Transportation Impact Assessment – Step 4: Analysis

1995 Carling Avenue

Prepared for Claridge Homes
by IBI Group
April 13, 2020

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TIA Plan Reports - Certification

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 associate documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below:

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;

2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;

3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and

4. I am either a licensed[1] or registered[1] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering □ or transportation planning □.

[1] **License or 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.**

Dated at Ottawa this 13th day of April 2020.
(City)

Name: David Hook, P.Eng.

Professional Title: Project Engineer

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

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Executive Summary

IBI Group (IBI) was retained by Claridge Homes to undertake a Transportation Impact Assessment (TIA) in support of a combined Zoning By-law Amendment and Site Plan Control application for a proposed high-rise residential development to be located at 1995 Carling Avenue in Ottawa. The proposed development consists a 27-storey building with a total of 210 dwelling units. The development will be constructed in a single phase and is projected to be fully occupied by 2024. Access to the site will be provided via a full-movement site access driveway on Bromley Road.

The site will provide 174 vehicle parking spaces and 155 bicycle parking spaces within a six-level underground parking garage and exceeds the minimum number of parking spaces required by the Zoning By-law.

It is anticipated that prior to 2024, the outside lanes on Carling Avenue will be converted to dedicated bus lanes between Lincoln Fields Station and the Trillium Line Carling Station, reducing the number of general traffic lanes in both directions to two. In recognition of the potential impact this may have on regional traffic patterns, a -0.5% linear reduction in background traffic volumes has been considered in the development of background traffic volumes.

Two future adjacent developments were identified in the vicinity of the proposed development and considered in the development of background traffic volumes as well: 485 Ancaster Avenue, a two-tower mixed-use development near the corner of Carling Avenue & Woodroffe Avenue, and the future Carlingwood Canadian Tire which will replace the former Sears Carlingwood.

With the implementation of transit lanes on Carling Avenue it is anticipated that transit use will increase by 25% with a corresponding decrease in automobile driver and passenger mode shares. With consideration of these expected changes in mode shares, it is projected that the site will generate approximately 55 to 60 two-way vehicle-trips and 30 to 40 two-way transit-trips during the weekday morning and afternoon peak hours.

Intersection capacity analysis has revealed that the intersection of Carling Avenue & Hare Avenue will exceed its theoretical capacity by 2024 under background traffic conditions due to the planned reduction in general traffic lanes to accommodate the dedicated transit lanes. Analysis has shown that prohibiting U-turns at this intersection would allow the intersection to operate at a Level of Service of ‘E’ through to the horizon year of this study. Most of the U-turn demand is expected to migrate to the intersection of Carling Avenue & Iroquois Road as a result of this prohibition. It is therefore recommended that the City consider providing a westbound protected-permitted left-turn phase to improve safety at the intersection by reducing conflicts between eastbound through traffic and the increased volume of westbound U-turn traffic. The intersection of Carling Avenue & Maitland Avenue / Sherbourne Road was also shown to be approaching its theoretical capacity under Future (2024) Background Traffic conditions, however, due to space constraints no modifications to this intersection was recommended. This intersection as well as all other study area intersections were shown to operate at or below their theoretical capacity through to the study horizon year.

Based on the auxiliary lane analysis, the northbound and southbound auxiliary left-turn lanes at the intersection of Carling Avenue & Maitland Avenue / Sherbourne Road are deficient by 5m and 40m, respectively. The northbound left-turn lane deficiency is considered negligible and therefore not necessary. In the southbound direction there are practical limitations due to the intersection of Sherbourne Road & Bromley Road and as such it is not recommended that the southbound left-turn lane be extended either.

A multi-modal analysis of each study area intersection identified existing deficiencies in the road network and potential remediation measures have been suggested in which the City could consider to meet the prescribed LOS targets. These remediation measures would improve mobility and comfort for all transportation modes but are not required to accommodate the proposed development.

A review of collision recorded indicated that there was a high frequency of angle and turning movement collisions at the intersection of Carling Avenue & Iroquois Road. It is therefore recommended that the City further investigate collisions at this intersection and implement mitigation measures. It should be noted that site-generated traffic is not anticipated to significantly contribute to movements with observed safety issues.

All intersections within the study area are shown to operate under their theoretical capacities beyond the 2024 horizon year of the study and no modifications to auxiliary lanes were recommended. A post-development monitoring plan is therefore not a requirement of this study. Further, the analysis conducted indicates that no off-site intersection improvements are necessary as a direct consequence of the proposed development in order to accommodate the projected site-generated travel demands. The study therefore does not require an RMA for off-site roadworks.

Based on the findings of this study, it is the overall opinion of IBI Group that the proposed development will integrate well with and can be safely accommodated by the adjacent transportation network.

1 Introduction

IBI Group (IBI) was retained by Claridge Homes to undertake a Transportation Impact Assessment (TIA) in support of a combined Zoning By-law Amendment and Site Plan Control application for a proposed high-rise residential development to be located at 1995 Carling Avenue in Ottawa.

In accordance with the City of Ottawa's Transportation Impact Assessment Guidelines, published in June 2017, the following report is divided into four major components:

- **Screening** – Prior to the commencement of a TIA, an initial assessment of the proposed development is undertaken to establish the need for a comprehensive review of the site based on three triggers: Trip Generation, Location and Safety.
- **Scoping** – This component of the TIA report describes both the existing and planned conditions in the vicinity of the development and defines study parameters such as the study area, analysis periods and analysis years of the development. It also provides an opportunity to identify any scope exemptions that would eliminate elements of scope described in the TIA Guidelines that are not relevant to the development proposal, based on consultation with City staff.
- **Forecasting** – The Forecasting component of the TIA is intended to review both the development-generated travel demand and the background network travel demand, and provides an opportunity to rationalize this demand to ensure projections are within the capacity constraints of the transportation network.
- **Analysis** – This component documents the results of any analyses undertaken to ensure that the transportation related features of the proposed development are in conformance with prescribed technical standards and that its impacts on the transportation network are both sustainable and effectively managed. It also identifies a development strategy to ensure that what is being proposed is aligned with the City of Ottawa's city-building objectives, targets and policies.

Throughout the development of a TIA report, each of the four study components above are submitted in draft form to the City of Ottawa and undergo a review by a designated Transportation Project Manager. Any comments received are addressed to the satisfaction of the City's Transportation Project Manager before proceeding with subsequent components of the study. All technical comments and responses throughout this process are included in **Appendix A**.

2 TIA Screening

An initial screening was completed to confirm the need for a Transportation Impact Assessment by reviewing the following three triggers:

- **Trip Generation**: Based on the proposed number of apartment dwelling units, the minimum development size threshold has been exceeded and therefore the Trip Generation trigger is satisfied.
- **Location**: The proposed development is located within a Design Priority Area (DPA) and, as such, the Location trigger is satisfied.
- **Safety**: Boundary street conditions were reviewed to determine if there is an elevated potential for safety concerns adjacent the site. Based on this review, the Safety Trigger is not satisfied.

As the proposed development meets the Trip Generation and Location triggers, the need to undertake a Transportation Impact Assessment is confirmed.

A copy of the Screening Form is provided in **Appendix B**.

3 Project Scoping

3.1 Description of Proposed Development

3.1.1 Site Location

The proposed development is located within the Carlingwood community and is approximately 0.14 hectares in size. It is bound by Carling Avenue to the south, Bromley Road to the east, the Bromley Square residential tower to the west, and low-density residential to the north.

The site location and its surrounding context is illustrated in **Exhibit 1**.

3.1.2 Land Use Details

The subject site is currently occupied by two residential dwellings and is zoned AM10 – Arterial Mainstreet, based on GeoOttawa.

The proposed development includes a single 27-storey tower with six levels of underground parking. **Table 1** summarizes the proposed land uses included in this development.

Table 1 - Land Use Statistics

LAND USE	SIZE
Apartments	210 dwelling units

The site will provide 174 vehicle parking spaces and 155 bicycle parking spaces within the six-level underground parking facility. Access to the site will be provided via a two-way private approach on Bromley Road.

The configuration of the proposed development is illustrated in **Exhibit 2**.

3.1.3 Development Phasing & Date of Occupancy

The proposed development is anticipated to be constructed and fully occupied by the end of 2024.

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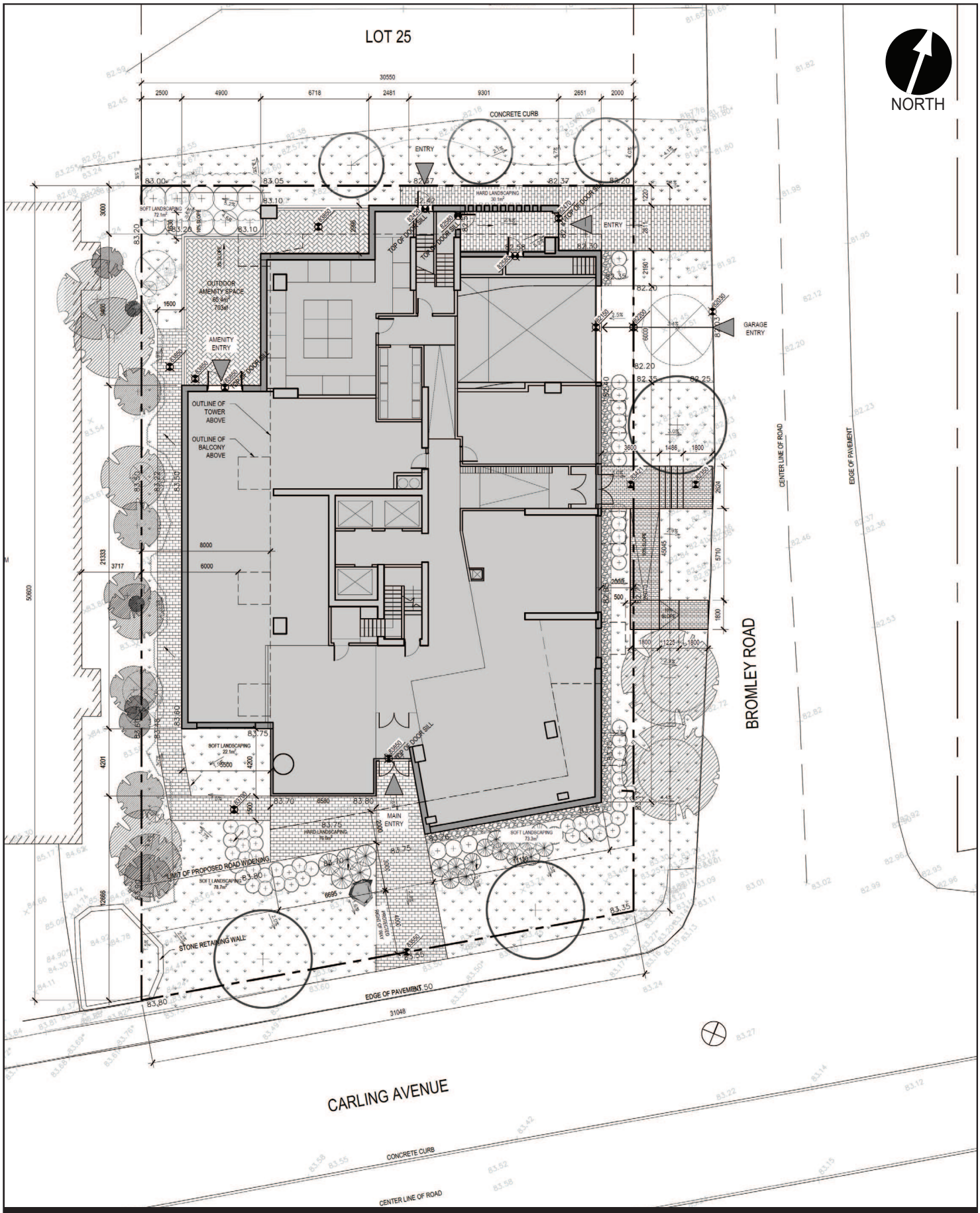
1995 Carling Avenue
Transportation Impact Assessment

Exhibit 1:
Site Location

PROJECT No. 124829
DATE: April 2020
SCALE: 0m 50m 100m



1995 Carling Avenue
Transportation Impact Assessment

Exhibit 2:
Proposed Development

PROJECT No. 124829
DATE: April 2020
SCALE: 0m 5m 10m

3.2 Existing Conditions

3.2.1 Existing Road Network

3.2.1.1 Roadways

The proposed development is bound by Carling Avenue to the south and Bromley Road to the east. **Table 2** below summarizes the details of the boundary roadways as well as other streets within the context area of the proposed development.

Table 2 - Existing Roadways

NAME	CLASS	JURISDICTION	ORIENTATION AND EXTENTS	CROSS-SECTION	RIGHT-OF-WAY	SPEED LIMIT
Carling Avenue	Arterial	City of Ottawa	East-West, from March Road to Bronson Avenue	Urban Six-Lane Divided	44.5m	60 km/h
Maitland Avenue	Arterial	City of Ottawa	North-South, from Carling Avenue to Clyde Avenue	Urban Four-Lane	26.0m	50 km/h
Sherbourne Road	Major Collector	City of Ottawa	North-South, from Byron Avenue to Carling Avenue	Urban Two-Lane	30.5m	50 km/h
Iroquois Road	Local	City of Ottawa	North-South, from Prince Charles Road to Strathmore Boulevard	Urban Two-Lane	20.0m	40 km/h
Bromley Road	Local	City of Ottawa	East-West, from Carling Avenue to east of Sherbourne Road	Urban Two-Lane	20.0m	50 km/h
Hare Avenue	Local	City of Ottawa	North-South, from Carling Avenue to Killarney Drive	Urban Two-Lane	21.5m	50 km/h

3.2.1.2 Nearby Driveways

On Bromley Road, there are currently two driveways near the proposed development: the loading access driveway for the adjacent Bromley Square apartment building and the McKellar Park Suites driveway. Approximately 60m north of Carling Avenue, permanent bollards are in place across Bromley Road to restrict cut-through traffic in the adjacent residential community.

On Carling Avenue, within 200m of the proposed development are the two main accesses for the Bromley Square apartment building and the accesses for the neighbouring Carling Terrace condominium building. Each of these driveways provide one-way right-in or right-out access to the adjacent developments.

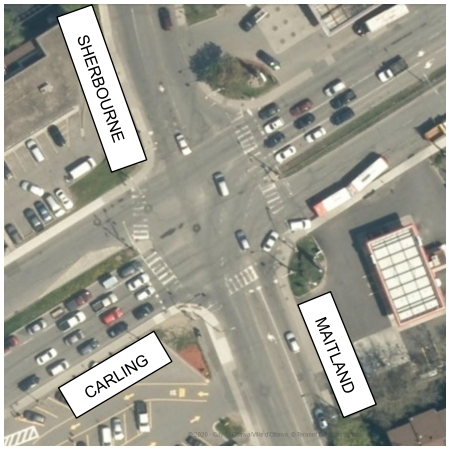
3.2.1.3 Intersections

The following intersections have the greatest potential to be impacted by the proposed development:

- **Carling Avenue & Iroquois Road** is a four-legged signalized intersection with right-turn channels provided on the eastbound and westbound approaches and left-turn lanes on all approaches except for the northbound approach. This intersection is located approximately 415 metres west of the site.

- **Carling Avenue & Hare Avenue** is a three-legged two-way stop-controlled intersection with free-flow on Carling Avenue. A median break permits left-turns at this intersection and a westbound left-turn lane has been provided on Carling Avenue. This intersection is located approximately 215 metres west of the site.

- **Carling Avenue & Bromley Road** is a three-legged two-way stop-controlled intersection with free-flow on Carling Avenue. Turning movements are restricted to right-in/right-out due to the presence of a median on Carling Avenue.



- **Carling Avenue & Maitland Avenue / Sherbourne Road** is a four-legged signalized intersection with single auxiliary left-turn lanes on the eastbound, northbound and southbound approaches and a double left-turn auxiliary lane on the westbound approach. This intersection is located approximately 450 metres east of the site.

The intersection control and lane configurations for all intersections described above are shown in **Exhibit 3**.

3.2.1.4 Traffic Management Measures

The following traffic management measures have been implemented within the context area of the proposed development:

- Bollards have been installed across Bromley Road approximately 60m north of Carling Avenue to restrict neighbourhood cut-through traffic.
- Pavement markings indicating to vehicles to slow down have been provided on Hare Avenue.
- On-road speed limit pavement markings have been provided on Iroquois Road south of Carling Avenue.

3.2.1.5 Existing Traffic Volumes

As the proposed development will consist of residential land uses, the weekday peak hour traffic conditions will be most affected by any associated increase in traffic. Weekday morning and afternoon peak hour turning movement counts were therefore obtained from the City of Ottawa at the following intersections:

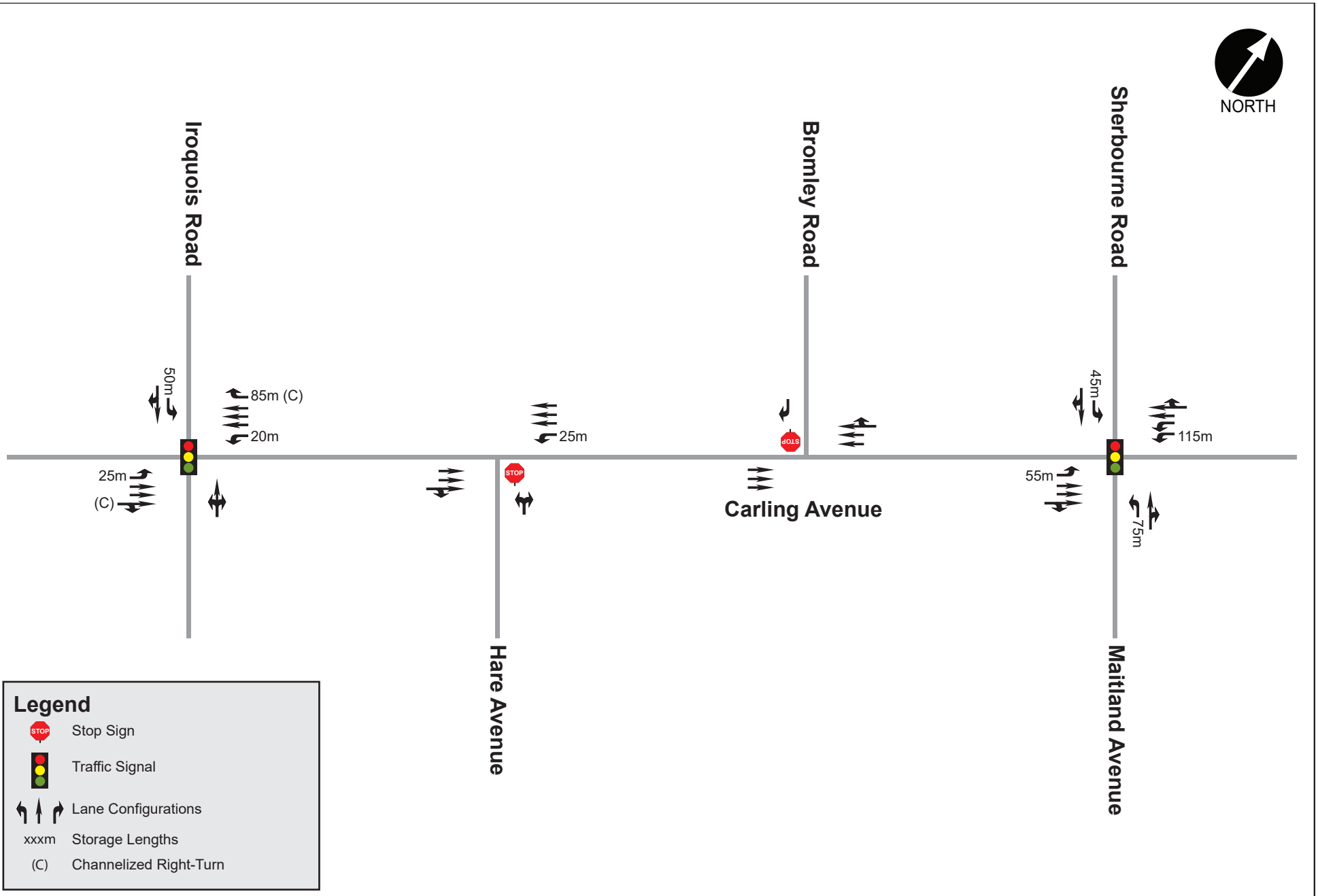
- Carling Avenue & Iroquois Road (City of Ottawa, May 2017)
- Carling Avenue & Maitland Avenue / Sherbourne Road (City of Ottawa, March 2017)

It should be noted that a major retailer within the vicinity of the proposed development (Sears Carlingwood) closed for business in early 2018. Traffic associated with this retailer remains accounted for in the volumes analyzed in this study. As will be discussed in subsequent sections of this study, this retail space will be replaced with another major anchor tenant to the Carlingwood Shopping Centre (Canadian Tire) and is expected to be open for business in 2021.

Supplemental sidestreet traffic counts were conducted by IBI Group at the following two intersections:

- Carling Avenue & Hare Avenue (IBI Group, March 2020)
- Carling Avenue & Bromley Road (IBI Group, March 2020)

Peak hour traffic volumes representative of existing conditions are shown in **Exhibit 4**. Weekday morning and afternoon peak hour turning movement counts have been provided in **Appendix C**.



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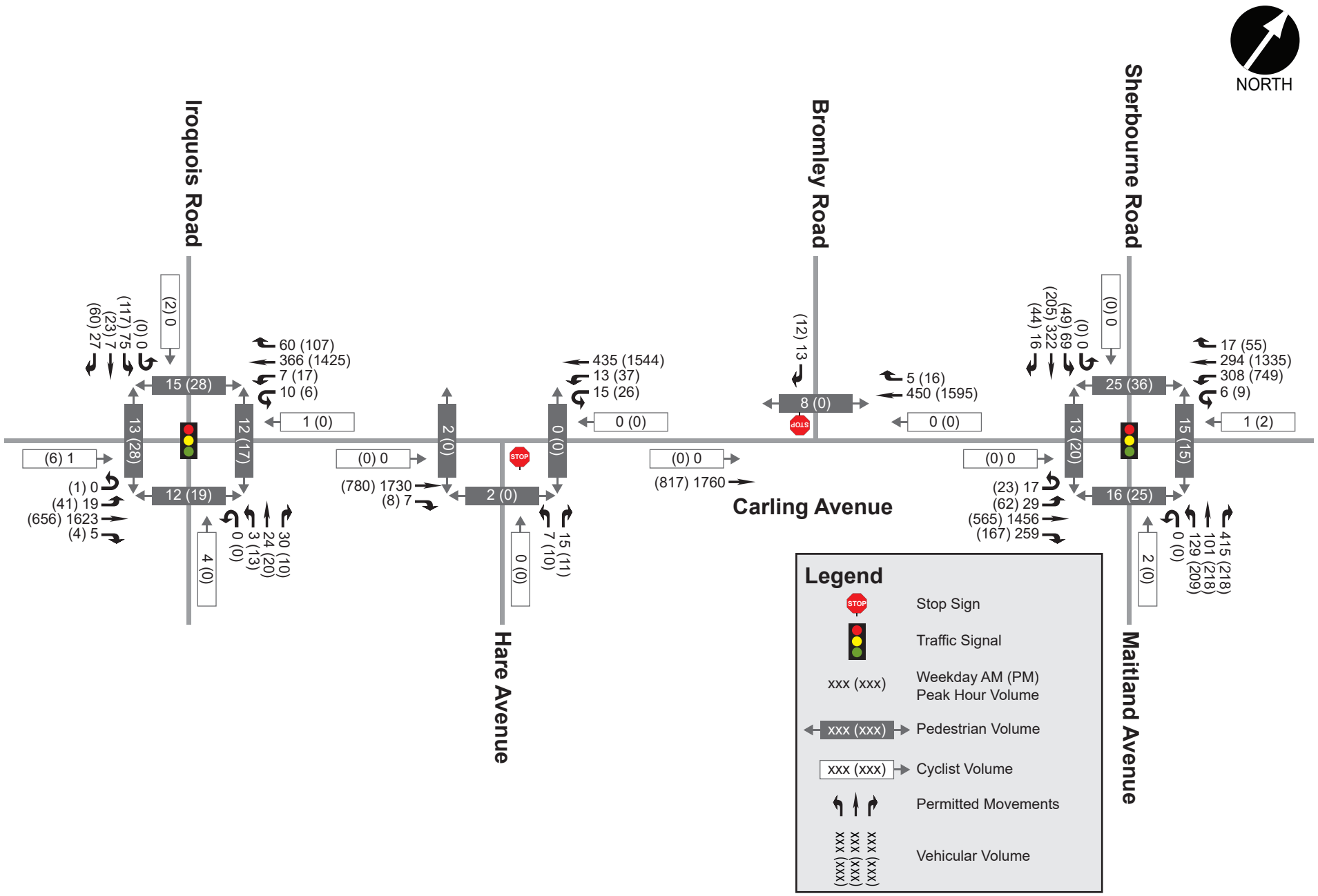
1995 Carling Avenue
Transportation Impact Assessment

Exhibit 3:
Lane Configuration
and Intersection Control

PROJECT No. 124829
DATE: April 2020
SCALE: N.T.S.



1995 Carling Avenue
Transportation Impact Assessment

Exhibit 4:
Existing (2020)
Traffic

PROJECT No. 124829
DATE: April 2020
SCALE: N.T.S.

3.2.2 Existing Bicycle and Pedestrian Facilities

Pedestrian facilities within the context area are provided in the form of sidewalks on both sides of most roadways. The exceptions are Bromley Road, Hare Avenue and Iroquois Road south of Carling Avenue which presently do not have any pedestrian facilities.

The only cycling facilities provided within the context area are bicycle lanes on both sides of Sherbourne Road. All other roadways require cyclists to share the road with motorists.

3.2.3 Existing Transit Facilities and Service

The following transit route, operated by OC Transpo, exists within the vicinity of the site:

- **Route #85** provides regular, all-day service between Bayshore Station and Terrasses de la Chaudière in Gatineau, operating on 15-minute headways during peak periods. On weekends, service is reduced to between 15- and 30-minute headways.

The nearest westbound bus stop serving Route #85 is located at the front entrance to Bromley Square, approximately 55m west of the proposed development. The nearest accessible eastbound bus stop is at the intersection of Carling Avenue & Iroquois, located at a walking distance of approximately 440m west of the proposed development. An existing eastbound bus stop is provided on Carling Avenue across from Bromley Square (Carling Avenue / Melwood Avenue) however there are no safe pedestrian crossings on Carling Avenue in the vicinity of this bus stop.

Within the study area, transit priority measures are limited to a queue jump lane after the right-turn lane on the westbound approach of the Carling Avenue & Iroquois Road intersection.

The transit map for Route #85 is provided in **Appendix D**.

3.2.4 Collision History

A review of historical collision data has been undertaken for the boundary streets with the vicinity of the proposed development. The TIA Guidelines require a safety review if at least six collisions for any one movement or of a discernible pattern, have occurred over a five-year period. **Table 3** summarizes all reported collisions between January 1, 2014 and December 31, 2018.

Table 3 - Reported Collisions within Vicinity of Proposed Development

LOCATION	# OF REPORTED COLLISIONS
INTERSECTIONS	
Carling Avenue & Iroquois Road	33
Carling Avenue & Hare Avenue	6
Carling Avenue & Bromley Road	2
Carling Avenue & Maitland Avenue / Sherbourne Road	63
SEGMENTS	
Carling Avenue – Iroquois Road to Hare Avenue	1
Carling Avenue – Hare Avenue to Bromley Road	6
Carling Avenue – Bromley Road to Maitland Avenue / Sherbourne Road	9

Based on a preliminary review of the collision history noted above, intersection and road segments with at least six collisions over the five-year period may require further review.

Detailed collision records are provided in **Appendix E**.

Another method of evaluating the relative magnitude of collision frequency at one intersection compared to another is to quantify the average historical number of collisions against the daily volume of traffic entering the intersection. This is commonly expressed in terms of average collisions per year per Million Vehicles Entering (MVE) and a rate of greater than 1.0 is considered significant. Average annual daily traffic (AADT) volumes are provided with all City-provided traffic counts. The intersection of Carling Avenue & Iroquois and Carling Avenue & Maitland Avenue / Sherbourne Road are therefore calculated as having average collision frequencies of 0.70 collisions per MVE and 0.79 collisions per MVE, respectively.

3.3 Planned Conditions

3.3.1 Transportation Network

3.3.1.1 Future Road Network Projects

The 2013 Transportation Master Plan (TMP) outlines future road network modifications required in the 2031 'Affordable Network'. A review of the TMP Affordable Plan indicates that there are no planned changes to the arterial road network within the broader area surrounding the proposed development.

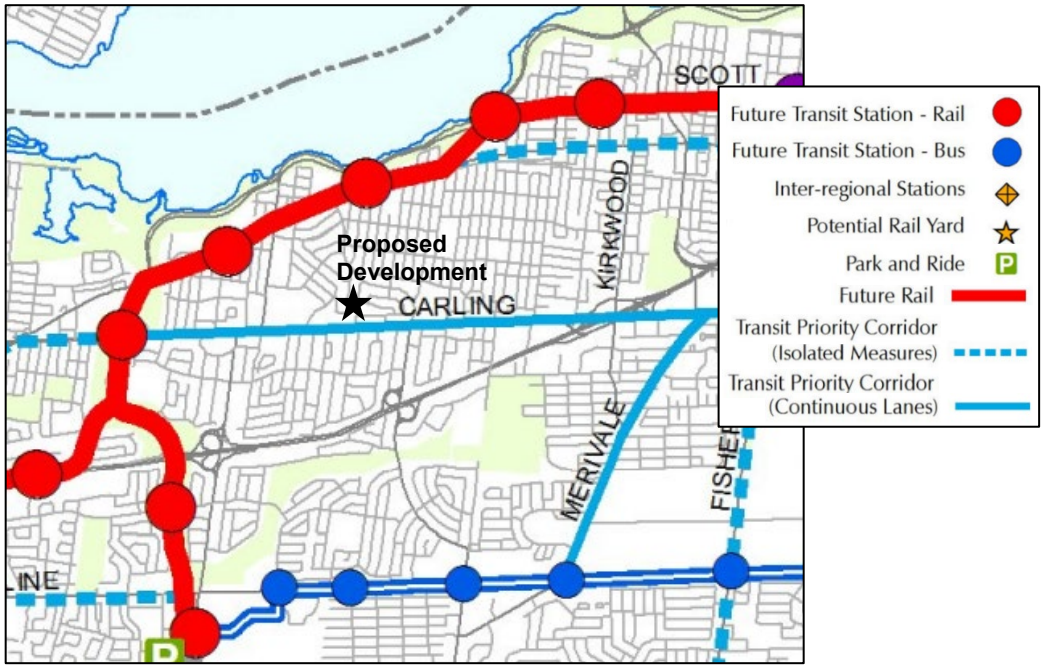
3.3.1.2 Future Transit Facilities and Services

The 2013 TMP outlines the future rapid transit and transit priority (RTTP) network. The following project was noted in the 'Affordable RTTP Network' that may have a significant impact on future travel demand in the vicinity of the proposed development:

- **Carling Avenue Transit Priority Corridor (Continuous Lanes):** Based on the TMP, continuous bus lanes are planned between Lincoln Fields Station and the Trillium Line Carling Station. Isolated transit priority measures (e.g. queue jump lanes, transit priority signals, etc.) will be provided on Carling Avenue beyond those stations. A Planning and Functional Design Study was initiated in February 2017 for this project. The current plans indicate that within the context area of the proposed development, the outside lanes on Carling Avenue will be converted to dedicated bus lanes and cyclists will be permitted to use these lanes as well. According to City of Ottawa staff, these transit priority measures are expected to be implemented prior to 2024.

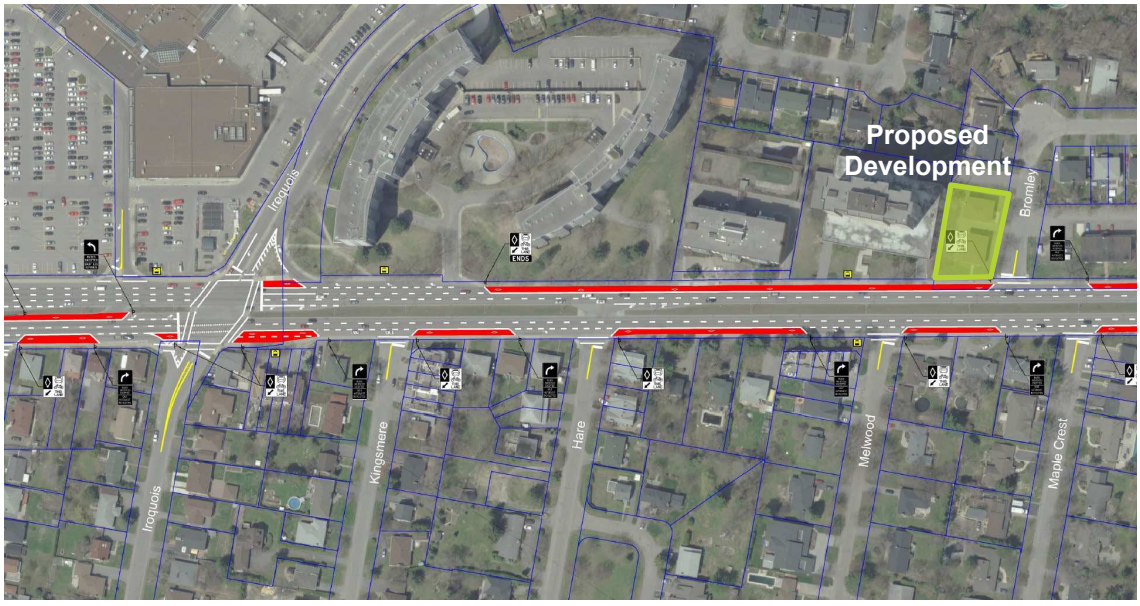
Figure 1 illustrates the transit infrastructure projects in the vicinity of the proposed development that are part of the TMP's 2031 Affordable Network. **Figure 2** and **Figure 3** illustrate the currently proposed transit priority measures within the context area of the proposed development.

