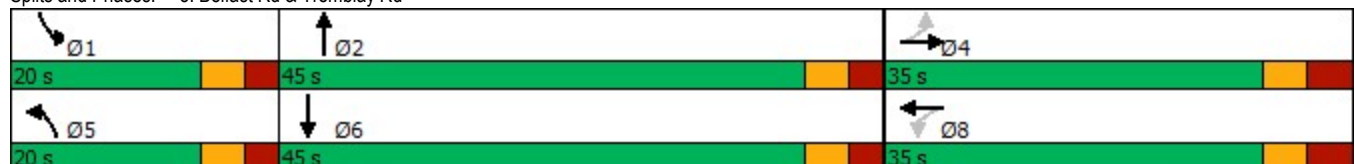
ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Belfast Rd & Tremblay Rd



Conditions

5: Belfast Rd & Tremblay Rd

2025 Phase 1 PM.syn

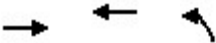
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	102	171	20	202	68	157	397	20	33	358	74
Future Volume (vph)	163	102	171	20	202	68	157	397	20	33	358	74
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1599		1676	1698		1676	1752		1676	1719	
Flt Permitted	0.46	1.00		0.45	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	805	1599		801	1698		1676	1752		1676	1719	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	172	107	180	21	213	72	165	418	21	35	377	78
RTOR Reduction (vph)	0	57	0	0	12	0	0	2	0	0	8	0
Lane Group Flow (vph)	172	230	0	21	273	0	165	437	0	35	447	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	28.6	28.6		28.6	28.6		12.2	37.4		4.8	30.0	
Effective Green, g (s)	31.4	31.4		31.4	31.4		14.1	39.3		6.7	31.9	
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.16	0.44		0.07	0.36	
Clearance Time (s)	6.8	6.8		6.8	6.8		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	282	561		281	596		264	770		125	613	
v/s Ratio Prot		0.14			0.16		c0.10	0.25		0.02	c0.26	
v/s Ratio Perm	c0.21			0.03								
v/c Ratio	0.61	0.41		0.07	0.46		0.62	0.57		0.28	0.73	
Uniform Delay, d1	23.9	22.0		19.3	22.4		35.2	18.7		39.1	25.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.5	2.2		0.5	2.5		4.6	1.0		1.2	4.3	
Delay (s)	33.4	24.2		19.8	25.0		39.7	19.7		40.3	29.3	
Level of Service	C	C		B	C		D	B		D	C	
Approach Delay (s)		27.6			24.6			25.2			30.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			89.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			72.3%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

Conditions

6: Avenue J & Tremblay Rd

2025 Phase 1 PM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	353	423	10
Future Volume (vph)	353	423	10
Lane Group Flow (vph)	374	449	19
Sign Control	Free	Free	Stop

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 36.9%		ICU Level of Service A
Analysis Period (min) 15		

Conditions

6: Avenue J & Tremblay Rd

2025 Phase 1 PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	353	2	4	423	10	8
Future Volume (Veh/h)	353	2	4	423	10	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	372	2	4	445	11	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	192			201		
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			374		826	373
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			334		789	333
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1183		347	684
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	374	449	19			
Volume Left	0	4	11			
Volume Right	2	0	8			
cSH	1700	1183	438			
Volume to Capacity	0.22	0.00	0.04			
Queue Length 95th (m)	0.0	0.1	1.1			
Control Delay (s)	0.0	0.1	13.6			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	13.6			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			36.9%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

1: Via Rail & Tremblay Rd

2030 Phase 2 AM.syn

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	428	118	33	231	75
Future Volume (vph)	428	118	33	231	75
Lane Group Flow (vph)	451	124	35	243	130
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	30.6
Total Split (s)	44.1	44.1	44.1	44.1	36.6
Total Split (%)	54.6%	54.6%	54.6%	54.6%	45.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	3.3
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.6
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	None
Act Effct Green (s)	48.2	48.2	48.2	48.2	13.2
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.20
v/c Ratio	0.18	0.11	0.05	0.10	0.35
Control Delay	3.9	1.2	4.2	3.7	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.9	1.2	4.2	3.7	17.5
LOS	A	A	A	A	B
Approach Delay	3.3			3.8	17.5
Approach LOS	A			A	B
Queue Length 50th (m)	8.9	0.0	1.2	4.4	9.1
Queue Length 95th (m)	15.7	4.5	4.2	8.7	21.0
Internal Link Dist (m)	89.5			96.8	14.3
Turn Bay Length (m)		55.0	50.0		
Base Capacity (vph)	2491	1146	643	2491	844
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.18	0.11	0.05	0.10	0.15

Intersection Summary

Cycle Length: 80.7

Actuated Cycle Length: 64.9

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 5.3

Intersection Capacity Utilization 39.2%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Via Rail & Tremblay Rd

↖ Ø2	→ Ø4
36.6 s	44.1 s
	↖ Ø8
	44.1 s

Conditions

1: Via Rail & Tremblay Rd

2030 Phase 2 AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	
Traffic Volume (vph)	428	118	33	231	75	48
Future Volume (vph)	428	118	33	231	75	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3353	1500	1676	3353	1622	
Flt Permitted	1.00	1.00	0.49	1.00	0.97	
Satd. Flow (perm)	3353	1500	867	3353	1622	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	451	124	35	243	79	51
RTOR Reduction (vph)	0	35	0	0	40	0
Lane Group Flow (vph)	451	89	35	243	90	0
Turn Type	NA	Perm	Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	45.2	45.2	45.2	45.2	8.3	
Effective Green, g (s)	47.3	47.3	47.3	47.3	10.9	
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.16	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	2395	1071	619	2395	267	
v/s Ratio Prot	c0.13			0.07	c0.06	
v/s Ratio Perm		0.06	0.04			
v/c Ratio	0.19	0.08	0.06	0.10	0.34	
Uniform Delay, d1	3.1	2.9	2.8	2.9	24.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.2	0.2	0.1	0.8	
Delay (s)	3.3	3.0	3.0	3.0	25.2	
Level of Service	A	A	A	A	C	
Approach Delay (s)	3.2			3.0	25.2	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			6.1		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.22			
Actuated Cycle Length (s)			66.2		Sum of lost time (s)	8.0
Intersection Capacity Utilization			39.2%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

Conditions

2: Pickering PI & Tremblay Rd

2030 Phase 2 AM.syn

					
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Traffic Volume (vph)	419	25	29	233	23
Future Volume (vph)	419	25	29	233	23
Lane Group Flow (vph)	441	26	31	245	39
Sign Control	Free			Free	Stop
Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 35.4%			ICU Level of Service A		
Analysis Period (min) 15					

Conditions

2: Pickering PI & Tremblay Rd

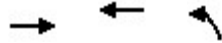
2030 Phase 2 AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	419	25	29	233	23	14
Future Volume (Veh/h)	419	25	29	233	23	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	441	26	31	245	24	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	121			272		
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			467		626	441
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			394		564	366
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		94	97
cM capacity (veh/h)			1084		414	589
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	441	26	31	122	122	39
Volume Left	0	0	31	0	0	24
Volume Right	0	26	0	0	0	15
cSH	1700	1700	1084	1700	1700	467
Volume to Capacity	0.26	0.02	0.03	0.07	0.07	0.08
Queue Length 95th (m)	0.0	0.0	0.7	0.0	0.0	2.2
Control Delay (s)	0.0	0.0	8.4	0.0	0.0	13.4
Lane LOS			A			B
Approach Delay (s)	0.0		0.9			13.4
Approach LOS						B
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			35.4%		ICU Level of Service	A
Analysis Period (min)			15			

Conditions

3: Avenue K & Tremblay Rd

2030 Phase 2 AM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	369	226	49
Future Volume (vph)	369	226	49
Lane Group Flow (vph)	450	322	100
Sign Control	Free	Free	Stop

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 37.6%

ICU Level of Service A

Analysis Period (min) 15

Conditions

3: Avenue K & Tremblay Rd

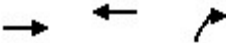
2030 Phase 2 AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	369	59	80	226	49	46
Future Volume (Veh/h)	369	59	80	226	49	46
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	388	62	84	238	52	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	262			131		
pX, platoon unblocked						
vC, conflicting volume			450		706	225
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			450		706	225
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		85	94
cM capacity (veh/h)			1107		342	778
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	259	191	163	159	100	
Volume Left	0	0	84	0	52	
Volume Right	0	62	0	0	48	
cSH	1700	1700	1107	1700	468	
Volume to Capacity	0.15	0.11	0.08	0.09	0.21	
Queue Length 95th (m)	0.0	0.0	2.0	0.0	6.4	
Control Delay (s)	0.0	0.0	4.7	0.0	14.8	
Lane LOS			A		B	
Approach Delay (s)	0.0		2.4		14.8	
Approach LOS					B	
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			37.6%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

4: Avenue L & Tremblay Rd

2030 Phase 2 AM.syn



Lane Group	EBT	WBT	NBR
Lane Configurations	↕↕	↕↕	↗
Traffic Volume (vph)	404	306	47
Future Volume (vph)	404	306	47
Lane Group Flow (vph)	437	340	49
Sign Control	Free	Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 25.6%	ICU Level of Service A
Analysis Period (min) 15	

Conditions

4: Avenue L & Tremblay Rd

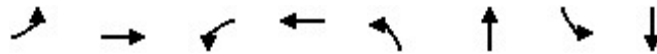
2030 Phase 2 AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	404	11	17	306	0	47
Future Volume (Veh/h)	404	11	17	306	0	47
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	425	12	18	322	0	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	331			62		
pX, platoon unblocked						
vC, conflicting volume			437		628	218
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			437		628	218
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	94
cM capacity (veh/h)			1119		408	786
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	283	154	125	215	49	
Volume Left	0	0	18	0	0	
Volume Right	0	12	0	0	49	
cSH	1700	1700	1119	1700	786	
Volume to Capacity	0.17	0.09	0.02	0.13	0.06	
Queue Length 95th (m)	0.0	0.0	0.4	0.0	1.6	
Control Delay (s)	0.0	0.0	1.3	0.0	9.9	
Lane LOS			A		A	
Approach Delay (s)	0.0		0.5		9.9	
Approach LOS					A	
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			25.6%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

5: Belfast Rd & Tremblay Rd

2030 Phase 2 AM.syn



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	147	169	18	142	124	269	49	244
Future Volume (vph)	147	169	18	142	124	269	49	244
Lane Group Flow (vph)	155	323	19	196	131	292	52	333
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		5		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	29.8	29.8	29.8	29.8	10.9	19.9	19.9	19.9
Total Split (s)	35.0	35.0	35.0	35.0	15.0	50.0	35.0	35.0
Total Split (%)	41.2%	41.2%	41.2%	41.2%	17.6%	58.8%	41.2%	41.2%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	3.5	3.5	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.8	-2.8	-2.8	-2.8	-1.9	-1.9	-1.9	-1.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead		Lag	
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	31.8	31.8	31.8	31.8	10.7	32.0	20.8	20.8
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.15	0.44	0.29	0.29
v/c Ratio	0.32	0.43	0.05	0.26	0.53	0.37	0.18	0.66
Control Delay	19.1	16.1	16.1	15.3	40.2	13.6	21.4	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	16.1	16.1	15.3	40.2	13.6	21.4	28.6
LOS	B	B	B	B	D	B	C	C
Approach Delay		17.1		15.3		21.9		27.6
Approach LOS		B		B		C		C
Queue Length 50th (m)	15.2	27.2	1.6	16.4	18.2	25.4	5.9	41.2
Queue Length 95th (m)	35.4	58.4	6.6	36.6	#42.4	41.2	14.1	67.3
Internal Link Dist (m)		37.8		75.7		74.6		56.3
Turn Bay Length (m)			50.0		65.0		25.0	
Base Capacity (vph)	478	757	369	762	262	1151	452	764
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	0.32	0.43	0.05	0.26	0.50	0.25	0.12	0.44

Intersection Summary

Cycle Length: 85

Actuated Cycle Length: 72.1

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 20.9

Intersection LOS: C

Intersection Capacity Utilization 65.4%

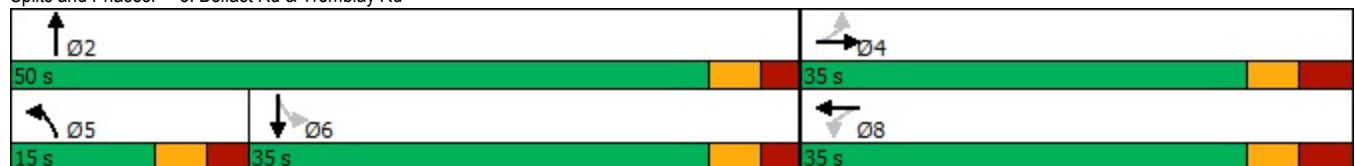
ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Belfast Rd & Tremblay Rd



Conditions

5: Belfast Rd & Tremblay Rd

2030 Phase 2 AM.syn

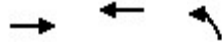
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	169	138	18	142	45	124	269	9	49	244	72
Future Volume (vph)	147	169	138	18	142	45	124	269	9	49	244	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.96		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1646		1676	1701		1676	1757		1676	1704	
Flt Permitted	0.61	1.00		0.48	1.00		0.95	1.00		0.58	1.00	
Satd. Flow (perm)	1082	1646		839	1701		1676	1757		1026	1704	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	155	178	145	19	149	47	131	283	9	52	257	76
RTOR Reduction (vph)	0	31	0	0	12	0	0	2	0	0	14	0
Lane Group Flow (vph)	155	292	0	19	184	0	131	290	0	52	319	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)	29.0	29.0		29.0	29.0		6.8	31.5		18.8	18.8	
Effective Green, g (s)	31.8	31.8		31.8	31.8		8.7	33.4		20.7	20.7	
Actuated g/C Ratio	0.43	0.43		0.43	0.43		0.12	0.46		0.28	0.28	
Clearance Time (s)	6.8	6.8		6.8	6.8		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	470	715		364	738		199	801		290	481	
v/s Ratio Prot		c0.18			0.11		c0.08	0.17			c0.19	
v/s Ratio Perm	0.14			0.02						0.05		
v/c Ratio	0.33	0.41		0.05	0.25		0.66	0.36		0.18	0.66	
Uniform Delay, d1	13.7	14.2		12.0	13.1		30.8	13.0		19.8	23.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	1.7		0.3	0.8		7.6	0.3		0.3	3.4	
Delay (s)	15.5	16.0		12.3	13.9		38.5	13.2		20.1	26.6	
Level of Service	B	B		B	B		D	B		C	C	
Approach Delay (s)		15.8			13.8			21.1			25.7	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.5									B
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			73.2								12.0	
Intersection Capacity Utilization			65.4%								C	
Analysis Period (min)			15									

c Critical Lane Group

Conditions

6: Avenue J & Tremblay Rd

2030 Phase 2 AM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	423	260	2
Future Volume (vph)	423	260	2
Lane Group Flow (vph)	456	290	7
Sign Control	Free	Free	Stop

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 29.4%

ICU Level of Service A

Analysis Period (min) 15

Conditions

6: Avenue J & Tremblay Rd

2030 Phase 2 AM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	423	10	15	260	2	5
Future Volume (Veh/h)	423	10	15	260	2	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	445	11	16	274	2	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	192			201		
pX, platoon unblocked						
vC, conflicting volume			456		620	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			456		620	228
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1101		414	775
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	297	159	107	183	7	
Volume Left	0	0	16	0	2	
Volume Right	0	11	0	0	5	
cSH	1700	1700	1101	1700	620	
Volume to Capacity	0.17	0.09	0.01	0.11	0.01	
Queue Length 95th (m)	0.0	0.0	0.4	0.0	0.3	
Control Delay (s)	0.0	0.0	1.3	0.0	10.9	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.5		10.9	
Approach LOS					B	
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			29.4%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

1: Via Rail & Tremblay Rd

2030 Phase 2 PM.syn



Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↑	↑↑	↑↑
Traffic Volume (vph)	314	164	56	437	146
Future Volume (vph)	314	164	56	437	146
Lane Group Flow (vph)	331	173	59	460	235
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	30.6
Total Split (s)	34.1	34.1	34.1	34.1	36.6
Total Split (%)	48.2%	48.2%	48.2%	48.2%	51.8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	3.3
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.6
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	None
Act Effct Green (s)	32.5	32.5	32.5	32.5	14.9
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.27
v/c Ratio	0.17	0.18	0.10	0.23	0.50
Control Delay	6.1	1.9	6.6	6.4	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	1.9	6.6	6.4	16.4
LOS	A	A	A	A	B
Approach Delay	4.6			6.4	16.4
Approach LOS	A			A	B
Queue Length 50th (m)	6.7	0.0	2.2	9.8	14.9
Queue Length 95th (m)	15.0	7.2	7.9	20.6	31.3
Internal Link Dist (m)	89.5			96.8	14.3
Turn Bay Length (m)		55.0	50.0		
Base Capacity (vph)	1965	950	570	1965	983
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.18	0.10	0.23	0.24

Intersection Summary

Cycle Length: 70.7

Actuated Cycle Length: 55.5

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 7.6

Intersection Capacity Utilization 41.0%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Via Rail & Tremblay Rd

 02 36.6 s	 04 34.1 s
	 08 34.1 s

Conditions

1: Via Rail & Tremblay Rd

2030 Phase 2 PM.syn

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	
Traffic Volume (vph)	314	164	56	437	146	77
Future Volume (vph)	314	164	56	437	146	77
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3353	1500	1676	3353	1629	
Flt Permitted	1.00	1.00	0.55	1.00	0.97	
Satd. Flow (perm)	3353	1500	974	3353	1629	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	331	173	59	460	154	81
RTOR Reduction (vph)	0	72	0	0	37	0
Lane Group Flow (vph)	331	101	59	460	198	0
Turn Type	NA	Perm	Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	30.4	30.4	30.4	30.4	12.3	
Effective Green, g (s)	32.5	32.5	32.5	32.5	14.9	
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.27	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1967	879	571	1967	438	
v/s Ratio Prot	0.10			c0.14	c0.12	
v/s Ratio Perm		0.07	0.06			
v/c Ratio	0.17	0.12	0.10	0.23	0.45	
Uniform Delay, d1	5.3	5.1	5.0	5.5	16.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.3	0.4	0.3	0.7	
Delay (s)	5.4	5.3	5.4	5.8	17.6	
Level of Service	A	A	A	A	B	
Approach Delay (s)	5.4			5.7	17.6	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			7.8		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.30			
Actuated Cycle Length (s)			55.4		Sum of lost time (s)	8.0
Intersection Capacity Utilization			41.0%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

Conditions

2: Pickering PI & Tremblay Rd

2030 Phase 2 PM.syn

					
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Traffic Volume (vph)	364	21	8	440	29
Future Volume (vph)	364	21	8	440	29
Lane Group Flow (vph)	383	22	8	463	46
Sign Control	Free			Free	Stop
Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 30.2%			ICU Level of Service A		
Analysis Period (min) 15					

Conditions

2: Pickering PI & Tremblay Rd

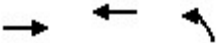
2030 Phase 2 PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	364	21	8	440	29	14
Future Volume (Veh/h)	364	21	8	440	29	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	383	22	8	463	31	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	121			272		
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			405		630	383
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			327		569	303
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		93	98
cM capacity (veh/h)			1148		420	647
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	383	22	8	232	232	46
Volume Left	0	0	8	0	0	31
Volume Right	0	22	0	0	0	15
cSH	1700	1700	1148	1700	1700	474
Volume to Capacity	0.23	0.01	0.01	0.14	0.14	0.10
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.0	2.6
Control Delay (s)	0.0	0.0	8.2	0.0	0.0	13.4
Lane LOS			A			B
Approach Delay (s)	0.0		0.1			13.4
Approach LOS						B
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			30.2%		ICU Level of Service	A
Analysis Period (min)			15			

Conditions

3: Avenue K & Tremblay Rd

2030 Phase 2 PM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations	↕↕	↕↕	↕↕
Traffic Volume (vph)	334	375	67
Future Volume (vph)	334	375	67
Lane Group Flow (vph)	405	442	135
Sign Control	Free	Free	Stop

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 41.6%		ICU Level of Service A
Analysis Period (min) 15		

Conditions

3: Avenue K & Tremblay Rd

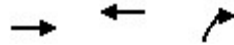
2030 Phase 2 PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	334	50	45	375	67	61
Future Volume (Veh/h)	334	50	45	375	67	61
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	352	53	47	395	71	64
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	262			131		
pX, platoon unblocked						
vC, conflicting volume			405		670	202
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			405		670	202
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		81	92
cM capacity (veh/h)			1150		374	805
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	235	170	179	263	135	
Volume Left	0	0	47	0	71	
Volume Right	0	53	0	0	64	
cSH	1700	1700	1150	1700	501	
Volume to Capacity	0.14	0.10	0.04	0.15	0.27	
Queue Length 95th (m)	0.0	0.0	1.0	0.0	8.6	
Control Delay (s)	0.0	0.0	2.4	0.0	14.8	
Lane LOS			A		B	
Approach Delay (s)	0.0		1.0		14.8	
Approach LOS					B	
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utilization			41.6%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

4: Avenue L & Tremblay Rd

2030 Phase 2 PM.syn



Lane Group	EBT	WBT	NBR
Lane Configurations			
Traffic Volume (vph)	383	420	54
Future Volume (vph)	383	420	54
Lane Group Flow (vph)	416	470	57
Sign Control	Free	Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 31.3%

ICU Level of Service A

Analysis Period (min) 15

Conditions

4: Avenue L & Tremblay Rd

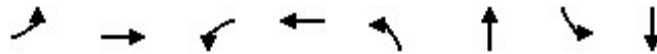
2030 Phase 2 PM.syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	383	12	27	420	0	54
Future Volume (Veh/h)	383	12	27	420	0	54
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	403	13	28	442	0	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	331			62		
pX, platoon unblocked						
vC, conflicting volume			416		686	208
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			416		686	208
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	93
cM capacity (veh/h)			1139		372	798
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	269	147	175	295	57	
Volume Left	0	0	28	0	0	
Volume Right	0	13	0	0	57	
cSH	1700	1700	1139	1700	798	
Volume to Capacity	0.16	0.09	0.02	0.17	0.07	
Queue Length 95th (m)	0.0	0.0	0.6	0.0	1.8	
Control Delay (s)	0.0	0.0	1.5	0.0	9.9	
Lane LOS			A		A	
Approach Delay (s)	0.0		0.6		9.9	
Approach LOS					A	
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			31.3%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

5: Belfast Rd & Tremblay Rd

2030 Phase 2 PM.syn



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	167	106	20	207	163	397	33	358
Future Volume (vph)	167	106	20	207	163	397	33	358
Lane Group Flow (vph)	176	296	21	290	172	439	35	461
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		5		1	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	29.8	29.8	29.8	29.8	10.9	19.9	10.9	19.9
Total Split (s)	35.0	35.0	35.0	35.0	20.0	45.0	20.0	45.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	20.0%	45.0%	20.0%	45.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	3.5	3.5	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.8	-2.8	-2.8	-2.8	-1.9	-1.9	-1.9	-1.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	31.4	31.4	31.4	31.4	14.3	39.8	9.3	29.5
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.16	0.46	0.11	0.34
v/c Ratio	0.62	0.47	0.08	0.47	0.63	0.55	0.20	0.78
Control Delay	38.0	19.8	23.5	25.5	46.8	21.5	41.1	35.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	19.8	23.5	25.5	46.8	21.5	41.1	35.3
LOS	D	B	C	C	D	C	D	D
Approach Delay		26.6		25.4		28.6		35.7
Approach LOS		C		C		C		D
Queue Length 50th (m)	26.1	28.4	2.5	37.7	28.5	59.6	5.9	71.7
Queue Length 95th (m)	#65.5	61.6	8.9	72.7	#56.8	94.3	16.1	107.5
Internal Link Dist (m)		37.8		75.7		74.6		56.3
Turn Bay Length (m)			50.0		65.0		25.0	
Base Capacity (vph)	284	630	279	621	310	855	310	823
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	0.62	0.47	0.08	0.47	0.55	0.51	0.11	0.56

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 87.4

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 29.4

Intersection Capacity Utilization 73.5%

Analysis Period (min) 15

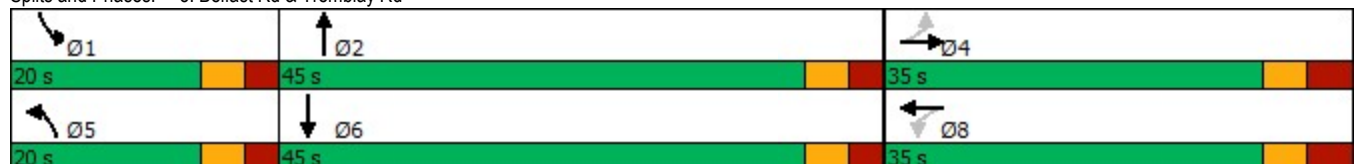
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Intersection LOS: C

ICU Level of Service D

Splits and Phases: 5: Belfast Rd & Tremblay Rd



Conditions

5: Belfast Rd & Tremblay Rd

2030 Phase 2 PM.syn

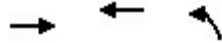
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	106	175	20	207	68	163	397	20	33	358	80
Future Volume (vph)	167	106	175	20	207	68	163	397	20	33	358	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1600		1676	1699		1676	1752		1676	1716	
Flt Permitted	0.45	1.00		0.44	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	791	1600		777	1699		1676	1752		1676	1716	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	176	112	184	21	218	72	172	418	21	35	377	84
RTOR Reduction (vph)	0	56	0	0	11	0	0	2	0	0	9	0
Lane Group Flow (vph)	176	240	0	21	279	0	172	437	0	35	452	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	28.6	28.6		28.6	28.6		12.4	37.9		4.8	30.3	
Effective Green, g (s)	31.4	31.4		31.4	31.4		14.3	39.8		6.7	32.2	
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.16	0.44		0.07	0.36	
Clearance Time (s)	6.8	6.8		6.8	6.8		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	276	558		271	593		266	775		124	614	
v/s Ratio Prot		0.15			0.16		c0.10	0.25		0.02	c0.26	
v/s Ratio Perm	c0.22			0.03								
v/c Ratio	0.64	0.43		0.08	0.47		0.65	0.56		0.28	0.74	
Uniform Delay, d1	24.5	22.4		19.6	22.8		35.4	18.6		39.3	25.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.8	2.4		0.6	2.7		5.3	0.9		1.3	4.6	
Delay (s)	35.3	24.8		20.1	25.4		40.8	19.6		40.6	29.7	
Level of Service	D	C		C	C		D	B		D	C	
Approach Delay (s)		28.7			25.1			25.5			30.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.6			HCM 2000 Level of Service					C	
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			89.9			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			73.5%			ICU Level of Service				D		
Analysis Period (min)			15									

c Critical Lane Group

Conditions

6: Avenue J & Tremblay Rd

2030 Phase 2 PM.syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	376	438	10
Future Volume (vph)	376	438	10
Lane Group Flow (vph)	398	465	19
Sign Control	Free	Free	Stop