Figure 1 - Future 'Affordable RTTP Network Projects'



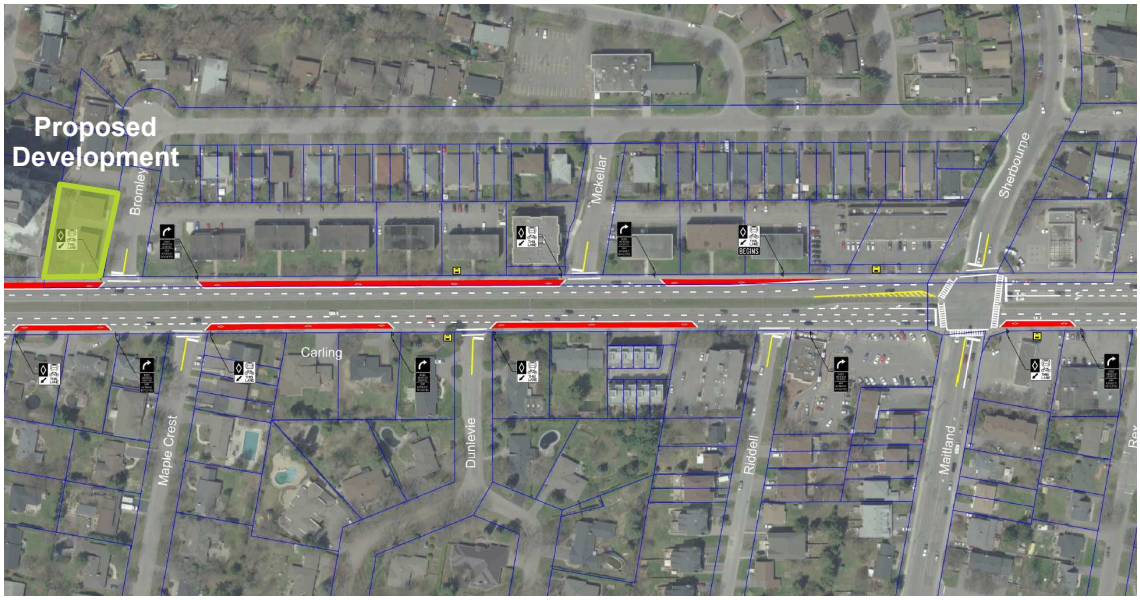
Source: 2013 Transportation Master Plan – Map 5 '2031 Affordable Network'

Figure 2 - Carling Avenue Transit Priority Corridor - Iroquois Road to Bromley Road



Source: https://ottawa.ca/en/city-hall/public-engagement/projects/carling-avenue-transit-priority-measures

Figure 3 - Carling Avenue Transit Priority Corridor - Bromley Road to Maitland Avenue / Sherbourne Road



Source: https://ottawa.ca/en/city-hall/public-engagement/projects/carling-avenue-transit-priority-measures

3.3.1.3 Future Cycling and Pedestrian Facilities

The 2013 Ottawa Cycling Plan (OCP) designates Carling Avenue and Maitland as 'Spine Routes', which form part of a system linking the commercial, employment, institutional, residential and educational nodes throughout the city. As shown on **Figure 4**, Sherbourne Road and Iroquois Road are designated as 'Local Routes', providing connections between 'Spine Routes' and 'Major Pathways'.

The OCP does not indicate any specific improvements on any of the context area roadways, however, the current plans for the Carling Avenue Transit Priority Corridor indicate that cyclists will be permitted to use the dedicated bus lanes on Carling Avenue.

Figure 4 – Future Cycling Facilities within Context Area

Source: GeoOttawa

The 2013 Ottawa Pedestrian Plan (OPP) indicates that within the context area the only planned improvement to pedestrian facilities is the implementation of a sidewalk on the west side of Sherbourne Road (Phase 2: 2020-2025).

3.3.2 Future Adjacent Developments

The City of Ottawa Transportation Impact Assessment (TIA) Guidelines specify that all significant developments proposed within the surrounding area which are likely to occur within the study's horizon year must be identified and taken into consideration in the development of future background traffic projections.

There are currently only two significant development applications in the vicinity of the proposed development:

- **485 Ancaster Avenue** is a proposed residential development consisting of one 4-storey building and one 22-storey building with ground floor commercial space.
- **Carlingwood Canadian Tire** is a proposed major retail store which will replace the former Sears store at the Carlingwood Shopping Centre and is expected to be open by 2021. It shall be noted that Sears closed in January 2018 and was demolished in March 2019.

There are currently no other significant development applications within the context area that are either in the development application approval process, have already been approved and in pre-construction or are currently under construction.

3.3.3 Network Concept Screenline

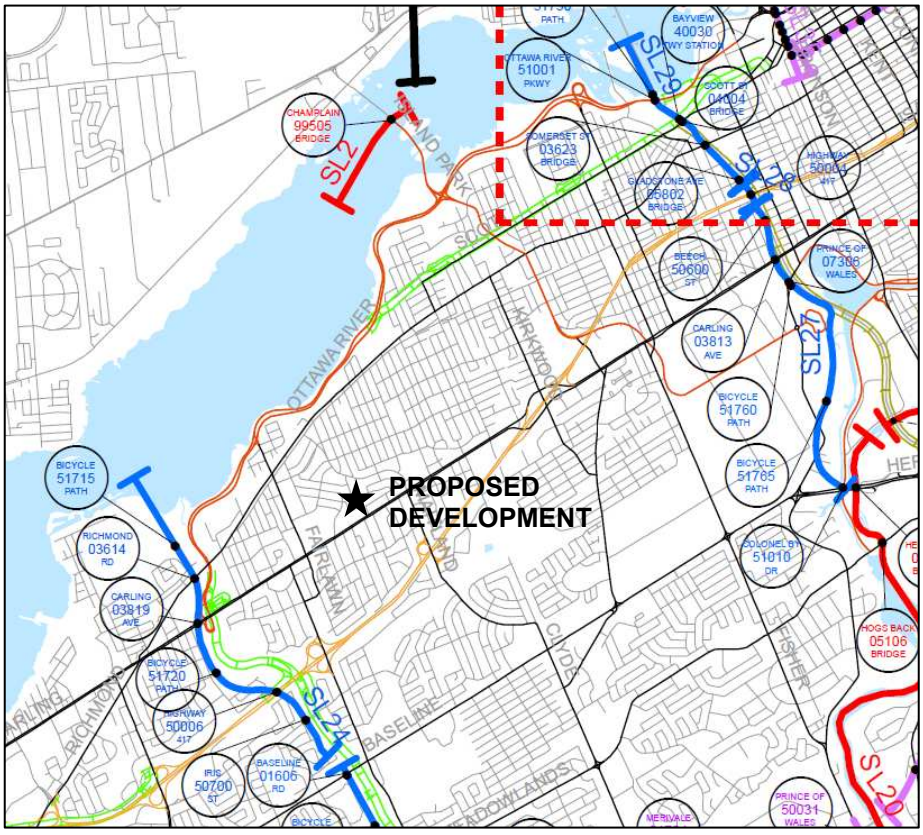
A screenline is an artificial boundary between areas of major traffic generation that captures all significant points of entry from one area to another to compare crossing demand with the available roadway capacity. Screenlines are typically located along geographical barriers such as rivers, rail lines or within the greenbelt. To capture existing flow and model future demand, count stations are established by the City of Ottawa at each crossing point along the screenline.

The nearest strategic planning screenlines adjacent to the development have been identified:

- **SL24 – Western Parkway** – This is the nearest north/south screenline that would capture trips from the proposed development heading towards Ottawa's west end, and it roughly follows the Transitway alignment from Lincoln Fields Station to Baseline Station. The screenline has four crossing points: Richmond Road, Carling Avenue, Highway 417 and Iris Street.
- **SL27, SL28 and SL28 – O-Train South, Centre and North** – These are the nearest north/south screenlines that would capture trips from the proposed development heading towards downtown Ottawa, and they roughly follow the Trillium Line alignment from the Ottawa River to Heron Road. These screenlines have nine crossing points: Sir John A. Macdonald Parkway, Scott Street, Somerset Street, Gladstone Avenue, Highway 417, Beech Street, Carling Avenue, Prince of Wales Drive and Colonel By Drive.
- **SL2** – This is the nearest east/west screenline that would capture trips from the proposed development crossing over to Gatineau and captures all traffic crossing the Ottawa River via the Champlain Bridge.

SL2, SL 24, SL27, SL28 and SL29 are shown in **Figure 5**, as determined from the City of Ottawa's *Road Network Development Report (2013)*, a supporting document to the 2013 Transportation Master Plan (TMP). A review of the above-noted screenlines may be required in the Analysis component of this study.

Figure 5 - Screenlines



Source: TRANS Screenline System (2010)

3.4 Study Area

With consideration of the information presented thus far, the following intersections have been identified as being most impacted by the proposed development and will be assessed for vehicular capacity as part of this study:

- Carling Avenue & Iroquois Road
- Carling Avenue & Hare Avenue
- Carling Avenue & Bromley Road
- Carling Avenue & Maitland Avenue / Sherbourne Road

Multi-Modal Level of Service (MMLOS) will be conducted for all intersections listed above with the exception of the stop-controlled intersections as no methodology currently exists for evaluating MMLOS at unsignalized intersections. The need to provide alternative means of traffic control (i.e. signals) at the stop-controlled intersections will be reviewed in the Analysis component of this study to determine whether signals are warranted or required operationally within the horizon year of this study.

Additional MMLOS analysis will be conducted for the relevant boundary street segments, which in this case is limited to the segments of Carling Avenue and Bromley Road adjacent to the proposed development.

3.5 Time Periods

Based on the proposed residential land use, traffic generated during the weekday morning and afternoon peak hour is expected to result in the most significant impact to traffic operations on the adjacent road network in terms of combined development-generated and background traffic. These two time periods will therefore be considered for operational analysis in this study.

3.6 Analysis Years

Based on the anticipated build-out year of the proposed development, the following two analysis years will be considered in this TIA:

- Year 2024 – Full Build-Out of the Proposed Development
- Year 2029 – 5 Years Beyond Full Build-out / Occupancy

3.7 Exemptions Review

The TIA Guidelines provide exemption considerations for elements of the Design Review and Network Impact components. **Table 4** summarizes the TIA modules that are not applicable to this study.

Table 4 - Exemptions Review

TIA MODULE	ELEMENT	EXEMPTION CONISDERATIONS	REQUIRED
DESIGN REVIEW COMPONENT			
4.1 Development Design	4.1.2 Circulation and Access	• Only required for site plans	✓
	4.1.3 New Street Networks	• Only required for plans of subdivision	✗
4.2 Parking	4.2.1 Parking Supply	• Only required for site plans	✓
	4.2.2 Spillover Parking	• Only required for site plans where parking supply is 15% below unconstrained demand	✗
NETWORK IMPACT COMPONENT			
4.5 Transportation Demand Management	All Elements	• Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	✓
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	• Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	✓
4.8 Network Concept	n/a	• Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning	✗

4 Forecasting

4.1 Development Generated Traffic

4.1.1 Trip Generation Methodology

Peak hour site-generated traffic volumes were developed using the 2009 TRANS Trip Generation Residential Trip Rates Study Report. The TRANS trip generation rates are based on a blended rate derived from 17 trip generation studies undertaken in 2008, the ITE Trip Generation Manual and the 2005 TRANS Origin-Destination (O-D) Travel Survey. Separate trip generation rates exist for each of the four general geographic areas in Ottawa: Core, Urban (Inside the Greenbelt), Suburban (Outside the Greenbelt) and Rural. These trip generation rates reflect existing travel behavior by dwelling type and geographic area. The TIA Guidelines recommend that the TRANS trip generation rates be converted to person-trips based on the vehicular mode share proportions detailed in the TRANS Trip Generation study. Person-trips were then subdivided based on representative mode share percentages applicable to the study area to determine the number of vehicle, transit, pedestrian, cycling and other trip types.

4.1.2 Trip Generation Results

4.1.2.1 Vehicle Trip Generation

Weekday peak hour vehicular traffic volumes associated with the subject development were determined using the trip generation rates published in the TRANS Trip Generation study.

The base vehicular trip generation for the proposed development has been summarized in **Table 5**.

Table 5 - Base Vehicular Trip Generation

LAND USE	SIZE	PERIOD	GENERATED TRIPS (VPH)		
			IN	OUT	TOTAL
High-Rise Apartment	210 units	AM	12	39	51
		PM	35	22	57

Note: vph = Vehicles Per Hour *Source: TRANS Trip Generation Residential Trip Rates, August 2009*

4.1.2.2 Person Trip Generation

The person-trip to vehicle-trip conversion factors for TRANS trip generation rates vary depending on the peak hour, geographic location and land use considered. The base vehicular trip generation values from the previous section were divided by the vehicle mode shares to determine the number of person-trips generated.

The resulting number of person-trips have been summarized in **Table 6**.

Table 6 - Person-Trip Generation

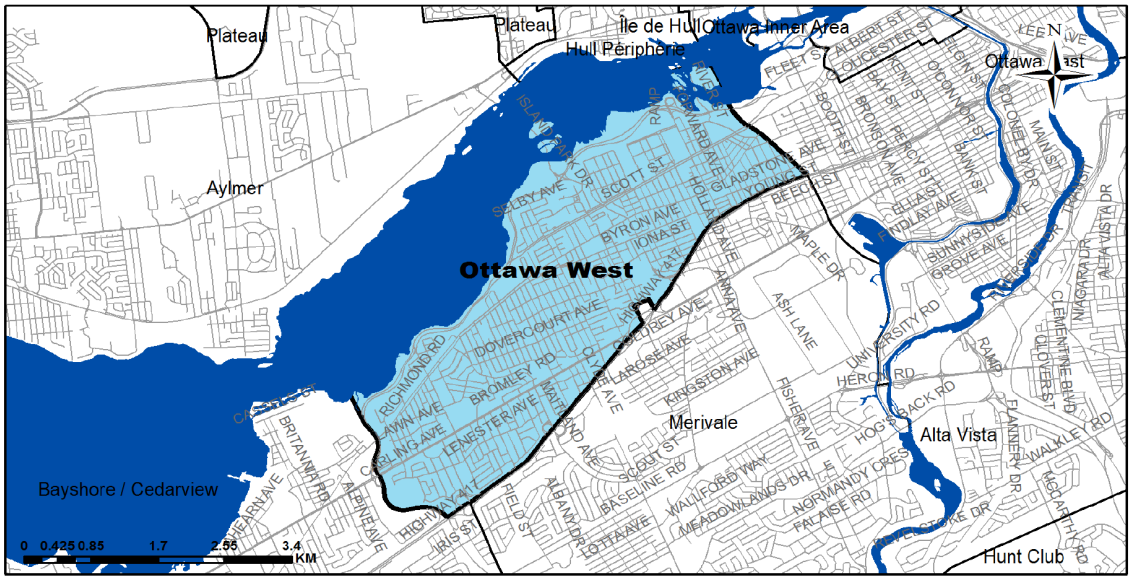
LAND USE	AUTO MODE SHARE	PERIOD	PERSON TRIPS (PPH)		
			IN	OUT	TOTAL
High-Rise Apartment	37%	AM	33	105	138
	40%	PM	88	55	143

Notes: pph = persons per hour

4.1.2.3 Mode Share Proportions

The 2011 TRANS Origin-Destination (O-D) Survey provides approximations of the existing modal share within the Ottawa West Traffic Assessment Zone (TAZ). The extents of the Ottawa West TAZ are illustrated in **Figure 6**. Relevant extracts from the 2011 O-D Survey are provided in **Appendix F**.

Figure 6 - Ottawa West TAZ



Source: 2011 TRANS O-D Survey

The proposed weekday morning and afternoon mode share targets were developed by calculating the weighted average 'AM From' and 'AM Within', and 'PM To' and 'PM Within' mode shares of the Ottawa West TAZ from the 2011 O-D Survey, respectively. The dedicated bus lanes along Carling Avenue are expected to be implemented prior to 2024 and as such adjustments have been made to account for the anticipated increase in transit demand. The Transportation Master Plan (TMP) indicates that by 2031 the goal is for 28% and 21% of trips from and to the inner suburbs to be transit-trips during the weekday morning and afternoon peak hours, respectively. This corresponds to a 17% to 31% increase in transit mode share. As such, the transit mode share targets for the proposed development have been increased by a factor of 25% (i.e. transit mode share target = 1.25 * existing transit mode share) to account for the expected increase in transit ridership. This increase in transit mode share is expected to result in a corresponding decrease in auto driver and auto passenger mode shares. It has been conservatively assumed that other non-auto mode shares (i.e. walking, cycling and other) will remain the same through to the horizon year of this study.

The existing mode shares and the mode share targets for the proposed development are outlined in **Table 7**.

Table 7 - Proposed Mode Share Targets

TRAVEL MODE	EXISTING MODE SHARES [1]						MODE SHARE TARGETS	
	AM FROM	AM TO	AM WITHIN	PM FROM	PM TO	PM WITHIN	AM	PM
Auto Driver	46%	51%	33%	55%	53%	32%	38%	41%
Auto Passenger	11%	15%	15%	16%	14%	10%	11%	11%
Transit	31%	23%	4%	21%	24%	4%	28%	20%
Cycling	6%	3%	6%	3%	6%	7%	6%	6%
Walking	4%	3%	33%	3%	3%	45%	13%	20%
Other	2%	5%	8%	2%	1%	2%	4%	1%

Notes:

[1] 2011 TRANS O-D Survey for the Ottawa West Traffic Assessment Zone

4.1.2.4 Trip Reduction Factors

Deduction of Existing Development Trips

Not Applicable: The residences on the proposed development lands are currently vacant and thus do not generate any traffic.

Pass-by Traffic

Not Applicable: The proposed development is residential and will not generate pass-by traffic.

Synergy/ Internalization

Not Applicable: The proposed development will include only residential land uses, therefore internalization reduction factors are not applicable.

4.1.2.5 Trip Generation by Mode

The mode share targets presented above were applied to the number of development-generated person-trips to establish the number of trips per travel mode, as summarized in **Table 8**.

Table 8 – Peak Hour Person-Trips by Mode

MODE	AM Peak Hour			PM Peak Hour		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Auto Driver	13	40	53	36	23	59
Auto Passenger	4	12	16	10	6	16
Transit	9	29	38	18	11	29
Cycling	2	6	8	5	3	8
Walking	4	14	18	18	11	29
Other	1	4	5	1	1	2
Total	**33**	**105**	**138**	**88**	**55**	**143**

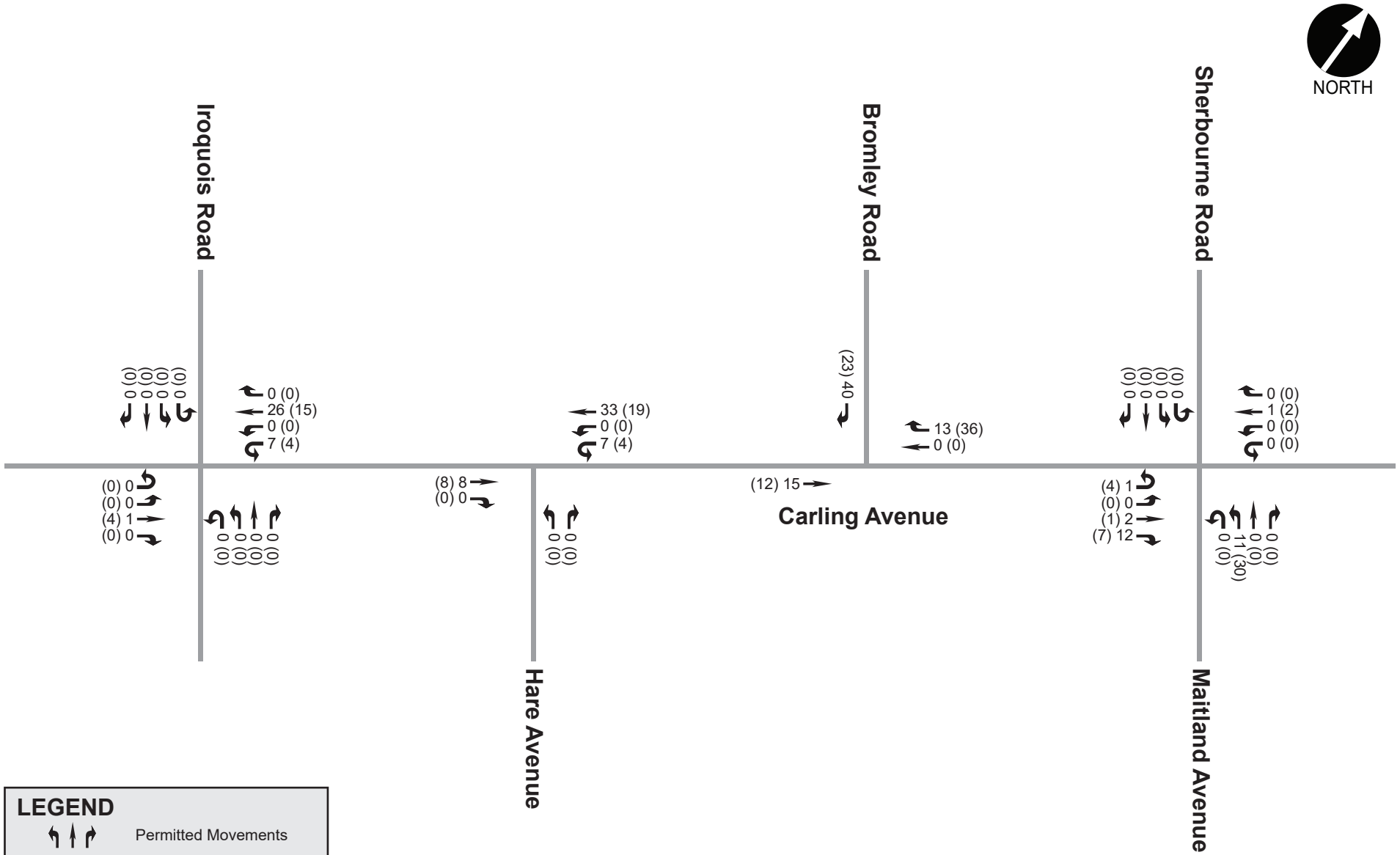
Based on the above, the proposed development is expected to generate up to 59 two-way vehicular trips and 38 two-way transit trips during the weekday peak hours.

4.1.3 Trip Distribution and Assignment

Consistent with the Ottawa West TAZ origin-destination distribution, site-generated vehicle trips are distributed in accordance with the following distribution. Assignment to specific routes was based on engineering judgement and an analysis of Google Maps travel times during peak hour conditions.

- 65% to/from the East
  - 45% via Sir John A. MacDonald Parkway
  - 45% via Highway 417
  - 10% via Carling Avenue
- 15% to/from the West
  - 65% via Carling Avenue
  - 35% via Highway 417
- 20% to/from the South
  - 100% to the South via Woodroffe Avenue
  - 100% from the South via Maitland Avenue

Utilizing the estimated number of new auto trips and applying the above distribution, future site-generated traffic volumes are illustrated for each of the study area intersections in **Exhibit 5**.



1995 Carling Avenue
Transportation Impact Assessment

Exhibit 5:
Site-Generated
AM & PM Peak Hour
Traffic Volumes

PROJECT No. 124829
DATE: April 2020
SCALE: N.T.S.

4.2 Background Network Traffic

4.2.1 Changes to the Background Transportation Network

To properly assess future traffic conditions, planned modifications to the transportation network that may impact travel patterns or demand within the study area have been considered. The Scoping section of this report summarized the anticipated changes to the study area transportation network based on the Transportation Master Plan (TMP) and determined that within the study area, the outside lanes on Carling Avenue will be converted to dedicated bus lanes prior to the 2024 analysis year. It is unknown, however, what impact the dedicated bus lanes will have on regional traffic patterns. As such, it has been conservatively assumed that there will be no impact background traffic volumes as a result of the reduction in general traffic capacity from three to two lanes per direction.

The OCP and OPP were also reviewed for cycling and pedestrian network projects. With the exception of the dedicated bus lanes which cyclists will be permitted to use as well, there are currently no planned changes to the pedestrian or cyclist networks. It is assumed that this will have a negligible impact on background traffic volumes.

4.2.2 General Background Growth Rates

The background growth rate is intended to represent any regional growth from outside the study area that will travel along the adjacent road network. Based on the supporting traffic studies of the future adjacent developments previously discussed, traffic volumes within the study area are expected to decrease linearly by approximately 0.5% to 1.0% per year. It is therefore assumed that there will be no growth in traffic within the horizon year of this study. Traffic generated by known future adjacent developments has been accounted for separately in this analysis.

4.2.3 Other Area Development

Future adjacent developments in the vicinity of the proposed development have been identified previously in the Scoping section of this report. **Table 9** summarizes the land use details and expected build-out year of these future adjacent developments.

Table 9 - Future Adjacent Developments

DEVELOPMENT	LAND USE	EXPECTED BUILD-OUT YEAR
485 Ancaster Avenue	• 290 High-Rise Condominium Units • 1,073m^2 Commercial Space	2022
Carlingwood Canadian Tire	• 14,949m^2 Home Improvement Store	2021

The proposed development at 485 Ancaster Avenue is located approximately 900 metres west of the site and has been considered in the estimation of future background volumes. Any traffic associated with this development within the context area of this study has only a minimal impact.

As previously mentioned, the traffic data used in this study was collected prior to the closing of Sears Carlingwood. As such, the net increase in traffic volumes associated with the proposed Canadian Tire has been considered in the development of future background volumes.

4.3 Demand Rationalization

The purpose of this section is to rationalize future travel demands within the study area to account for potential capacity limitations in the transportation network and its ability to effectively accommodate the additional demand generated by a new development.

4.3.1 Description of Capacity Issues

A Public Open House (POH) was held for the Carling Avenue Transit Priority Measures project in February 2017. Display boards from this POH noted that the intersection of Carling Avenue & Maitland Avenue / Sherbourne Road may operate at capacity (i.e. Level of Service 'E') once the transit priority measures have been implemented as a result of a reduction in the number of general traffic lanes in each direction. There are no other documented records of existing or future capacity issues at any of the other study area intersections.

4.3.2 Adjustment to Development-Generated Demands

The development of the proposed mode share targets considered both the existing local mode shares and the expected increase in transit demand as a result of the planned transit priority measures. As such, no further adjustments to development-generated demand is necessary.

4.3.3 Adjustment to Background Network Demands

As discussed previously, although the implementation of dedicated bus lanes on Carling Avenue will result in a reduction in vehicular capacity on Carling Avenue its impact on regional traffic patterns is unknown. Based on information presented in studies associated with nearby adjacent developments, there is evidence to support negative growth in traffic within the study area. In recognition of planned transit priority measures, an annual background growth rate of -0.5% can be expected and has therefore been considered in the future background traffic projections for this study.

4.4 Traffic Volume Summary

4.4.1 Future Background Traffic Volumes

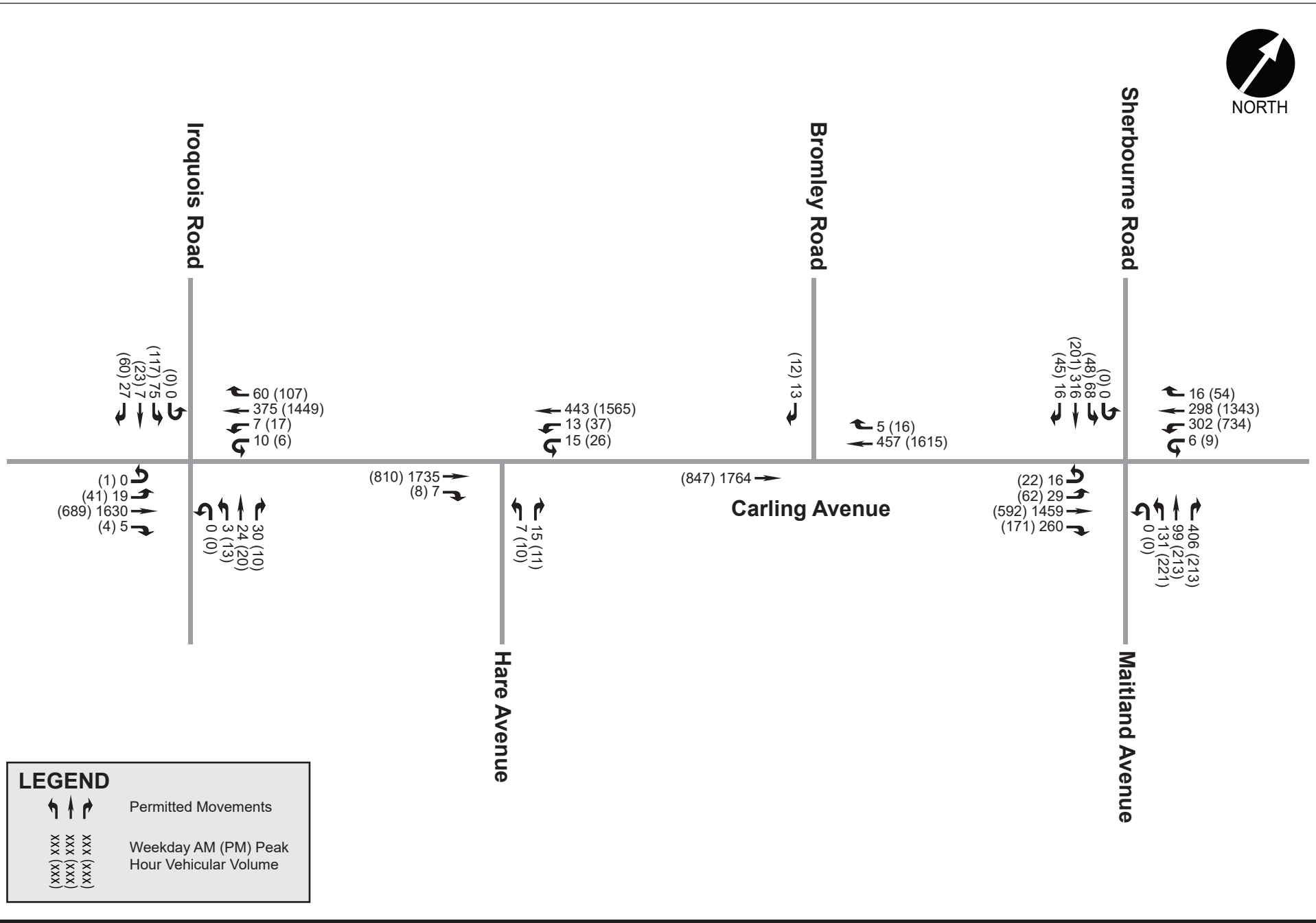
Future background traffic volumes have been established through the application of growth rates to through movements on Carling Avenue and all movements at the intersection of Carling Avenue & Maitland Avenue / Sherbourne Road, and by superimposing these adjusted traffic volumes with future adjacent development traffic volumes.

Exhibit 6 and **Exhibit 7** present the future background traffic volumes anticipated for the 2024 and 2029 analysis years, respectively.

4.4.2 Future Total Traffic Volumes

Future total traffic volumes have been established by combining the site-generated traffic volumes with the future background traffic volumes.

Exhibit 8 and **Exhibit 9** present the future total traffic volumes anticipated for the 2024 and 2029 analysis years, respectively.