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 25.7%

ICU Level of Service A

Analysis Period (min) 15

Conditions

6: Avenue J & Tremblay Rd

2030 Phase 2 PM.syn

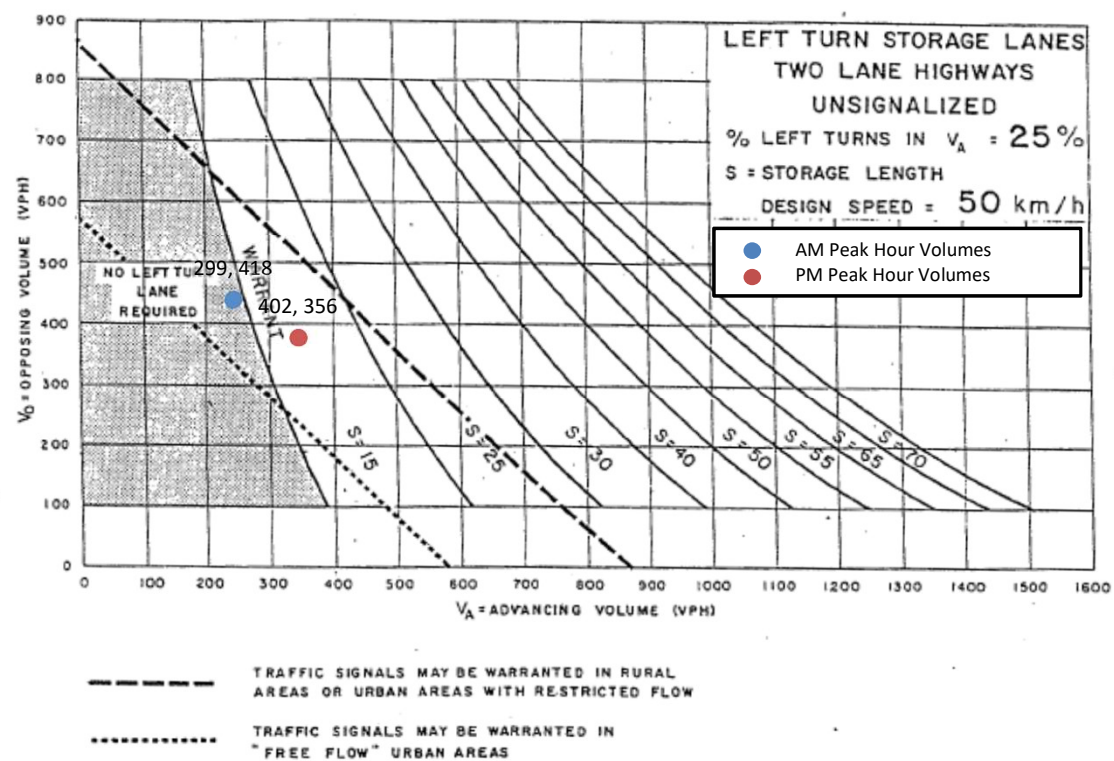
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	376	2	4	438	10	8
Future Volume (Veh/h)	376	2	4	438	10	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	396	2	4	461	11	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	192			201		
pX, platoon unblocked						
vC, conflicting volume			398		636	199
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			398		636	199
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1157		409	809
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	264	134	158	307	19	
Volume Left	0	0	4	0	11	
Volume Right	0	2	0	0	8	
cSH	1700	1700	1157	1700	517	
Volume to Capacity	0.16	0.08	0.00	0.18	0.04	
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.9	
Control Delay (s)	0.0	0.0	0.2	0.0	12.2	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.1		12.2	
Approach LOS					B	
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			25.7%	ICU Level of Service		A
Analysis Period (min)			15			

G

Appendix G – MTO Left-turn Lane Warrant and Signal Warrant Analysis

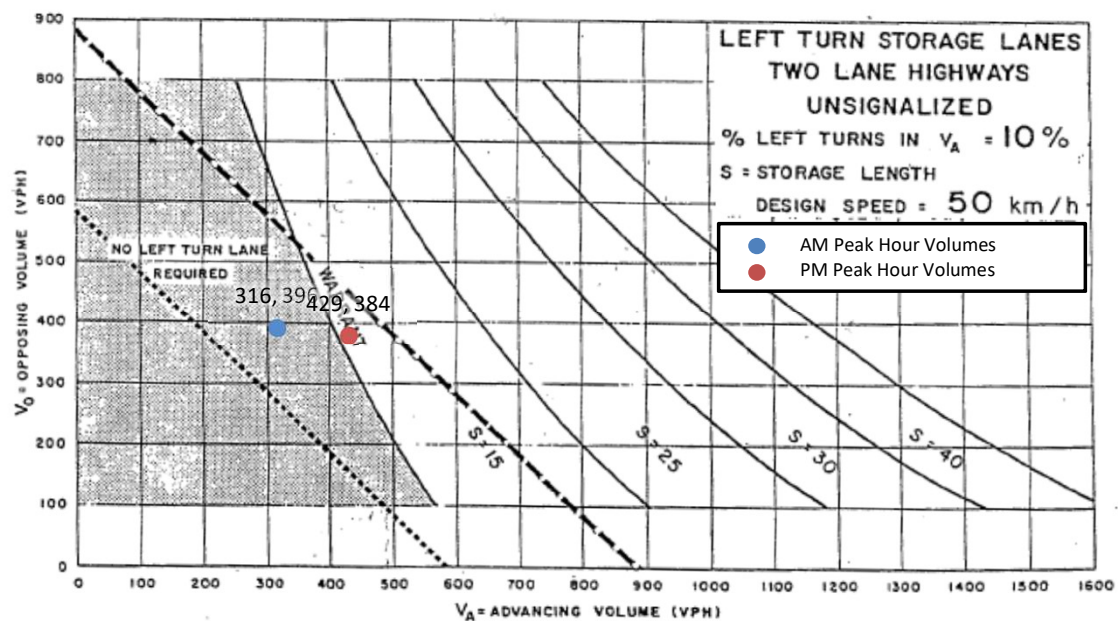
Intersection	Left-Turn Warrant	Advancing Traffic Volume (V_A)		Opposing Traffic Volume (V_O)		Left Turn Traffic Volume (V_L)		% of Left Turning Traffic		Warrant
		AM	PM	AM	PM	AM	PM	AM	PM	
Avenue K/Tremblay - P1 Projected	WBL	299	402	418	356	73	27	24%	7%	Yes

	 NBL	 NBT	 NBR	 SBL	 SBT	 SBR	 EBL	 EBT	 EBR	 WBL	 WBT	 WBR
AM	20	0	26	0	0	0	0	370	48	73	226	0
PM	49	0	48	0	0	0	0	336	20	27	375	0



Intersection	Left-Turn Warrant	Advancing Traffic Volume (V_A)		Opposing Traffic Volume (V_O)		Left Turn Traffic Volume (V_L)		% of Left Turning Traffic		Warrant
		AM	PM	AM	PM	AM	PM	AM	PM	
Avenue L/Tremblay - P1 Projected	WBL	316	429	396	384	17	27	5%	6%	Yes

	 NBL	 NBT	 NBR	 SBL	 SBT	 SBR	 EBL	 EBT	 EBR	 WBL	 WBT	 WBR
AM	0	0	46	0	0	0	0	385	11	17	299	0
PM	0	0	53	0	0	0	0	372	12	27	402	0



Avenue K/Tremblay Rd - (peak hour signal warrant) -P1 Projected

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	56%	14%	23% No
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	14%		
	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	51%	23%	
		(2) B	Combined Vehicle and Pedestrian Volume <u>Crossing</u> the Major Street for Each of the Same 8 Hours	75	23%		

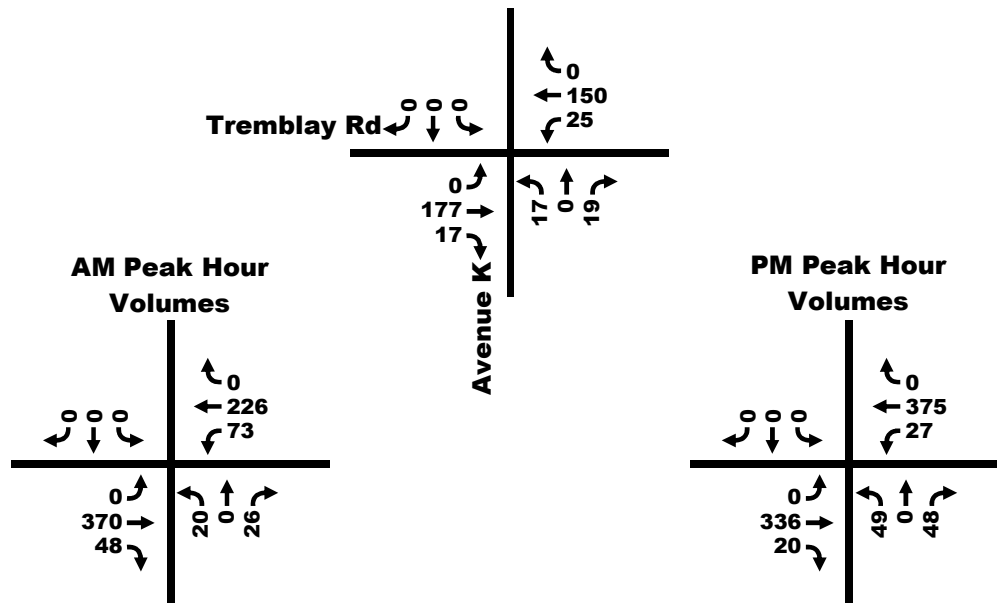
Notes

- 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
- 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)