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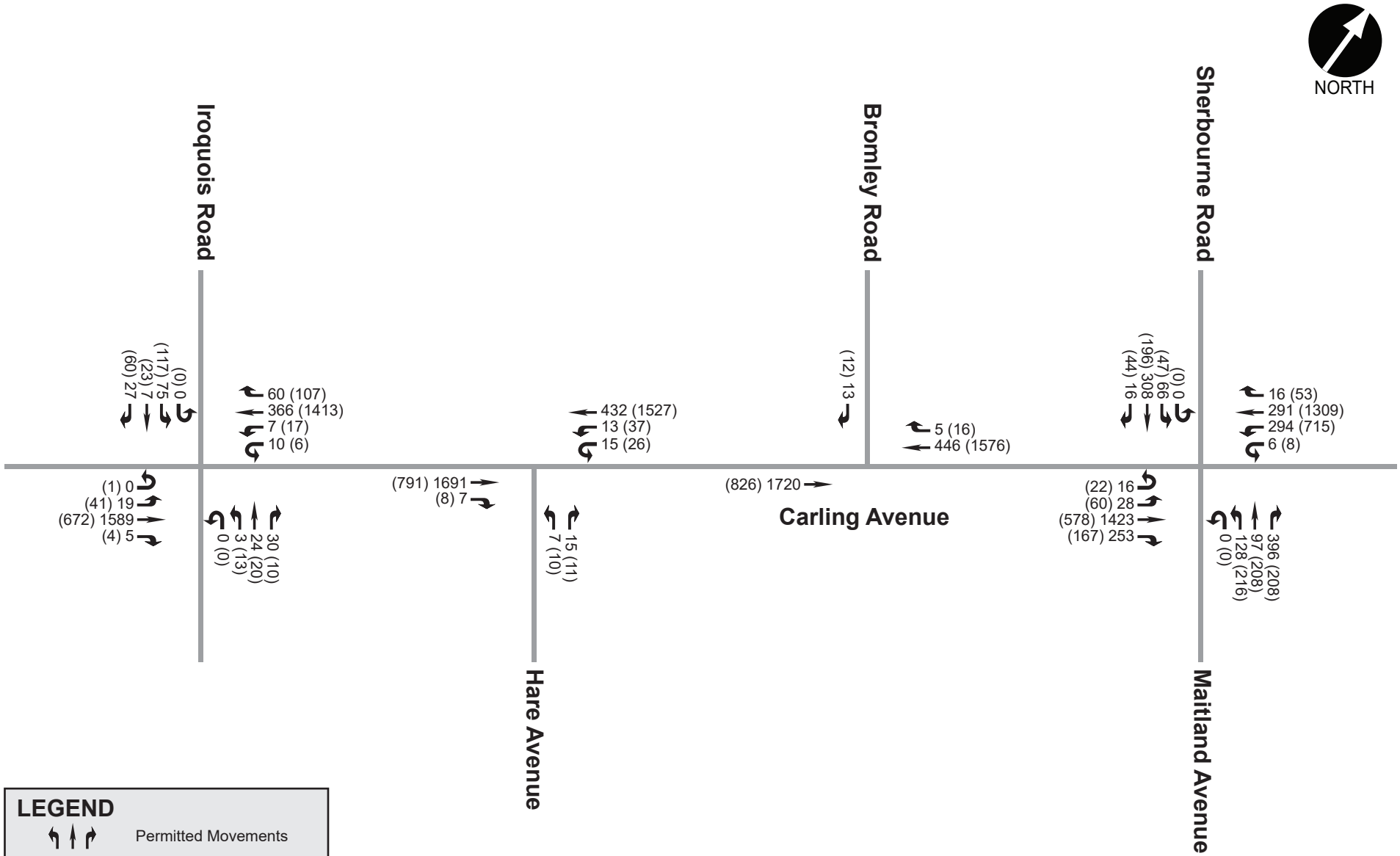
1995 Carling Avenue
Transportation Impact Assessment

Exhibit 6:
Future (2024)
Background Traffic

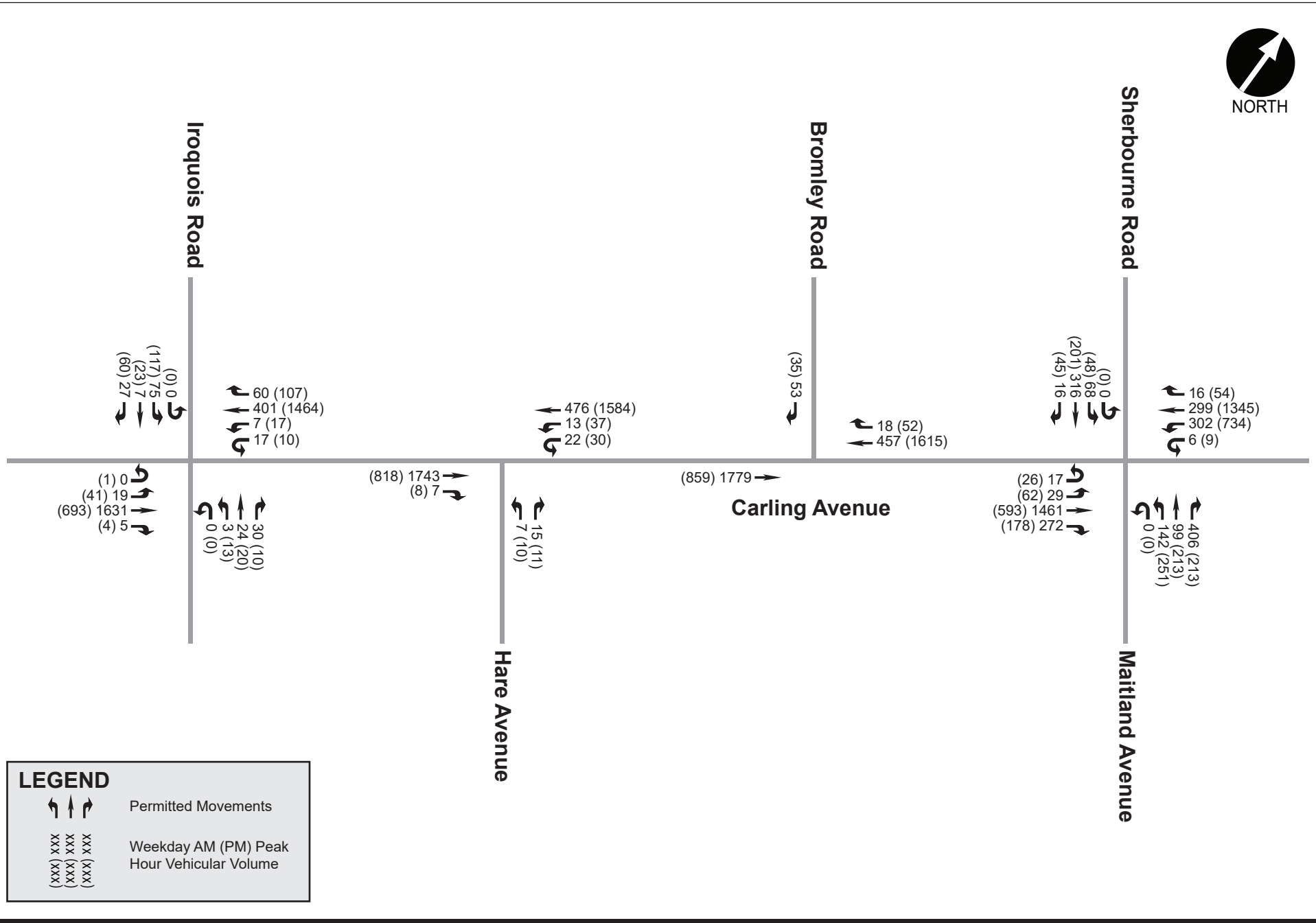
PROJECT No. 124829
DATE: April 2020
SCALE: N.T.S.



1995 Carling Avenue
Transportation Impact Assessment

Exhibit 7:
Future (2029)
Background Traffic

PROJECT No. 124829
DATE: April 2020
SCALE: N.T.S.



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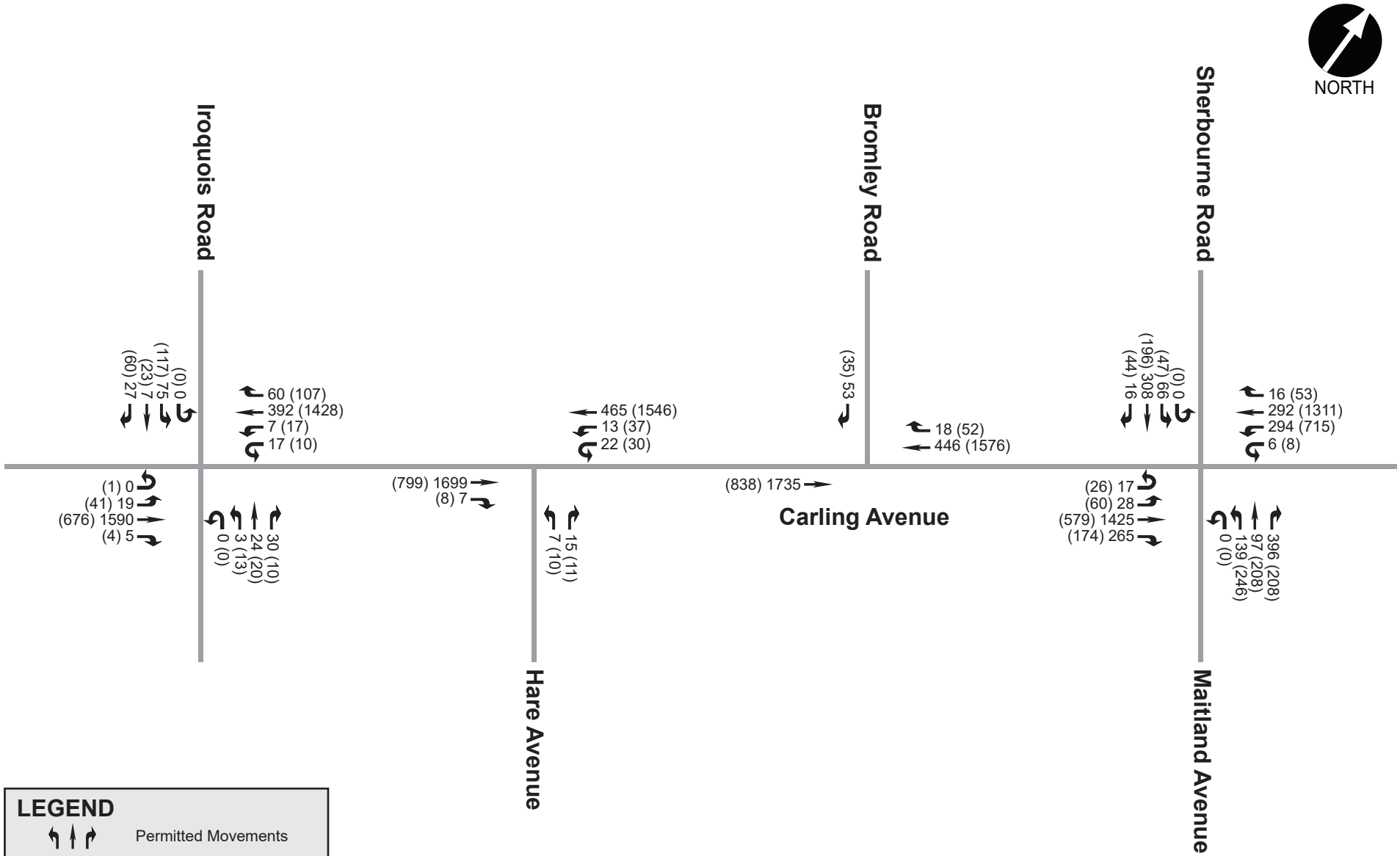
1995 Carling Avenue
Transportation Impact Assessment

Exhibit 8:
Future (2024)
Total Traffic

PROJECT No. 124829
DATE: April 2020
SCALE: N.T.S.



1995 Carling Avenue
Transportation Impact Assessment

Exhibit 9:
Future (2029)
Total Traffic

PROJECT No. 124829
DATE: April 2020
SCALE: N.T.S.

5 Analysis

5.1 Development Design

5.1.1 Design for Sustainable Modes

For consistency with the City of Ottawa's Urban Design Guidelines and transportation policies, new developments shall provide safe and efficient access for all users, while creating an environment that encourages walking, cycling and transit use.

The proposed development is located adjacent to Carling Avenue which will have dedicated bus lanes in both directions prior to the 2024 buildout year, thereby improving the convenience and reliability of transit service along this corridor. Currently, the nearest westbound and eastbound bus stops are 55m and 440m west of the proposed development, respectively. As such, the proposed development is only 40m short of meeting OC Transpo's service design guidelines of providing peak period service within a five minute (400m) walk of residences.

The TDM-Supportive Development Design and Infrastructure Checklist was completed and is provided in **Appendix G**. This checklist identifies specific measures that are being considered in association with the proposed development to offset the vehicular impact on the adjacent road network.

5.1.2 Circulation and Access

All site-generated traffic will access the proposed development via a two-way private approach on Bromley Road. Within the underground parking facility, all drive aisles will be a minimum of 6.0m wide.

All pick-up and drop-offs activities, loading and waste collection will occur on Bromley Road. The pedestrian access has been oriented to facilitate this on Bromley Road and to discourage these activities from occurring on Carling Avenue within the dedicated bus lane. In order to accommodate these activities, it is recommended that on-street parking be permitted on Bromley Road adjacent to the proposed development.

5.1.3 New Street Networks

Not Applicable: The New Street Networks element is exempt from this TIA, as defined in the study scope. This element is not required for development applications involving site plans.

5.2 Parking

5.2.1 Parking Supply

Six levels of underground parking will be provided with a total of 168 vehicle parking spaces and 155 bicycle parking spaces.

Based on the number of residential units proposed and the provisions for Area X of the Zoning By-law, a minimum of 89 vehicle parking spaces, 20 visitor parking spaces and 105 bicycle parking spaces must be provided by the proposed development. The proposed parking supply therefore exceeds the Zoning Bylaw requirements.

5.2.2 Spillover Parking

The minimum parking supply requirement has been met, therefore, no further review of parking will be necessary for the purposes of this study.

5.3 Boundary Streets

There are two existing boundary streets adjacent to the proposed development: Carling Avenue and Bromley Road. As there are plans to make Carling Avenue a 'Complete Street' through the implementation of transit lanes, Multi-Modal Level of Service (MMLOS) analysis has been conducted for Bromley Road only.

5.3.1 Mobility

Segment-based Multi-Modal Level of Service (MMLOS) results for Bromley Road along the proposed development frontage are provided in **Table 10** below.

Details of the Multi-Modal Level of Service (MMLOS) analysis are provided in **Appendix H**.

Table 10 - Segment MMLOS Results

LOCATION	LEVEL OF SERVICE BY MODE			
	PEDESTRIAN (PLOS)	BICYCLE (BLOS)	TRANSIT (TLOS)	TRUCK (TkLOS)
SEGMENTS				
Bromley Road	F (Target: C)	B (Target: D)	D (Target: D)	B (Target: N/A)

The results of the Segment MMLOS indicate that Bromley Road is not currently meeting its PLOS target. The City may wish to consider providing a sidewalk along one side of Bromley Road in order to increase pedestrian comfort and safety along this roadway segment.

5.3.2 Road Safety

A summary of all reported collisions within the study period over the past five years was presented in the Scoping section of this TIA. The City requires a safety review if at least six collisions for any one movement or of a discernible pattern have occurred over a five-year period. Preliminary analysis identified some intersections and road segments of potential concern, therefore further review was conducted, as summarized below:

Carling Avenue & Iroquois Road

In the past five years there have been a total of 33 collisions at this intersection, one of which involved a pedestrian. Based on the traffic volumes observed, this intersection experiences an average collision rate of 0.70 collisions per Million Vehicle Entering (MVE). A collision rate of less than 1.0 collisions per MVE is generally considered to be within the 'expected' or 'normal' operating range for a given location. Over the past five years, there have been 13 angle collisions, five rear-end collisions, three sideswipe collisions, 11 turning movement collisions and one pedestrian collision. Of the 13 angle collisions that occurred, seven involved eastbound through vehicles and northbound through vehicles, and four involved westbound through vehicles and southbound through or left-turning vehicles. The majority of the turning movement collisions involved eastbound vehicles completing left-turns or U-turns and westbound through vehicles. Most of the angle and turning movement collisions occurred during the daytime under clear environmental conditions (i.e. no rain or snow) and dry pavement conditions. Based on the above information, it is possible that excessive westbound speeds and red-light running may be contributing factors to these collision trends and should be investigated by the City for consideration of appropriate mitigation measures.

Carling Avenue & Hare Avenue

In the past five years there have been a total of six collisions at this intersection including two angle, two sideswipe and two turning movement collisions. No significant reoccurring collision patterns have therefore been observed.

Carling Avenue & Maitland Avenue / Sherbourne Road

In the past five years there have been a total of 63 collisions at this intersection. This translates to 0.79 collisions per MVE which is within the normal operating range. Of the 63 collisions that occurred in the past five years, there was one head-on collision, four angle collisions, 31 rear-end collisions, 21 sideswipe collisions, five turning movement collisions and one single motor vehicle (SMV) collision. Of the rear-end and sideswipe collisions, 12 involved northbound vehicles, four involved southbound vehicles, 11 involved eastbound vehicles and 25 involved westbound vehicles. The majority of these collisions occurred during the daytime under clear environmental conditions (i.e. no rain or snow) and dry pavement conditions. Based on the collision records, most of these collisions appeared to involve two vehicles going straight through (not turning right or left) with the exception of a few westbound left-turn collisions. The majority of these collisions occurred in the peak direction of traffic and, based on a preliminary review of field conditions, there is no apparent cause.

Carling Avenue – Hare Avenue to Bromley Road

There have been a total six collisions along this roadway segment in the past five years. Four of these collisions were rear-end collisions and two were SMV collisions. As such, no significant reoccurring collision patterns have been observed on this segment of Carling Avenue.

Carling Avenue –Bromley Road to Maitland Avenue / Sherbourne Road

Nine collisions have been observed along this segment of Carling Avenue in the past five years: one angle collisions (likely driveway related), five rear-end collisions (three eastbound and two westbound) and three sideswipe collisions (two eastbound and one westbound). As there have not been any significant reoccurring collisions patterns, further analysis is not warranted.

5.4 Access Intersections

5.4.1 Location and Design of Access

The proposed development will provide a new two-way private approach on Bromley Road. The existing private approach will be removed. The proposed site access is in conformance with the City of Ottawa Private Approach By-law 2003-447, with particular confirmation of the following items:

- Width: A private approach shall have a minimum width of 2.4m and a maximum width of 9.0m. The City of Ottawa Zoning By-law, however, indicates that for parking garage a two-way private approach shall have a minimum width of 6.0m.
    - The private approach will be 6.0m wide, which is appropriate for an access to a structured parking facility. ✓
- Quantity and Spacing of Private Approaches: For sites with frontage between 35 and 45 metres, two (2) two-way private approaches or two (2) one-way private approaches are permitted. Any two private approaches must be separated by at least 9.0m and can be reduced to 2.0m in the case of two one-way driveways. On lots that abut more than one roadway, these provisions apply to each frontage separately.
    - The frontage on Bromley Road is approximately 45m, therefore the single two-way private approach is compliant with the by-law. ✓

- Distance from Property Line: Private approaches must be at least 3.0m from the abutting property line, however this requirement can be reduced to 0.3m provided that the access is a safe distance from the access serving the adjacent property, sight lines are adequate and that it does not create a traffic hazard.
    - The private approach is approximately 6.2m from the property line. ✓
- Distance from Nearest Intersecting Street Line: For apartment buildings with 100 to 199 parking spaces located on a parcel adjacent to or within 46m of an arterial or major collector, all private approaches must be a minimum of 30m from the nearest intersecting street line.
    - The private approach is approximately 34.7m from the nearest intersecting street line. ✓
- Distance from Any Other Private Approach: For apartment buildings with 100 to 199 parking spaces located on a parcel adjacent to or within 46m of an arterial or major collector, all two-way private approaches must be a minimum of 30m from the any other private approach.
    - The private approach is approximately 10.3m from the loading access for Bromley Square. ✗
        - It is not expected that the proximity of the two accesses will have any impact to Carling Avenue, therefore, a relaxation of the bylaw is recommended in this situation.
- Grade of Private Approach: The grade of a private approach serving a parking area of more than 50 spaces must not exceed 2% within the private property for a distance of 9m from the highway/curb line.
    - The grade of the private approaches will be less than 2% within 9m of the curb line. ✓

5.4.2 Access Intersection Control

It is anticipated that the site access driveway will be unsignalized.

5.4.3 Access Intersection Design (MMLOS)

Not Applicable – The site access driveway will be unsignalized, therefore MMLOS analysis is not required.

5.5 Transportation Demand Management (TDM)

The City of Ottawa is committed to implementing Transportation Demand Management (TDM) measures on a City-wide basis in an effort to reduce automobile dependence, particularly during the weekday peak travel periods. TDM initiatives are aimed at encouraging individuals to use non-auto modes of travel during the peak periods.

5.5.1 Context for TDM

As discussed previously, the proposed development is located immediately adjacent to Carling Avenue which will be upgraded with continuous bus lanes between Lincoln Fields Station and the Trillium Line Carling Station and is also located within the Carling Avenue Arterial Mainstreet Design Priority Area (DPA).

The mode share targets used to estimate future development traffic were based on the TRANS Origin-Destination (O-D) Survey for the Ottawa West Traffic Assessment Zone (TAZ) and were adjusted to account for the impact of the planned Carling Avenue transit priority measures.

5.5.2 Need and Opportunity

A failure to meet the non-auto mode share targets would result in increased traffic at the study area intersections, potentially resulting in reduced Levels of Service (LOS). However, it is expected that there is a low probability that the mode share targets will not be achieved given the proximity of the site to a future transit priority corridor and its relative proximity to amenities such as the Carlingwood Shopping Centre.

5.5.3 TDM Program

The proposed development conforms to the City's TDM principles by providing convenient and direct connections to adjacent pedestrian and transit facilities and is within a 500m walking distance from the Carlingwood Shopping Centre.

The City of Ottawa's TDM Measures Checklist was completed for the proposed development and provided in **Appendix G**. This checklist indicates measures that are being contemplated as part of this development. A more detailed TDM program will be further developed at the site plan application stage.

5.6 Neighbourhood Traffic Management

5.6.1 Adjacent Neighbourhoods

As the development is dependent on Bromley Road for access, a review of Neighbourhood Traffic Management thresholds is required as part of the TIA process.

The TIA Guidelines specify a liveability threshold of 120 vehicles per hour for local roads. Bromley Road is projected to operate with two-way total traffic volumes of up to 71 and 87 vehicles per hour during the weekday morning and afternoon peak hours, respectively. As both weekday peak hours are expected to operate within the liveability threshold at the horizon year of the study, a Neighbourhood Traffic Management (NTM) plan is not necessary for this development.

5.7 Transit

5.7.1 Route Capacity

The estimated Future (2024) Total transit passenger demand within the study area was provided in Section 4.1.2.5. The results have been summarized in **Table 11**.

Table 11 – 2024 Development Generated Transit Demand

PERIOD	PEAK PERIOD DEMAND	
	IN	OUT
AM	9	29
PM	18	11

As shown above, site-generated two-way transit ridership volumes of roughly 38 and 29 passengers are expected during the weekday morning and afternoon peak hours, respectively. It is expected that these transit trips will be easily accommodated by the future bus priority corridor along Carling Avenue.

5.7.1 Transit Priority Measures

It is expected that the transit priority measures that will be implemented as part of the Carling Avenue transit priority corridor will be sufficient to accommodate the proposed development.

5.8 Review of Network Concept

Not Applicable: The Network Concept element is exempt from this TIA, as defined in the study scope. This element is not required for development applications that generate less than 200 person-trips.

5.9 Intersection Design

The following sections summarize the methodology and results of the multi-modal intersection capacity analysis conducted within the study area.

5.9.1 Intersection Control

The following section evaluates the need to conduct traffic signal warrant analyses and roundabout analyses at any applicable study area intersections. The results of the intersection control warrants discussed below are provided in **Appendix I**.

5.9.1.1 Traffic Signal Warrants

Traffic signal warrant analysis has been completed for the intersection of Carling Avenue & Hare Avenue which the intersection capacity analysis indicates is expected to approach or exceed its theoretical capacity under Future (2024 & 2029) Background and Total Traffic conditions. The results of the traffic signal warrant analysis indicate that traffic signals are not warranted at this intersection.

5.9.1.2 Roundabout Analysis

The City's Roundabout Implementation Policy indicates that intersections that satisfy any of the following criteria should be screened utilizing the Roundabout Initial Feasibility Screening Tool:

- At any new City intersection
- Where traffic signals are warranted
- At intersections where capacity or safety problems are being experienced

The intersections of Carling Avenue & Maitland Avenue / Sherbourne Road and Carling Avenue & Hare Avenue were therefore screened as both are expected to approach or exceed their theoretical capacity under Future (2024 & 2029) Background and Total Traffic conditions. Based on the results of the roundabout screening analysis, it is not recommended that a roundabout be considered at either intersection.

5.9.2 Intersection Analysis Criteria (Automobile)

The following section outlines the City of Ottawa's methodology for determining motor vehicle Level-of-Service (LOS) at signalized and unsignalized intersections.

5.9.2.1 Signalized Intersections

In qualitative terms, the Level-of-Service (LOS) defines operational conditions within a traffic stream and their perception by motorists. A LOS definition generally describes these conditions in terms of such factors as delay, speed and travel time, freedom to manoeuvre, traffic interruptions,

safety, comfort and convenience. LOS can also be related to the ratio of the volume to capacity (v/c) which is simply the relationship of the traffic volume (either measured or forecast) to the capability of the intersection or road section to accommodate a given traffic volume. This capability varies depending on the factors described above. LOS are given letter designations from 'A' to 'F'. LOS 'A' represents the best operating conditions and LOS 'E' represents the level at which the intersection or an approach to the intersection is carrying the maximum traffic volume that can, practicably, be accommodated. LOS 'F' indicates that the intersection is operating beyond its theoretical capacity.

The City of Ottawa has developed criteria as part of the Transportation Impact Assessment Guidelines, which directly relate the volume to capacity (v/c) ratio of a signalized intersection to a LOS designation. These criteria are presented in **Table 12** as follows:

Table 12 - LOS Criteria for Signalized Intersections

LOS	VOLUME TO CAPACITY RATIO (v/c)
A	0 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	> 1.00

The intersection capacity analysis technique provides an indication of the LOS for each movement at the intersection under consideration and for the intersection as a whole. The overall v/c ratio for an intersection is defined as the sum of equivalent volumes for all critical movements at the intersection divided by the sum of capacities for all critical movements.

The Level of Service calculation is based on locally-specific parameters as described in the TIA Guidelines and incorporates existing signal timing plans obtained from the City of Ottawa. The analysis existing conditions utilized a Peak Hour Factor (PHF) of 0.90, while future conditions considers optimized signal timing plans and use of a Peak Hour Factor (PHF) of 1.0 to recognize peak spreading beyond a 15-minute period in congested conditions.

5.9.2.2 Unsignalized Intersections

The capacity of an unsignalized intersection can also be expressed in terms of the LOS it provides. For an unsignalized intersection, the Level of Service is defined in terms of the average movement delays at the intersection. This is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this includes the time required for a vehicle to travel from the last-in-queue position to the first-in-queue position. The average delay for any particular minor movement at the un-signalized intersection is a function of the capacity of the approach and the degree of saturation.

The Highway Capacity Manual 2010 (HCM), prepared by the Transportation Research Board, includes the following Levels of Service criteria for un-signalized intersections, related to average movement delays at the intersection, as indicated in **Table 13**.

Table 13 - LOS Criteria for Unsignalized Intersections

LOS	DELAY (seconds)
A	<10
B	>10 and <15
C	>15 and <25
D	>25 and <35
E	>35 and <50
F	>50

The unsignalized intersection capacity analysis technique included in the HCM and used in the current study provides an indication of the Level of Service for each movement of the intersection under consideration. By this technique, the performance of the unsignalized intersection can be compared under varying traffic scenarios, using the Level of Service concept in a qualitative sense. One unsignalized intersection can be compared with another unsignalized intersection using this concept. Level of Service 'E' represents the capacity of the movement under consideration and generally, in large urban areas, Level of Service 'D' is considered to represent an acceptable operating condition. Level of Service 'E' is considered an acceptable operating condition for planning purposes for intersections located within Ottawa's Urban Core the downtown and its vicinity). Level of Service 'F' indicates that the movement is operating beyond its design capacity.

5.9.3 Intersection Capacity Analysis

Following the established intersection capacity analysis criteria described above, the existing and future conditions are analyzed during the weekday peak hour traffic volumes derived in this study.

The following section presents the results of the intersection capacity analysis. All tables summarize study area intersection LOS results during the weekday morning and afternoon peak hour periods.

The Synchro output files have been provided in **Appendix J**.

5.9.3.1 Existing (2020) Traffic

An intersection capacity analysis has been undertaken using the Existing (2020) Traffic volumes presented in **Exhibit 4. Table 14** summarizes the results of the intersection capacity analysis.

Table 14 - Intersection Capacity Analysis: Existing (2020) Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Carling Avenue & Iroquois Road	Signalized	A (0.52)	EBTR (0.52)	B (0.65)	WBT (0.65)
Carling Avenue & Hare Avenue	Unsignalized	**E (42.1s)**	**NBRL (42.1s)**	D (25.7s)	NBRL (25.7s)
Carling Avenue & Bromley Road	Unsignalized	B (10.9s)	SBR (10.9s)	C (21.3s)	SBR (21.3s)
Carling Avenue & Maitland Avenue/ Sherbourne Road	Signalized	D (0.90)	**SBL (1.33)**	**E (0.95)**	**NBL (0.98)**

Based on the results of the analysis, the intersections of Carling Avenue & Hare Avenue and Carling Avenue & Maitland Avenue / Sherbourne Road are presently approaching their theoretical capacity (i.e. LOS 'E') under Existing (2020) Traffic conditions during the weekday morning and afternoon peak hour, respectively. During the weekday morning peak hour, several movements at the Carling Avenue & Maitland Avenue / Sherbourne Road intersection are operating in excess of their theoretical capacity; however, the intersection as a whole is operating at an acceptable Level of Service (i.e. LOS 'D' or better).

5.9.3.2 Future (2024) Background Traffic

An intersection capacity analysis has been undertaken using the Future (2024) Background Traffic volumes presented in **Exhibit 6**, yielding the following results:

Table 15 - Intersection Capacity Analysis: Future (2024) Background Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Carling Avenue & Iroquois Road	Signalized	B (0.62)	EBT (0.62)	A (0.59)	WBT (0.59)
	Signalized [1,2]	B (0.63)	EBT (0.68)	A (0.57)	WBT (0.57)
Carling Avenue & Hare Avenue	Unsignalized	**F (52.1s)**	**NBRL (52.1s)**	**E (36.8s)**	**NBRL (36.8s)**
	Unsignalized [1]	**E (43.6s)**	**NBRL (43.6s)**	D (33.8s)	NBRL (33.8s)
Carling Avenue & Bromley Road	Unsignalized	A (9.8s)	SBR (9.8s)	C (17.0s)	SBR (17.0s)
Carling Avenue & Maitland Avenue/ Sherbourne Road	Signalized [3]	**E (0.91)**	**NBTR (0.93)**	C (0.74)	WBL (0.88)

Notes:

[1] – U-turns prohibited at Carling Avenue & Hare Avenue and rerouted to Carling Avenue & Iroquois Road.

[2] – Protected-permitted westbound left-turn phase added.

[3] – Optimized signal timing plan.

Under Future (2024) Background Traffic conditions, the intersection of Carling Avenue & Maitland Avenue / Sherbourne is expected to approach its theoretical capacity in the morning peak hour. In the afternoon peak hour, the intersection as a whole is operating at an acceptable Level of Service (i.e. LOS 'D' or better). Given the space constraints at the intersection, no physical intersection modifications (e.g. additional lanes) are recommended. Potential signal timing plan modifications were considered; however, none were identified that would improve traffic operations at the intersection during the morning peak hour.

With the planned conversion of two general traffic lanes to dedicated bus lanes the traffic capacity on Carling Avenue is expected to decrease resulting in less gaps for northbound traffic at the intersection of Carling Avenue & Hare Avenue which ultimately results in increased delays. The increased delays are expected to cause the northbound approach to exceed its theoretical capacity in the morning peak hour and to approach its theoretical capacity in the afternoon peak hour. Analysis has shown that prohibiting U-turn movements at this intersection will permit the intersection to operate at or below its theoretical capacity during both peak hours with minimal impacts to the intersection of Carling Avenue & Iroquois Road. It is recommended that a westbound let-turn protected-permitted phase be added at the intersection of Carling Avenue & Iroquois Road to reduce conflicts between the increased westbound U-turn traffic and eastbound through traffic.

5.9.3.3 Future (2029) Background Traffic

An intersection capacity analysis has been undertaken using the Future (2029) Background Traffic volumes presented in **Exhibit 7**, yielding the following results:

Table 16 - Intersection Capacity Analysis: Future (2029) Background Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Carling Avenue & Iroquois Road	Signalized [1,2]	B (0.61)	EBT (0.66)	A (0.56)	WBT (0.56)
Carling Avenue & Hare Avenue	Unsignalized [1]	**E (40.5s)**	**NBRL (40.5s)**	D (32.0s)	NBRL (32.0s)
Carling Avenue & Bromley Road	Unsignalized	A (9.7s)	SBR (9.7s)	C (16.7s)	SBR (16.7s)
Carling Avenue & Maitland Avenue/ Sherbourne Road	Signalized [3]	D (0.89)	**NBTR (0.91)**	B (0.68)	NBL (0.84)

Notes:

[1] – U-turns prohibited at Carling Avenue & Hare Avenue and rerouted to Carling Avenue & Iroquois Road.

[2] – Protected-permitted westbound left-turn phase added.

[3] – Optimized signal timing plan.

Under Future (2029) Background Traffic conditions, only the Carling Avenue & Hare Avenue intersection is expected to continue operating at its theoretical capacity during the morning peak hour. During the morning peak hour, traffic operations at the Carling Avenue & Maitland Avenue / Sherbourne Road intersection is expected to operate at an overall LOS of 'D'. Overall, traffic operations are expected to improve slightly at all intersections as a result of continuing decreases in background traffic demand.

5.9.3.4 Future (2024) Total Traffic

An intersection capacity analysis has been undertaken using the Future (2024) Total Traffic volumes presented in **Exhibit 8**, yielding the following results:

Table 17 - Intersection Capacity Analysis: Future (2024) Total Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Carling Avenue & Iroquois Road	Signalized [1,2]	B (0.66)	EBT (0.70)	A (0.58)	WBT (0.58)
Carling Avenue & Hare Avenue	Unsignalized [1]	**E (45.7s)**	**NBRL (45.7s)**	D (34.9s)	NBRL (34.9s)
Carling Avenue & Bromley Road	Unsignalized	A (10.1s)	SBR (10.1s)	C (18.0s)	SBR (18.0s)
Carling Avenue & Maitland Avenue/ Sherbourne Road	Signalized [3]	**E (0.91)**	**NBTR (0.93)**	C (0.73)	NBL (0.89)

Notes:

[1] – U-turns prohibited at Carling Avenue & Hare Avenue and rerouted to Carling Avenue & Iroquois Road.

[2] – Protected-permitted westbound left-turn phase added.

[3] – Optimized signal timing plan.

Based on the above results, the addition of site-generated traffic is expected to have a minor impact at all study area intersections. Overall, however, traffic operations will not be significantly affected, and all intersection movements will continue operating at or below their theoretical capacity.

5.9.3.5 Future (2029) Total Traffic

An intersection capacity analysis has been undertaken using the Future (2029) Total Traffic volumes presented in **Exhibit 9**, yielding the following results:

Table 18 - Intersection Capacity Analysis: Future (2024) Total Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Carling Avenue & Iroquois Road	Signalized [1,2]	B (0.63)	EBT (0.68)	A (0.56)	WBT (0.56)
Carling Avenue & Hare Avenue	Unsignalized [1]	**E (42.4s)**	**NBRL (42.4s)**	D (33.1s)	NBRL (33.1s)
Carling Avenue & Bromley Road	Unsignalized	A (10.0s)	SBR (10.0s)	C (17.6s)	SBR (17.6s)
Carling Avenue & Maitland Avenue/ Sherbourne Road	Signalized [3]	D (0.89)	**NBTR (0.91)**	C (0.71)	NBL (0.86)

Notes:

[1] – U-turns prohibited at Carling Avenue & Hare Avenue and rerouted to Carling Avenue & Iroquois Road.

[2] – Protected-permitted westbound left-turn phase added.

[3] – Optimized signal timing plan.

As observed under Future (2024) Total Traffic conditions, under Future (2029) Total Traffic conditions all study area intersections are expected to continue operating at or below their theoretical capacity and no intersection movements are expected to exceed their theoretical capacity. Minor improvements in traffic operations are expected relative to Future (2024) Total Traffic conditions as a result of anticipated declines in background traffic volumes.

5.9.4 Intersection Design (MMLOS)

5.9.4.1 Intersection MMLOS Methodology

Analysis criteria for each of the four non-auto modes are briefly described as follows:

Intersection Pedestrian Level of Service (PLOS)

The PLOS at intersections is based on several factors including the number of traffic lanes that pedestrians must cross, corner radii, and whether the crossing allows for permissive or protective right or left turns, among others. The City of Ottawa target for PLOS along an Arterial Mainstreet is 'C'.

Intersection Bicycle Level of Service (BLOS)

The BLOS at intersections is dependent on several factors: the number of lanes that the cyclist is required to cross to make a left-turn; the presence of a dedicated right-turn lane on the approach; and the operating speed of each approach. The City target for BLOS along an Arterial Mainstreet spine route is 'C'.

Intersection Transit Level of Service (TLOS)

Intersection TLOS is based on the average signal delay experienced by transit vehicles at each intersection. The City Target TLOS along an Arterial Mainstreet with a Transit Priority Corridor (Continuous Lanes) is 'C'.

Intersection Truck Level of Service (TkLOS)

The Truck LOS (TkLOS) is based on the right-turn radii, as well as the number of receiving lanes for vehicles making a right-turn from the traffic lane being analyzed. The City of Ottawa target for TkLOS along an Arterial Mainstreet is 'D' for truck routes or 'E' for non-truck routes.

5.9.4.2 Intersection MMLOS Results

An analysis of the future conditions for each mode has been conducted based on the methodology prescribed in the City of Ottawa Multi-Modal Level of Service (MMLOS) Guidelines. The Level of Service (LOS) for each mode has been calculated for each intersection where signals exist or are anticipated.

The intersection MMLOS results have been summarized in **Table 19**. Detailed intersection MMLOS analysis results are provided **Appendix H**.

Table 19 - Intersection MMLOS

LOCATION	LEVEL OF SERVICE BY MODE			
	PEDESTRIAN (PLOS)	BICYCLE (BLOS)	TRANSIT (TLOS)	TRUCK (TkLOS)
INTERSECTIONS				
Carling Avenue & Iroquois Road	**F** (Target: C)	**F** (Target: C)	**F** (Target: C)	**E** (Target: D)
Carling Avenue & Maitland Avenue / Sherbourne Road	**F** (Target: C)	**F** (Target: C)	**F** (Target: C)	**F** (Target: D)

5.9.4.3 Summary of Potential Improvements

Based on the MMLOS results outlined in **Table 19**, the following measures have been identified that could improve conditions for each travel mode:

Pedestrians

- The analysis indicates that all study area intersections are presently operating below the City's PLOS target of 'C'. Achieving a PLOS of 'C' would require reducing the width of Carling Avenue as well as reducing the traffic signal cycle lengths. With consideration of the volume of traffic demand on Carling Avenue, such modifications would have a significant negative impact to vehicle LOS. As a result of the number of travel lanes necessary to accommodate the traffic demand and transit priority lanes, it is not possible to achieve the targeted PLOS at these intersections but may be improved through supplemental design features such as enhanced crosswalk markings or advanced pedestrian signal phases.

Cyclists

- Based on the analysis, none of the study area intersections meet their respective BLOS targets. This is primarily due to the high operating speeds along most study area roadways (i.e. 60 km/h or greater) and the number of lanes that cyclists must cross to make a left-turn. Cyclists will be permitted to use the planned bus lanes on Carling Avenue and therefore they will be much less exposed to general traffic. At intersections, however, left-turning cyclists would still be required to cross many lanes of traffic in order to complete left-turn movements. Furthermore, at the intersection of Carling Avenue & Maitland Avenue / Sherbourne Road, the dedicated bus lanes will transition to right-turn lanes in advance of the intersection and cyclists will be required to mix with general traffic. To achieve BLOS targets, significant intersection modifications such as the addition of bike pocket lanes at the intersection approaches complete with two-stage left turn boxes or a redesign to 'protected intersection' standards would be required. As both Carling and Maitland are each designated as Spine cycling routes, the City should consider infrastructure improvements within the study area to address these existing gaps in the active transportation network.

Transit

- The results of the analysis indicate that neither signalized intersection is meeting its TLOS target. However, if the northbound and southbound approaches of the Carling Avenue & Iroquois Road intersection are ignored the intersection would meet its TLOS target as the eastbound and westbound approaches will have queue jump lanes in the future. At the intersection of Carling Avenue & Maitland Avenue / Sherbourne Road, the dedicated bus lanes end in advance of the intersection and, as such, transit will be delayed by general traffic resulting in a poor TLOS. Given that the intersection is expected to approach its theoretical capacity under both Future (2024 & 2029) Background and Total Traffic conditions, it should be cautioned that any reduction in vehicular capacity at the intersection to accommodate transit priority lanes through the intersection may result in significant traffic congestion. It should be noted that the TLOS deficiency is primarily a result of background traffic demand and site-generated traffic demand has a negligible impact.

Truck

- Both signalized intersections within the study area do not meet the TLOS target. However, at the intersection of Carling Avenue & Iroquois Road, it is only the eastbound right-turn movement that is failing to meet the TLOS target. As Iroquois Road is not a trucking route it is expected that this deficiency is acceptable. Similarly, at the intersection of Carling

Avenue & Maitland Avenue / Sherboune Road, it is the westbound right-turn movement that is failing to meet the TLOS target. Sherbourne Road is also not a trucking route therefore it is expected that this deficiency is also acceptable. If both of these movements are ignored then both signalized intersections meet the TLOS target.

The recommended measures listed above are intended only as suggestions to the City on how the MMLOS within the study area could be improved and do not identify measures to be implemented as a direct consequence of this development. The MMLOS analysis identifies existing deficiencies in the study area and are not expected to be exacerbated by the proposed development.

5.10 Geometric Review

The following section reviews all geometric requirements for the study area intersections.

5.10.1 Sight Distance and Corner Clearances

The proposed site access is located along a straight segment of Bromley Road with clear sightlines in both directions. From the southbound approach of the Carling Avenue & Bromley Road intersection there is at least 130m of visibility to approaching westbound vehicles in the curb lane which is in excess of the minimum stopping sight distance for a design speed on Carling Avenue of 70km/h. With consideration that the curb lane will be converted to a bus lane, the volume and speed of traffic will be significantly reduced in this lane, thereby facilitating right turns from Bromley Road.

The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads indicates that a minimum corner clearance of 15m should be maintained between a private approach on a local road and any intersecting roadway. The proposed site access will be located approximately 33.3m from Carling Avenue and therefore meets this requirement.

5.10.2 Auxiliary Lane Analysis

Auxiliary turning lane requirements for all intersections within the study area are described as follows:

5.10.2.1 Unsignalized Auxiliary Left-Turn Lane Requirements

Based on the intersection capacity analysis, the westbound left-turn lane at the intersection of Carling Avenue & Hare Avenue is expected to experience negligible queues and therefore the existing storage provided will be sufficient. It shall be noted that this result is contingent on the implementation of westbound U-turn restrictions at this location.

5.10.2.2 Signalized Auxiliary Left-Turn Requirements

A review of auxiliary left-turn lane storage requirements was completed at all signalized intersections within the study area under Future (2029) Total Traffic conditions. The review compared the projected 95th percentile queue lengths from Synchro operational results, and the standard queue length calculation based on the following equation:

$$Storage\ Length = \frac{NL}{C} \times 1.5$$

Where:
N = number of vehicles per hour
L = Length occupied by a vehicle in the queue = 7 m
C = number of traffic signal cycles per hour

The results of the auxiliary left-turn lane analysis are summarized below in **Table 20**.

Table 20 - Auxiliary Left-Turn Storage Analysis at Signalized Intersections

INTERSECTION	APPROACH	95TH %ILE QUEUE LENGTH / CALCULATED QUEUE (M)		EXISTING STORAGE LENGTH (M)	STORAGE DEFICIENCY (M)
		AM PEAK HR	PM PEAK HR		
Carling Avenue & Iroquois Road	SB	32.8 / 28.4	46.8 / 44.4	50	-
	EB	3.2 / 7.6	6.6 / 16.3	25	-
	WB	5.9 / 17.4	8.2 / 21.6	20	-
Carling Avenue & Maitland Avenue / Sherbourne Road	NB	#57.6 / 23.0	80.7 / 16.5	75	5
	SB	#41.3 / 48.7	17.5 / 86.3	45	40
	EB	22.7 / 15.7	#57.0 / 30.0	55	-
	WB	#65.8 / 57.8	#121.2 / 139.3	115 (D)	-

Notes: 'D' stands for double left-turn lane.

Based on the results of the left-turn analysis presented above, the northbound and southbound auxiliary left-turn lanes at the intersection of Carling Avenue & Maitland Avenue / Sherbourne Road are 5m and 40m deficient, respectively.

While modifications to pavement markings can address the 5m storage deficiency, it can be considered negligible and therefore not necessary. With regard to the southbound left-turn lane on Sherbourne Road, there are practical limitations to extending the turn lane as it would extend beyond the intersection with Bromley Road. Given the above, modifications to storage capacity to address these are not feasible and therefore not recommended.

5.10.2.3 Unsignalized Auxiliary Right-Turn Lane Requirements

All unsignalized intersections in the study area are expected to have auxiliary right-turn lanes in the future as part of the planned implementation of dedicated bus lanes along Carling Avenue. Based on the projected 95th percentile queue lengths under Future (2029) Total Traffic conditions, the proposed auxiliary right-turn lane lengths will be sufficient to accommodate the projected traffic demand.

5.10.2.4 Signalized Auxiliary Right-Turn Lane Requirements

For signalized intersections, Section 9.14 of TAC suggests that auxiliary right-turn lanes shall be considered when more than 10% of vehicles on an approach are turning right and when the peak hour demand exceeds 60 vehicles. The purpose of this guideline is to mitigate operational impacts to through-traffic, particularly on high-speed arterial roadways, and may not be applicable in all circumstances.

The results of the auxiliary right-turn lane analysis are summarized below in **Table 21** below:

Table 21 – Auxiliary Right-Turn Lane Storage Analysis at Signalized Intersections

INTERSECTION	APPROACH	NUMBER OF RIGHT-TURNS / % RIGHT-TURNS		95TH %ILE QUEUE (M) AM / PM	EXISTING / PROPOSED STORAGE LENGTH (M)	STORAGE DEFICIENCY (M)
		AM PEAK HOUR	PM PEAK HOUR			
Carling Avenue & Iroquois Road	NB	30 / 53%	10 / 23%	-	-	-
	SB	27 / 25%	60 / 30%	-	-	-
	EB	5 / 0%	4 / 1%	0.0 / 0.0	40	-
	WB	60 / 12%	107 / 7%	2.5 / 9.2	85	-
Carling Avenue & Maitland Avenue / Sherbourne Road	NB	396 / 63%	208 / 31%	-	-	- [1]
	SB	16 / 4%	44 / 15%	-	-	-
	EB	265 / 15%	174 / 21%	21.0 / 17.8	130	-
	WB	16 / 3%	53 / 3%	-	-	-

Notes:

[1] – Meets the right-turn criteria, however, there is insufficient right-of-way available to accommodate a right-turn lane.

Based on the results presented above, the northbound approach at the Carling Avenue & Maitland Avenue / Sherbourne Road intersection meets the criteria for a right-turn lane however there is insufficient right-of-way to accommodate one at this location. All existing and future proposed right-turn lanes are expected to be sufficiently long to accommodate the projected Future (2029) Total Traffic demand.

5.11 Summary of Recommended Modifications

Based on the intersection capacity, Multi-Modal Level of Service and auxiliary lane analyses results presented above, no off-site improvements to the adjacent road network are required as a direct consequence of the proposed development in order to accommodate multi-modal transportation demands generated by the site. Under Future (2024) Background Traffic conditions, it was observed that the northbound approach at the Carling Avenue & Hare Avenue intersection experienced significant delays once the outer lanes on Carling Avenue were converted to dedicated bus lanes. Prohibiting U-turns at this location was found to allow this intersection to operate at LOS 'E' through to the horizon year of this study. It is expected that prohibiting U-turns at the Carling Avenue & Hare Avenue intersection would result in most of this demand to transfer to the Carling Avenue & Iroquois Road intersection. There is sufficient capacity at this intersection to accommodate this additional demand, however, it is recommended that the City consider implementing a protected-permitted westbound left-turn phase at this location. This would provide a protected phase that would make completing U-turn movements much safer as it would reduce conflicts with through traffic. Prohibiting U-turns at Carling Avenue & Hare Avenue would also improve safety at that intersection by also reducing conflicts with through traffic on Carling Avenue.

The MMLOS results identified existing deficiencies with respect to user comfort as well as potential mitigation measures that could be considered for implementation by the City but are not required to safely accommodate the proposed development.

As indicated in Section 5.3.2, it is suggested that the City further investigate collision patterns at the intersection of Carling Avenue & Iroquois Road to address the high frequency of angle and turning-movement collisions observed at the intersection and implement mitigation measures. Considering the collision patterns observed, it is not expected that site-generated traffic will significantly contribute to movements with observed safety issues.

6 Conclusion

The proposed residential development at 1995 Carling Avenue is expected to generate up to 53 and 59 two-way vehicular trips during the weekday morning and afternoon peak hours, respectively. It is expected that with the introduction of dedicated bus lanes on Carling Avenue that local transit mode shares may increase by 25% over existing levels, resulting in a reduction in local automobile use. It is also expected that this would have an impact to regional traffic patterns, however, the magnitude of this impact is unknown at the moment. Traffic volumes on Carling Avenue have been shown to decline slightly year over year and this trend is expected to continue with the introduction of higher quality transit service within the study area.

A review of historical collision records identified a high frequency of angle and turning-movement collisions at the intersection of Carling Avenue & Iroquois Road. Based on the reoccurring collision patterns observed, it was recommended that the City further investigate collision patterns at this intersection and implement mitigation measures. With consideration of the expected distribution of site-generated traffic, it is not anticipated that the proposed development will significantly contribute to movements with observed safety issues.

A multi-modal analysis of each study area intersection identified deficiencies in the existing road network and potential remediation measures have been suggested in which the City could consider in order to meet the prescribed targets. These remediation measures would improve mobility and comfort for all transportation modes but are not required to safely accommodate the proposed development.

It was found that the intersections of Carling Avenue & Hare Avenue and Carling Avenue & Maitland Avenue / Sherbourne Road would approach or exceed their theoretical capacities under Future (2024) Background Traffic conditions. Due to space constraints, no intersection modifications were recommended for the Carling Avenue & Maitland Avenue / Sherbourne Road intersection. At the Carling Avenue & Hare Avenue intersection, however, it is recommended that the City prohibit U-turn movements to address the capacity issue. The analyses indicate that with this prohibition, this intersection would not exceed its theoretical capacity within the horizon year of this study. A prohibition of U-turns at this location would result in demand shifting to the intersection of Carling Avenue & Iroquois Road, therefore, it is recommended that the City implement a protected-permitted phase for the westbound left-turn movement to improve safety at the intersection by reducing conflicts between vehicles completing a U-turn movement and through traffic on Carling Avenue.

As no physical modifications are required as a result of site-generated demand, an RMA will not be required. Further, as all required road network modifications are a result of background demand, a post-development monitoring plan will not be required either.

Based on the findings of this study, it is the overall opinion of IBI Group that the proposed development will integrate well with and can be safely accommodated by the adjacent transportation network.

Appendix A – City Circulation Comments

Step 1, 2 & 3 Submission (Screening, Scoping & Forecasting) – Circulation Comments & Response

Report Submitted: March 17, 2020
Comments Received: April 1, 2020
Transportation Project Manager: Mike Giampa

1. Revise the existing mode share. Since this is a residential development, a blend of from/within district should be used for the AM Peak and to/within district in the PM Peak.
   - IBI Response: Existing mode shares have been updated.

2. Provide future mode share targets to account for the Carling transit improvements.
   - IBI Response: Future transit mode share has been increased by a factor of 25% to account for increases in future transit ridership as a result of the Carling Avenue transit improvements.

3. Transit lanes are planned to be in place prior to the development's 2024 buildout year.
   - IBI Response: Report has been updated to reflect this new information.

4. Correct Table 8. The auto driver trips are incorrect.
   - IBI Response: Table 8 has been corrected.

5. Revisit the need for demand rationalization as a result of the reduction of the number of general traffic lanes. Provide figures depicting the total traffic operating in study area intersections.
   - IBI Response: The demand rationalization has been revised to reflect the reduction in general traffic lanes and the traffic volume exhibits have been updated.

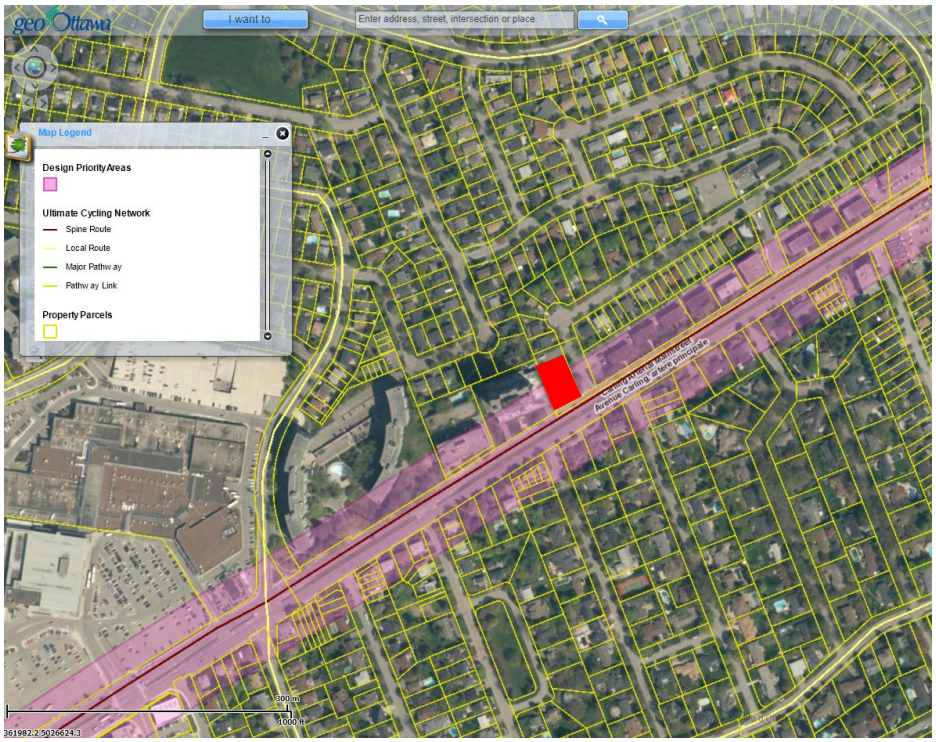
6. Consider a background traffic reduction for a 2024/2029 horizon years given recent trends and the implementation of transit lanes on Carling Avenue from Lincoln Fields to Bronson.
   - IBI Response: Based on traffic growth rates identified in supporting TIAs for adjacent developments, a -0.5% linear growth rate has been applied to background traffic volumes.

7. Left turn storage analysis is required at the intersections to make sure there is enough storage capacity where development traffic is expected to complete turning movements and/or U-turn movements.
   - IBI Response: Acknowledged, left-turn storage analysis will be conducted in Step 4 Analysis.

Appendix B – Screening Form

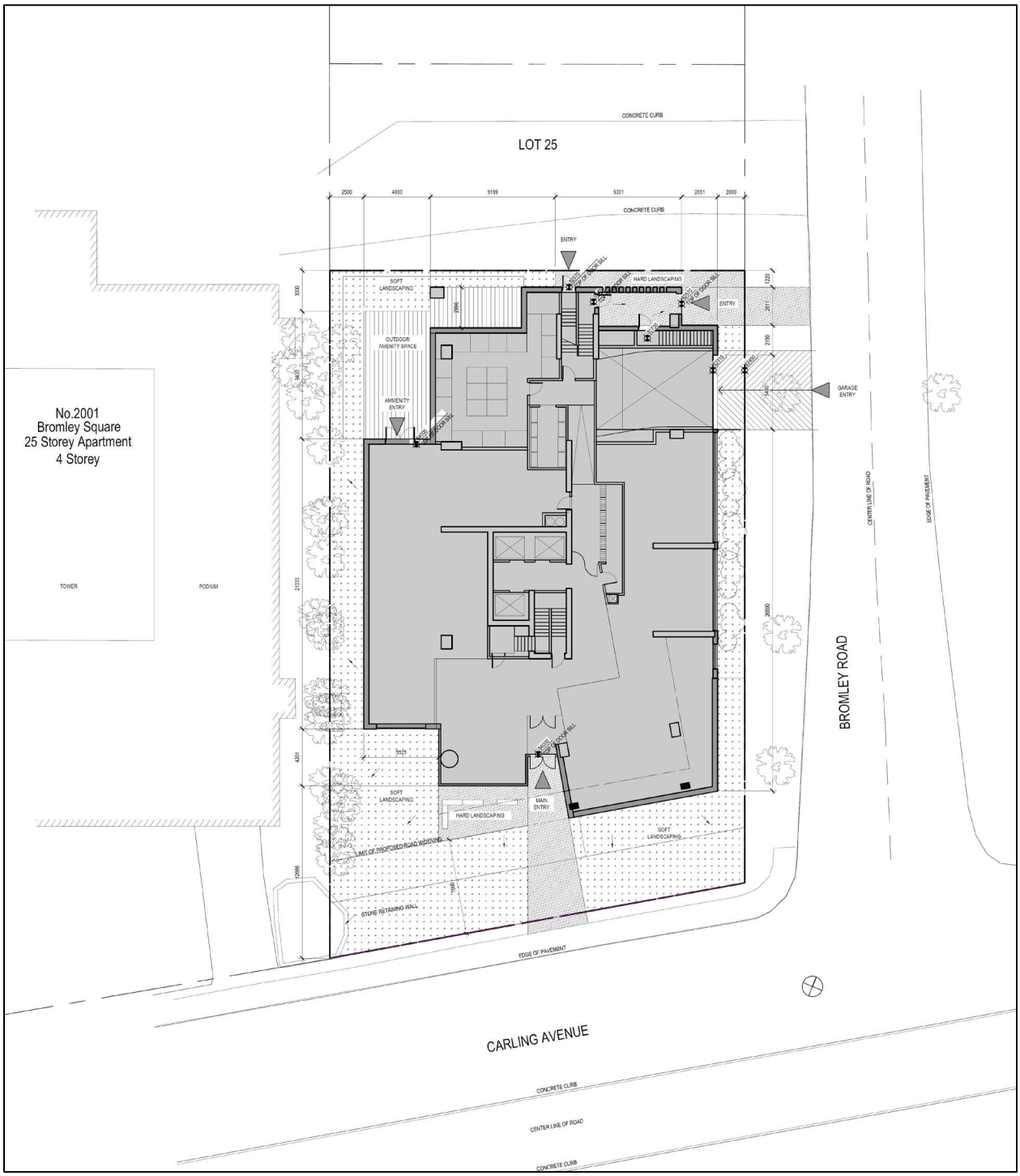
City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	1995 Carling Avenue
Description of Location	The site is situated north of Carling Avenue and west of Bromley Road, between McKellar Park Suites and Bromley Square. 
Land Use Classification	High-Rise Residential
Development Size (units)	210 Residential Units
Development Size (m^2)	
Number of Accesses and Locations	One two-way access on Bromley Road.
Phase of Development	Single Phase
Buildout Year	2024

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

Proposed Development:



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.*

- **Based on the results 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).*

- **Based on the results above, 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 that 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?		✓

- **Based on the results above, the Safety Trigger is NOT 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?		✓

CONCLUSION: The Trip Generation and Location Triggers are satisfied, therefore a TIA is required.

Appendix C – Turning Movement Counts

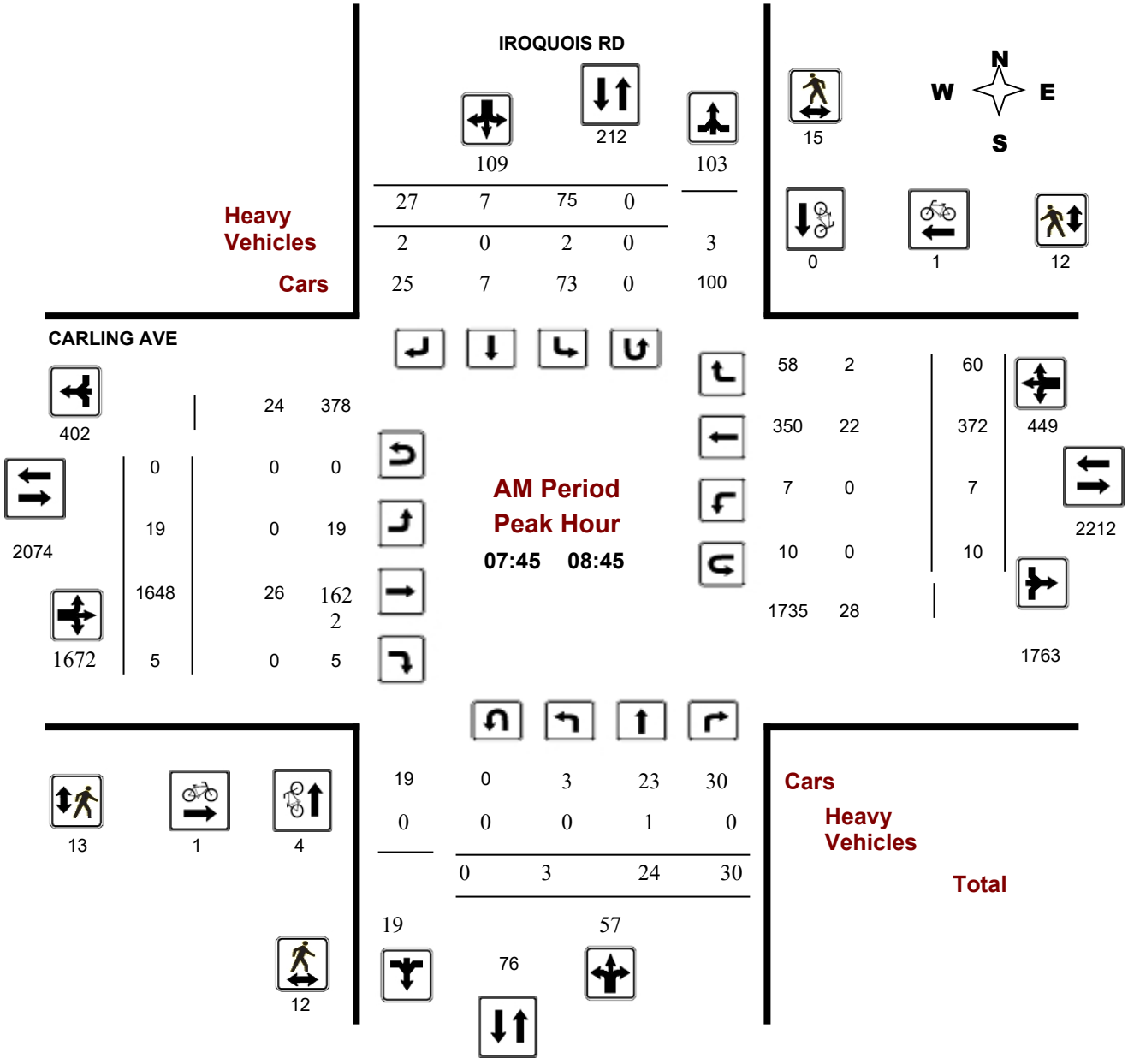
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARLING AVE @ IROQUOIS RD

Survey Date: Wednesday, May 10, 2017
Start Time: 07:00

WO No: 37025
Device: Miovision



Comments

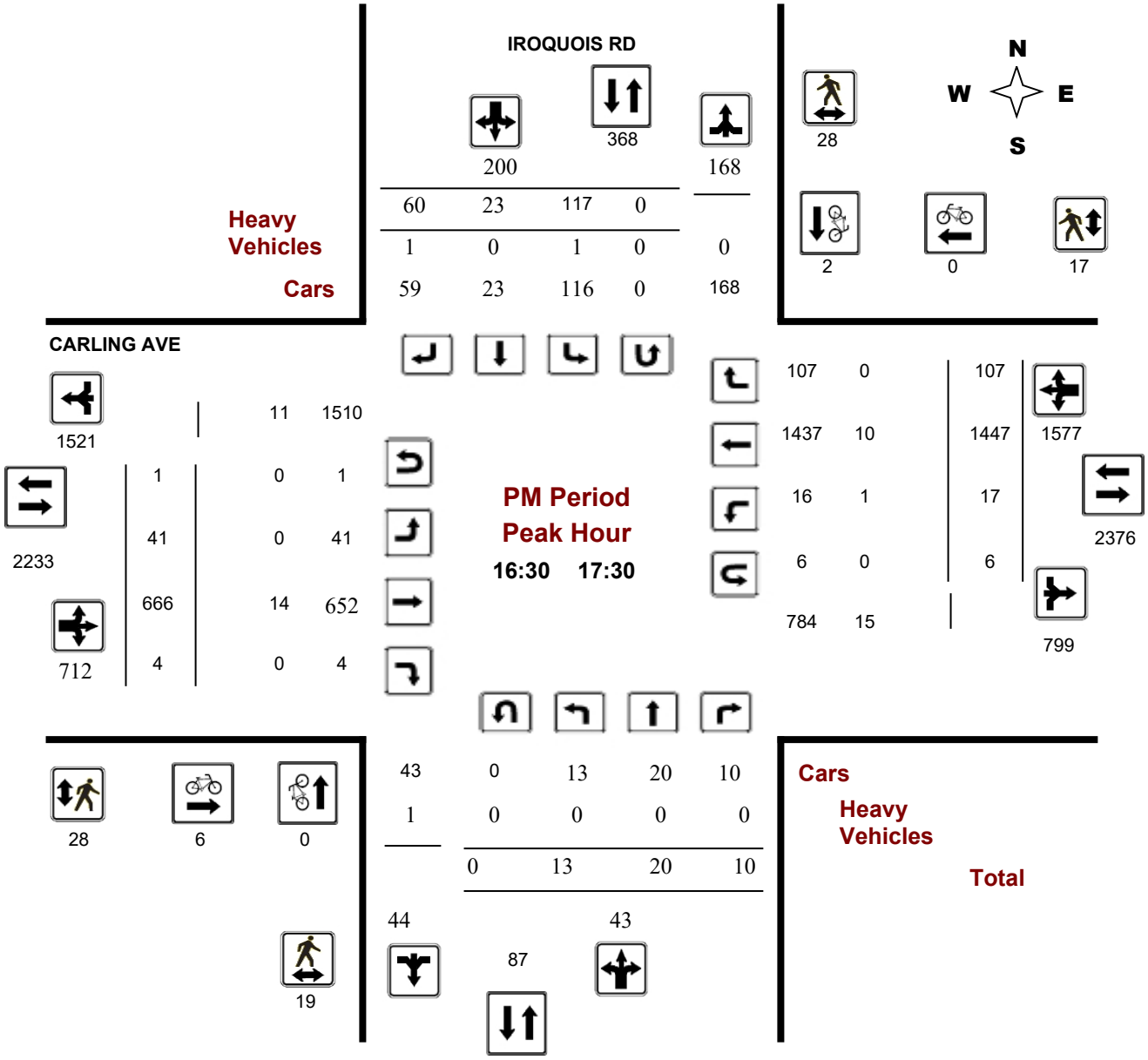
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARLING AVE @ IROQUOIS RD

Survey Date: Wednesday, May 10, 2017 **WO No:** 37025

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



Comments

Survey Date: Wednesday March 11 2020
Weather: Dry

NB (South Leg) Street Name: Hare Avenue
SB (North Leg) Street Name:

EB (West Leg) Street Name: Carling Avenue
WB (East Leg) Street Name: Carling Avenue

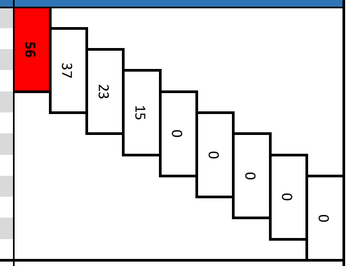
Start Time (AM Peak): 8:00
End Time (AM Peak): 11:00

The AM Peak Hour is from 8:00 AM to 9:00 AM

AADT Factor: 1.0

Turning Movement Count - 15 Minute Vehicle Summary Report (AM Peak)

Time Period	Hare Avenue Northbound					Southbound					N/S STREET TOTAL	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STREET TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
8:00 8:15	4		3		**7**					**0**	**7**			4	0	**4**	5			3	**8**	**12**	**19**
8:15 8:30	1		5		**6**					**0**	**6**			1	0	**1**	1			6	**7**	**8**	**14**
8:30 8:45	1		1		**2**					**0**	**2**			0	0	**0**	3			3	**6**	**6**	**8**
8:45 9:00	1		5		**6**					**0**	**6**			1	1	**2**	4			3	**7**	**9**	**15**
9:00 9:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
9:15 9:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
9:30 9:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
9:45 10:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:00 10:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:15 10:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:30 10:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:45 11:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
TOTAL:	7	0	14	0	**21**	0	0	0	0	**0**	**21**	0	0	6	1	**7**	13	0	0	15	**28**	**35**	**56**
TOTAL PK HR:	7	0	14	0	21	0	0	0	0	0	21	0	0	6	1	7	13	0	0	15	28	35	56

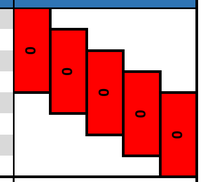


Start Time (MD Peak): 11:30
End Time (MD Peak): 13:30

The Mid-day Peak Hour is from 11:30 AM to 12:30 PM

Turning Movement Count - 15 Minute Vehicle Summary Report (Mid-Day Peak)

Time Period	Hare Avenue Northbound					Southbound					N/S STREET TOTAL	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STREET TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
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**
TOTAL:	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**0**
TOTAL PK HR:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

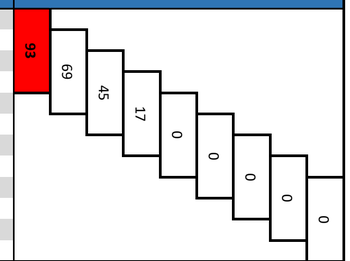


Start Time (PM Peak): 16:30
End Time (PM Peak): 19:30

The PM Peak Hour is from 4:30 PM to 5:30 PM

Turning Movement Count - 15 Minute Vehicle Summary Report (PM Peak)