No

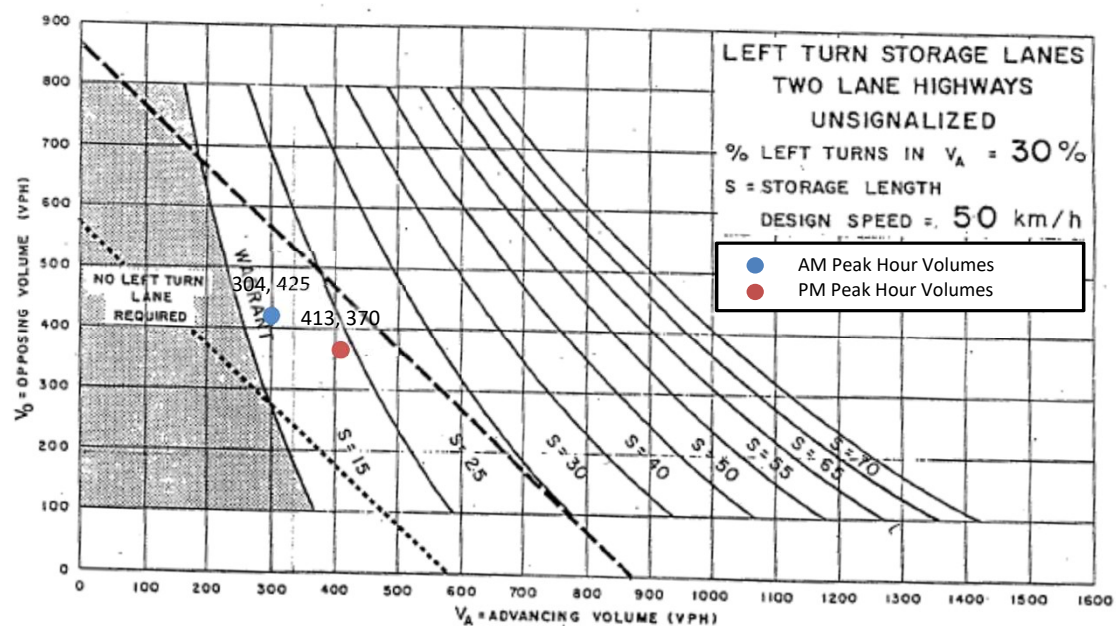
Yes

Average 8 Hour Volumes



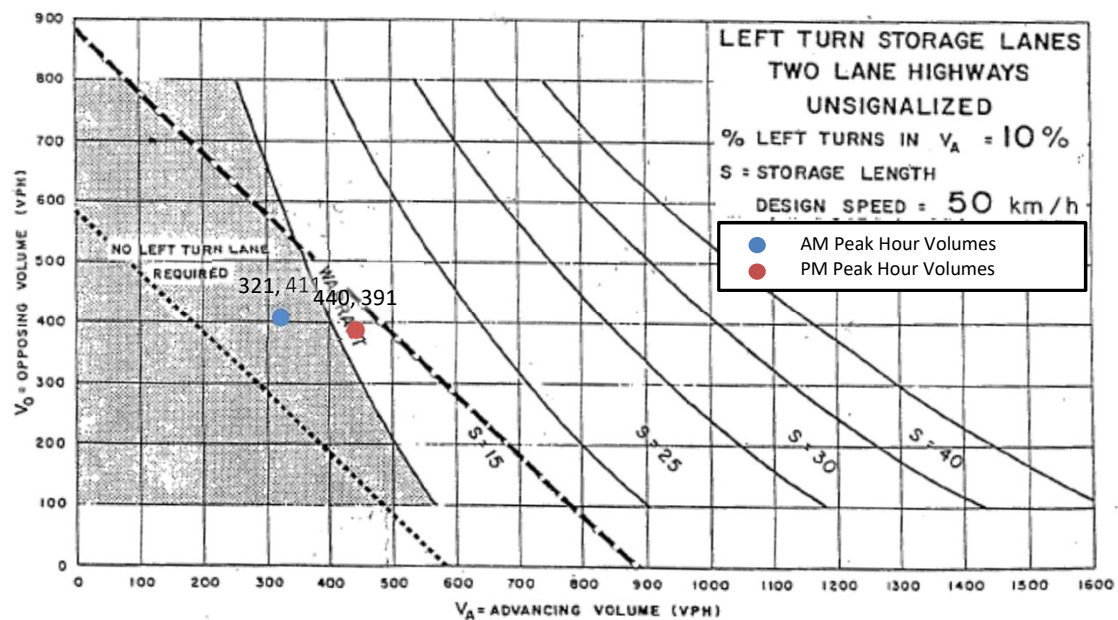
Intersection	Left-Turn Warrant	Advancing Traffic Volume (V_A)		Opposing Traffic Volume (V_O)		Left Turn Traffic Volume (V_L)		% of Left Turning Traffic		Warrant
		AM	PM	AM	PM	AM	PM	AM	PM	
Avenue K/Tremblay - P2 Projected	WBL	304	413	425	370	78	38	26%	9%	Yes

	 NBL	 NBT	 NBR	 SBL	 SBT	 SBR	 EBL	 EBT	 EBR	 WBL	 WBT	 WBR
AM	40	0	42	0	0	0	0	369	56	78	226	0
PM	59	0	57	0	0	0	0	334	36	38	375	0



Intersection	Left-Turn Warrant	Advancing Traffic Volume (V_A)		Opposing Traffic Volume (V_O)		Left Turn Traffic Volume (V_L)		% of Left Turning Traffic		Warrant
		AM	PM	AM	PM	AM	PM	AM	PM	
Avenue L/Tremblay - P2 Projected	WBL	321	440	411	391	17	27	5%	6%	Yes

	 NBL	 NBT	 NBR	 SBL	 SBT	 SBR	 EBL	 EBT	 EBR	 WBL	 WBT	 WBR
AM	0	0	46	0	0	0	0	400	11	17	304	0
PM	0	0	53	0	0	0	0	379	12	27	413	0



Avenue K/Tremblay Rd - (peak hour signal warrant) - P2 Projected

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	59%	20%	33% No
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	20%		
	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	53%	33%	
		(2) B	Combined Vehicle and Pedestrian Volume <u>Crossing</u> the Major Street for Each of the Same 8 Hours	75	33%		

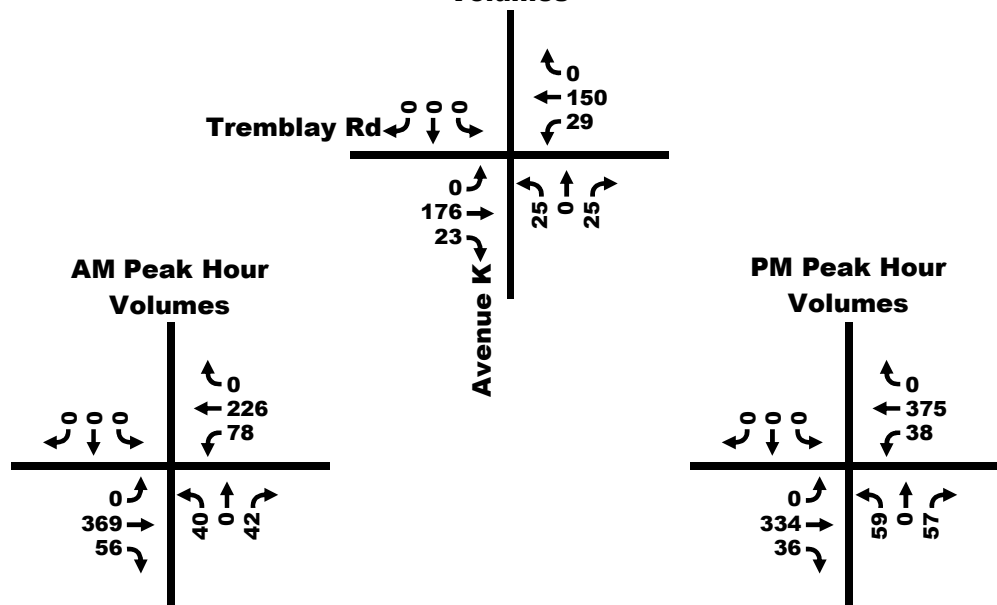
Notes

- 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
- 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)

No

Yes

Average 8 Hour Volumes



H

Appendix H – Transportation Demand Management (TDM) Strategies

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: <i>Non-residential developments</i>		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 (<i>see Official Plan policy 4.3.3</i>)	✓
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 (<i>see Official Plan policy 4.3.12</i>)	✓

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		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 (<i>see Official Plan policy 4.3.10</i>)	✓
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 (<i>see Official Plan policy 4.3.10</i>)	✓
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 (<i>see Official Plan policy 4.3.11</i>)	☐
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: <i>Non-residential developments</i>		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 (<i>see Official Plan policy 4.3.6</i>)	☐
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 (<i>see Zoning By-law Section 111</i>)	☐
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 (<i>see Zoning By-law Section 111</i>)	☐
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 (<i>see Zoning By-law Section 111</i>)	☐
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: <i>Non-residential developments</i>		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 (<i>see Zoning By-law Section 94</i>)	☐
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: <i>Non-residential developments</i>		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 (<i>see Zoning By-law Section 104</i>)	☐
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 (<i>see Zoning By-law Section 111</i>)	☐
6.2 Separate long-term & short-term parking areas		
BETTER	6.2.1 Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
7. OTHER		
7.1 On-site amenities to minimize off-site trips		
BETTER	7.1.1 Provide on-site amenities to minimize mid-day or mid-commute errands	☐



Appendix I – Segment MMLoS Assessment



Phase 1

SEGMENTS		LOS	via Rail Pickering	Pickering Avenue J	Avenue J Avenue K	Avenue K Avenue L	Avenue L Belfast
Pedestrian	Sidewalk Width	B	1.8 m	1.8 m	1.8 m	1.8 m	1.8 m
	Boulevard Width		< 0.5 m	< 0.5 m	< 0.5 m	< 0.5 m	< 0.5 m
	Avg Daily Curb Lane Traffic Volume		≤ 3000	≤ 3000	≤ 3000	≤ 3000	≤ 3000
	Operating Speed		> 30 to 50 km/h no	> 30 to 50 km/h no	> 30 to 50 km/h no	> 30 to 50 km/h no	> 30 to 50 km/h no
	On-Street Parking						
	Exposure to Traffic PLoS		B	B	B	B	B
	Effective Sidewalk Width		1.5 m	1.5 m	1.5 m	1.5 m	1.5 m
Bicycle	Pedestrian Volume	A	250 ped/hr	250 ped/hr	250 ped/hr	250 ped/hr	500 ped /hr
	Crowding PLoS		B	B	B	B	B
	Level of Service		B	B	B	B	B
	Type of Cycling Facility		Physically Separated	Physically Separated	Physically Separated	Physically Separated	Physically Separated
	Number of Travel Lanes		4-5 lanes total	2-3 lanes total	2-3 lanes total	2-3 lanes total	2-3 lanes total
	Operating Speed		>40 to <50 km/h	>40 to <50 km/h	>40 to <50 km/h	>40 to <50 km/h	>40 to <50 km/h
	# of Lanes & Operating Speed LoS		A	A	A	A	A
Transit	Bike Lane (+ Parking Lane) Width	D					
	Bike Lane Width LoS		-	-	-	-	-
	Bike Lane Blockages						
	Blockage LoS		-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes	≤ 3 lanes	≤ 3 lanes	≤ 3 lanes
	Sidestreet Operating Speed		≤ 40 km/h	≤ 40 km/h	≤ 40 km/h	≤ 40 km/h	≤ 40 km/h
Truck	Unsignalized Crossing - Lowest LoS	B	A	A	A	A	A
	Level of Service		A	A	A	A	A
	Facility Type		Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
Truck	Friction or Ratio Transit:Posted Speed	D	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8
	Level of Service		D	D	D	D	D
	Truck Lane Width		> 3.7 m	> 3.7 m	> 3.7 m	> 3.7 m	> 3.7 m
Truck	Travel Lanes per Direction	B	> 1	1	1	1	1
	Level of Service		A	B	B	B	B

Phase 2

SEGMENTS		LOS	via Rail Pickering	Pickering Avenue J	Avenue J Avenue K	Avenue K Avenue L	Avenue L Belfast
Pedestrian	Sidewalk Width	B	1.8 m	1.8 m	1.8 m	1.8 m	1.8 m
	Boulevard Width		< 0.5 m	< 0.5 m	< 0.5 m	< 0.5 m	< 0.5 m
	Avg Daily Curb Lane Traffic Volume		≤ 3000	≤ 3000	≤ 3000	≤ 3000	≤ 3000
	Operating Speed		> 30 to 50 km/h no	> 30 to 50 km/h no	> 30 to 50 km/h no	> 30 to 50 km/h no	> 30 to 50 km/h no
	On-Street Parking						
	Exposure to Traffic PLoS		B	B	B	B	B
	Effective Sidewalk Width		2.5 m	1.5 m	1.5 m	1.5 m	1.5 m
Bicycle	Pedestrian Volume	A	250 ped/hr	250 ped/hr	250 ped/hr	250 ped/hr	500 ped /hr
	Crowding PLoS		B	B	B	B	B
	Level of Service		B	B	B	B	B
	Type of Cycling Facility		Physically Separated	Physically Separated	Physically Separated	Physically Separated	Physically Separated
	Number of Travel Lanes		4-5 lanes total	4-5 lanes total	4-5 lanes total	4-5 lanes total	4-5 lanes total
	Operating Speed		>40 to <50 km/h	>40 to <50 km/h	>40 to <50 km/h	>40 to <50 km/h	>40 to <50 km/h
	# of Lanes & Operating Speed LoS		A	A	A	A	A
Transit	Bike Lane (+ Parking Lane) Width	D					
	Bike Lane Width LoS		-	-	-	-	-
	Bike Lane Blockages						
	Blockage LoS		-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes	≤ 3 lanes	≤ 3 lanes	≤ 3 lanes
	Sidestreet Operating Speed		≤ 40 km/h	≤ 40 km/h	≤ 40 km/h	≤ 40 km/h	≤ 40 km/h
Truck	Unsignalized Crossing - Lowest LoS	B	A	A	A	A	A
	Level of Service		A	A	A	A	A
	Facility Type		Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
Truck	Friction or Ratio Transit:Posted Speed	D	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8	Vt/Vp ≥ 0.8
	Level of Service		D	D	D	D	D
	Truck Lane Width		> 3.7 m	> 3.7 m	> 3.7 m	> 3.7 m	> 3.7 m
Truck	Travel Lanes per Direction	B	> 1	1	1	1	1
	Level of Service		A	B	B	B	B

J

Appendix J – PXO Scenario at Tremblay/Avenue K

MEMO

TO: City of Ottawa

CC:

FROM: Junshen Feng, B.Eng. CIMA+

REVIEWED BY: Derek Napoli, Dipl.T. CIMA+

DATE: 29 September 2020

SUBJECT: Pedestrian Crossover Scenario at Tremblay/Avenue K

A Pedestrian Crossover (PXO) is proposed on the east side of Tremblay/Avenue K intersection to enhance pedestrian/cyclist experience. The PXO will improve access to the Tremblay LRT station for the inbound (westbound) cyclist, and offer greater connectivity for pedestrians and local residences.

Tremblay road is a medium volume, major collector roadway with 50 km/h posted speed that will be expanded to 4 lanes (2 way) cross-section by the year 2030. A Level 2 Type B PXO treatment was selected based on the Pedestrian Crossover Selection Matrix in Ontario Traffic Manual Book 15 (OTM 2016).¹

The Synchro analysis was performed based on the 2030 and 2035 Total Projected scenario to identify the impact of the PXO on vehicle traffic delay. Synchro results are depicted below in **Table 1**, and the Synchro output is attached to the end of this memo. The number of pedestrian calls per hour of the PXO was assumed to be 5.