Time Period	Hare Avenue Northbound					Southbound					N/S STR TOTAL	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STR TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
16:30 16:45	3		2		**5**					**0**	**5**			2	0	**2**	9			8	**17**	**19**	**24**
16:45 17:00	1		3		**4**					**0**	**4**			3	1	**4**	13			3	**16**	**20**	**24**
17:00 17:15	5		4		**9**					**0**	**9**			1	0	**1**	12			6	**18**	**19**	**28**
17:15 17:30	1		2		**3**					**0**	**3**			2	0	**2**	9			3	**12**	**14**	**17**
17:30 17:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
17:45 18:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:00 18:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:15 18:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:30 18:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:45 19:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
19:00 19:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
19:15 19:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
TOTAL:	10	0	11	0	**21**	0	0	0	0	**0**	**21**	0	0	8	1	**9**	43	0	0	20	**63**	**72**	**93**
TOTAL PK HR:	10	0	11	0	21	0	0	0	0	0	21	0	0	8	1	9	43	0	0	20	63	72	93



Survey Date: Wednesday March 11 2020
Weather: Dry

NB (South Leg) Street Name: Hare Avenue
SB (North Leg) Street Name:

EB (West Leg) Street Name: Carling Avenue
WB (East Leg) Street Name: Carling Avenue

Start Time (AM Peak): 8:00
End Time (AM Peak): 11:00

Turning Movement Count - 15 Minute Pedestrian Volume Report (AM Peak)

Time Period	Hare Avenue		N/S STREET TOTAL	Carling Avenue	Carling Avenue	E/W STREET TOTAL	Grand TOTAL
	NB Approach (East or West Crossing)	SB Approach (East or West Crossing)		EB Approach (North or South Crossing)	WB Approach (North or South Crossing)		
8:00 8:15	0		**0**	2	0	**2**	**2**
8:15 8:30	0		**0**	0	0	**0**	**0**
8:30 8:45	2		**2**	0	0	**0**	**2**
8:45 9:00	0		**0**	0	0	**0**	**0**
9:00 9:15			**0**			**0**	**0**
9:15 9:30			**0**			**0**	**0**
9:30 9:45			**0**			**0**	**0**
9:45 10:00			**0**			**0**	**0**
10:00 10:15			**0**			**0**	**0**
10:15 10:30			**0**			**0**	**0**
10:30 10:45			**0**			**0**	**0**
10:45 11:00			**0**			**0**	**0**
TOTAL:	2	0	**2**	2	0	**2**	**4**
TOTAL PK HR:	2	0	2	2	0	2	4

Start Time (MD Peak): 11:30
End Time (MD Peak): 13:30

Turning Movement Count - 15 Minute Pedestrian Volume Report (Mid-Day Peak)

Time Period	Hare Avenue		N/S STREET TOTAL	Carling Avenue	Carling Avenue	E/W STREET TOTAL	Grand TOTAL
	NB Approach (East or West Crossing)	SB Approach (East or West Crossing)		EB Approach (North or South Crossing)	WB Approach (North or South Crossing)		
11:30 11:45			**0**			**0**	**0**
11:45 12:00			**0**			**0**	**0**
12:00 12:15			**0**			**0**	**0**
12:15 12:30			**0**			**0**	**0**
12:30 12:45			**0**			**0**	**0**
12:45 13:00			**0**			**0**	**0**
13:00 13:15			**0**			**0**	**0**
13:15 13:30			**0**			**0**	**0**
TOTAL:	0	0	**0**	0	0	**0**	**0**
TOTAL PK HR:	0	0	**0**	0	0	0	0

Start Time (PM Peak): 16:30
End Time (PM Peak): 19:30

Turning Movement Count - 15 Minute Pedestrian Volume Report (PM Peak)

Time Period	Hare Avenue		N/S STREET TOTAL	Carling Avenue	Carling Avenue	E/W STREET TOTAL	Grand TOTAL
	NB Approach (East or West Crossing)	SB Approach (East or West Crossing)		EB Approach (North or South Crossing)	WB Approach (North or South Crossing)		
16:30 16:45	1		**1**	0	0	**0**	**1**
16:45 17:00	4		**4**	0	0	**0**	**4**
17:00 17:15	5		**5**	1	0	**1**	**6**
17:15 17:30	2		**2**	1	0	**1**	**3**
17:30 17:45			**0**			**0**	**0**
17:45 18:00			**0**			**0**	**0**
18:00 18:15			**0**			**0**	**0**
18:15 18:30			**0**			**0**	**0**
18:30 18:45			**0**			**0**	**0**
18:45 19:00			**0**			**0**	**0**
19:00 19:15			**0**			**0**	**0**
19:15 19:30			**0**			**0**	**0**
TOTAL:	12	0	**12**	2	0	**2**	**14**
TOTAL PK HR:	12	0	12	2	0	2	14

Survey Date: Wednesday March 11 2020
Weather: Dry

NB (South Leg) Street Name: Hare Avenue
SB (North Leg) Street Name:

EB (West Leg) Street Name: Carling Avenue
WB (East Leg) Street Name: Carling Avenue

Start Time (AM Peak): 8:00
End Time (AM Peak): 11:00

Turning Movement Count - 15 Minute Heavy Vehicle Report (AM Peak)

Time Period	Hare Avenue Northbound					Southbound					N/S STREET Total	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STREET TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
8:00 8:15	0		1		**1**					**0**	**1**			0	0	**0**	0			0	**0**	**0**	**1**
8:15 8:30	0		0		**0**					**0**	**0**			0	0	**0**	0			0	**0**	**0**	**0**
8:30 8:45	0		0		**0**					**0**	**0**			0	0	**0**	0			0	**0**	**0**	**0**
8:45 9:00	0		0		**0**					**0**	**0**			1	0	**1**	0			0	**0**	**1**	**1**
9:00 9:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
9:15 9:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
9:30 9:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
9:45 10:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:00 10:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:15 10:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:30 10:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:45 11:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
TOTAL:	0	0	1	0	**1**	0	0	0	0	**0**	**1**	0	0	1	0	**1**	0	0	0	0	**0**	**1**	**2**
TOTAL PK HR:	0	0	1	0	**1**	0	0	0	0	**0**	**1**	0	0	1	0	**1**	0	0	0	0	**0**	**1**	**2**

Start Time (MD Peak): 11:30
End Time (MD Peak): 13:30

Turning Movement Count - 15 Minute Heavy Vehicle Report (Mid-Day Peak)

Time Period	Hare Avenue Northbound					Southbound					N/S STREET Total	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STREET TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
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**
TOTAL:	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**0**
TOTAL PK HR:	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**0**

Start Time (PM Peak): 16:30
End Time (PM Peak): 19:30

Turning Movement Count - 15 Minute Heavy Vehicle Report (PM Peak)

Time Period	Hare Avenue Northbound					Southbound					N/S STREET TOTAL	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STREET TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
16:30 16:45	0		0		**0**					**0**	**0**			0	0	**0**	0			1	**1**	**1**	**1**
16:45 17:00	0		0		**0**					**0**	**0**			0	1	**1**	0			0	**0**	**1**	**1**
17:00 17:15	0		0		**0**					**0**	**0**			0	0	**0**	0			0	**0**	**0**	**0**
17:15 17:30	0		0		**0**					**0**	**0**			0	0	**0**	0			0	**0**	**0**	**0**
17:30 17:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
17:45 18:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:00 18:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:15 18:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:30 18:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:45 19:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
19:00 19:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
19:15 19:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
TOTAL:	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	1	**1**	0	0	0	1	**1**	**2**	**2**
TOTAL PK HR:	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	1	**1**	0	0	0	1	**1**	**2**	**2**

Survey Date: Wednesday March 11 2020
Weather: Dry

NB (South Leg) Street Name:
SB (North Leg) Street Name: Bromley Road

EB (West Leg) Street Name: Carling Avenue
WB (East Leg) Street Name: Carling Avenue

Start Time (AM Peak): 8:00
End Time (AM Peak): 11:00

The AM Peak Hour is from 8:00 AM to 9:00 AM

AADT Factor: 1.0

Turning Movement Count - 15 Minute Vehicle Summary Report (AM Peak)

Time Period	Northbound					Bromley Road Southbound					N/S STREET TOTAL	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STREET TOTAL	Grand TOTAL	1 Hour Traffic Volumes (All Scenarios)
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL			
8:00 8:15					**0**			2		**2**	**2**					**0**			2		**2**	**2**	**4**	18
8:15 8:30					**0**			5		**5**	**5**					**0**			2		**2**	**2**	**7**	14
8:30 8:45					**0**			3		**3**	**3**					**0**			1		**1**	**1**	**4**	7
8:45 9:00					**0**			3		**3**	**3**					**0**			0		**0**	**0**	**3**	3
9:00 9:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**	0
9:15 9:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**	0
9:30 9:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**	0
9:45 10:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**	0
10:00 10:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**	
10:15 10:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**	
10:30 10:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**	
10:45 11:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**	
TOTAL:	0	0	0	0	**0**	0	0	13	0	**0**	**13**	0	0	0	0	**0**	0	0	5	0	**5**	**5**	**18**	
TOTAL PK HR:	0	0	0	0	0	0	0	13	0	13	13	0	0	0	0	0	0	0	5	0	5	5	18	

Start Time (MD Peak): 11:30
End Time (MD Peak): 13:30

The Mid-day Peak Hour is from 11:30 AM to 12:30 PM

Turning Movement Count - 15 Minute Vehicle Summary Report (Mid-Day Peak)

Time Period	Northbound					Bromley Road Southbound					N/S STREET TOTAL	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STREET TOTAL	Grand TOTAL	1 Hour Traffic Volumes (All Scenarios)
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL			
11:30 11:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**	0
11:45 12:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**	0
12:00 12:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**	0
12:15 12:30					**0**					**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**	
TOTAL:	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**0**	
TOTAL PK HR:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Start Time (PM Peak): 16:30
End Time (PM Peak): 19:30

The PM Peak Hour is from 4:30 PM to 5:30 PM

Turning Movement Count - 15 Minute Vehicle Summary Report (PM Peak)

Time Period	Northbound					Bromley Road Southbound					N/S STR TOTAL	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STR TOTAL	Grand TOTAL	1 Hour Traffic Volumes (All Scenarios)
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL			
16:30 16:45					**0**			5		**5**	**5**					**0**			9		**9**	**9**	**14**	27
16:45 17:00					**0**			3		**3**	**3**					**0**			4		**4**	**4**	**7**	13
17:00 17:15					**0**			2		**2**	**2**					**0**			1		**1**	**1**	**3**	6
17:15 17:30					**0**			1		**1**	**1**					**0**			2		**2**	**2**	**3**	3
17:30 17:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**	0
17:45 18:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**	0
18:00 18:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**	0
18:15 18:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**	
18:30 18:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**	
18:45 19:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**	
19:00 19:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**	
19:15 19:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**	
TOTAL:	0	0	0	0	**0**	0	0	11	0	**11**	**11**	0	0	0	0	**0**	0	0	16	0	**16**	**16**	**27**	
TOTAL PK HR:	0	0	0	0	0	0	0	11	0	11	11	0	0	0	0	0	0	0	16	0	16	16	27	

Survey Date: Wednesday March 11 2020
Weather: Dry

NB (South Leg) Street Name:
SB (North Leg) Street Name: Bromley Road

EB (West Leg) Street Name: Carling Avenue
WB (East Leg) Street Name: Carling Avenue

Start Time (AM Peak): 8:00
End Time (AM Peak): 11:00

Turning Movement Count - 15 Minute Pedestrian Volume Report (AM Peak)

Time Period		Bromley Road	N/S STREET TOTAL	Carling Avenue	Carling Avenue	E/W STREET TOTAL	Grand TOTAL
	NB Approach (East or West Crossing)	SB Approach (East or West Crossing)		EB Approach (North or South Crossing)	WB Approach (North or South Crossing)		
8:00 8:15		2	**2**	0	0	**0**	**2**
8:15 8:30		3	**3**	0	0	**0**	**3**
8:30 8:45		2	**2**	0	0	**0**	**2**
8:45 9:00		1	**1**	0	0	**0**	**1**
9:00 9:15			**0**			**0**	**0**
9:15 9:30			**0**			**0**	**0**
9:30 9:45			**0**			**0**	**0**
9:45 10:00			**0**			**0**	**0**
10:00 10:15			**0**			**0**	**0**
10:15 10:30			**0**			**0**	**0**
10:30 10:45			**0**			**0**	**0**
10:45 11:00			**0**			**0**	**0**
TOTAL:	0	8	**8**	0	0	**0**	**8**
TOTAL PK HR:	0	8	8	0	0	0	8

Start Time (MD Peak): 11:30
End Time (MD Peak): 13:30

Turning Movement Count - 15 Minute Pedestrian Volume Report (Mid-Day Peak)

Time Period		Bromley Road	N/S STREET TOTAL	Carling Avenue	Carling Avenue	E/W STREET TOTAL	Grand TOTAL
	NB Approach (East or West Crossing)	SB Approach (East or West Crossing)		EB Approach (North or South Crossing)	WB Approach (North or South Crossing)		
11:30 11:45			**0**			**0**	**0**
11:45 12:00			**0**			**0**	**0**
12:00 12:15			**0**			**0**	**0**
12:15 12:30			**0**			**0**	**0**
12:30 12:45			**0**			**0**	**0**
12:45 13:00			**0**			**0**	**0**
13:00 13:15			**0**			**0**	**0**
13:15 13:30			**0**			**0**	**0**
TOTAL:	0	0	**0**	0	0	**0**	**0**
TOTAL PK HR:	0	0	**0**	0	0	0	0

Start Time (PM Peak): 16:30
End Time (PM Peak): 19:30

Turning Movement Count - 15 Minute Pedestrian Volume Report (PM Peak)

Time Period		Bromley Road	N/S STREET TOTAL	Carling Avenue	Carling Avenue	E/W STREET TOTAL	Grand TOTAL
	NB Approach (East or West Crossing)	SB Approach (East or West Crossing)		EB Approach (North or South Crossing)	WB Approach (North or South Crossing)		
16:30 16:45		2	**2**	0	0	**0**	**2**
16:45 17:00		8	**8**	0	0	**0**	**8**
17:00 17:15		6	**6**	0	0	**0**	**6**
17:15 17:30		5	**5**	0	0	**0**	**5**
17:30 17:45			**0**			**0**	**0**
17:45 18:00			**0**			**0**	**0**
18:00 18:15			**0**			**0**	**0**
18:15 18:30			**0**			**0**	**0**
18:30 18:45			**0**			**0**	**0**
18:45 19:00			**0**			**0**	**0**
19:00 19:15			**0**			**0**	**0**
19:15 19:30			**0**			**0**	**0**
TOTAL:	0	21	**21**	0	0	**0**	**21**
TOTAL PK HR:	0	21	21	0	0	0	21

Survey Date: Wednesday March 11 2020
Weather: Dry

NB (South Leg) Street Name:
SB (North Leg) Street Name: Bromley Road

EB (West Leg) Street Name: Carling Avenue
WB (East Leg) Street Name: Carling Avenue

Start Time (AM Peak): 8:00
End Time (AM Peak): 11:00

Turning Movement Count - 15 Minute Heavy Vehicle Report (AM Peak)

Time Period	Northbound					Bromley Road Southbound					N/S STREET Total	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STREET TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
8:00 8:15					**0**			0		**0**	**0**					**0**			0		**0**	**0**	**0**
8:15 8:30					**0**			0		**0**	**0**					**0**			0		**0**	**0**	**0**
8:30 8:45					**0**			0		**0**	**0**					**0**			0		**0**	**0**	**0**
8:45 9:00					**0**			0		**0**	**0**					**0**			0		**0**	**0**	**0**
9:00 9:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
9:15 9:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
9:30 9:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
9:45 10:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:00 10:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:15 10:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:30 10:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
10:45 11:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
TOTAL:	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**0**
TOTAL PK HR:	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**0**

Start Time (MD Peak): 11:30
End Time (MD Peak): 13:30

Turning Movement Count - 15 Minute Heavy Vehicle Report (Mid-Day Peak)

Time Period	Northbound					Bromley Road Southbound					N/S STREET Total	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STREET TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
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**
TOTAL:	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**0**
TOTAL PK HR:	0	0	0	0	**0**	0	0	0	0	**0**	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**0**

Start Time (PM Peak): 16:30
End Time (PM Peak): 19:30

Turning Movement Count - 15 Minute Heavy Vehicle Report (PM Peak)

Time Period	Northbound					Bromley Road Southbound					N/S STREET TOTAL	Carling Avenue Eastbound					Carling Avenue Westbound					E/W STREET TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
16:30 16:45					**0**			1		**1**	**1**					**0**			0		**0**	**0**	**1**
16:45 17:00					**0**			0		**0**	**0**					**0**			0		**0**	**0**	**0**
17:00 17:15					**0**			0		**0**	**0**					**0**			0		**0**	**0**	**0**
17:15 17:30					**0**			0		**0**	**0**					**0**			0		**0**	**0**	**0**
17:30 17:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
17:45 18:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:00 18:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:15 18:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:30 18:45					**0**					**0**	**0**					**0**					**0**	**0**	**0**
18:45 19:00					**0**					**0**	**0**					**0**					**0**	**0**	**0**
19:00 19:15					**0**					**0**	**0**					**0**					**0**	**0**	**0**
19:15 19:30					**0**					**0**	**0**					**0**					**0**	**0**	**0**
TOTAL:	0	0	0	0	**0**	0	0	1	0	**1**	**1**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**1**
TOTAL PK HR:	0	0	0	0	**0**	0	0	1	0	**1**	**1**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**1**

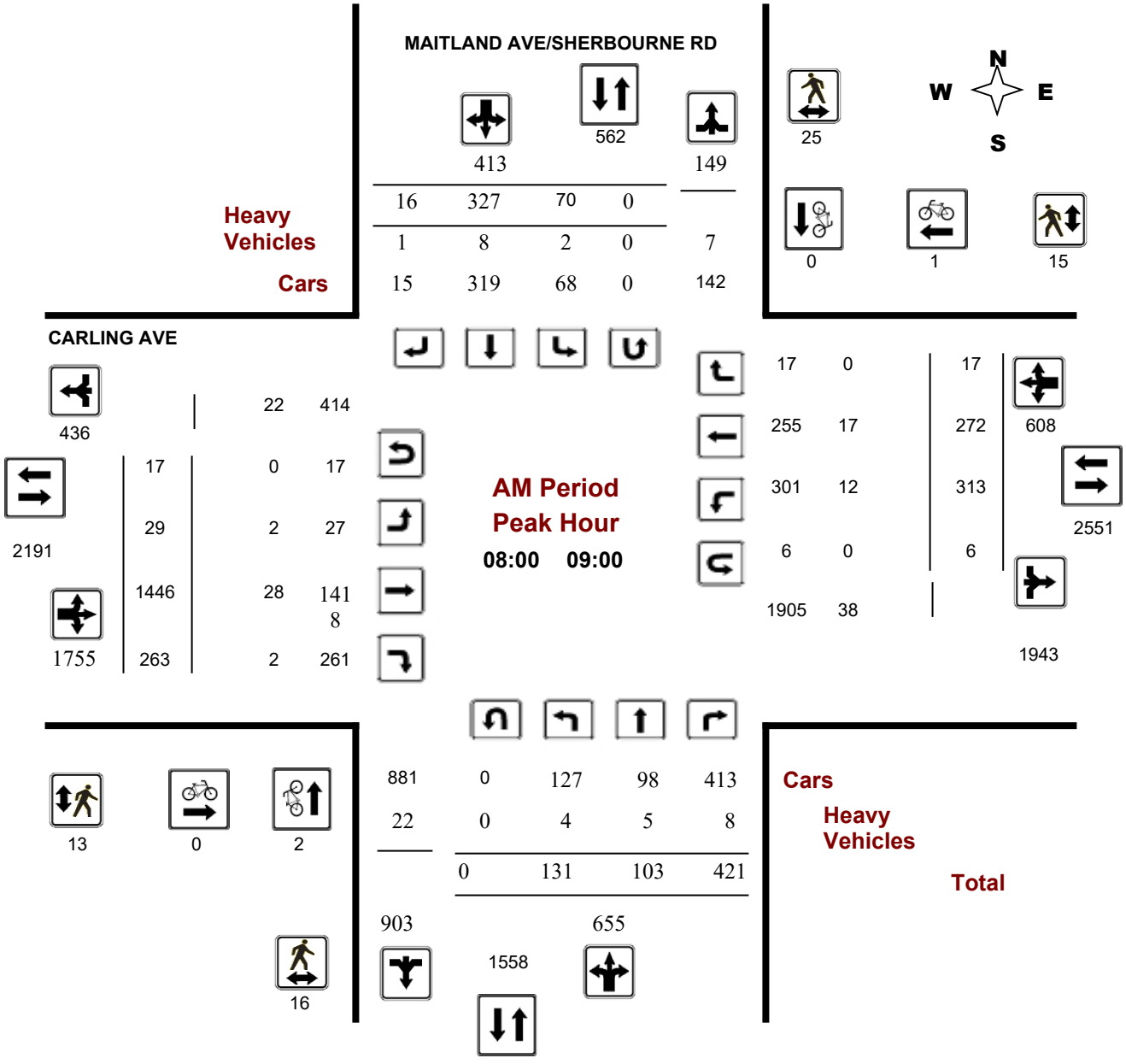
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARLING AVE @ MAITLAND AVE/SHERBOURNE RD

Survey Date: Thursday, March 30, 2017 **WO No:** 36828

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



Comments

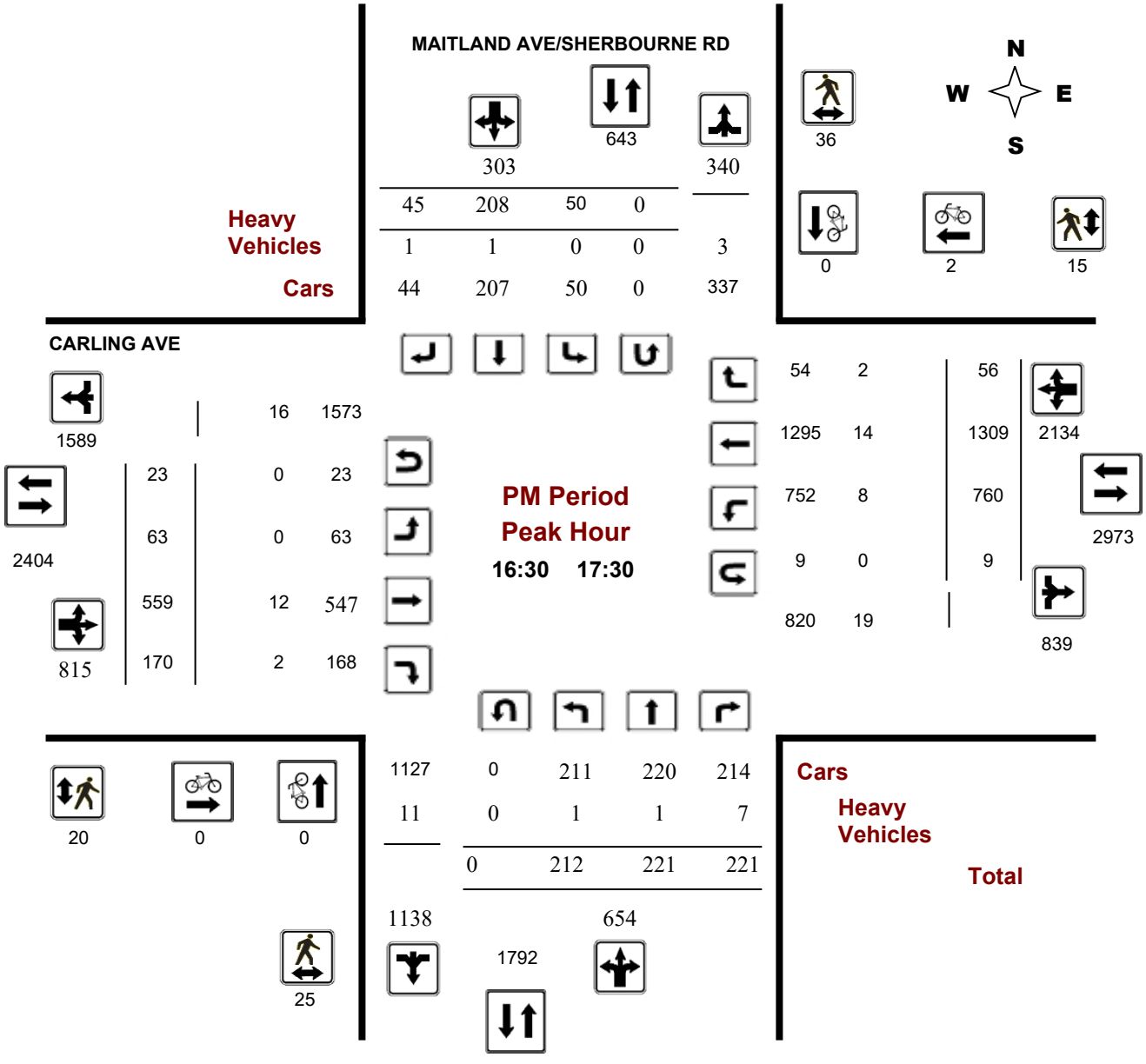
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CARLING AVE @ MAITLAND AVE/SHERBOURNE RD

Survey Date: Thursday, March 30, 2017
Start Time: 07:00

WO No: 36828
Device: Miovision



Comments

Appendix D – OC Transpo Routes

85

Fréquent

GATINEAU

BAYSHORE

7 days a week / 7 jours par semaine

All day service

Service toute la journée

GATINEAU

BAYSHORE

○	Station
▲	Timepoint / Heures de passage

2019.07

1

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

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

Security / Sécurité **613-741-2478**

OC Transpo

INFO 613-741-4390
octranspo.com

Appendix E – Collision Data

City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** December 31, 2018

Location: BROMLEY RD @ CARLING AVE

Traffic Control: Stop sign

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Feb-11, Tue,15:40	Clear	Sideswipe	P.D. only	Wet	West	Changing lanes	Passenger van	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-May-27, Fri,14:59	Clear	Sideswipe	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	
					South	Turning right	Automobile, station wagon	Other motor vehicle	

Location: CARLING AVE @ HARE AVE

Traffic Control: Stop sign

Total Collisions: 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-25, Sat,13:27	Clear	Angle	P.D. only	Wet	North	Turning left	Pick-up truck	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jun-05, Fri,13:27	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	
					East	Going ahead	Passenger van	Other motor vehicle	
2016-May-21, Sat,18:21	Clear	Turning movement	Non-fatal injury	Dry	West	Making "U" turn	Automobile, station wagon	Other motor vehicle	

					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: CARLING AVE @ IROQUOIS RD

Traffic Control: Traffic signal **Total Collisions:** 33

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Mar-26, Wed,21:15	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Apr-15, Tue,12:30	Snow	Angle	Non-fatal injury	Wet	West	Going ahead	Pick-up truck	Other motor vehicle	
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2014-Sep-08, Mon,08:50	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	
2015-Sep-08, Tue,14:35	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2016-May-05, Thu,17:15	Clear	Turning movement	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	2
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2016-Jun-21, Tue,16:00	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Pick-up truck	Other motor vehicle	

2016-Oct-31, Mon,10:13	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Nov-16, Wed,16:11	Clear	Turning movement	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2016-Dec-04, Sun,13:50	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Dec-14, Wed,10:40	Clear	Rear end	P.D. only	Dry	South	Unknown	Automobile, station wagon	Other motor vehicle
					South	Unknown	Truck - closed	Other motor vehicle
2017-Feb-10, Fri,07:44	Clear	Turning movement	P.D. only	Dry	West	Turning left	Pick-up truck	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Feb-12, Sun,12:19	Snow	Angle	P.D. only	Slush	West	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2017-May-02, Tue,08:31	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Truck - dump	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle

2017-May-15, Mon,20:15	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Jun-03, Sat,17:14	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Jun-06, Tue,15:05	Rain	Sideswipe	P.D. only	Wet	East	Changing lanes	Passenger van	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Jun-11, Sun,11:40	Clear	Angle	Non-fatal injury	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Aug-16, Wed,16:56	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Oct-18, Wed,18:42	Clear	SMV other	Non-fatal injury	Dry	East	Turning right	Automobile, station wagon	Pedestrian	2
2017-Oct-20, Fri,16:15	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2017-Nov-29, Wed,14:55	Clear	Angle	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	

					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Dec-02, Sat,21:11	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Jan-02, Tue,09:32	Snow	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Passenger van	Skidding/sliding
					East	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jan-08, Mon,14:30	Snow	Turning movement	P.D. only	Packed snow	East	Making "U" turn	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2018-Jan-25, Thu,15:23	Clear	Turning movement	P.D. only	Dry	East	Making "U" turn	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Feb-09, Fri,11:04	Clear	Angle	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Apr-03, Tue,09:02	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Apr-08, Sun,17:26	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle

					North	Going ahead	Pick-up truck	Other motor vehicle
2018-Jun-26, Tue,13:38	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2018-Sep-06, Thu,16:30	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Municipal transit bus	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Sep-18, Tue,11:56	Clear	Turning movement	P.D. only	Dry	East	Turning left	Unknown	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Oct-10, Wed,17:02	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2018-Dec-14, Fri,16:30	Freezing Rain	Turning movement	P.D. only	Slush	East	Turning left	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle

Location: CARLING AVE @ MAITLAND AVE/SHERBOURNE RD

Traffic Control: Traffic signal

Total Collisions: 63

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-07, Tue,15:47	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

					North	Stopped	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2014-Jan-25, Sat,18:00	Snow	Rear end	P.D. only	Loose snow	North	Slowing or stopping	Automobile, station wagon	Skidding/sliding
					North	Stopped	Automobile, station wagon	Other motor vehicle
2014-Feb-14, Fri,10:30	Snow	Approaching	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2014-Mar-01, Sat,12:55	Clear	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2014-Mar-06, Thu,17:22	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Passenger van	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Apr-29, Tue,13:30	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2014-May-20, Tue,17:16	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle

2014-Jul-16, Wed,10:05	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2014-Aug-12, Tue,21:28	Rain	Angle	Non-fatal injury	Wet	North	Going ahead	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Sep-14, Sun,10:37	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Unknown	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Sep-23, Tue,12:15	Clear	Sideswipe	Non-reportable	Dry	East	Unknown	Pick-up truck	Other motor vehicle
					East	Unknown	Automobile, station wagon	Other motor vehicle
2014-Nov-12, Wed,12:03	Clear	Sideswipe	P.D. only	Dry	West	Turning left	Truck and trailer	Other motor vehicle
					West	Turning left	Pick-up truck	Other motor vehicle
2015-Jan-25, Sun,16:40	Clear	Rear end	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2015-Jan-26, Mon,15:33	Clear	Rear end	P.D. only	Slush	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle

2015-Feb-13, Fri,19:03	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
2015-May-11, Mon,13:40	Rain	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2015-Jul-04, Sat,16:11	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Passenger van	Other motor vehicle
2015-Sep-18, Fri,16:00	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Passenger van	Other motor vehicle
2015-Sep-21, Mon,18:32	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2015-Sep-27, Sun,13:53	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Sep-30, Wed,16:19	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle

2015-Oct-21, Wed,00:23	Clear	Angle	P.D. only	Dry	West	Making "U" turn	Automobile, station wagon	Other motor vehicle
					North	Turning right	Pick-up truck	Other motor vehicle
2015-Oct-31, Sat,11:57	Clear	Rear end	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2015-Nov-11, Wed,16:57	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Nov-20, Fri,18:34	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					North	Slowing or stopping	Pick-up truck	Other motor vehicle
2016-Jan-20, Wed,15:37	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2016-Feb-14, Sun,16:45	Clear	Rear end	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Mar-07, Mon,15:26	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Passenger van	Other motor vehicle

2016-Jun-30, Thu,11:35	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2016-Sep-08, Thu,12:19	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2016-Sep-20, Tue,11:59	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Passenger van	Other motor vehicle
2016-Oct-21, Fri,11:43	Rain	Sideswipe	P.D. only	Wet	West	Turning left	Truck and trailer	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Nov-07, Mon,09:02	Clear	Sideswipe	P.D. only	Dry	West	Turning left	Construction equipment	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2016-Nov-11, Fri,15:43	Clear	Rear end	P.D. only	Dry	North	Turning left	Passenger van	Other motor vehicle
					North	Turning left	Passenger van	Other motor vehicle
2017-Feb-05, Sun,13:46	Snow	Rear end	P.D. only	Loose snow	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle

2017-Feb-10, Fri,06:45	Clear	Rear end	P.D. only	Ice	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Feb-23, Thu,15:53	Clear	Sideswipe	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle
					North	Turning right	Pick-up truck	Other motor vehicle
2017-Aug-29, Tue,16:45	Clear	Rear end	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2017-Aug-31, Thu,12:54	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Sep-07, Thu,17:00	Rain	Sideswipe	P.D. only	Wet	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Oct-17, Tue,15:52	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Oct-26, Thu,09:33	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle

2017-Nov-11, Sat,16:15	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Unknown	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2017-Nov-14, Tue,17:21	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2017-Dec-12, Tue,15:01	Snow	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Unknown	Unknown	Other motor vehicle
2017-Dec-13, Wed,09:37	Clear	Angle	P.D. only	Slush	East	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Dec-19, Tue,08:55	Clear	Rear end	P.D. only	Dry	East	Unknown	Passenger van	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jan-14, Sun,11:46	Clear	Sideswipe	P.D. only	Packed snow	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Jan-16, Tue,09:05	Snow	SMV other	P.D. only	Loose snow	West	Slowing or stopping	Automobile, station wagon	Fence/noice barrier

2018-Feb-09, Fri,10:45	Clear	Turning movement	Non-fatal injury	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Feb-13, Tue,07:55	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Mar-04, Sun,08:23	Clear	Turning movement	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2018-Mar-06, Tue,14:30	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Mar-28, Wed,16:34	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jul-12, Thu,06:32	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Turning right	Automobile, station wagon	Other motor vehicle
2018-Sep-06, Thu,15:00	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Truck - dump	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle

2018-Oct-11, Thu,19:01	Fog, mist, smoke, dust	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2018-Oct-13, Sat,18:52	Clear	Turning movement	P.D. only	Dry	East	Turning right	Unknown	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
2018-Oct-20, Sat,18:00	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Nov-13, Tue,18:45	Clear	Sideswipe	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Nov-15, Thu,12:10	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2018-Nov-30, Fri,13:00	Clear	Rear end	P.D. only	Dry	East	Going ahead	Unknown	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2018-Dec-08, Sat,16:50	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle

Location: CARLING AVE WB btwn BROMLEY RD & MCKELLAR AVE

Traffic Control: No control

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Aug-15, Fri,16:16	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Pick-up truck	Other motor vehicle	
2015-Jul-28, Tue,16:07	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	

Location: CARLING AVE WB btwn HARE AVE & BROMLEY RD

Traffic Control: No control

Total Collisions: 5

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-28, Tue,16:25	Clear	Rear end	Non-fatal injury	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2014-Jun-30, Mon,16:34	Clear	Other	P.D. only	Dry	East	Reversing	Truck - closed	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Dec-10, Wed,16:19	Snow	Rear end	P.D. only	Slush	West	Changing lanes	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Mar-20, Fri,14:54	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	

					West	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Mar-15, Wed,08:37	Snow	SMV other	P.D. only	Packed snow	West	Overtaking	Automobile, station wagon	Curb	

Location: CARLING AVE WB btwn MCKELLAR AVE & SHERBOURNE RD

Traffic Control: No control **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Oct-02, Thu,10:51	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Turning right	Pick-up truck	Other motor vehicle	
					South	Turning right	Automobile, station wagon	Other motor vehicle	

City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** December 31, 2018

Location: CARLING AVE @ HARE AVE

Traffic Control: Stop sign **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-May-21, Sat,18:21	Clear	Turning movement	Non-fatal injury	Dry	West	Making "U" turn	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jun-05, Fri,13:27	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	
					East	Going ahead	Passenger van	Other motor vehicle	
2014-Jan-25, Sat,13:27	Clear	Angle	P.D. only	Wet	North	Turning left	Pick-up truck	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: CARLING AVE EB btwn HARE AVE & MELWOOD AVE

Traffic Control: No control **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Aug-15, Sat,07:39	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Skidding/sliding	

Location: CARLING AVE EB btwn IROQUOIS RD & KINGSMERE AVE

Traffic Control: No control **Total Collisions:** 1

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

2017-Apr-24, Mon,09:01	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Truck - closed	Other motor vehicle	

Location: CARLING AVE EB btwn MAPLECREST AVE & DUNLEVIE AVE

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Oct-16, Thu,08:40	Rain	Sideswipe	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: CARLING AVE EB btwn RIDDELL AVE N & MAITLAND AVE

Traffic Control: No control

Total Collisions: 5

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Dec-19, Wed,10:11	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Jul-28, Thu,15:21	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	
					East	Slowing or stopping	Pick-up truck	Other motor vehicle	
2016-Jan-18, Mon,10:00	Clear	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Pick-up truck	Other motor vehicle	

2015-Aug-27, Thu,15:11	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jun-15, Mon,16:53	Clear	Angle	P.D. only	Dry	North	Turning right	Motorcycle	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle

Appendix F – Trip Generation Data

Table 3.12: Person Trip Generation Rates – (all households with residents not older than 55 years of age)

Person Trip Generation Rates
All Households with persons 55 years of age or less
AM and PM Peak Hours

Dwelling Unit Types \ Geographic Areas		Core Area Person Trip Rate	Core Area %▽	Urban Area (Inside the greenbelt) Person Trip Rate	Urban Area %▽	Suburban (Outside the greenbelt) Person Trip Rate	Suburban %▽	Rural Person Trip Rate	Rural %▽	All Areas Person Trip Rate
Single detached:	AM	0.85	- 7%	0.99	+ 9%	0.94	+ 3%	0.78	- 14%	0.91
	PM	0.74	- 3%	0.75	- 1%	0.79	+ 4%	0.71	- 7%	0.76
Semi-detached:	AM	0.79	- 10%	0.97	10%	0.89	+ 1%	0.64	- 27%	0.88
	PM	0.74	- 1%	0.68	- 9%	0.82	+ 9%	0.60	- 20%	0.75
Row Townhouse:	AM	0.71	- 3%	0.78	+ 7%	0.67	- 8%	0.74	+ 1%	0.73
	PM	0.62	- 3%	0.60	- 6%	0.69	+ 8%	0.56	- 13%	0.64
Apartment:	AM	0.48	- 4%	0.51	+ 2%	0.53	+ 6%	0.36	- 28%	0.50
	PM	0.45	0%	0.42	- 7%	0.52	+ 16%	0.52	+ 16%	0.45
All Types:	AM	0.62	- 23%	0.82	+ 2%	0.86	+ 8%	0.76	- 5%	0.80
	PM	0.57	- 16%	0.63	- 7%	0.75	+ 10%	0.69	+ 1%	0.68

Note: 5 % (+ or -) represents the percentage delta change in trip rate when compared against the average trip rate across all geographic areas

Table 3.13: Mode Shares - (all households with residents not older than 55 years of age)

Reported Mode Shares
All Households with persons 55 years of age or less
AM and PM Peak Hours

Dwelling Unit Types \ Geographic Areas		Core Area Vehicle Trips	Core Area Transit Share	Core Area Non-Motorised	Urban Area (Inside the greenbelt) Vehicle Trips	Urban Area Transit Share	Urban Area Non-Motorised	Suburban (Outside the greenbelt) Vehicle Trips	Suburban Transit Share	Suburban Non-Motorised	Rural * Vehicle Trips	Rural * Transit Share	Rural * Non-Motorised	All Areas Vehicle Trips	All Areas Transit Share	All Areas Non-Motorised
Single - Detached:	AM	35%	20%	33%	51%	26%	11%	55%	25%	9%	60%	27%	4%	54%	25%	10%
	PM	45%	11%	32%	58%	19%	13%	64%	19%	6%	73%	13%	2%	63%	17%	8%
Semi-Detached:	AM	38%	30%	26%	44%	35%	10%	52%	24%	12%	64%	27%	5%	49%	28%	12%
	PM	36%	20%	34%	51%	27%	13%	62%	17%	7%	77%	12%	1%	58%	20%	10%
Row / Townhouse:	AM	33%	22%	40%	45%	34%	10%	55%	27%	8%	73%	15%	3%	49%	30%	11%
	PM	39%	15%	42%	53%	28%	8%	61%	22%	6%	74%	15%	1%	57%	24%	9%
Apartment:	AM	27%	27%	43%	37%	41%	14%	44%	34%	13%	76%	8%	16%	36%	35%	23%
	PM	23%	29%	42%	40%	37%	14%	44%	33%	9%	48%	4%	17%	35%	33%	23%
All Types:	AM	32%	24%	38%	47%	31%	11%	54%	26%	9%	61%	26%	4%	51%	27%	11%
	PM	34%	21%	38%	53%	24%	12%	62%	20%	6%	73%	13%	2%	59%	20%	10%

Note: Percentages do not necessarily sum to 100% as the proportion of automobile passengers have not been tabulated. Vehicle trips reflect the percentage of vehicle drivers.
* - Rural area sample size is extremely low and mode shares are highly influenced by school types where public transportation levels are high during the AM versus the PM peaks.

Table 6.1: Vehicle Trip Generation Rates

Vehicle Trip Generation Rates AM and PM Peak Hours						
ITE Land Use Code	Dwelling Unit Type / Data Source		Vehicle Trip Generation Rate			
			2008 Count Data	ITE	OD Survey	Blended Rate
210	Single-detached dwellings	AM	0.66	0.75	0.56	0.66
		PM	0.89	1.01	0.53	0.81
224	Semi-detached dwellings, townhouses, rowhouses	AM	0.40	0.70	0.46	0.52
		PM	0.64	0.72	0.46	0.61
231	Low-rise condominiums (1 or 2 floors)	AM	0.53	0.67	0.21	0.47
		PM	0.41	0.78	0.18	0.46
232	High-rise condominiums (3+ floors)	AM	0.53	0.34	0.21	0.36
		PM	0.41	0.38	0.18	0.32
233	Luxury condominiums	AM	0.53	0.56	0.21	0.43
		PM	0.41	0.55	0.18	0.38
221	Low-rise apartments (2 floors)	AM	0.19	0.46	0.21	0.29
		PM	0.21	0.58	0.18	0.32
223	Mid-rise apartments (3-10 floors)	AM	0.19	0.30	0.21	0.23
		PM	0.21	0.39	0.18	0.26
222	High-rise apartments (10+ floors)	AM	0.19	0.30	0.21	0.23
		PM	0.21	0.35	0.18	0.25

Table 6.2: Recommended Vehicle Trip Directional Splits

Comparison of Directional Splits (Inbound/Outbound) AM and PM Peak Hours								
ITE Land Use Code	Area Dwelling Unit Type / Data Source		2008 Count Data		ITE		Blended Rate	
			Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
210	Single-detached dwellings	AM	33%	67%	25%	75%	29%	71%
		PM	60%	40%	63%	37%	62%	39%
224	Semi-detached dwellings, townhouses, rowhouses	AM	40%	60%	33%	67%	37%	64%
		PM	55%	45%	51%	49%	53%	47%
231	Low-rise condominiums (1 or 2 floors)	AM	36%	64%	25%	75%	31%	70%
		PM	54%	46%	58%	42%	56%	44%
232	High-rise condominiums (3+ floors)	AM	36%	64%	19%	81%	28%	73%
		PM	54%	46%	62%	38%	58%	42%
233	Luxury condominiums	AM	36%	64%	23%	77%	30%	71%
		PM	54%	46%	63%	37%	59%	42%
221	Low-rise apartments (2 floors)	AM	22%	78%	21%	79%	22%	79%
		PM	62%	38%	65%	35%	64%	37%
223	Mid-rise apartments (3-10 floors)	AM	22%	78%	25%	75%	24%	77%
		PM	62%	38%	61%	39%	62%	39%
222	High-rise apartments (10+ floors)	AM	22%	78%	25%	75%	24%	77%
		PM	62%	38%	61%	39%	62%	39%

Table 6.3: Recommended Vehicle Trip Generation Rates for Residential Land Uses with Transit Bonus

Recommended Vehicle Trip Generation Rates with Transit Bonus AM and PM Peak Hours									
ITE Land Use Code	Dwelling Unit Type / Geographic Area		Vehicle Trip Rate						
			Core		Urban (Inside the Greenbelt)		Suburban (Outside the Greenbelt)		Rural
			Base Rate	< 600m to Rapid Transit	Base Rate	< 600m to Rapid Transit	Base Rate	< 600m to Rapid Transit	Base Rate
210	Single-detached dwellings	AM	0.40	0.31	0.67	0.50	0.70	0.49	0.62
		PM	0.60	0.33	0.76	0.57	0.90	0.63	0.92
224	Semi-detached dwellings, townhouses, rowhouses	AM	0.34	0.34	0.51	0.50	0.54	0.39	0.62
		PM	0.39	0.38	0.51	0.51	0.71	0.51	0.67
231	Low-rise condominiums (1 or 2 floors)	AM	0.34	0.34	0.50	0.50	0.60	0.60	0.71
		PM	0.29	0.29	0.49	0.49	0.66	0.66	0.72
232	High-rise condominiums (3+ floors)	AM	0.26	0.26	0.38	0.38	0.46	0.46	0.54
		PM	0.20	0.20	0.34	0.34	0.46	0.46	0.50
233	Luxury condominiums	AM	0.31	0.31	0.45	0.45	0.55	0.55	0.65
		PM	0.24	0.24	0.40	0.40	0.55	0.55	0.59
221	Low-rise apartments (2 floors)	AM	0.21	0.21	0.31	0.31	0.37	0.37	0.44
		PM	0.20	0.20	0.34	0.34	0.46	0.46	0.50
223	Mid-rise apartments (3-10 floors)	AM	0.17	0.17	0.24	0.24	0.29	0.29	0.35
		PM	0.16	0.16	0.28	0.28	0.37	0.37	0.41
222	High-rise apartments (10+ floors)	AM	0.17	0.17	0.24	0.24	0.29	0.29	0.35
		PM	0.16	0.16	0.27	0.27	0.36	0.36	0.39
Note: The transit bonus was only applied to geographic areas and dwelling unit types where the reported transit mode shares were less than the transit mode share reported for residential development located within the 600m proximity to a rapid transit station. It is noted that condominium and apartment housing categories reported similar levels of transit mode shares independent of location to rapid transit stations.									

6.5 Future Data Collection

While the rates presented in were prepared by blending the vehicle trip rates from ITE, the OD Survey and the 2008 local trip generation studies, it is important to stress the importance and need for ongoing local trip generation surveys to monitor changes in travel behaviour. The 2008 trip generation studies undertaken to support this study provide insight into local travel patterns and a well organized ongoing annual data collection program aimed at trip generation surveys of key land uses or requirement for data collection by local developers will continue to provide recent and accurate local trip generation rates. For example the high-rise apartment category of dwelling units reported the lowest peak hour vehicle trip rates.

Ottawa West

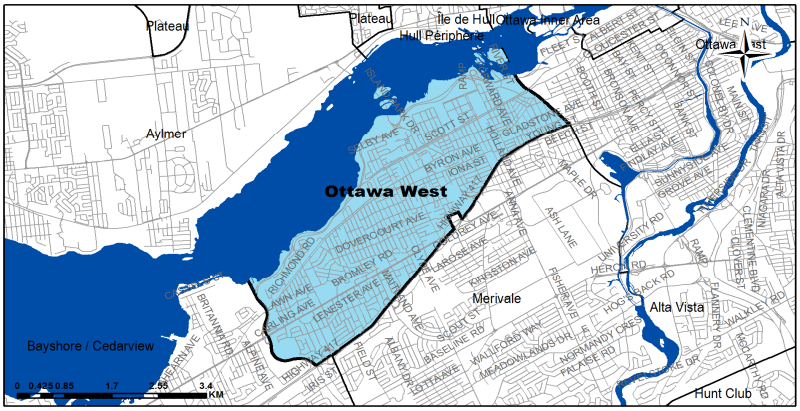
Demographic Characteristics

Population	50,410	Actively Travelled	40,800
Employed Population	22,930	Number of Vehicles	23,590
Households	24,070	Area (km^2)	18.3

Occupation Status (age 5+)	Male	Female	Total
Full Time Employed	10,960	9,490	20,450
Part Time Employed	930	1,540	2,480
Student	4,680	4,690	9,370
Retiree	4,580	7,260	11,840
Unemployed	570	980	1,540
Homemaker	30	990	1,020
Other	670	600	1,270
Total:	22,410	25,560	47,970

Traveller Characteristics	Male	Female	Total
Transit Pass Holders	4,120	5,780	9,900
Licensed Drivers	17,020	17,720	34,740
Telecommuters	140	250	390
Trips made by residents	65,610	75,080	140,690

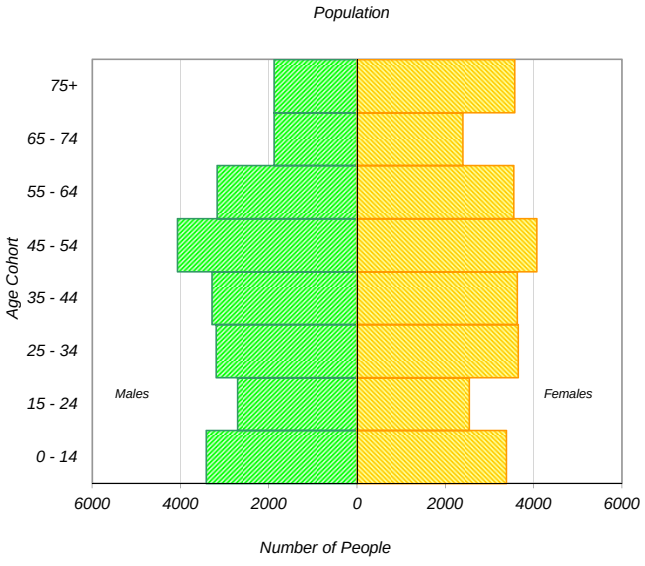
Selected Indicators	
Daily Trips per Person (age 5+)	2.93
Vehicles per Person	0.47
Number of Persons per Household	2.09
Daily Trips per Household	5.85
Vehicles per Household	0.98
Workers per Household	0.95
Population Density (Pop/km2)	2760

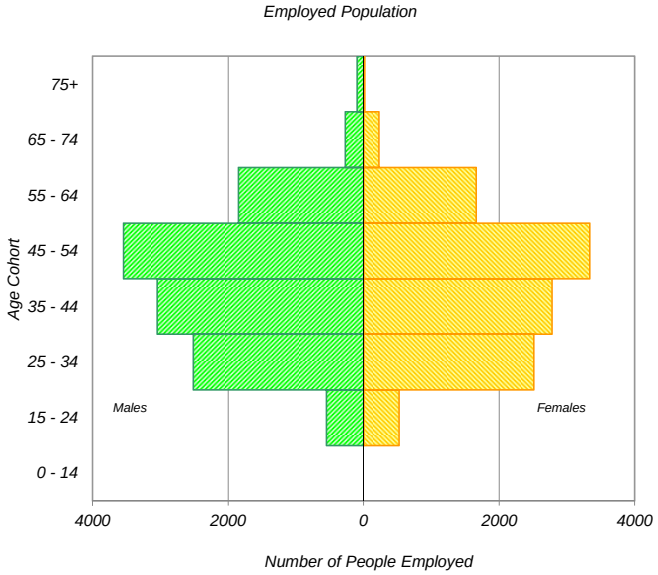


Household Size		
1 person	10,380	43%
2 persons	7,710	32%
3 persons	2,730	11%
4 persons	2,280	9%
5+ persons	970	4%
Total:	24,070	100%

Households by Vehicle Availability		
0 vehicles	6,230	26%
1 vehicle	12,950	54%
2 vehicles	4,200	17%
3 vehicles	540	2%
4+ vehicles	140	1%
Total:	24,070	100%

Households by Dwelling Type		
Single-detached	8,320	35%
Semi-detached	1,780	7%
Townhouse	980	4%
Apartment/Condo	13,000	54%
Total:	24,070	100%



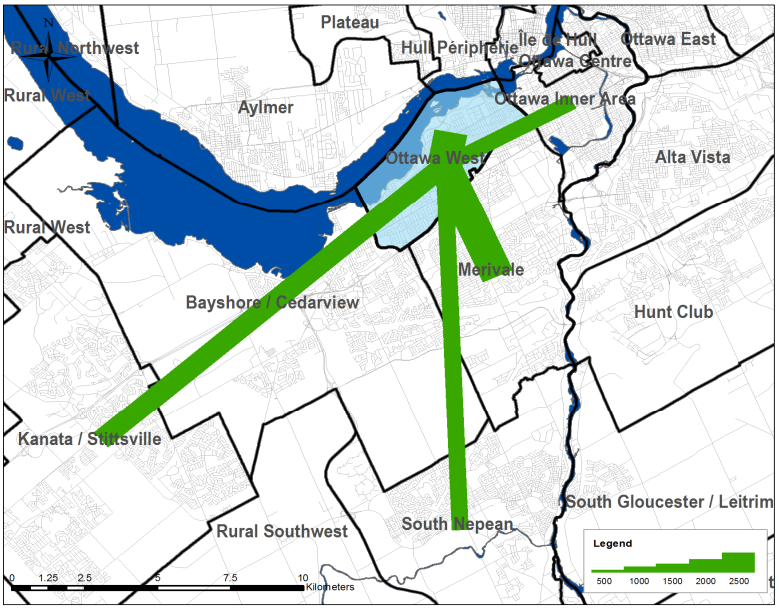


* In 2005 data was only collected for household members aged 11$^+$ therefore these results cannot be compared to the 2011 data.

Travel Patterns

Top Five Origins of Trips to Ottawa West

AM Peak Period



Summary of Trips to and from Ottawa West

AM Peak Period (6:30 - 8:59) Districts	Destinations of Trips From District	% Total	Origins of Trips To District	% Total
Ottawa Centre	4,270	16%	340	1%
Ottawa Inner Area	3,080	12%	1,750	5%
Ottawa East	310	1%	460	1%
Beacon Hill	150	1%	610	2%
Alta Vista	1,550	6%	1,160	4%
Hunt Club	360	1%	580	2%
Merivale	3,340	13%	4,960	15%
Ottawa West	8,280	32%	8,280	25%
Bayshore / Cedarview	1,940	7%	4,870	15%
Orléans	220	1%	1,460	4%
Rural East	40	0%	60	0%
Rural Southeast	50	0%	190	1%
South Gloucester / Leitrim	0	0%	290	1%
South Nepean	160	1%	1,830	6%
Rural Southwest	80	0%	400	1%
Kanata / Stittsvile	840	3%	2,020	6%
Rural West	70	0%	170	1%
Île de Hull	730	3%	170	1%
Hull Périphérie	170	1%	360	1%
Plateau	40	0%	760	2%
Aylmer	60	0%	770	2%
Rural Northwest	20	0%	310	1%
Pointe Gatineau	30	0%	450	1%
Gatineau Est	70	0%	310	1%
Rural Northeast	60	0%	170	1%
Buckingham / Masson-Angers	70	0%	140	0%
Ontario Sub-Total:	24,740	95%	29,430	90%
Québec Sub-Total:	1,250	5%	3,440	10%
Total:	25,990	100%	32,870	100%

Trips by Trip Purpose

24 Hours	From District		To District		Within District	
Work or related	17,850	19%	24,050	25%	4,670	8%
School	3,820	4%	4,540	5%	4,230	7%
Shopping	9,960	10%	10,800	11%	10,260	18%
Leisure	9,570	10%	9,420	10%	6,520	11%
Medical	2,740	3%	2,190	2%	1,140	2%
Pick-up / drive passenger	6,010	6%	7,490	8%	4,320	7%
Return Home	40,560	43%	32,380	34%	23,230	40%
Other	4,500	5%	4,550	5%	3,520	6%
Total:	95,010	100%	95,420	100%	57,890	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Work or related	11,500	65%	16,000	65%	1,900	23%
School	2,450	14%	4,090	17%	3,260	39%
Shopping	120	1%	250	1%	270	3%
Leisure	720	4%	450	2%	340	4%
Medical	470	3%	330	1%	60	1%
Pick-up / drive passenger	1,110	6%	1,880	8%	1,400	17%
Return Home	790	4%	530	2%	560	7%
Other	540	3%	1,060	4%	490	6%
Total:	17,700	100%	24,590	100%	8,280	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Work or related	590	2%	550	3%	300	2%
School	180	1%	10	0%	110	1%
Shopping	2,510	10%	2,680	12%	1,940	14%
Leisure	2,090	8%	2,220	10%	1,780	13%
Medical	200	1%	270	1%	120	1%
Pick-up / drive passenger	1,970	8%	2,350	11%	1,030	7%
Return Home	17,330	68%	12,540	58%	8,090	57%
Other	790	3%	870	4%	850	6%
Total:	25,660	100%	21,490	100%	14,220	100%

Peak Period (%)	Total:	% of 24 Hours	Within District (%)
24 Hours	248,320		23%
AM Peak Period	50,570	20%	16%
PM Peak Period	61,370	25%	23%

Trips by Primary Travel Mode

24 Hours	From District		To District		Within District	
Auto Driver	53,530	56%	53,730	56%	22,130	38%
Auto Passenger	14,560	15%	14,560	15%	6,300	11%
Transit	18,670	20%	18,820	20%	2,810	5%
Bicycle	3,120	3%	3,140	3%	3,110	5%
Walk	2,780	3%	2,750	3%	21,610	37%
Other	2,340	2%	2,430	3%	1,910	3%
Total:	95,000	100%	95,430	100%	57,870	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Auto Driver	8,230	46%	12,650	51%	2,740	33%
Auto Passenger	1,910	11%	3,800	15%	1,220	15%
Transit	5,490	31%	5,550	23%	370	4%
Bicycle	1,050	6%	710	3%	500	6%
Walk	650	4%	770	3%	2,770	33%
Other	370	2%	1,110	5%	690	8%
Total:	17,700	100%	24,590	100%	8,290	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Auto Driver	14,180	55%	11,370	53%	4,550	32%
Auto Passenger	4,060	16%	3,010	14%	1,370	10%
Transit	5,400	21%	5,090	24%	570	4%
Bicycle	750	3%	1,250	6%	1,000	7%
Walk	690	3%	620	3%	6,400	45%
Other	570	2%	160	1%	320	2%
Total:	25,650	100%	21,500	100%	14,210	100%

Avg Vehicle Occupancy	From District	To District	Within District
24 Hours	1.27	1.27	1.28
AM Peak Period	1.23	1.30	1.45
PM Peak Period	1.29	1.26	1.30

Transit Modal Split	From District	To District	Within District
24 Hours	22%	22%	9%
AM Peak Period	35%	25%	9%
PM Peak Period	23%	26%	9%

Appendix G – TDM Checklists

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

Legend

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

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

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

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑ All bicycle parking will be located below-grade.
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑ Sufficient bicycle parking spaces will be provided to meet by-law requirements.
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑ All bicycle parking spaces will be located in the below-grade parking facility.
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☑ A direct pedestrian connection to Bromley has been provided to facilitate pick-up and drop-off activity on Bromley near the building entrance rather than on Carling.
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑ Parking by-law requirements have been met.
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

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

Legend

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

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

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

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

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

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

Appendix H – MMLOS Analysis

Multi-Modal Level of Service
1995 Carling Avenue - Transportation Impact Assessment
Scenario: Existing and Future Conditions

April 6, 2020

IBI

INTERSECTIONS		Carling Avenue & Iroquois Road				Carling Avenue & Maitland / Sherbourne			
		NORTH leg	SOUTH leg	EAST leg	WEST leg	NORTH leg	SOUTH leg	EAST leg	WEST leg
Pedestrian	Lanes (do NOT include lanes protected by bulb-outs)	3	2	8	8	3	4	7	7
	Median	No Median	No Median	Median (>2.4m)	Median (>2.4m)	No Median	No Median	Median (>2.4m)	Median (>2.4m)
	Island Refuge								
	Conflicting Left Turns (from street to right)	Protected/permissive	Permissive	Permissive	Permissive	Protected	Protected	Permissive	Permissive
	Conflicting Right Turns (from street to left)	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
	RTOR? (from street to left)	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Leading Interval? (on cross street)	No	No	No	No	No	No	No	No
	Corner Radius	> 10m to 15m	> 5m to 10m	Right turn channel with receiving lane	Right turn channel with receiving lane	> 5m to 10m	> 5m to 10m	> 5m to 10m	> 5m to 10m
	Right Turn Channel	No right turn channel	No right turn channel	Conventional right turn channel without receiving lane	Conventional right turn channel without receiving lane	No right turn channel	No right turn channel	No right turn channel	No right turn channel
	Crosswalk Type	Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings
	LOS (PETSI)	**70 C**	**86 B**	**2 F**	**2 F**	**79 B**	**65 C**	**14 F**	**14 F**
	Cycle Length (sec)	130	130	130	130	120	120	120	120
	Pedestrian Walk Time (solid white symbol) (sec)	10	10	27	27	7	7	20	20
	LOS (Delay,seconds)	**56.9 E**	**56.9 E**	**44.4 E**	**44.4 E**	**54.3 E**	**54.3 E**	**44.5 E**	**44.5 E**
	Overall Level of Service	**F**				**F**			
Cyclist	Type of Bikeway	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Turning Speed (based on corner radius & angle)			Fast					
	Right Turn Storage Length			> 50m					
	Dual Right Turn?			No					
	Shared Through-Right?	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	Bike Box?	No	No	No	No	No	No	No	No
	Number of Lanes Crossed for Left Turns	1 Lane Crossed	No Lanes Crossed	2+ Lanes Crossed	2+ Lanes Crossed	1 Lane Crossed	1 Lane Crossed	2+ Lanes Crossed	2+ Lanes Crossed
	Operating Speed on Approach	50km/h	50km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h
	Dual Left Turn Lanes?	No	No	No	No	No	No	Yes	No
	Level of Service	**D**	**B**	**F**	**F**	**F**	**F**	**F**	**F**
		F				**F**			
Transit	Average Signal Delay	>40 sec	≤40 sec	0	0	>40 sec	>40 sec	>40 sec	≤40 sec
	Level of Service	**F**	**E**	**A**	**A**	**F**	**F**	**F**	**E**
		F				**F**			
Truck	Turning Radius (Right Turn)	10 to 15m	< 10m	> 15m	10 to 15m	< 10m	< 10m	< 10m	< 10m
	Number of Receiving Lanes	2+	2+	1	1	2+	2+	1	2+
		B	**D**	**C**	**E**	**D**	**D**	**F**	**D**
		E				**F**			

SEGMENTS		Bromley Road - Adjacent to Proposed Development				
		1	2	3		
Pedestrian	Sidewalk Width	No Sidewalk				
	Boulevard Width	N/A				
	AADT	N/A				
	On-Street Parking	N/A				
	Operating Speed	31 to 50 km/h				
	Level of Service	**F**				
		F				
Cyclist	Type of Bikeway	Mixed Traffic				
	Number of Travel Lanes (per direction)	1 Travel Lane Per Direction				
	Raised Median?					
	Bike Lane Width					
	Operating Speed	50 km/h				
	Bike Lane Blockages (Commercial Areas)					
	Median Refuge					
	Number of Travel Lanes on Sidestreet					
	Sidestreet Operating Speed					
	Level of Service	**B**				
Transit	Facility Type	Mixed Traffic				
	Friction	Limited parking/driveway friction				
	Level of Service	**D**				
Truck	Curb Lane Width	>3.7				
	Number of Travel Lanes	2				
		B				
		B				

Appendix I – Intersection Control Warrants

IBI GROUP

MINIMUM WARRANTS FOR INSTALLATION OF TRAFFIC SIGNALS USING PROJECTED VOLUMES*

Project: 1995 Carling Avenue - Transportation Impact Assessment **Date:** 2020-04-13

Project # 124829

Location Carling Avenue (Roadway) at Hare Avenue (Intersecting Roadway)

Municipality City of Ottawa Projected Volume Future (2029) Total Traffic

Peak Hour Average Hourly Volume

WARRANT	DESCRIPTION	MINIMUM REQUIREMENT FOR 2 LANE HIGHWAYS				COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	ADJUSTED FREE FLOW	ADJUSTED RESTRICTED FLOW	SECTIONAL Number	SECTIONAL %	ENTIRE %
1. VEHICULAR VOLUME	A. Vehicle volumes, all approaches (Average Hour)	480	720	720	1080	1168	162%	4%
	B. Vehicle volume along minor roads (Average Hour)	120	170	270	383	11	4%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volumes, along artery (Average Hour)	480	720	720	1080	1157	161%	5%
	B. Combined vehicle and pedestrian volume crossing artery from minor roads (Average Hour)	50	75	75	113	4	5%	

Projected Traffic Volumes:

Approach Volume Input (vph)			
Artery V1	Artery V2	Minor V3	Minor V4
528	629	11	0

Average Hourly Volume (AHV) = PHV/2 or (amPHV + pmPHV)/4
PHV = Either AM or PM Peak Hour Volume

Notes and Adjustment Factors:

		Adj. Factors
1. Vehicle volume warrants (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction should be 25% higher than the values given above.	Yes	1.25
2. Warrant values for free flow apply when the 85th percentile speed of artery traffic equals or exceeds 70 km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000.	Yes	
3. Warrant values for restricted flow apply to large urban communities when the 85th percentile speed of artery traffic does not exceed 70 km/h.	No	
4. The lowest sectional percentage governs the entire warrant.		
5. For "T" intersections the warrant values for the minor road should be increased by 50% (Warrant 1B only).	Yes	1.5
6. All flow values for Warrant 1 and Warrant 2 are to be increased by 20% for existing intersections and by 50% in the case of new intersections.	Existing	1.2
7. The crossing volumes are defined as:		
(a) Left-turns from both minor road approaches.	4 0	
(b) The heaviest through volume from the minor road.	0	
© 50% of the heavier left turn movement from major road when both of the following are met:	26	0
(i) the left-turn volume >120 vph	No	
(ii) the left-turn volume plus the opposing volume >720 vph	No	
(d) Pedestrians crossing the main road.	0	

CONCLUSION: The intersection does NOT meet the minimum warrants for traffic control signals.

* "Ontario Traffic Manual, Book 12", Ontario Ministry of Transportation.

City of Ottawa
Roundabout Initial Feasability Screening Tool

The intent of this screening tool is to provide a relatively quick assessment of the feasibility of a roundabout at a particular intersection in comparison to other appropriate forms of traffic control or road modifications including all-way stop control, traffic signals, auxiliary lanes, etc. The intended outcome of this tool is to provide enough information to assist staff in deciding whether or not to proceed with an Intersection Control Study to investigate the feasibility of a roundabout in more detail.

1	Project Name:	1995 Carling Avenue - Transportation Impact Assessment
2	Intersection:	Carling Avenue & Hare Avenue
3	Location and Description of Intersection: Lane Configuration, total or approach AADT, distance to nearby intersection(s), etc. Attach or sketch a diagram and include existing and/or horizon-year turning movements. If an existing intersection then indicate type of control	The intersection is currently configured as a stop-controlled intersection and is estimated to experience traffic volumes in the order of 24,000 vehicles per day. The eastbound and westbound approaches both have three through lanes, and the westbound approach has an auxiliary left-turn lane. The northbound approach has a single shared right/left lane.
4	What traditional modifications are proposed? All-way stop control, traffic signals, auxiliary lanes, etc. Attach or sketch a diagram if necessary.	The prohibition of U-turn movements.
5	What size of roundabout is being considered? Describe, and attach a Roundabout Traffic Flow Worksheet	Three-lane roundabout
6	Why is a roundabout being considered?	As an alternative to the existing stop-control

7 Are there contra-indications for

If "Yes" is indicated for one or more of the contra-indications then a roundabout may be problematic at the subject intersection. That is not to say

No.	Contra-Indication	Outcome
1	Is there insufficient property at the intersection (i.e. less than 44 metres diameter if considering a single-lane roundabout, and less than 60 metres if considering a two-lane roundabout) or property constraints that would require demolition of adjacent structures?	Yes [X] No [ ]
2	Are there any instances where stopping sight distance (SSD) of a roundabout yield line may not be attainable (i.e. the intersection is on a crest vertical curve)?	Yes [ ] No [X]
3	Is there an existing uncontrolled approach with a grade in excess of 4 percent?	Yes [ ] No [X]
4	Is the intersection located within a coordinated signal system?	Yes [X] No [ ]
5	Is there a closely-spaced traffic signal or railway crossing that could not be controlled with a nearby roundabout?	Yes [ ] No [X]
6	Are significant differences in directional flows or any situations of sudden high demand expected?	Yes [X] No [ ]
7	Are there known visually-impaired pedestrians that cross this intersection?	Yes [ ] No [X]

8 Are there suitability factors for a roundabout?

If "Yes" is indicated for two or more of the suitability factors then a roundabout should be technically feasible at the subject intersection..