Table 1: Study Area Intersection Operations - 2030,2035 Total Projected Conditions (PXO)

Movement	Lanes	AM Peak Hour				PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Tremblay Rd/Avenue K (PXO) - Semi Act-Uncoord Signal									
EBT	2 T	0.14	3.2	A	26	0.14	3.2	A	25
WBT	2 T	0.11	3.2	A	19	0.15	3.2	A	26
NBL/R	1 L	0.21	14.8	A	6	0.27	14.8	A	9
Overall		0.13	3.2	A	-	0.15	3.2	A	-
Note: The northbound movement shown above is stop controlled, not controlled by the PXO signal. Performance of other intersections within the study area can be found in Table 11 in the main report.									

As shown in **Table 1**, the PXO is expected to introduce 3.2 seconds of delay, and to introduce a maximum 95-percentile queue of 26 meters to the roadway.

At the Tremblay/Belfast intersection, the highest projected 95-percentile queue (66 m in the eastbound left-turn lane) is less than the available 100 metre storage. The eastbound left-turn queue at Tremblay/Belfast is not expected to spillback to the PXO.

¹ Table 7: Pedestrian Crossover Selection Matrix, page 34, Ontario Traffic Manual Book 15, June 2016

Based on the above, the proposed PXO located at Tremblay/Avenue K is recommended from a transportation perspective.

Conditions

1: Via Rail & Tremblay Rd

2030 Phase 2 AM(PXO).syn

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↘	↑↑	↘
Traffic Volume (vph)	428	118	33	231	75
Future Volume (vph)	428	118	33	231	75
Lane Group Flow (vph)	451	124	35	243	130
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	30.6
Total Split (s)	44.1	44.1	44.1	44.1	36.6
Total Split (%)	54.6%	54.6%	54.6%	54.6%	45.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	3.3
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.6
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	None
Act Effct Green (s)	48.2	48.2	48.2	48.2	13.2
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.20
v/c Ratio	0.18	0.11	0.05	0.10	0.35
Control Delay	3.9	1.2	4.2	3.7	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.9	1.2	4.2	3.7	17.5
LOS	A	A	A	A	B
Approach Delay	3.3			3.8	17.5
Approach LOS	A			A	B
Queue Length 50th (m)	8.9	0.0	1.2	4.4	9.1
Queue Length 95th (m)	15.7	4.5	4.2	8.7	21.0
Internal Link Dist (m)	89.5			96.8	14.3
Turn Bay Length (m)		55.0	50.0		
Base Capacity (vph)	2491	1146	643	2491	844
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.18	0.11	0.05	0.10	0.15

Intersection Summary

Cycle Length: 80.7

Actuated Cycle Length: 64.9

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 5.3

Intersection Capacity Utilization 39.2%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Via Rail & Tremblay Rd

↖ Ø2	→ Ø4
36.6 s	44.1 s
	↖ Ø8
	44.1 s

Conditions

1: Via Rail & Tremblay Rd

2030 Phase 2 AM(PXO).syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	
Traffic Volume (vph)	428	118	33	231	75	48
Future Volume (vph)	428	118	33	231	75	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3353	1500	1676	3353	1622	
Flt Permitted	1.00	1.00	0.49	1.00	0.97	
Satd. Flow (perm)	3353	1500	867	3353	1622	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	451	124	35	243	79	51
RTOR Reduction (vph)	0	35	0	0	40	0
Lane Group Flow (vph)	451	89	35	243	90	0
Turn Type	NA	Perm	Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	45.2	45.2	45.2	45.2	8.3	
Effective Green, g (s)	47.3	47.3	47.3	47.3	10.9	
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.16	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	2395	1071	619	2395	267	
v/s Ratio Prot	c0.13			0.07	c0.06	
v/s Ratio Perm		0.06	0.04			
v/c Ratio	0.19	0.08	0.06	0.10	0.34	
Uniform Delay, d1	3.1	2.9	2.8	2.9	24.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.2	0.2	0.1	0.8	
Delay (s)	3.3	3.0	3.0	3.0	25.2	
Level of Service	A	A	A	A	C	
Approach Delay (s)	3.2			3.0	25.2	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			6.1		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.22			
Actuated Cycle Length (s)			66.2		Sum of lost time (s)	8.0
Intersection Capacity Utilization			39.2%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

Conditions
2: Pickering PI & Tremblay Rd

2030 Phase 2 AM(PXO).syn

					
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations				 	 
Traffic Volume (vph)	419	25	29	233	23
Future Volume (vph)	419	25	29	233	23
Lane Group Flow (vph)	441	26	31	245	39
Sign Control	Free			Free	Stop
Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 35.4%			ICU Level of Service A		
Analysis Period (min) 15					

Conditions

2: Pickering PI & Tremblay Rd

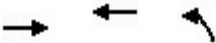
2030 Phase 2 AM(PXO).syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	419	25	29	233	23	14
Future Volume (Veh/h)	419	25	29	233	23	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	441	26	31	245	24	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	121			154		
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			467		626	441
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			394		564	366
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		94	97
cM capacity (veh/h)			1084		414	589
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	441	26	31	122	122	39
Volume Left	0	0	31	0	0	24
Volume Right	0	26	0	0	0	15
cSH	1700	1700	1084	1700	1700	467
Volume to Capacity	0.26	0.02	0.03	0.07	0.07	0.08
Queue Length 95th (m)	0.0	0.0	0.7	0.0	0.0	2.2
Control Delay (s)	0.0	0.0	8.4	0.0	0.0	13.4
Lane LOS			A			B
Approach Delay (s)	0.0		0.9			13.4
Approach LOS						B
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			35.4%		ICU Level of Service	A
Analysis Period (min)			15			

Conditions

3: Avenue K & Tremblay Rd

2030 Phase 2 AM(PXO).syn



Lane Group	EBT	WBT	NBL
Lane Configurations	↕↕	↕↕↕	↕↕
Traffic Volume (vph)	369	226	49
Future Volume (vph)	369	226	49
Lane Group Flow (vph)	450	322	100
Sign Control	Free	Free	Stop

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 37.6%		ICU Level of Service A
Analysis Period (min) 15		

Conditions

3: Avenue K & Tremblay Rd

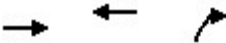
2030 Phase 2 AM(PXO).syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	369	59	80	226	49	46
Future Volume (Veh/h)	369	59	80	226	49	46
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	388	62	84	238	52	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	262			13		
pX, platoon unblocked					0.98	
vC, conflicting volume			450		706	225
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			450		663	225
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		85	94
cM capacity (veh/h)			1107		358	778
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	259	191	163	159	100	
Volume Left	0	0	84	0	52	
Volume Right	0	62	0	0	48	
cSH	1700	1700	1107	1700	483	
Volume to Capacity	0.15	0.11	0.08	0.09	0.21	
Queue Length 95th (m)	0.0	0.0	2.0	0.0	6.2	
Control Delay (s)	0.0	0.0	4.7	0.0	14.4	
Lane LOS			A		B	
Approach Delay (s)	0.0		2.4		14.4	
Approach LOS					B	
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utilization			37.6%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

4: Avenue L & Tremblay Rd

2030 Phase 2 AM(PXO).syn



Lane Group	EBT	WBT	NBR
Lane Configurations			
Traffic Volume (vph)	404	306	47
Future Volume (vph)	404	306	47
Lane Group Flow (vph)	437	340	49
Sign Control	Free	Free	

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 25.6%	ICU Level of Service A
Analysis Period (min) 15	

Conditions

4: Avenue L & Tremblay Rd

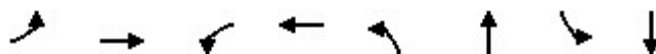
2030 Phase 2 AM(PXO).syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	404	11	17	306	0	47
Future Volume (Veh/h)	404	11	17	306	0	47
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	425	12	18	322	0	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	56			62		
pX, platoon unblocked			0.99		0.99	0.99
vC, conflicting volume			437		628	218
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			404		597	182
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	94
cM capacity (veh/h)			1137		422	818
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	283	154	125	215	49	
Volume Left	0	0	18	0	0	
Volume Right	0	12	0	0	49	
cSH	1700	1700	1137	1700	818	
Volume to Capacity	0.17	0.09	0.02	0.13	0.06	
Queue Length 95th (m)	0.0	0.0	0.4	0.0	1.5	
Control Delay (s)	0.0	0.0	1.3	0.0	9.7	
Lane LOS			A		A	
Approach Delay (s)	0.0		0.5		9.7	
Approach LOS					A	
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			25.6%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

5: Belfast Rd & Tremblay Rd

2030 Phase 2 AM(PXO).syn



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	147	169	18	142	124	269	49	244
Future Volume (vph)	147	169	18	142	124	269	49	244
Lane Group Flow (vph)	155	323	19	196	131	292	52	333
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	NA
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		5		6	
Detector Phase	4	4	8	8	5	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	29.8	29.8	29.8	29.8	10.9	19.9	19.9	19.9
Total Split (s)	35.0	35.0	35.0	35.0	15.0	50.0	35.0	35.0
Total Split (%)	41.2%	41.2%	41.2%	41.2%	17.6%	58.8%	41.2%	41.2%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	3.5	3.5	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.8	-2.8	-2.8	-2.8	-1.9	-1.9	-1.9	-1.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead		Lag	
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	31.8	31.8	31.8	31.8	10.7	32.0	20.8	20.8
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.15	0.44	0.29	0.29
v/c Ratio	0.32	0.43	0.05	0.26	0.53	0.37	0.18	0.66
Control Delay	19.1	16.1	16.1	15.3	40.2	13.6	21.4	28.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	16.4	16.1	15.3	40.2	13.6	21.4	28.6
LOS	B	B	B	B	D	B	C	C
Approach Delay		17.3		15.3		21.9		27.6
Approach LOS		B		B		C		C
Queue Length 50th (m)	15.2	27.2	1.6	16.4	18.2	25.4	5.9	41.2
Queue Length 95th (m)	35.4	58.4	6.6	36.6	#42.4	41.2	14.1	67.3
Internal Link Dist (m)		37.8		75.7		74.6		56.3
Turn Bay Length (m)			50.0		65.0		25.0	
Base Capacity (vph)	478	757	369	762	262	1151	452	764
Starvation Cap Reductn	0	113	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	0.32	0.50	0.05	0.26	0.50	0.25	0.12	0.44

Intersection Summary

Cycle Length: 85

Actuated Cycle Length: 72.1

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 20.9

Intersection LOS: C

Intersection Capacity Utilization 65.4%

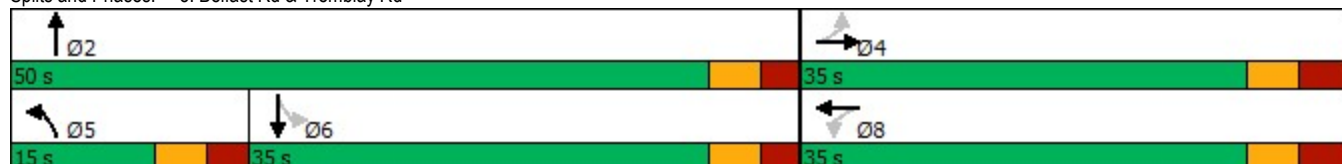
ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Belfast Rd & Tremblay Rd



Conditions

5: Belfast Rd & Tremblay Rd

2030 Phase 2 AM(PXO).syn

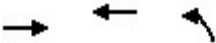
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	169	138	18	142	45	124	269	9	49	244	72
Future Volume (vph)	147	169	138	18	142	45	124	269	9	49	244	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.96		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1646		1676	1701		1676	1757		1676	1704	
Flt Permitted	0.61	1.00		0.48	1.00		0.95	1.00		0.58	1.00	
Satd. Flow (perm)	1082	1646		839	1701		1676	1757		1026	1704	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	155	178	145	19	149	47	131	283	9	52	257	76
RTOR Reduction (vph)	0	31	0	0	12	0	0	2	0	0	14	0
Lane Group Flow (vph)	155	292	0	19	184	0	131	290	0	52	319	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)	29.0	29.0		29.0	29.0		6.8	31.5		18.8	18.8	
Effective Green, g (s)	31.8	31.8		31.8	31.8		8.7	33.4		20.7	20.7	
Actuated g/C Ratio	0.43	0.43		0.43	0.43		0.12	0.46		0.28	0.28	
Clearance Time (s)	6.8	6.8		6.8	6.8		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	470	715		364	738		199	801		290	481	
v/s Ratio Prot		c0.18			0.11		c0.08	0.17			c0.19	
v/s Ratio Perm	0.14			0.02						0.05		
v/c Ratio	0.33	0.41		0.05	0.25		0.66	0.36		0.18	0.66	
Uniform Delay, d1	13.7	14.2		12.0	13.1		30.8	13.0		19.8	23.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	1.7		0.3	0.8		7.6	0.3		0.3	3.4	
Delay (s)	15.5	16.0		12.3	13.9		38.5	13.2		20.1	26.6	
Level of Service	B	B		B	B		D	B		C	C	
Approach Delay (s)		15.8			13.8			21.1			25.7	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			73.2			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			65.4%			ICU Level of Service				C		
Analysis Period (min)			15									

c Critical Lane Group

Conditions

6: Avenue J & Tremblay Rd

2030 Phase 2 AM(PXO).syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	423	260	2
Future Volume (vph)	423	260	2
Lane Group Flow (vph)	456	290	7
Sign Control	Free	Free	Stop