No.	Suitability Factor	Outcome
1	Does the intersection currently experience an average collision frequency of more than 1.5 injury crashes per year, or a collision rate in excess of 1 injury crash per 1 million vehicles entering (MVE)?	Yes [ ] No [X]
2	Has there been a fatal crash at the intersection in the last 10 years?	Yes [ ] No [X]
3	Are capacity problems currently being experienced, or expected in the future?	Yes [X] No [ ]
4	Are traffic signals warranted, or expected to be warranted in the future?	Yes [ ] No [X]
5	Does the intersection have more than 4 legs, or unusual geometry?	Yes [ ] No [X]
6	Will Planned modifications to the intersection require that nearby structures be widened (i.e. to accommodate left-turn lanes)?	Yes [ ] No [X]
7	Is the intersection located at a transition between rural and urban environments (i.e. an urban boundary) such that a roundabout could act as a means of speed transition?	Yes [ ] No [X]

9	Conclusions/recommendation whether to proceed with an Intersection Control Study:	This intersection does not meet sufficient suitability factors to warrant a roundabout. Furthermore, there is insufficient property available for implementing even a two-lane roundabout and the intersection is located within a coordinated signal system. As such, it is not recommended that a roundabout be implemented at this intersection.

City of Ottawa
Mini-Roundabout Screening Criteria

Mini roundabouts are best suited and most effective when they meet the following conditions;

No.	Criteria	Outcome
1	Located at minor collector road intersecting a minor collector road or a local residential road	Yes ☐ No ☒
2	ADT lesser than 15,000 (estimated ADT in case of new development area)	Yes ☐ No ☒
3	At least 10% of the total traffic has generated from minor road (estimated in case of new development area)	Yes ☒ No ☐
4	Operating speed <55km/hr or posted speed ≤ 50km/hr in a new development area	Yes ☐ No ☒
5	A right of way wide enough to accommodate a 13 m to 27 m Inscribed Circle Diameter roundabout and adjacent sidewalks	Yes ☒ No ☐
6	Situated on a non truck route or roads without heavy truck movements	Yes ☐ No ☒
7	Intersections with no more than four legs	Yes ☒ No ☐

Conclusion

Given that this is a large arterial to local intersection a mini-roundabout is not appropriate for this location.

City of Ottawa
Roundabout Initial Feasability Screening Tool

The intent of this screening tool is to provide a relatively quick assessment of the feasibility of a roundabout at a particular intersection in comparison to other appropriate forms of traffic control or road modifications including all-way stop control, traffic signals, auxiliary lanes, etc. The intended outcome of this tool is to provide enough information to assist staff in deciding whether or not to proceed with an Intersection Control Study to investigate the feasibility of a roundabout in more detail.

1	Project Name:	1995 Carling Avenue - Transportation Impact Assessment
2	Intersection:	Carling Avenue & Maitland Avenue / Sherbourne Road
3	Location and Description of Intersection: Lane Configuration, total or approach AADT, distance to nearby intersection(s), etc. Attach or sketch a diagram and include existing and/or horizon-year turning movements. If an existing intersection then indicate type of control	The intersection is currently configured as a signalized intersection and experiences traffic volumes in the order of 44,000 vehicles per day. The eastbound and westbound approaches both have three through lanes and a single left-turn lane while the northbound and southbound approaches have a single through and left-turn lane each.
4	What traditional modifications are proposed? All-way stop control, traffic signals, auxiliary lanes, etc. Attach or sketch a diagram if necessary.	Traffic signal phase changes.
5	What size of roundabout is being considered? Describe, and attach a Roundabout Traffic Flow Worksheet	Three-lane roundabout
6	Why is a roundabout being considered?	As an alternative to traffic signals.

7 Are there contra-indications for

If "Yes" is indicated for one or more of the contra-indications then a roundabout may be problematic at the subject intersection. That is not to say

No.	Contra-Indication	Outcome
1	Is there insufficient property at the intersection (i.e. less than 44 metres diameter if considering a single-lane roundabout, and less than 60 metres if considering a two-lane roundabout) or property constraints that would require demolition of adjacent structures?	Yes [X] No [ ]
2	Are there any instances where stopping sight distance (SSD) of a roundabout yield line may not be attainable (i.e. the intersection is on a crest vertical curve)?	Yes [ ] No [X]
3	Is there an existing uncontrolled approach with a grade in excess of 4 percent?	Yes [ ] No [X]
4	Is the intersection located within a coordinated signal system?	Yes [X] No [ ]
5	Is there a closely-spaced traffic signal or railway crossing that could not be controlled with a nearby roundabout?	Yes [ ] No [X]
6	Are significant differences in directional flows or any situations of sudden high demand expected?	Yes [X] No [ ]
7	Are there known visually-impaired pedestrians that cross this intersection?	Yes [ ] No [X]

8 Are there suitability factors for a roundabout?

If "Yes" is indicated for two or more of the suitability factors then a roundabout should be technically feasible at the subject intersection..

No.	Suitability Factor	Outcome
1	Does the intersection currently experience an average collision frequency of more than 1.5 injury crashes per year, or a collision rate in excess of 1 injury crash per 1 million vehicles entering (MVE)?	Yes [ ] No [X]
2	Has there been a fatal crash at the intersection in the last 10 years?	Yes [ ] No [X]
3	Are capacity problems currently being experienced, or expected in the future?	Yes [X] No [ ]
4	Are traffic signals warranted, or expected to be warranted in the future?	Yes [X] No [ ]
5	Does the intersection have more than 4 legs, or unusual geometry?	Yes [ ] No [X]
6	Will Planned modifications to the intersection require that nearby structures be widened (i.e. to accommodate left-turn lanes)?	Yes [ ] No [X]
7	Is the intersection located at a transition between rural and urban environments (i.e. an urban boundary) such that a roundabout could act as a means of speed transition?	Yes [ ] No [X]

9	Conclusions/recommendation whether to proceed with an Intersection Control Study:	Althought this location may meet a couple of the suitability factors, there is insufficient property available for implementing even a two-lane roundabout and the intersection is located within a coordinated signal system. As such, it is not recommended that a roundabout be implemented at this intersection.

City of Ottawa
Mini-Roundabout Screening Criteria

Mini roundabouts are best suited and most effective when they meet the following conditions;

No.	Criteria	Outcome
1	Located at minor collector road intersecting a minor collector road or a local residential road	Yes ☐ No ☒
2	ADT lesser than 15,000 (estimated ADT in case of new development area)	Yes ☐ No ☒
3	At least 10% of the total traffic has generated from minor road (estimated in case of new development area)	Yes ☒ No ☐
4	Operating speed <55km/hr or posted speed ≤ 50km/hr in a new development area	Yes ☐ No ☒
5	A right of way wide enough to accommodate a 13 m to 27 m Inscribed Circle Diameter roundabout and adjacent sidewalks	Yes ☒ No ☐
6	Situated on a non truck route or roads without heavy truck movements	Yes ☐ No ☒
7	Intersections with no more than four legs	Yes ☒ No ☐

Conclusion

Given that this is a large arterial to arterial/major collector intersection a mini-roundabout is not appropriate for this location.

Appendix J – Intersection Capacity Analyses

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	19	1623	5	10	7	366	60	3	24	30	75	7
Future Volume (vph)	19	1623	5	10	7	366	60	3	24	30	75	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	25.0		0.0		20.0		85.0	0.0		0.0	50.0	
Storage Lanes	1		0		1		1	0		0	1	
Taper Length (m)	7.5				7.5			7.5			7.5	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00			1.00		0.94		0.99		0.99	0.98
Frt							0.850		0.929			0.882
Flt Protected	0.950				0.950				0.998		0.950	
Satd. Flow (prot)	1729	4871	0	0	1729	4687	1502	0	1636	0	1679	1492
Flt Permitted	0.462				0.116				0.991		0.704	
Satd. Flow (perm)	822	4871	0	0	211	4687	1406	0	1624	0	1231	1492
Right Turn on Red			Yes				Yes			Yes		
Satd. Flow (RTOR)		1					95		16			30
Link Speed (k/h)		60				60			50			50
Link Distance (m)		305.5				198.3			297.2			304.9
Travel Time (s)		18.3				11.9			21.4			22.0
Confl. Peds. (#/hr)	15		12		12		15	13		12	12	
Confl. Bikes (#/hr)			1				1			4		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	0%	0%	0%	6%	3%	0%	4%	0%	3%	0%
Adj. Flow (vph)	21	1803	6	11	8	407	67	3	27	33	83	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	1809	0	0	19	407	67	0	63	0	83	38
Turn Type	pm+pt	NA		Perm	Perm	NA	Perm	Perm	NA		Perm	NA
Protected Phases	7	4				8			2			6
Permitted Phases	4			8	8		8	2			6	
Detector Phase	7	4		8	8	8	8	2	2		6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0	10.0		10.0	10.0
Minimum Split (s)	12.0	28.3		28.3	28.3	28.3	28.3	47.3	47.3		47.3	47.3
Total Split (s)	14.0	83.0		69.0	69.0	69.0	69.0	47.0	47.0		47.0	47.0
Total Split (%)	10.8%	63.8%		53.1%	53.1%	53.1%	53.1%	36.2%	36.2%		36.2%	36.2%
Maximum Green (s)	7.0	76.7		62.7	62.7	62.7	62.7	39.7	39.7		39.7	39.7
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.3	3.3		3.3	3.3
All-Red Time (s)	3.3	2.6		2.6	2.6	2.6	2.6	4.0	4.0		4.0	4.0
Lost Time Adjust (s)	-3.0	-2.3			-2.3	-2.3	-2.3		-3.3		-3.3	-3.3
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	Lag	Lag					
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Recall Mode	Max	C-Max		C-Max	C-Max	C-Max	C-Max	None	None		None	None
Walk Time (s)		10.0		10.0	10.0	10.0	10.0	27.0	27.0		27.0	27.0
Flash Dont Walk (s)		12.0		12.0	12.0	12.0	12.0	13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)		12		15	15	15	15	12	12		13	13
Act Effct Green (s)	95.8	95.8			65.0	65.0	65.0		26.2		26.2	26.2
Actuated g/C Ratio	0.74	0.74			0.50	0.50	0.50		0.20		0.20	0.20

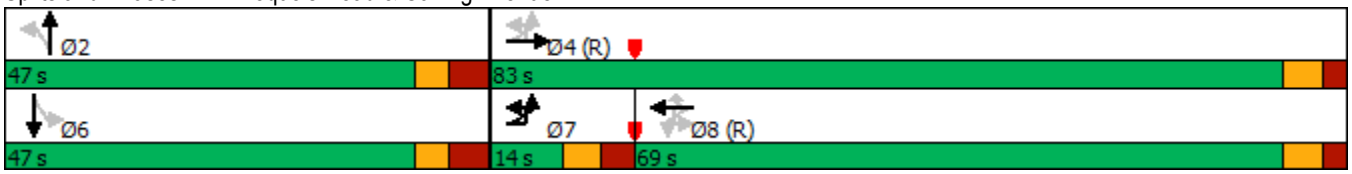
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	27
Future Volume (vph)	27
Ideal Flow (vphpl)	1800
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	13
Confl. Bikes (#/hr)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	7%
Adj. Flow (vph)	30
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
v/c Ratio	0.03	0.50			0.18	0.17	0.09		0.19		0.33	0.12
Control Delay	8.3	9.9			23.4	18.0	1.6		29.5		44.2	14.4
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	8.3	9.9			23.4	18.0	1.6		29.5		44.2	14.4
LOS	A	A			C	B	A		C		D	B
Approach Delay		9.8				16.0			29.5			34.8
Approach LOS		A				B			C			C
Queue Length 50th (m)	0.9	42.5			2.6	20.3	0.0		10.9		20.1	1.8
Queue Length 95th (m)	5.4	113.9			8.4	26.9	3.7		18.8		28.4	9.2
Internal Link Dist (m)		281.5				174.3			273.2			280.9
Turn Bay Length (m)	25.0				20.0		85.0				50.0	
Base Capacity (vph)	792	3589			105	2343	750		547		407	513
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	0.03	0.50			0.18	0.17	0.09		0.12		0.20	0.07

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 6 (5%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.50
Intersection Signal Delay: 12.7 Intersection LOS: B
Intersection Capacity Utilization 58.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Iroquois Road & Carling Avenue



Lane Group	SBR
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	0.8

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations								
Traffic Vol, veh/h	1	1730	7	15	13	435	7	15
Future Vol, veh/h	1	1730	7	15	13	435	7	15
Conflicting Peds, #/hr	0	0	2	0	2	0	2	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	-	-	-	-	250	-	0	-
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	14	0	0	0	0	7
Mvmt Flow	1	1922	8	17	14	483	8	17

Major/Minor	Major1			Major2			Minor1	
Conflicting Flow All	353	0	0	1409	1932	0	2187	967
Stage 1	-	-	-	-	-	-	1930	-
Stage 2	-	-	-	-	-	-	257	-
Critical Hdwy	5.6	-	-	5.6	5.3	-	5.7	7.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	2.3	3.1	-	3.8	3.97
Pot Cap-1 Maneuver	1010	-	-	265	139	-	76	211
Stage 1	-	-	-	-	-	-	64	-
Stage 2	-	-	-	-	-	-	705	-
Platoon blocked, %		-	-			-		
Mov Cap-1 Maneuver	1010	-	-	181	181	-	63	211
Mov Cap-2 Maneuver	-	-	-	-	-	-	63	-
Stage 1	-	-	-	-	-	-	64	-
Stage 2	-	-	-	-	-	-	583	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	42.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	121	-	-	181	-
HCM Lane V/C Ratio	0.202	-	-	0.172	-
HCM Control Delay (s)	42.1	-	-	28.9	-
HCM Lane LOS	E	-	-	D	-
HCM 95th %tile Q(veh)	0.7	-	-	0.6	-

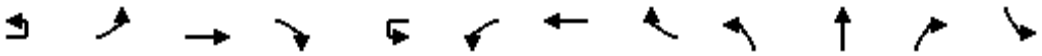
Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↱			↱
Traffic Vol, veh/h	0	1760	450	5	0	13
Future Vol, veh/h	0	1760	450	5	0	13
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	1956	500	6	0	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	261
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.9
Pot Cap-1 Maneuver	0	-	-	-	0	633
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	628
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	628
HCM Lane V/C Ratio	-	-	-	0.023
HCM Control Delay (s)	-	-	-	10.9
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	17	29	1456	259	6	308	294	17	129	101	415	69
Future Volume (vph)	17	29	1456	259	6	308	294	17	129	101	415	69
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		55.0		0.0		115.0		0.0	75.0		0.0	45.0
Storage Lanes		1		0		2		0	1		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.91	1.00	0.91	0.91	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95	0.99			1.00	0.99			0.97		
Frt			0.977				0.992			0.879		
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1656	4735	0	0	3228	3228	0	1679	1506	0	1679
Flt Permitted		0.950				0.950			0.266			0.111
Satd. Flow (perm)	0	1571	4735	0	0	3216	3228	0	470	1506	0	196
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)			40				7			141		
Link Speed (k/h)			60				60			50		
Link Distance (m)			447.3				309.6			300.2		
Travel Time (s)			26.8				18.6			21.6		
Confl. Peds. (#/hr)		25		16		16		25	13		15	15
Confl. Bikes (#/hr)								1			2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	7%	2%	1%	0%	4%	6%	0%	3%	5%	2%	3%
Adj. Flow (vph)	19	32	1618	288	7	342	327	19	143	112	461	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	51	1906	0	0	349	346	0	143	573	0	77
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases									2			6
Detector Phase	7	7	4		3	3	8		2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0	5.0		10.0	10.0		10.0
Minimum Split (s)	10.9	10.9	23.9		10.9	10.9	23.9		24.8	24.8		24.8
Total Split (s)	19.0	19.0	61.0		19.0	19.0	61.0		40.0	40.0		40.0
Total Split (%)	15.8%	15.8%	50.8%		15.8%	15.8%	50.8%		33.3%	33.3%		33.3%
Maximum Green (s)	13.1	13.1	55.1		13.1	13.1	55.1		33.2	33.2		33.2
Yellow Time (s)	3.7	3.7	3.7		3.7	3.7	3.7		3.3	3.3		3.3
All-Red Time (s)	2.2	2.2	2.2		2.2	2.2	2.2		3.5	3.5		3.5
Lost Time Adjust (s)		-1.9	-1.9			-1.9	-1.9		-2.8	-2.8		-2.8
Total Lost Time (s)		4.0	4.0			4.0	4.0		4.0	4.0		4.0
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None	C-Max		None	None	C-Max		None	None		None
Walk Time (s)			7.0				7.0		7.0	7.0		7.0
Flash Dont Walk (s)			11.0				11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)			16				25		15	15		13
Act Effct Green (s)		11.0	57.0			15.0	63.3		36.0	36.0		36.0
Actuated g/C Ratio		0.09	0.48			0.12	0.53		0.30	0.30		0.30

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	322	16
Future Volume (vph)	322	16
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	1.00	
Frt	0.993	
Flt Protected		
Satd. Flow (prot)	1765	0
Flt Permitted		
Satd. Flow (perm)	1765	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	2	
Link Speed (k/h)	50	
Link Distance (m)	301.0	
Travel Time (s)	21.7	
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	2%	6%
Adj. Flow (vph)	358	18
Shared Lane Traffic (%)		
Lane Group Flow (vph)	376	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	24.8	
Total Split (s)	40.0	
Total Split (%)	33.3%	
Maximum Green (s)	33.2	
Yellow Time (s)	3.3	
All-Red Time (s)	3.5	
Lost Time Adjust (s)	-2.8	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	7.0	
Flash Dont Walk (s)	11.0	
Pedestrian Calls (#/hr)	13	
Act Effct Green (s)	36.0	
Actuated g/C Ratio	0.30	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.34	0.84			0.87	0.20		1.01	1.04		1.33
Control Delay		56.3	31.2			73.2	16.1		122.8	81.2		264.7
Queue Delay		0.0	0.0			0.0	0.0		0.0	0.0		0.0
Total Delay		56.3	31.2			73.2	16.1		122.8	81.2		264.7
LOS		E	C			E	B		F	F		F
Approach Delay			31.8				44.8			89.5		
Approach LOS			C				D			F		
Queue Length 50th (m)		11.4	137.3			42.1	22.3		~34.6	~121.1		~23.3
Queue Length 95th (m)		23.3	158.6			#66.4	33.4		#76.2	#189.4		#54.2
Internal Link Dist (m)			423.3				285.6			276.2		
Turn Bay Length (m)		55.0				115.0			75.0			45.0
Base Capacity (vph)		207	2270			403	1706		141	550		58
Starvation Cap Reductn		0	0			0	0		0	0		0
Spillback Cap Reductn		0	0			0	0		0	0		0
Storage Cap Reductn		0	0			0	0		0	0		0
Reduced v/c Ratio		0.25	0.84			0.87	0.20		1.01	1.04		1.33

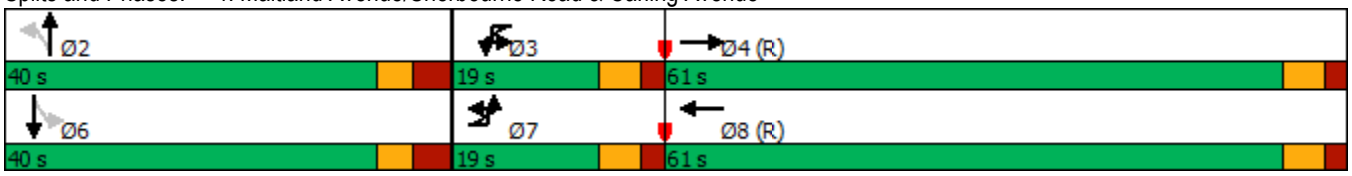
Intersection Summary

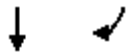
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.33
Intersection Signal Delay: 51.0 Intersection LOS: D
Intersection Capacity Utilization 101.0% ICU Level of Service G
Analysis Period (min) 15

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

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

Splits and Phases: 4: Maitland Avenue/Sherbourne Road & Carling Avenue

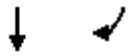




Lane Group	SBT	SBR
v/c Ratio	0.71	
Control Delay	45.7	
Queue Delay	0.0	
Total Delay	45.7	
LOS	D	
Approach Delay	82.9	
Approach LOS	F	
Queue Length 50th (m)	78.3	
Queue Length 95th (m)	113.1	
Internal Link Dist (m)	277.0	
Turn Bay Length (m)		
Base Capacity (vph)	530	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.71	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	41	656	4	6	17	1425	107	13	20	10	117
Future Volume (vph)	1	41	656	4	6	17	1425	107	13	20	10	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0		0.0		20.0		85.0	0.0		0.0	50.0
Storage Lanes		1		0		1		1	0		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.91	1.00	0.91	0.91	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			1.00			0.98		0.90		0.99		0.98
Frt			0.999					0.850		0.968		
Flt Protected		0.950				0.950				0.985		0.950
Satd. Flow (prot)	0	1729	4865	0	0	1656	4919	1547	0	1724	0	1712
Flt Permitted		0.086				0.362				0.918		0.753
Satd. Flow (perm)	0	157	4865	0	0	618	4919	1391	0	1595	0	1336
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)			1					119		11		
Link Speed (k/h)			60				60			50		
Link Distance (m)			305.5				198.3			297.2		
Travel Time (s)			18.3				11.9			21.4		
Confl. Peds. (#/hr)		28		19		19		28	28		17	17
Confl. Bikes (#/hr)				6								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	2%	0%	0%	6%	1%	0%	0%	0%	0%	1%
Adj. Flow (vph)	1	46	729	4	7	19	1583	119	14	22	11	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	733	0	0	26	1583	119	0	47	0	130
Turn Type	pm+pt	pm+pt	NA		Perm	Perm	NA	Perm	Perm	NA		Perm
Protected Phases	7	7	4				8			2		
Permitted Phases	4	4			8	8		8	2			6
Detector Phase	7	7	4		8	8	8	8	2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	10.0	10.0		10.0
Minimum Split (s)	12.0	12.0	28.3		28.3	28.3	28.3	28.3	47.3	47.3		47.3
Total Split (s)	12.0	12.0	83.0		71.0	71.0	71.0	71.0	47.0	47.0		47.0
Total Split (%)	9.2%	9.2%	63.8%		54.6%	54.6%	54.6%	54.6%	36.2%	36.2%		36.2%
Maximum Green (s)	5.0	5.0	76.7		64.7	64.7	64.7	64.7	39.7	39.7		39.7
Yellow Time (s)	3.7	3.7	3.7		3.7	3.7	3.7	3.7	3.3	3.3		3.3
All-Red Time (s)	3.3	3.3	2.6		2.6	2.6	2.6	2.6	4.0	4.0		4.0
Lost Time Adjust (s)		-3.0	-2.3			-2.3	-2.3	-2.3		-3.3		-3.3
Total Lost Time (s)		4.0	4.0			4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lead			Lag	Lag	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	Max	Max	C-Max		C-Max	C-Max	C-Max	C-Max	None	None		None
Walk Time (s)			10.0		10.0	10.0	10.0	10.0	27.0	27.0		27.0
Flash Dont Walk (s)			12.0		12.0	12.0	12.0	12.0	13.0	13.0		13.0
Pedestrian Calls (#/hr)			19		28	28	28	28	17	17		28
Act Effct Green (s)		89.8	89.8			67.0	67.0	67.0		32.2		32.2
Actuated g/C Ratio		0.69	0.69			0.52	0.52	0.52		0.25		0.25



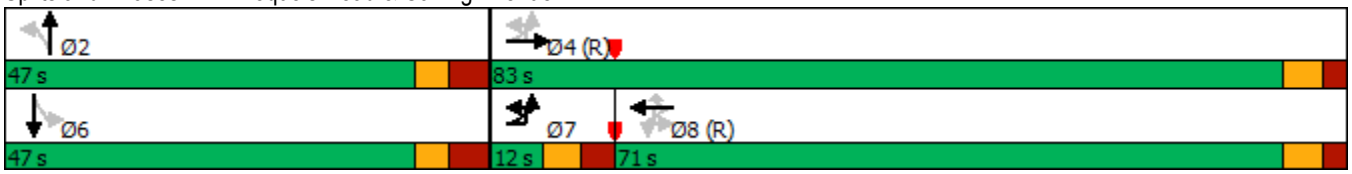
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	23	60
Future Volume (vph)	23	60
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.97	
Frt	0.892	
Flt Protected		
Satd. Flow (prot)	1554	0
Flt Permitted		
Satd. Flow (perm)	1554	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	24	
Link Speed (k/h)	50	
Link Distance (m)	304.9	
Travel Time (s)	22.0	
Confl. Peds. (#/hr)		28
Confl. Bikes (#/hr)		2
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	2%
Adj. Flow (vph)	26	67
Shared Lane Traffic (%)		
Lane Group Flow (vph)	93	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	47.3	
Total Split (s)	47.0	
Total Split (%)	36.2%	
Maximum Green (s)	39.7	
Yellow Time (s)	3.3	
All-Red Time (s)	4.0	
Lost Time Adjust (s)	-3.3	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	27.0	
Flash Dont Walk (s)	13.0	
Pedestrian Calls (#/hr)	28	
Act Effct Green (s)	32.2	
Actuated g/C Ratio	0.25	

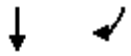
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.14	0.22			0.08	0.62	0.15		0.12		0.39
Control Delay		10.4	9.1			16.9	23.9	3.2		26.4		41.4
Queue Delay		0.0	0.0			0.0	0.0	0.0		0.0		0.0
Total Delay		10.4	9.1			16.9	23.9	3.2		26.4		41.4
LOS		B	A			B	C	A		C		D
Approach Delay			9.2				22.4			26.4		
Approach LOS			A				C			C		
Queue Length 50th (m)		4.6	30.0			3.3	102.8	0.0		6.3		24.6
Queue Length 95th (m)		9.6	36.8			8.5	118.0	9.3		15.2		41.6
Internal Link Dist (m)			281.5				174.3			273.2		
Turn Bay Length (m)		25.0				20.0		85.0				50.0
Base Capacity (vph)		335	3359			318	2535	774		534		441
Starvation Cap Reductn		0	0			0	0	0		0		0
Spillback Cap Reductn		0	0			0	0	0		0		0
Storage Cap Reductn		0	0			0	0	0		0		0
Reduced v/c Ratio		0.14	0.22			0.08	0.62	0.15		0.09		0.29

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 19.7 Intersection LOS: B
Intersection Capacity Utilization 68.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Iroquois Road & Carling Avenue





Lane Group	SBT	SBR
v/c Ratio	0.23	
Control Delay	26.4	
Queue Delay	0.0	
Total Delay	26.4	
LOS	C	
Approach Delay	35.1	
Approach LOS	D	
Queue Length 50th (m)	12.4	
Queue Length 95th (m)	25.2	
Internal Link Dist (m)	280.9	
Turn Bay Length (m)		
Base Capacity (vph)	530	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.18	

Intersection Summary

Intersection	
Int Delay, s/veh	0.6

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations								
Traffic Vol, veh/h	1	780	8	26	37	1544	10	11
Future Vol, veh/h	1	780	8	26	37	1544	10	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	-	-	-	-	250	-	0	-
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	4	0	0	0	0
Mvmt Flow	1	867	9	29	41	1716	11	12

Major/Minor	Major1			Major2			Minor1	
Conflicting Flow All	1252	0	0	639	876	0	1700	438
Stage 1	-	-	-	-	-	-	874	-
Stage 2	-	-	-	-	-	-	826	-
Critical Hdwy	5.6	-	-	5.68	5.3	-	5.7	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	2.34	3.1	-	3.8	3.9
Pot Cap-1 Maneuver	324	-	-	686	455	-	138	489
Stage 1	-	-	-	-	-	-	292	-
Stage 2	-	-	-	-	-	-	358	-
Platoon blocked, %		-	-			-		
Mov Cap-1 Maneuver	324	-	-	525	525	-	119	489
Mov Cap-2 Maneuver	-	-	-	-	-	-	119	-
Stage 1	-	-	-	-	-	-	290	-
Stage 2	-	-	-	-	-	-	310	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	25.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	197	-	-	525	-
HCM Lane V/C Ratio	0.118	-	-	0.133	-
HCM Control Delay (s)	25.7	-	-	12.9	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	0.4	-	-	0.5	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↱
Traffic Vol, veh/h	0	817	1595	16	0	12
Future Vol, veh/h	0	817	1595	16	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	8
Mvmt Flow	0	908	1772	18	0	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	895
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.26
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.98
Pot Cap-1 Maneuver	0	-	-	-	0	234
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	234
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	21.3
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	234
HCM Lane V/C Ratio	-	-	-	0.057
HCM Control Delay (s)	-	-	-	21.3
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.2

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	23	62	565	167	9	749	1335	55	209	218	218	49
Future Volume (vph)	23	62	565	167	9	749	1335	55	209	218	218	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		55.0		0.0		115.0		0.0	75.0		0.0	45.0
Storage Lanes		1		0		1		0	1		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.91	1.00	0.91	0.91	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.99			0.97	0.99		0.98	0.98		
Frt			0.966				0.994			0.925		
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1729	4650	0	0	3321	3381	0	1729	1624	0	1729
Flt Permitted		0.950				0.950			0.423			0.157
Satd. Flow (perm)	0	1705	4650	0	0	3232	3381	0	755	1624	0	286
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)			61				5			44		
Link Speed (k/h)			60				60			50		
Link Distance (m)			447.3				309.6			300.2		
Travel Time (s)			26.8				18.6			21.6		
Confl. Peds. (#/hr)		36		25		25		36	20		15	15
Confl. Bikes (#/hr)								2				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	2%	1%	0%	1%	1%	4%	0%	0%	3%	0%
Adj. Flow (vph)	26	69	628	186	10	832	1483	61	232	242	242	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	95	814	0	0	842	1544	0	232	484	0	54
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases									2			6
Detector Phase	7	7	4		3	3	8		2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0	5.0		10.0	10.0		10.0
Minimum Split (s)	10.9	10.9	23.9		10.9	10.9	23.9		24.8	24.8		24.8
Total Split (s)	15.0	15.0	36.0		41.0	41.0	62.0		43.0	43.0		43.0
Total Split (%)	12.5%	12.5%	30.0%		34.2%	34.2%	51.7%		35.8%	35.8%		35.8%
Maximum Green (s)	9.1	9.1	30.1		35.1	35.1	56.1		36.2	36.2		36.2
Yellow Time (s)	3.7	3.7	3.7		3.7	3.7	3.7		3.3	3.3		3.3
All-Red Time (s)	2.2	2.2	2.2		2.2	2.2	2.2		3.5	3.5		3.5
Lost Time Adjust (s)		-1.9	-1.9			-1.9	-1.9		-2.8	-2.8		-2.8
Total Lost Time (s)		4.0	4.0			4.0	4.0		4.0	4.0		4.0
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None	C-Max		None	None	C-Max		None	None		None
Walk Time (s)			7.0				7.0		7.0	7.0		7.0
Flash Dont Walk (s)			11.0				11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)			25				36		15	15		20
Act Effct Green (s)		10.7	34.3			35.3	59.0		38.4	38.4		38.4
Actuated g/C Ratio		0.09	0.29			0.29	0.49		0.32	0.32		0.32

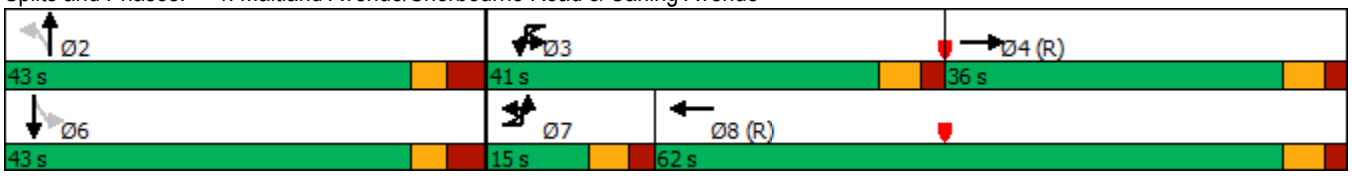
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	205	44
Future Volume (vph)	205	44
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.99	
Frt	0.973	
Flt Protected		
Satd. Flow (prot)	1749	0
Flt Permitted		
Satd. Flow (perm)	1749	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	10	
Link Speed (k/h)	50	
Link Distance (m)	301.0	
Travel Time (s)	21.7	
Confl. Peds. (#/hr)		20
Confl. Bikes (#/hr)		
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	2%
Adj. Flow (vph)	228	49
Shared Lane Traffic (%)		
Lane Group Flow (vph)	277	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	24.8	
Total Split (s)	43.0	
Total Split (%)	35.8%	
Maximum Green (s)	36.2	
Yellow Time (s)	3.3	
All-Red Time (s)	3.5	
Lost Time Adjust (s)	-2.8	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	7.0	
Flash Dont Walk (s)	11.0	
Pedestrian Calls (#/hr)	20	
Act Effct Green (s)	38.4	
Actuated g/C Ratio	0.32	

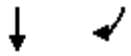
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.62	0.59			0.86	0.93		0.96	0.88		0.59
Control Delay		70.8	36.9			50.0	39.8		90.2	53.9		63.5
Queue Delay		0.0	0.0			0.0	0.0		0.0	0.0		0.0
Total Delay		70.8	36.9			50.0	39.8		90.2	53.9		63.5
LOS		E	D			D	D		F	D		E
Approach Delay			40.4				43.4			65.7		
Approach LOS			D				D			E		
Queue Length 50th (m)		21.9	58.0			94.5	176.2		53.1	98.5		10.6
Queue Length 95th (m)		m#41.7	m72.1			118.8	#229.4		#102.6	#157.2		#30.2
Internal Link Dist (m)			423.3				285.6			276.2		
Turn Bay Length (m)		55.0				115.0			75.0			45.0
Base Capacity (vph)		158	1371			1023	1663		245	557		92
Starvation Cap Reductn		0	0			0	0		0	0		0
Spillback Cap Reductn		0	0			0	0		0	0		0
Storage Cap Reductn		0	0			0	0		0	0		0
Reduced v/c Ratio		0.60	0.59			0.82	0.93		0.95	0.87		0.59