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 29.4%	ICU Level of Service A
Analysis Period (min) 15	

Conditions

6: Avenue J & Tremblay Rd

2030 Phase 2 AM(PXO).syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	423	10	15	260	2	5
Future Volume (Veh/h)	423	10	15	260	2	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	445	11	16	274	2	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	192			83		
pX, platoon unblocked						
vC, conflicting volume			456		620	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			456		620	228
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1101		414	775
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	297	159	107	183	7	
Volume Left	0	0	16	0	2	
Volume Right	0	11	0	0	5	
cSH	1700	1700	1101	1700	620	
Volume to Capacity	0.17	0.09	0.01	0.11	0.01	
Queue Length 95th (m)	0.0	0.0	0.4	0.0	0.3	
Control Delay (s)	0.0	0.0	1.3	0.0	10.9	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.5		10.9	
Approach LOS					B	
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			29.4%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

7: Tremblay Rd & PXO

2030 Phase 2 AM(PXO).syn



Lane Group	EBT	WBT	Ø1
Lane Configurations	↑↑	↑↑	
Traffic Volume (vph)	415	306	
Future Volume (vph)	415	306	
Lane Group Flow (vph)	437	322	
Turn Type	NA	NA	
Protected Phases	4	8	1
Permitted Phases			
Detector Phase	4	8	
Switch Phase			
Minimum Initial (s)	10.0	10.0	1.0
Minimum Split (s)	24.0	24.0	30.0
Total Split (s)	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50%
Yellow Time (s)	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	6.0	6.0	
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	None
Act Effct Green (s)	46.1	46.1	
Actuated g/C Ratio	0.90	0.90	
v/c Ratio	0.14	0.11	
Control Delay	3.2	3.2	
Queue Delay	0.0	0.0	
Total Delay	3.2	3.2	
LOS	A	A	
Approach Delay	3.2	3.2	
Approach LOS	A	A	
Queue Length 50th (m)	0.0	0.0	
Queue Length 95th (m)	26.0	19.3	
Internal Link Dist (m)	0.1	32.3	
Turn Bay Length (m)			
Base Capacity (vph)	3031	3031	
Starvation Cap Reductn	0	0	
Spillback Cap Reductn	0	0	
Storage Cap Reductn	0	0	
Reduced v/c Ratio	0.14	0.11	

Intersection Summary

Cycle Length: 60	
Actuated Cycle Length: 51	
Natural Cycle: 55	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.14	
Intersection Signal Delay: 3.2	Intersection LOS: A
Intersection Capacity Utilization 17.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: Tremblay Rd & PXO

 Ø1	 Ø4
30 s	30 s
	 Ø8
	30 s

Conditions

7: Tremblay Rd & PXO

2030 Phase 2 AM(PXO).syn

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	415	0	0	306	0	0	0	0	0	0	0
Future Volume (vph)	0	415	0	0	306	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0							
Lane Util. Factor		0.95			0.95							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3353			3353							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3353			3353							
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	437	0	0	322	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	437	0	0	322	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		4			8							
Permitted Phases												
Actuated Green, G (s)		40.7			40.7							
Effective Green, g (s)		40.7			40.7							
Actuated g/C Ratio		0.78			0.78							
Clearance Time (s)		6.0			6.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		2599			2599							
v/s Ratio Prot		0.13			0.10							
v/s Ratio Perm												
v/c Ratio		0.17			0.12							
Uniform Delay, d1		1.5			1.5							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.1			0.1							
Delay (s)		1.7			1.6							
Level of Service		A			A							
Approach Delay (s)		1.7			1.6			0.0			0.0	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		1.6			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.15										
Actuated Cycle Length (s)		52.5			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		17.1%			ICU Level of Service			A				
Analysis Period (min)		15										

c Critical Lane Group

Conditions

1: Via Rail & Tremblay Rd

2030 Phase 2 PM(PXO).syn

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑↑	↑	↓	↑↑	↓
Traffic Volume (vph)	314	164	56	437	146
Future Volume (vph)	314	164	56	437	146
Lane Group Flow (vph)	331	173	59	460	235
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	30.6
Total Split (s)	34.1	34.1	34.1	34.1	36.6
Total Split (%)	48.2%	48.2%	48.2%	48.2%	51.8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	3.3
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.6
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	None
Act Effct Green (s)	32.5	32.5	32.5	32.5	14.9
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.27
v/c Ratio	0.17	0.18	0.10	0.23	0.50
Control Delay	6.1	1.9	6.6	6.4	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	1.9	6.6	6.4	16.4
LOS	A	A	A	A	B
Approach Delay	4.6			6.4	16.4
Approach LOS	A			A	B
Queue Length 50th (m)	6.7	0.0	2.2	9.8	14.9
Queue Length 95th (m)	15.0	7.2	7.9	20.6	31.3
Internal Link Dist (m)	89.5			96.8	14.3
Turn Bay Length (m)		55.0	50.0		
Base Capacity (vph)	1965	950	570	1965	983
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.18	0.10	0.23	0.24

Intersection Summary

Cycle Length: 70.7

Actuated Cycle Length: 55.5

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 7.6

Intersection Capacity Utilization 41.0%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 1: Via Rail & Tremblay Rd

↖ Ø2	→ Ø4
36.6 s	34.1 s
	↖ Ø8
	34.1 s

Conditions

1: Via Rail & Tremblay Rd

2030 Phase 2 PM(PXO).syn

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓
Traffic Volume (vph)	314	164	56	437	146	77
Future Volume (vph)	314	164	56	437	146	77
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	0.85	1.00	1.00	0.95	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	3353	1500	1676	3353	1629	
Flt Permitted	1.00	1.00	0.55	1.00	0.97	
Satd. Flow (perm)	3353	1500	974	3353	1629	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	331	173	59	460	154	81
RTOR Reduction (vph)	0	72	0	0	37	0
Lane Group Flow (vph)	331	101	59	460	198	0
Turn Type	NA	Perm	Perm	NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	30.4	30.4	30.4	30.4	12.3	
Effective Green, g (s)	32.5	32.5	32.5	32.5	14.9	
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.27	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1967	879	571	1967	438	
v/s Ratio Prot	0.10			c0.14	c0.12	
v/s Ratio Perm		0.07	0.06			
v/c Ratio	0.17	0.12	0.10	0.23	0.45	
Uniform Delay, d1	5.3	5.1	5.0	5.5	16.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.3	0.4	0.3	0.7	
Delay (s)	5.4	5.3	5.4	5.8	17.6	
Level of Service	A	A	A	A	B	
Approach Delay (s)	5.4			5.7	17.6	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			7.8		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.30			
Actuated Cycle Length (s)			55.4		Sum of lost time (s)	8.0
Intersection Capacity Utilization			41.0%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

Conditions
2: Pickering PI & Tremblay Rd

2030 Phase 2 PM(PXO).syn

					
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations				 	 
Traffic Volume (vph)	364	21	8	440	29
Future Volume (vph)	364	21	8	440	29
Lane Group Flow (vph)	383	22	8	463	46
Sign Control	Free			Free	Stop
Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 30.2%			ICU Level of Service A		
Analysis Period (min) 15					

Conditions

2: Pickering PI & Tremblay Rd

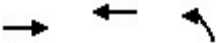
2030 Phase 2 PM(PXO).syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	364	21	8	440	29	14
Future Volume (Veh/h)	364	21	8	440	29	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	383	22	8	463	31	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	121			153		
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			405		630	383
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			327		569	303
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		93	98
cM capacity (veh/h)			1148		420	647
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	383	22	8	232	232	46
Volume Left	0	0	8	0	0	31
Volume Right	0	22	0	0	0	15
cSH	1700	1700	1148	1700	1700	474
Volume to Capacity	0.23	0.01	0.01	0.14	0.14	0.10
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.0	2.6
Control Delay (s)	0.0	0.0	8.2	0.0	0.0	13.4
Lane LOS			A			B
Approach Delay (s)	0.0		0.1			13.4
Approach LOS						B
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			30.2%		ICU Level of Service	A
Analysis Period (min)			15			

Conditions

3: Avenue K & Tremblay Rd

2030 Phase 2 PM(PXO).syn



Lane Group	EBT	WBT	NBL
Lane Configurations	↕↕	↕↕	↕↕
Traffic Volume (vph)	334	375	67
Future Volume (vph)	334	375	67
Lane Group Flow (vph)	405	442	135
Sign Control	Free	Free	Stop

Intersection Summary		
Control Type: Unsignalized		
Intersection Capacity Utilization 41.6%		ICU Level of Service A
Analysis Period (min) 15		

Conditions

3: Avenue K & Tremblay Rd

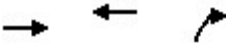
2030 Phase 2 PM(PXO).syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	334	50	45	375	67	61
Future Volume (Veh/h)	334	50	45	375	67	61
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	352	53	47	395	71	64
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	262			12		
pX, platoon unblocked					0.97	
vC, conflicting volume			405		670	202
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			405		597	202
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		82	92
cM capacity (veh/h)			1150		404	805
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	235	170	179	263	135	
Volume Left	0	0	47	0	71	
Volume Right	0	53	0	0	64	
cSH	1700	1700	1150	1700	529	
Volume to Capacity	0.14	0.10	0.04	0.15	0.26	
Queue Length 95th (m)	0.0	0.0	1.0	0.0	8.1	
Control Delay (s)	0.0	0.0	2.4	0.0	14.1	
Lane LOS			A		B	
Approach Delay (s)	0.0		1.0		14.1	
Approach LOS					B	
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			41.6%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

4: Avenue L & Tremblay Rd

2030 Phase 2 PM(PXO).syn



Lane Group	EBT	WBT	NBR
Lane Configurations	↕↕	↕↕	↗
Traffic Volume (vph)	383	420	54
Future Volume (vph)	383	420	54
Lane Group Flow (vph)	416	470	57
Sign Control	Free	Free	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 31.3%	ICU Level of Service A
Analysis Period (min) 15	

Conditions

4: Avenue L & Tremblay Rd

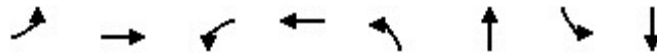
2030 Phase 2 PM(PXO).syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	383	12	27	420	0	54
Future Volume (Veh/h)	383	12	27	420	0	54
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	403	13	28	442	0	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	57			62		
pX, platoon unblocked			0.99		0.99	0.99
vC, conflicting volume			416		686	208
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			390		663	180
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	93
cM capacity (veh/h)			1153		381	823
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	269	147	175	295	57	
Volume Left	0	0	28	0	0	
Volume Right	0	13	0	0	57	
cSH	1700	1700	1153	1700	823	
Volume to Capacity	0.16	0.09	0.02	0.17	0.07	
Queue Length 95th (m)	0.0	0.0	0.6	0.0	1.8	
Control Delay (s)	0.0	0.0	1.5	0.0	9.7	
Lane LOS			A		A	
Approach Delay (s)	0.0		0.6		9.7	
Approach LOS					A	
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			31.3%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

5: Belfast Rd & Tremblay Rd

2030 Phase 2 PM(PXO).syn



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	167	106	20	207	163	397	33	358
Future Volume (vph)	167	106	20	207	163	397	33	358
Lane Group Flow (vph)	176	296	21	290	172	439	35	461
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		5		1	
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	29.8	29.8	29.8	29.8	10.9	19.9	10.9	19.9
Total Split (s)	35.0	35.0	35.0	35.0	20.0	45.0	20.0	45.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	20.0%	45.0%	20.0%	45.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	3.5	3.5	3.5	3.5	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.8	-2.8	-2.8	-2.8	-1.9	-1.9	-1.9	-1.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	31.4	31.4	31.4	31.4	14.3	39.8	9.3	29.5
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.16	0.46	0.11	0.34
v/c Ratio	0.62	0.47	0.08	0.47	0.63	0.55	0.20	0.78
Control Delay	38.0	19.8	23.5	25.5	46.8	21.5	41.1	35.3
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	20.3	23.5	25.5	46.8	21.5	41.1	35.3
LOS	D	C	C	C	D	C	D	D
Approach Delay		26.9		25.4		28.6		35.7
Approach LOS		C		C		C		D
Queue Length 50th (m)	26.1	28.4	2.5	37.7	28.5	59.6	5.9	71.7
Queue Length 95th (m)	#65.5	61.6	8.9	72.7	#56.8	94.3	16.1	107.5
Internal Link Dist (m)		37.8		75.7		74.6		56.3
Turn Bay Length (m)			50.0		65.0		25.0	
Base Capacity (vph)	284	630	279	621	310	855	310	823
Starvation Cap Reductn	0	86	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	0.62	0.54	0.08	0.47	0.55	0.51	0.11	0.56

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 87.4

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 29.5

Intersection LOS: C

Intersection Capacity Utilization 73.5%

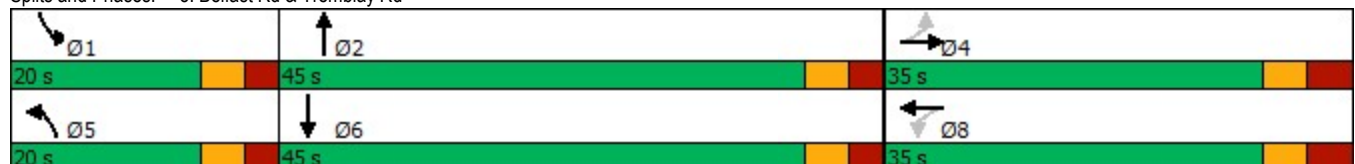
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Belfast Rd & Tremblay Rd



Conditions

5: Belfast Rd & Tremblay Rd

2030 Phase 2 PM(PXO).syn

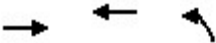
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	106	175	20	207	68	163	397	20	33	358	80
Future Volume (vph)	167	106	175	20	207	68	163	397	20	33	358	80
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1676	1600		1676	1699		1676	1752		1676	1716	
Flt Permitted	0.45	1.00		0.44	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	791	1600		777	1699		1676	1752		1676	1716	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	176	112	184	21	218	72	172	418	21	35	377	84
RTOR Reduction (vph)	0	56	0	0	11	0	0	2	0	0	9	0
Lane Group Flow (vph)	176	240	0	21	279	0	172	437	0	35	452	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	28.6	28.6		28.6	28.6		12.4	37.9		4.8	30.3	
Effective Green, g (s)	31.4	31.4		31.4	31.4		14.3	39.8		6.7	32.2	
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.16	0.44		0.07	0.36	
Clearance Time (s)	6.8	6.8		6.8	6.8		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	276	558		271	593		266	775		124	614	
v/s Ratio Prot		0.15			0.16		c0.10	0.25		0.02	c0.26	
v/s Ratio Perm	c0.22			0.03								
v/c Ratio	0.64	0.43		0.08	0.47		0.65	0.56		0.28	0.74	
Uniform Delay, d1	24.5	22.4		19.6	22.8		35.4	18.6		39.3	25.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.8	2.4		0.6	2.7		5.3	0.9		1.3	4.6	
Delay (s)	35.3	24.8		20.1	25.4		40.8	19.6		40.6	29.7	
Level of Service	D	C		C	C		D	B		D	C	
Approach Delay (s)		28.7			25.1			25.5			30.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			89.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			73.5%			ICU Level of Service			D			
Analysis Period (min)			15									

c Critical Lane Group

Conditions

6: Avenue J & Tremblay Rd

2030 Phase 2 PM(PXO).syn



Lane Group	EBT	WBT	NBL
Lane Configurations			
Traffic Volume (vph)	376	438	10
Future Volume (vph)	376	438	10
Lane Group Flow (vph)	398	465	19
Sign Control	Free	Free	Stop

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

Conditions

6: Avenue J & Tremblay Rd

2030 Phase 2 PM(PXO).syn

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	376	2	4	438	10	8
Future Volume (Veh/h)	376	2	4	438	10	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	396	2	4	461	11	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	192			82		
pX, platoon unblocked						
vC, conflicting volume			398		636	199
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			398		636	199
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1157		409	809
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	264	134	158	307	19	
Volume Left	0	0	4	0	11	
Volume Right	0	2	0	0	8	
cSH	1700	1700	1157	1700	517	
Volume to Capacity	0.16	0.08	0.00	0.18	0.04	
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.9	
Control Delay (s)	0.0	0.0	0.2	0.0	12.2	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.1		12.2	
Approach LOS					B	
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			25.7%	ICU Level of Service		A
Analysis Period (min)			15			

Conditions

7: Tremblay Rd & PXO

2030 Phase 2 PM(PXO).syn



Lane Group	EBT	WBT	Ø1
Lane Configurations	↑↑	↑↑	
Traffic Volume (vph)	395	420	
Future Volume (vph)	395	420	
Lane Group Flow (vph)	416	442	
Turn Type	NA	NA	
Protected Phases	4	8	1
Permitted Phases			
Detector Phase	4	8	
Switch Phase			
Minimum Initial (s)	10.0	10.0	1.0
Minimum Split (s)	24.0	24.0	30.0
Total Split (s)	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50%
Yellow Time (s)	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	6.0	6.0	
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode	Max	Max	None
Act Effct Green (s)	46.1	46.1	
Actuated g/C Ratio	0.90	0.90	
v/c Ratio	0.14	0.15	
Control Delay	3.2	3.2	
Queue Delay	0.0	0.0	
Total Delay	3.2	3.2	
LOS	A	A	
Approach Delay	3.2	3.2	
Approach LOS	A	A	
Queue Length 50th (m)	0.0	0.0	
Queue Length 95th (m)	24.7	26.3	
Internal Link Dist (m)	0.1	32.8	
Turn Bay Length (m)			
Base Capacity (vph)	3031	3031	
Starvation Cap Reductn	0	0	
Spillback Cap Reductn	0	0	
Storage Cap Reductn	0	0	
Reduced v/c Ratio	0.14	0.15	

Intersection Summary

Cycle Length: 60	
Actuated Cycle Length: 51	
Natural Cycle: 55	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.15	
Intersection Signal Delay: 3.2	Intersection LOS: A
Intersection Capacity Utilization 17.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: Tremblay Rd & PXO

 Ø1	 Ø4
30 s	30 s
	 Ø8
	30 s

Conditions

7: Tremblay Rd & PXO

2030 Phase 2 PM(PXO).syn

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	395	0	0	420	0	0	0	0	0	0	0
Future Volume (vph)	0	395	0	0	420	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		6.0			6.0							
Lane Util. Factor		0.95			0.95							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3353			3353							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3353			3353							
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	416	0	0	442	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	416	0	0	442	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		4			8							
Permitted Phases												
Actuated Green, G (s)		40.7			40.7							
Effective Green, g (s)		40.7			40.7							
Actuated g/C Ratio		0.78			0.78							
Clearance Time (s)		6.0			6.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		2599			2599							
v/s Ratio Prot		0.12			0.13							
v/s Ratio Perm												
v/c Ratio		0.16			0.17							
Uniform Delay, d1		1.5			1.5							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.1			0.1							
Delay (s)		1.6			1.7							
Level of Service		A			A							
Approach Delay (s)		1.6			1.7			0.0			0.0	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		1.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.16										
Actuated Cycle Length (s)		52.5			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		17.3%			ICU Level of Service			A				
Analysis Period (min)		15										

c Critical Lane Group

K

Appendix K – Collision Analysis

Total Area

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	9	5	3	4	2	2	0	25
02 - Non-Fatal inj	0	2	1	0	3	0	0	0	6
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	11	6	3	7	2	2	0	31
	#7 or 0%	#1 or 35%	#3 or 19%	#4 or 10%	#2 or 23%	#5 or 6%	#5 or 6%	#7 or 0%	

81%
19%
0%
100%

BELFAST RD @ TREMBLAY RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	8	16,708	1825	0.26

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	1	1	1	1	0	0	0	4
02 - Non-Fatal inj	0	1	1	0	2	0	0	0	4
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	2	2	1	3	0	0	0	8
	0%	25%	25%	13%	38%	0%	0%	0%	

50%
50%
0%
100%

TREMBLAY RD @ TRAIN STATION

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	5	9,492	1825	0.29

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	1	0	1	1	0	1	0	4
02 - Non-Fatal inj	0	1	0	0	0	0	0	0	1
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	2	0	1	1	0	1	0	5
	0%	40%	0%	20%	20%	0%	20%	0%	

80%
20%
0%
100%

AVENUE L @ TREMBLAY RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	3	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	1	0	0	2	0	0	0	3
02 - Non-Fatal inj	0	0	0	0	0	0	0	0	0
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	2	0	0	0	3
	0%	33%	0%	0%	67%	0%	0%	0%	

100%
0%
0%
100%

TREMBLAY RD btwn RIVERSIDE DR & TRAIN STATION

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	5	7,606	1825	0.36

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	2	1	1	0	0	1	0	5
02 - Non-Fatal inj	0	0	0	0	0	0	0	0	0
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	2	1	1	0	0	1	0	5
	0%	40%	20%	20%	0%	0%	20%	0%	

100%
0%
0%
100%

PICKERING PL @ TREMBLAY RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	4	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	4	0	0	0	0	0	0	4
02 - Non-Fatal inj	0	0	0	0	0	0	0	0	0
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	4	0	0	0	0	0	0	4
	0%	100%	0%	0%	0%	0%	0%	0%	

100%
0%
0%
100%

AVENUE L btwn TREMBLAY RD & END

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	2	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	0	0	0	0	2	0	0	2
02 - Non-Fatal inj	0	0	0	0	0	0	0	0	0
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	0	2
	0%	0%	0%	0%	0%	100%	0%	0%	

100%
0%
0%
100%

TREMBLAY RD btwn AVENUE K & AVENUE L

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	1	5,777	1825	0.09

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	0	1	0	0	0	0	0	1
02 - Non-Fatal inj	0	0	0	0	0	0	0	0	0
01 - Fatal injury	0	0	1	0	0	0	0	0	0
Total	0	0	1	0	0	0	0	0	1
	0%	0%	100%	0%	0%	0%	0%	0%	

100%
0%
0%
100%

AVENUE K @ TREMBLAY RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2014-2018	3	n/a	1825	n/a

Classification of Accident	01 - Approaching	02 - Angle	03 - Rear end	04 - Sideswipe	05 - Turning movement	06 - SMV unattended vehicle	07 - SMV other	99 - Other	Total
03 - P.D. only	0	0	2	0	0	0	0	0	2
02 - Non-Fatal inj	0	0	0	0	1	0	0	0	1
01 - Fatal injury	0	0	0	0	0	0	0	0	0
Total	0	0	2	0	1	0	0	0	3
	0%	0%	67%	0%	33%	0%	0%	0%	

67%
33%
0%
100%



Appendix L – Intersection MMLoS Assessment

INTERSECTIONS									
Crossing Side		Via Rail / Tremblay Road				Tremblay Road / Belfast			
		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	0 - 2	0 - 2	5	5	3	3	3	3
	Median	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	No Median - 2.4 m
	Conflicting Left Turns	Protected	Protected	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
	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
	Right Turns on Red (RTor) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	10-15m	10-15m	10-15m	10-15m	15-25m	15-25m	15-25m	15-25m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	93	93	37	37	76	68	68	68
	Ped. Exposure to Traffic LoS	A	A	E	E	B	C	C	C
	Cycle Length	37	37	44	44	32	32	46	85
	Effective Walk Time	7	7	7	7	8	8	28	67
	Average Pedestrian Delay	12	12	16	16	9	9	4	2
	Pedestrian Delay LoS	B	B	B	B	A	A	A	A
Level of Service		B	B	E	E	B	C	C	C
		E				C			
Approach From		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP
	Right Turn Lane Configuration	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Right Turning Speed	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Cyclist relative to RT motorists	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Separated or Mixed Traffic	Separated	Separated	Separated	Separated	Separated	Separated	Separated	Separated
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	1 lane crossed	1 lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed
	Operating Speed	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h
	Left Turning Cyclist	E	E	C	C	E	E	E	E
	Level of Service	E	E	C	C	E	E	E	E
Level of Service		E				E			
Transit	Average Signal Delay	≤ 20 sec	≤ 10 sec	≤ 10 sec	≤ 10 sec	≤ 30 sec	≤ 30 sec	≤ 20 sec	≤ 20 sec
	Level of Service	C	B	B	B	D	D	C	C
		C				D			
Truck	Effective Corner Radius	10 - 15 m	10 - 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m
	Number of Receiving Lanes on Departure from Intersection	≥ 2	≥ 2	1	1	1	1	1	1
	Level of Service	B	B	C	C	C	C	C	C
Level of Service		C				C			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.61 - 0.70			
	Level of Service	A				B			

INTERSECTIONS									
Crossing Side		Via Rail / Tremblay Road				Tremblay Road / Belfast			
		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	0 - 2	0 - 2	5	5	3	3	4	4
	Median	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	No Median - 2.4 m
	Conflicting Left Turns	Protected	Protected	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
	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
	Right Turns on Red (RTor) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	10-15m	10-15m	10-15m	10-15m	15-25m	15-25m	15-25m	15-25m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	93	93	37	37	76	68	51	51
	Ped. Exposure to Traffic LoS	A	A	E	E	B	C	D	D
	Cycle Length	37	37	44	44	32	32	46	85
	Effective Walk Time	7	7	7	7	8	8	28	67
	Average Pedestrian Delay	12	12	16	16	9	9	4	2
	Pedestrian Delay LoS	B	B	B	B	A	A	A	A
Level of Service		B	B	E	E	B	C	D	D
		E				D			
Approach From		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP
	Right Turn Lane Configuration	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Right Turning Speed	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Cyclist relative to RT motorists	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Separated or Mixed Traffic	Separated	Separated	Separated	Separated	Separated	Separated	Separated	Separated
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed
	Operating Speed	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h
	Left Turning Cyclist	E	E	E	E	E	E	E	E
	Level of Service	E	E	E	E	E	E	E	E
Level of Service		E				E			
Transit	Average Signal Delay	≤ 20 sec	≤ 10 sec	≤ 10 sec	≤ 10 sec	≤ 30 sec	≤ 30 sec	≤ 20 sec	≤ 20 sec
	Level of Service	C	B	B	B	D	D	C	C
		C				D			
Truck	Effective Corner Radius	10 - 15 m	10 - 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m
	Number of Receiving Lanes on Departure from Intersection	≥ 2	≥ 2	1	1	1	1	1	1
	Level of Service	B	B	C	C	C	C	C	C
Level of Service		C				C			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.61 - 0.70			
	Level of Service	A				B			

M

Appendix M – TDM Checklist

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: <i>Non-residential developments</i>		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		
<i>Commuter travel</i>		
BETTER ★	2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
2.3 Valet bike parking		
<i>Visitor travel</i>		
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: <i>Non-residential developments</i>		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		
<i>Commuter travel</i>		
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	☐
<i>Visitor travel</i>		
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		
<i>Commuter travel</i>		
BETTER	3.3.1 Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
<i>Visitor travel</i>		
BETTER	3.3.2 Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
3.4 Private transit service		
<i>Commuter travel</i>		
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)	☐
<i>Visitor travel</i>		
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: <i>Non-residential developments</i>		Check if proposed & add descriptions
4. RIDESHARING		
4.1 Ridematching service		
<i>Commuter travel</i>		
BASIC ★	4.1.1 Provide a dedicated ridematching portal at OttawaRideMatch.com	☐
4.2 Carpool parking price incentives		
<i>Commuter travel</i>		
BETTER	4.2.1 Provide discounts on parking costs for registered carpools	☐
4.3 Vanpool service		
<i>Commuter travel</i>		
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	☐
<i>Commuter travel</i>		
BETTER	5.1.2 Provide employees with bikeshare memberships for local business travel	☐
5.2 Carshare vehicles & memberships		
<i>Commuter travel</i>		
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		
<i>Commuter travel</i>		
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	✓
<i>Visitor travel</i>		
BETTER	6.1.3 Charge for short-term parking (hourly)	☐

TDM measures: <i>Non-residential developments</i>			Check if proposed & add descriptions
7. TDM MARKETING & COMMUNICATIONS			
7.1 Multimodal travel information			
<i>Commuter travel</i>			
BASIC	★	7.1.1 Provide a multimodal travel option information package to new/relocating employees and students	☐
<i>Visitor travel</i>			
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			
<i>Commuter travel</i>			
BETTER	★	7.2.1 Offer personalized trip planning to new/relocating employees	☐
7.3 Promotions			
<i>Commuter travel</i>			
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			
<i>Commuter travel</i>			
BETTER	★	8.1.1 Provide emergency ride home service to non-driving commuters	☐
8.2 Alternative work arrangements			
<i>Commuter travel</i>			
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			
<i>Commuter travel</i>			
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			
<i>Commuter travel</i>			
BETTER		8.4.1 Offer employees a taxable, mode-neutral commuting allowance	☐
8.5 On-site amenities			
<i>Commuter travel</i>			
BETTER		8.5.1 Provide on-site amenities/services to minimize mid-day or mid-commute errands	✓

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: <i>Residential developments</i>		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 (<i>multi-family, condominium</i>)	✓
2.2 Bicycle skills training		
BETTER	2.2.1 Offer on-site cycling courses for residents, or subsidize off-site courses	☐

TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
3. TRANSIT		
3.1 Transit information		
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances (<i>multi-family, condominium</i>)	☐
BETTER	3.1.2 Provide real-time arrival information display at entrances (<i>multi-family, condominium</i>)	☐
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 (<i>subdivision</i>)	☐
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 (<i>multi-family</i>)	☐
BETTER	4.1.2 Provide residents with bikeshare memberships, either free or subsidized (<i>multi-family</i>)	☐
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 (<i>condominium</i>)	✓
BASIC ★	5.1.2 Unbundle parking cost from monthly rent (<i>multi-family</i>)	☐

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



Appendix N –Transit Map





EAST
EST

○ Blair

○ Cyrville

○ St-Laurent

○ Tremblay

■ VIA

○ Hurdman  SOUTH
SUD → 

○ Lees

24 min. ○ uOttawa

○ Rideau

○ Parliament
Parlement

○ Lyon

○ Pimisi

○ Bayview 2

○ Tunney's Pasture



WEST
OUEST





18

ST-LAURENT

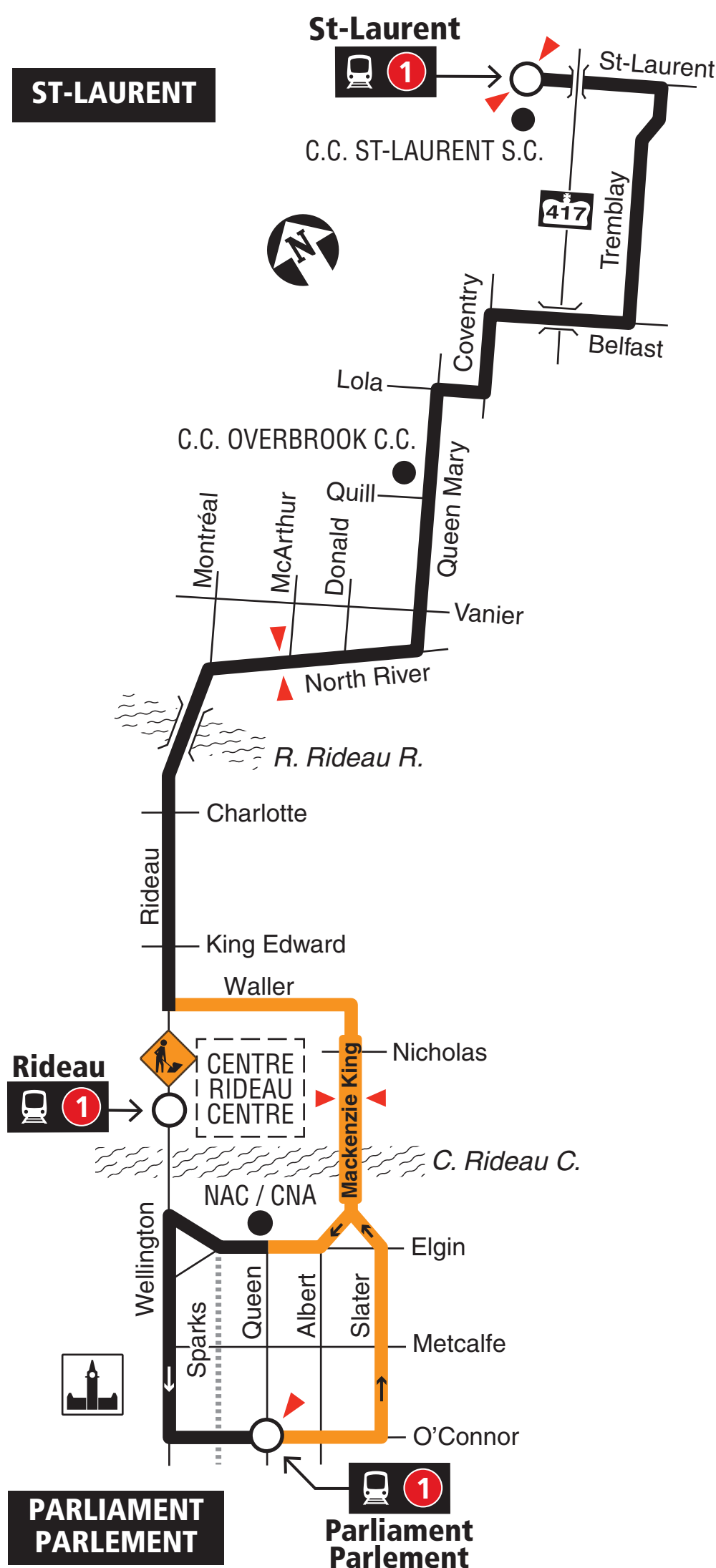
PARLIAMENT PARLEMENT

Local

7 days a week / 7 jours par semaine

All day service

Service toute la journée



2020.04



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

Text / Texto560560

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

Customer Service

Service à la clientèle **613-741-4390**

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

Security / Sécurité **613-741-2478**

Effective April 26, 2020

En vigueur 26 avril 2020



INFO 613-741-4390
octranspo.com



Rapid

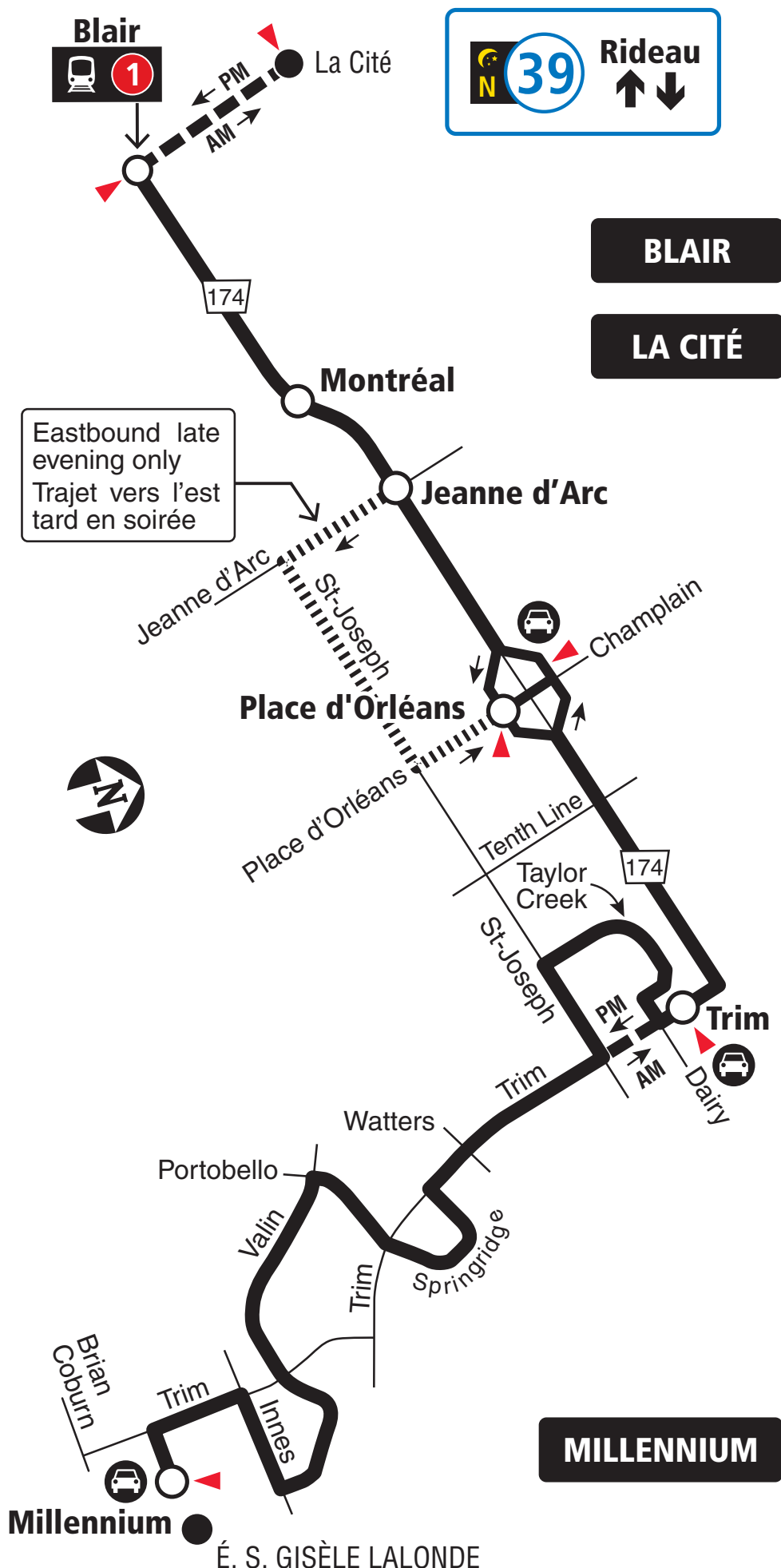
MILLENNIUM

**BLAIR
LA CITÉ**

7 days a week / 7 jours par semaine

All day service and limited overnight

Service toute la journée et limité la nuit



Station



Peak periods / Périodes de pointe



Park & Ride / Parc-o-bus



Timepoint / Heures de passage



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

2019.07



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

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

Security / Sécurité **613-741-2478**

Transpo

INFO 613-741-4390
octranspo.com



Appendix O – Transit Ridership Data

Winter 2020 (5 Jan 2020 - 7 Mar 2020)

Stop No.	Location	Route	Direction	AM			PM			24-HR		
				Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure
1371	TREMBLAY/VIA RAIL(B)	39	WB	-	-	-	-	-	-	0	3	2
1369	TREMBLAY/VIA RAIL(A)	39	EB	-	-	-	-	-	-	0	0	2
1836	TREMBLAY / BELFAST	18 39	WB WB	3 -	3 -	6 -	2 -	2 -	16 -	10 0	13 0	8 0
1837	TREMBLAY / AVENUE K	39	EB	-	-	-	-	-	-	0	0	2
1849	TREMBLAY / AVENUE P	18 39	EB EB	0 -	0 -	7 -	1 -	5 -	7 -	1 0	7 0	6 1