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 103 (86%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 46.2 Intersection LOS: D
Intersection Capacity Utilization 94.5% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Maitland Avenue/Sherbourne Road & Carling Avenue





Lane Group	SBT	SBR
v/c Ratio	0.49	
Control Delay	35.0	
Queue Delay	0.0	
Total Delay	35.0	
LOS	C	
Approach Delay	39.6	
Approach LOS	D	
Queue Length 50th (m)	50.1	
Queue Length 95th (m)	75.7	
Internal Link Dist (m)	277.0	
Turn Bay Length (m)		
Base Capacity (vph)	575	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.48	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	19	1630	5	10	7	375	60	3	24	30	75	7
Future Volume (vph)	19	1630	5	10	7	375	60	3	24	30	75	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	25.0		40.0		20.0		85.0	0.0		0.0	50.0	
Storage Lanes	1		1		1		1	0		0	1	
Taper Length (m)	7.5				7.5			7.5			7.5	
Lane Util. Factor	1.00	0.95	1.00	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.94				0.94		0.99		0.99	0.98
Frt			0.850				0.850		0.929			0.881
Flt Protected	0.950				0.950				0.997		0.950	
Satd. Flow (prot)	1729	3390	1547	0	1729	4687	1502	0	1635	0	1679	1490
Flt Permitted	0.479				0.152				0.990		0.717	
Satd. Flow (perm)	852	3390	1461	0	277	4687	1406	0	1623	0	1254	1490
Right Turn on Red			Yes				Yes			Yes		
Satd. Flow (RTOR)			36				95		25			27
Link Speed (k/h)		60				60			50			50
Link Distance (m)		305.5				136.9			297.2			304.9
Travel Time (s)		18.3				8.2			21.4			22.0
Confl. Peds. (#/hr)	15		12		12		15	13		12	12	
Confl. Bikes (#/hr)			1				1			4		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	2%	0%	0%	0%	6%	3%	0%	4%	0%	3%	0%
Adj. Flow (vph)	19	1630	5	10	7	375	60	3	24	30	75	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	1630	5	0	17	375	60	0	57	0	75	34
Turn Type	pm+pt	NA	Perm	Perm	Perm	NA	Perm	Perm	NA		Perm	NA
Protected Phases	7	4				8			2			6
Permitted Phases	4		4	8	8		8	2			6	
Detector Phase	7	4	4	8	8	8	8	2	2		6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0	10.0
Minimum Split (s)	12.0	28.3	28.3	28.3	28.3	28.3	28.3	47.3	47.3		47.3	47.3
Total Split (s)	14.0	83.0	83.0	69.0	69.0	69.0	69.0	47.0	47.0		47.0	47.0
Total Split (%)	10.8%	63.8%	63.8%	53.1%	53.1%	53.1%	53.1%	36.2%	36.2%		36.2%	36.2%
Maximum Green (s)	7.0	76.7	76.7	62.7	62.7	62.7	62.7	39.7	39.7		39.7	39.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3	3.3
All-Red Time (s)	3.3	2.6	2.6	2.6	2.6	2.6	2.6	4.0	4.0		4.0	4.0
Lost Time Adjust (s)	-3.0	-2.3	-2.3		-2.3	-2.3	-2.3		-3.3		-3.3	-3.3
Total Lost Time (s)	4.0	4.0	4.0		4.0	4.0	4.0		4.0		4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag	Lag					
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Recall Mode	Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None
Walk Time (s)		10.0	10.0	10.0	10.0	10.0	10.0	27.0	27.0		27.0	27.0
Flash Dont Walk (s)		12.0	12.0	12.0	12.0	12.0	12.0	13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)		12	12	15	15	15	15	12	12		13	13
Act Effct Green (s)	99.6	100.4	100.4		65.0	65.0	65.0		25.9		25.9	25.9
Actuated g/C Ratio	0.77	0.77	0.77		0.50	0.50	0.50		0.20		0.20	0.20

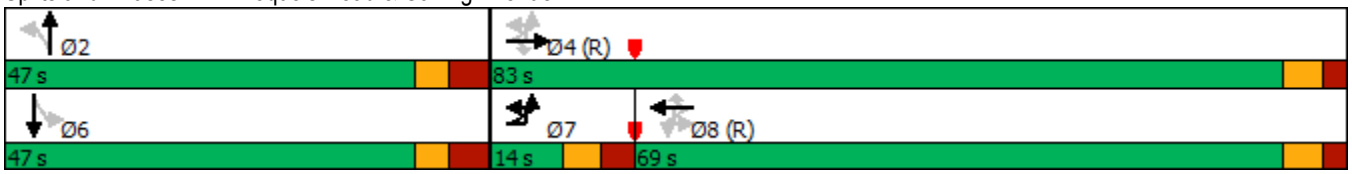
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	27
Future Volume (vph)	27
Ideal Flow (vphpl)	1800
Storage Length (m)	0.0
Storage Lanes	0
Taper Length (m)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	13
Confl. Bikes (#/hr)	
Peak Hour Factor	1.00
Heavy Vehicles (%)	7%
Adj. Flow (vph)	27
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
v/c Ratio	0.02	0.62	0.00		0.12	0.16	0.08		0.17		0.30	0.11
Control Delay	8.3	12.3	0.0		20.3	17.9	1.1		23.3		43.3	14.5
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	8.3	12.3	0.0		20.3	17.9	1.1		23.3		43.3	14.5
LOS	A	B	A		C	B	A		C		D	B
Approach Delay		12.2				15.8			23.3			34.3
Approach LOS		B				B			C			C
Queue Length 50th (m)	0.7	63.6	0.0		2.3	18.6	0.0		7.4		18.2	1.6
Queue Length 95th (m)	5.0	187.8	0.0		7.2	24.9	2.4		15.4		25.9	8.7
Internal Link Dist (m)		281.5				112.9			273.2			280.9
Turn Bay Length (m)	25.0		40.0		20.0		85.0				50.0	
Base Capacity (vph)	859	2618	1136		138	2343	750		553		414	510
Starvation Cap Reductn	0	0	0		0	0	0		0		0	0
Spillback Cap Reductn	0	0	0		0	0	0		0		0	0
Storage Cap Reductn	0	0	0		0	0	0		0		0	0
Reduced v/c Ratio	0.02	0.62	0.00		0.12	0.16	0.08		0.10		0.18	0.07

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 6 (5%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 14.3 Intersection LOS: B
Intersection Capacity Utilization 73.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Iroquois Road & Carling Avenue



Lane Group	SBR
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	19	1629	5	25	7	374	60	3	24	30	75
Future Volume (vph)	1	19	1629	5	25	7	374	60	3	24	30	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0		40.0		20.0		85.0	0.0		0.0	50.0
Storage Lanes		1		1		1		1	0		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97		0.94				0.94		0.99		0.99
Frt				0.850				0.850		0.929		
Flt Protected		0.950				0.950				0.997		0.950
Satd. Flow (prot)	0	1729	3390	1547	0	1729	4687	1502	0	1635	0	1679
Flt Permitted		0.479				0.125				0.990		0.717
Satd. Flow (perm)	0	850	3390	1461	0	228	4687	1406	0	1623	0	1254
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				95				95		30		
Link Speed (k/h)			60				60			50		
Link Distance (m)			305.5				136.9			297.2		
Travel Time (s)			18.3				8.2			21.4		
Confl. Peds. (#/hr)		15		12		12		15	13		12	12
Confl. Bikes (#/hr)				1				1			4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	3%	0%	4%	0%	3%
Adj. Flow (vph)	1	19	1629	5	25	7	374	60	3	24	30	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	20	1629	5	0	32	374	60	0	57	0	75
Turn Type	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases	4	4		4	8	8		8	2			6
Detector Phase	7	7	4	4	3	3	8	8	2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0
Minimum Split (s)	12.0	12.0	28.3	28.3	12.0	12.0	28.3	28.3	47.3	47.3		47.3
Total Split (s)	14.0	14.0	69.0	69.0	14.0	14.0	69.0	69.0	47.0	47.0		47.0
Total Split (%)	10.8%	10.8%	53.1%	53.1%	10.8%	10.8%	53.1%	53.1%	36.2%	36.2%		36.2%
Maximum Green (s)	7.0	7.0	62.7	62.7	7.0	7.0	62.7	62.7	39.7	39.7		39.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3
All-Red Time (s)	3.3	3.3	2.6	2.6	3.3	3.3	2.6	2.6	4.0	4.0		4.0
Lost Time Adjust (s)		-3.0	-2.3	-2.3		-3.0	-2.3	-2.3		-3.3		-3.3
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	Max	Max	C-Max	C-Max	None	None	C-Max	C-Max	None	None		None
Walk Time (s)			10.0	10.0			10.0	10.0	27.0	27.0		27.0
Flash Dont Walk (s)			12.0	12.0			12.0	12.0	13.0	13.0		13.0
Pedestrian Calls (#/hr)			12	12			15	15	12	12		13
Act Effct Green (s)		98.0	92.2	92.2		74.2	65.0	65.0		25.9		25.9
Actuated g/C Ratio		0.75	0.71	0.71		0.57	0.50	0.50		0.20		0.20

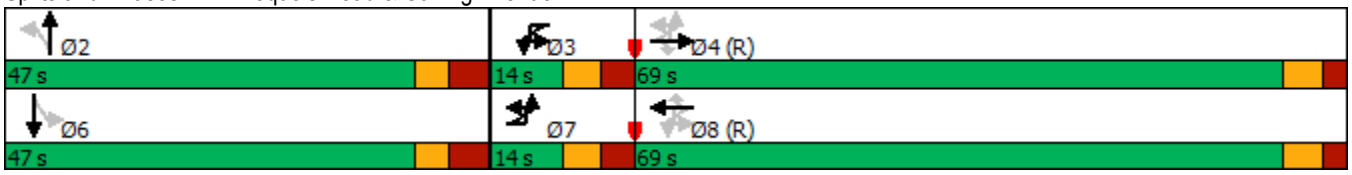
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	7	27
Future Volume (vph)	7	27
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.98	
Frt	0.881	
Flt Protected		
Satd. Flow (prot)	1490	0
Flt Permitted		
Satd. Flow (perm)	1490	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	27	
Link Speed (k/h)	50	
Link Distance (m)	304.9	
Travel Time (s)	22.0	
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	7%
Adj. Flow (vph)	7	27
Shared Lane Traffic (%)		
Lane Group Flow (vph)	34	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	47.3	
Total Split (s)	47.0	
Total Split (%)	36.2%	
Maximum Green (s)	39.7	
Yellow Time (s)	3.3	
All-Red Time (s)	4.0	
Lost Time Adjust (s)	-3.3	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	27.0	
Flash Dont Walk (s)	13.0	
Pedestrian Calls (#/hr)	13	
Act Effct Green (s)	25.9	
Actuated g/C Ratio	0.20	

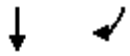
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.02	0.68	0.00		0.14	0.16	0.08		0.16		0.30
Control Delay		8.3	19.6	0.0		10.6	17.9	1.1		20.4		43.3
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0
Total Delay		8.3	19.6	0.0		10.6	17.9	1.1		20.4		43.3
LOS		A	B	A		B	B	A		C		D
Approach Delay			19.4				15.2			20.4		
Approach LOS			B				B			C		
Queue Length 50th (m)		0.8	108.5	0.0		1.8	18.5	0.0		6.2		18.2
Queue Length 95th (m)		5.2	#261.2	0.0		7.2	24.7	2.4		14.4		25.9
Internal Link Dist (m)			281.5				112.9			273.2		
Turn Bay Length (m)		25.0		40.0		20.0		85.0				50.0
Base Capacity (vph)		847	2405	1064		247	2343	750		556		414
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		0.02	0.68	0.00		0.13	0.16	0.08		0.10		0.18

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 6 (5%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 19.3 Intersection LOS: B
Intersection Capacity Utilization 73.1% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Iroquois Road & Carling Avenue





Lane Group	SBT	SBR
v/c Ratio	0.11	
Control Delay	14.5	
Queue Delay	0.0	
Total Delay	14.5	
LOS	B	
Approach Delay	34.3	
Approach LOS	C	
Queue Length 50th (m)	1.6	
Queue Length 95th (m)	8.7	
Internal Link Dist (m)	280.9	
Turn Bay Length (m)		
Base Capacity (vph)	510	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.07	

Intersection Summary

Intersection	
Int Delay, s/veh	0.9

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations		↑↑	↱		↳	↑↑	↰	
Traffic Vol, veh/h	1	1735	7	15	13	443	7	15
Future Vol, veh/h	1	1735	7	15	13	443	7	15
Conflicting Peds, #/hr	0	0	2	0	2	0	2	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	-	-	350	-	250	-	0	-
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	14	0	0	0	0	7
Mvmt Flow	1	1735	7	15	13	443	7	15

Major/Minor	Major1			Major2			Minor1	
Conflicting Flow All	443	0	0	1735	1744	0	2019	870
Stage 1	-	-	-	-	-	-	1739	-
Stage 2	-	-	-	-	-	-	280	-
Critical Hdwy	6.4	-	-	6.4	4.1	-	6.8	7.04
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	-
Follow-up Hdwy	2.5	-	-	2.5	2.2	-	3.5	3.37
Pot Cap-1 Maneuver	761	-	-	113	365	-	52	285
Stage 1	-	-	-	-	-	-	129	-
Stage 2	-	-	-	-	-	-	748	-
Platoon blocked, %		-	-			-		
Mov Cap-1 Maneuver	761	-	-	159	159	-	41	284
Mov Cap-2 Maneuver	-	-	-	-	-	-	41	-
Stage 1	-	-	-	-	-	-	123	-
Stage 2	-	-	-	-	-	-	615	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	52.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	98	-	-	159	-
HCM Lane V/C Ratio	0.224	-	-	0.176	-
HCM Control Delay (s)	52.1	-	-	32.4	-
HCM Lane LOS	F	-	-	D	-
HCM 95th %tile Q(veh)	0.8	-	-	0.6	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1750	7	13	458	7	15
Future Vol, veh/h	1750	7	13	458	7	15
Conflicting Peds, #/hr	0	2	2	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	350	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	14	0	0	0	7
Mvmt Flow	1750	7	13	458	7	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1759	0	2009	877
Stage 1	-	-	-	-	1752	-
Stage 2	-	-	-	-	257	-
Critical Hdwy	-	-	4.1	-	6.8	7.04
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.37
Pot Cap-1 Maneuver	-	-	360	-	53	282
Stage 1	-	-	-	-	127	-
Stage 2	-	-	-	-	768	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	359	-	51	281
Mov Cap-2 Maneuver	-	-	-	-	51	-
Stage 1	-	-	-	-	127	-
Stage 2	-	-	-	-	739	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	43.6
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	115	-	-	359	-
HCM Lane V/C Ratio	0.191	-	-	0.036	-
HCM Control Delay (s)	43.6	-	-	15.4	-
HCM Lane LOS	E	-	-	C	-
HCM 95th %tile Q(veh)	0.7	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1764	457	5	0	13
Future Vol, veh/h	0	1764	457	5	0	13
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	1764	457	5	0	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	237
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	771
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	765
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	765
HCM Lane V/C Ratio	-	-	-	0.017
HCM Control Delay (s)	-	-	-	9.8
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.1

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	16	29	1459	260	6	302	298	16	131	99	406	68
Future Volume (vph)	16	29	1459	260	6	302	298	16	131	99	406	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		55.0		130.0		115.0		0.0	75.0		0.0	45.0
Storage Lanes		1		1		2		0	1		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95		0.96		0.99	0.99		0.99	0.97		
Frt				0.850			0.992			0.879		
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1654	3390	1532	0	3228	3229	0	1679	1506	0	1679
Flt Permitted		0.950				0.950			0.351			0.134
Satd. Flow (perm)	0	1565	3390	1465	0	3205	3229	0	614	1506	0	237
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				242			6			90		
Link Speed (k/h)			60				60			50		
Link Distance (m)			447.3				309.6			300.2		
Travel Time (s)			26.8				18.6			21.6		
Confl. Peds. (#/hr)		25		16		16		25	13		15	15
Confl. Bikes (#/hr)								1			2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	7%	2%	1%	0%	4%	6%	0%	3%	5%	2%	3%
Adj. Flow (vph)	16	29	1459	260	6	302	298	16	131	99	406	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	45	1459	260	0	308	314	0	131	505	0	68
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases				4					2			6
Detector Phase	7	7	4	4	3	3	8		2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		10.0	10.0		10.0
Minimum Split (s)	10.9	10.9	23.9	23.9	10.9	10.9	23.9		24.8	24.8		24.8
Total Split (s)	13.2	13.2	59.0	59.0	17.0	17.0	62.8		44.0	44.0		44.0
Total Split (%)	11.0%	11.0%	49.2%	49.2%	14.2%	14.2%	52.3%		36.7%	36.7%		36.7%
Maximum Green (s)	7.3	7.3	53.1	53.1	11.1	11.1	56.9		37.2	37.2		37.2
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.2		3.5	3.5		3.5
Lost Time Adjust (s)		-1.9	-1.9	-1.9		-1.9	-1.9		-2.8	-2.8		-2.8
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0		4.0	4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None	C-Max	C-Max	None	None	C-Max		None	None		None
Walk Time (s)			7.0	7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)			16	16			25		15	15		13
Act Effct Green (s)		8.8	56.0	56.0		13.4	62.9		38.6	38.6		38.6
Actuated g/C Ratio		0.07	0.47	0.47		0.11	0.52		0.32	0.32		0.32

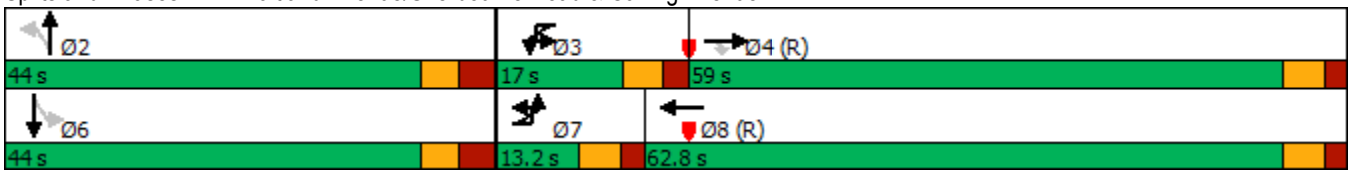
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	316	16
Future Volume (vph)	316	16
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	1.00	
Frt	0.993	
Flt Protected		
Satd. Flow (prot)	1765	0
Flt Permitted		
Satd. Flow (perm)	1765	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	2	
Link Speed (k/h)	50	
Link Distance (m)	301.0	
Travel Time (s)	21.7	
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	2%	6%
Adj. Flow (vph)	316	16
Shared Lane Traffic (%)		
Lane Group Flow (vph)	332	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	24.8	
Total Split (s)	44.0	
Total Split (%)	36.7%	
Maximum Green (s)	37.2	
Yellow Time (s)	3.3	
All-Red Time (s)	3.5	
Lost Time Adjust (s)	-2.8	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	7.0	
Flash Dont Walk (s)	11.0	
Pedestrian Calls (#/hr)	13	
Act Effct Green (s)	38.6	
Actuated g/C Ratio	0.32	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.37	0.92	0.32		0.85	0.19		0.66	0.93		0.89
Control Delay		61.8	41.2	4.2		74.7	16.2		52.8	56.6		118.7
Queue Delay		0.0	0.0	0.0		0.0	0.0		0.0	0.0		0.0
Total Delay		61.8	41.2	4.2		74.7	16.2		52.8	56.6		118.7
LOS		E	D	A		E	B		D	E		F
Approach Delay			36.3				45.2			55.8		
Approach LOS			D				D			E		
Queue Length 50th (m)		10.2	168.0	2.3		37.4	20.8		26.0	95.9		14.9
Queue Length 95th (m)		22.3	#218.2	16.7		#61.6	29.6		#53.3	#159.4		#43.4
Internal Link Dist (m)			423.3				285.6			276.2		
Turn Bay Length (m)		55.0		130.0		115.0			75.0			45.0
Base Capacity (vph)		126	1581	812		361	1694		204	562		79
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		0.36	0.92	0.32		0.85	0.19		0.64	0.90		0.86

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 43.4 Intersection LOS: D
Intersection Capacity Utilization 106.6% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Maitland Avenue/Sherbourne Road & Carling Avenue



Lane Group	SBT	SBR
v/c Ratio	0.58	
Control Delay	38.3	
Queue Delay	0.0	
Total Delay	38.3	
LOS	D	
Approach Delay	51.9	
Approach LOS	D	
Queue Length 50th (m)	63.5	
Queue Length 95th (m)	92.8	
Internal Link Dist (m)	277.0	
Turn Bay Length (m)		
Base Capacity (vph)	589	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.56	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	41	689	4	6	17	1449	107	13	20	10	117
Future Volume (vph)	1	41	689	4	6	17	1449	107	13	20	10	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0		40.0		20.0		85.0	0.0		0.0	50.0
Storage Lanes		1		1		1		1	0		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.92		0.98		0.90		0.99		0.98
Frt				0.850				0.850		0.969		
Flt Protected		0.950				0.950				0.985		0.950
Satd. Flow (prot)	0	1729	3390	1547	0	1656	4919	1547	0	1726	0	1712
Flt Permitted		0.108				0.390				0.921		0.761
Satd. Flow (perm)	0	197	3390	1426	0	665	4919	1391	0	1602	0	1350
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				36				107		10		
Link Speed (k/h)			60				60			50		
Link Distance (m)			305.5				137.5			297.2		
Travel Time (s)			18.3				8.3			21.4		
Confl. Peds. (#/hr)		28		19		19		28	28		17	17
Confl. Bikes (#/hr)				6								
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	6%	1%	0%	0%	0%	0%	1%
Adj. Flow (vph)	1	41	689	4	6	17	1449	107	13	20	10	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	689	4	0	23	1449	107	0	43	0	117
Turn Type	pm+pt	pm+pt	NA	Perm	Perm	Perm	NA	Perm	Perm	NA		Perm
Protected Phases	7	7	4				8			2		
Permitted Phases	4	4		4	8	8		8	2			6
Detector Phase	7	7	4	4	8	8	8	8	2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0
Minimum Split (s)	12.0	12.0	28.3	28.3	28.3	28.3	28.3	28.3	47.3	47.3		47.3
Total Split (s)	12.0	12.0	83.0	83.0	71.0	71.0	71.0	71.0	47.0	47.0		47.0
Total Split (%)	9.2%	9.2%	63.8%	63.8%	54.6%	54.6%	54.6%	54.6%	36.2%	36.2%		36.2%
Maximum Green (s)	5.0	5.0	76.7	76.7	64.7	64.7	64.7	64.7	39.7	39.7		39.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3
All-Red Time (s)	3.3	3.3	2.6	2.6	2.6	2.6	2.6	2.6	4.0	4.0		4.0
Lost Time Adjust (s)		-3.0	-2.3	-2.3		-2.3	-2.3	-2.3		-3.3		-3.3
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lead			Lag	Lag	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	Max	Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None
Walk Time (s)			10.0	10.0	10.0	10.0	10.0	10.0	27.0	27.0		27.0
Flash Dont Walk (s)			12.0	12.0	12.0	12.0	12.0	12.0	13.0	13.0		13.0
Pedestrian Calls (#/hr)			19	19	28	28	28	28	17	17		28
Act Effct Green (s)		90.1	90.1	90.1		67.0	67.0	67.0		31.9		31.9
Actuated g/C Ratio		0.69	0.69	0.69		0.52	0.52	0.52		0.25		0.25

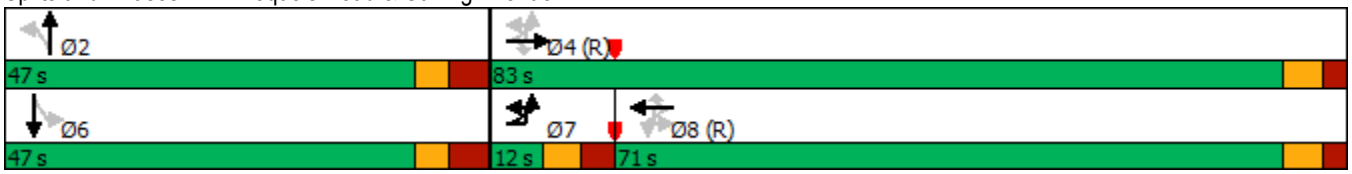
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	23	60
Future Volume (vph)	23	60
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.97	
Frt	0.892	
Flt Protected		
Satd. Flow (prot)	1554	0
Flt Permitted		
Satd. Flow (perm)	1554	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	30	
Link Speed (k/h)	50	
Link Distance (m)	304.9	
Travel Time (s)	22.0	
Confl. Peds. (#/hr)		28
Confl. Bikes (#/hr)		2
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	2%
Adj. Flow (vph)	23	60
Shared Lane Traffic (%)		
Lane Group Flow (vph)	83	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	47.3	
Total Split (s)	47.0	
Total Split (%)	36.2%	
Maximum Green (s)	39.7	
Yellow Time (s)	3.3	
All-Red Time (s)	4.0	
Lost Time Adjust (s)	-3.3	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	27.0	
Flash Dont Walk (s)	13.0	
Pedestrian Calls (#/hr)	28	
Act Effct Green (s)	31.9	
Actuated g/C Ratio	0.25	

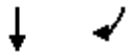
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.12	0.29	0.00		0.07	0.57	0.14		0.11		0.35
Control Delay		10.1	9.9	0.0		16.6	22.8	3.3		26.5		40.4
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0
Total Delay		10.1	9.9	0.0		16.6	22.8	3.3		26.5		40.4
LOS		B	A	A		B	C	A		C		D
Approach Delay			9.8				21.4			26.5		
Approach LOS			A				C			C		
Queue Length 50th (m)		4.1	43.3	0.0		2.9	90.5	0.0		5.8		21.9
Queue Length 95th (m)		8.8	54.4	0.0		7.8	104.5	8.9		14.4		37.8
Internal Link Dist (m)			281.5				113.5			273.2		
Turn Bay Length (m)		25.0		40.0		20.0		85.0				50.0
Base Capacity (vph)		361	2350	999		342	2535	768		536		446
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		0.12	0.29	0.00		0.07	0.57	0.14		0.08		0.26

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 19.0 Intersection LOS: B
Intersection Capacity Utilization 69.0% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Iroquois Road & Carling Avenue

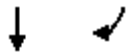




Lane Group	SBT	SBR
v/c Ratio	0.21	
Control Delay	22.8	
Queue Delay	0.0	
Total Delay	22.8	
LOS	C	
Approach Delay	33.1	
Approach LOS	C	
Queue Length 50th (m)	9.4	
Queue Length 95th (m)	21.5	
Internal Link Dist (m)	280.9	
Turn Bay Length (m)		
Base Capacity (vph)	534	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.16	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	2	41	688	4	32	17	1448	107	13	20	10	117
Future Volume (vph)	2	41	688	4	32	17	1448	107	13	20	10	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0		40.0		20.0		85.0	0.0		0.0	50.0
Storage Lanes		1		1		1		1	0		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.92		0.98		0.90		0.99		0.98
Frt				0.850				0.850		0.969		
Flt Protected		0.950				0.950				0.985		0.950
Satd. Flow (prot)	0	1729	3390	1547	0	1694	4919	1547	0	1726	0	1712
Flt Permitted		0.108				0.390				0.921		0.761
Satd. Flow (perm)	0	197	3390	1425	0	684	4919	1391	0	1602	0	1350
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				95				107		10		
Link Speed (k/h)			60				60			50		
Link Distance (m)			305.5				137.5			297.2		
Travel Time (s)			18.3				8.3			21.4		
Confl. Peds. (#/hr)		28		19		19		28	28		17	17
Confl. Bikes (#/hr)				6								
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	6%	1%	0%	0%	0%	0%	1%
Adj. Flow (vph)	2	41	688	4	32	17	1448	107	13	20	10	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	688	4	0	49	1448	107	0	43	0	117
Turn Type	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases	4	4		4	8	8		8	2			6
Detector Phase	7	7	4	4	3	3	8	8	2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0
Minimum Split (s)	12.0	12.0	28.3	28.3	12.0	12.0	28.3	28.3	47.3	47.3		47.3
Total Split (s)	12.0	12.0	71.0	71.0	12.0	12.0	71.0	71.0	47.0	47.0		47.0
Total Split (%)	9.2%	9.2%	54.6%	54.6%	9.2%	9.2%	54.6%	54.6%	36.2%	36.2%		36.2%
Maximum Green (s)	5.0	5.0	64.7	64.7	5.0	5.0	64.7	64.7	39.7	39.7		39.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3
All-Red Time (s)	3.3	3.3	2.6	2.6	3.3	3.3	2.6	2.6	4.0	4.0		4.0
Lost Time Adjust (s)		-3.0	-2.3	-2.3		-3.0	-2.3	-2.3		-3.3		-3.3
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	Max	Max	C-Max	C-Max	None	None	C-Max	C-Max	None	None		None
Walk Time (s)			10.0	10.0			10.0	10.0	27.0	27.0		27.0
Flash Dont Walk (s)			12.0	12.0			12.0	12.0	13.0	13.0		13.0
Pedestrian Calls (#/hr)			19	19			28	28	17	17		28
Act Effct Green (s)		87.7	80.3	80.3		75.3	67.0	67.0		31.9		31.9
Actuated g/C Ratio		0.67	0.62	0.62		0.58	0.52	0.52		0.25		0.25



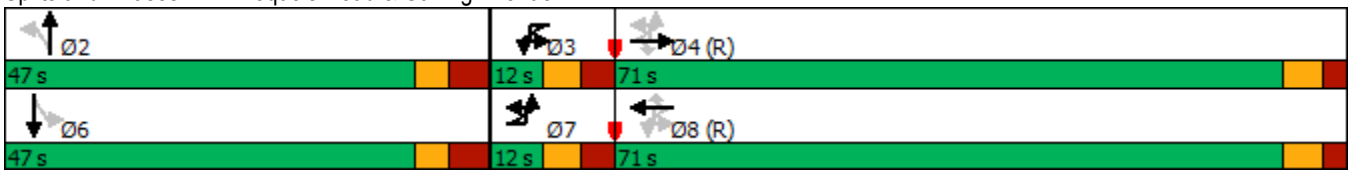
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	23	60
Future Volume (vph)	23	60
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.97	
Frt	0.892	
Flt Protected		
Satd. Flow (prot)	1554	0
Flt Permitted		
Satd. Flow (perm)	1554	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	30	
Link Speed (k/h)	50	
Link Distance (m)	304.9	
Travel Time (s)	22.0	
Confl. Peds. (#/hr)		28
Confl. Bikes (#/hr)		2
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	2%
Adj. Flow (vph)	23	60
Shared Lane Traffic (%)		
Lane Group Flow (vph)	83	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	47.3	
Total Split (s)	47.0	
Total Split (%)	36.2%	
Maximum Green (s)	39.7	
Yellow Time (s)	3.3	
All-Red Time (s)	4.0	
Lost Time Adjust (s)	-3.3	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	27.0	
Flash Dont Walk (s)	13.0	
Pedestrian Calls (#/hr)	28	
Act Effct Green (s)	31.9	
Actuated g/C Ratio	0.25	

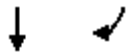
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.12	0.33	0.00		0.11	0.57	0.14		0.11		0.35
Control Delay		10.3	15.3	0.0		10.4	22.8	3.3		26.5		40.4
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0
Total Delay		10.3	15.3	0.0		10.4	22.8	3.3		26.5		40.4
LOS		B	B	A		B	C	A		C		D
Approach Delay			14.9				21.1			26.5		
Approach LOS			B				C			C		
Queue Length 50th (m)		4.2	54.6	0.0		4.8	90.4	0.0		5.8		21.9
Queue Length 95th (m)		9.0	69.0	0.0		10.0	104.5	8.9		14.4		37.8
Internal Link Dist (m)			281.5				113.5			273.2		
Turn Bay Length (m)		25.0		40.0		20.0		85.0				50.0
Base Capacity (vph)		358	2095	917		460	2535	768		536		446
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		0.12	0.33	0.00		0.11	0.57	0.14		0.08		0.26

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 20.3 Intersection LOS: C
Intersection Capacity Utilization 69.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Iroquois Road & Carling Avenue





Lane Group	SBT	SBR
v/c Ratio	0.21	
Control Delay	22.8	
Queue Delay	0.0	
Total Delay	22.8	
LOS	C	
Approach Delay	33.1	
Approach LOS	C	
Queue Length 50th (m)	9.4	
Queue Length 95th (m)	21.5	
Internal Link Dist (m)	280.9	
Turn Bay Length (m)		
Base Capacity (vph)	534	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.16	

Intersection Summary

Intersection	
Int Delay, s/veh	0.6

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations		↑↑	↱		↳	↑↑	↰	
Traffic Vol, veh/h	1	810	8	26	37	1565	10	11
Future Vol, veh/h	1	810	8	26	37	1565	10	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None
Storage Length	-	-	350	-	250	-	0	-
Veh in Median Storage, #	-	0	-	-	-	0	0	-
Grade, %	-	0	-	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	4	0	0	0	0
Mvmt Flow	1	810	8	26	37	1565	10	11

Major/Minor	Major1			Major2			Minor1	
Conflicting Flow All	1565	0	0	810	818	0	1721	405
Stage 1	-	-	-	-	-	-	812	-
Stage 2	-	-	-	-	-	-	909	-
Critical Hdwy	6.4	-	-	6.48	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.8	-
Follow-up Hdwy	2.5	-	-	2.54	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	146	-	-	433	819	-	82	601
Stage 1	-	-	-	-	-	-	402	-
Stage 2	-	-	-	-	-	-	358	-
Platoon blocked, %		-	-			-		
Mov Cap-1 Maneuver	146	-	-	592	592	-	72	601
Mov Cap-2 Maneuver	-	-	-	-	-	-	72	-
Stage 1	-	-	-	-	-	-	397	-
Stage 2	-	-	-	-	-	-	320	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	36.8
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	134	-	-	592	-
HCM Lane V/C Ratio	0.157	-	-	0.106	-
HCM Control Delay (s)	36.8	-	-	11.8	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	0.5	-	-	0.4	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	836	8	37	1591	10	11
Future Vol, veh/h	836	8	37	1591	10	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	350	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	836	8	37	1591	10	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	844	0	1706	418
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	870	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	801	-	84	589
Stage 1	-	-	-	-	391	-
Stage 2	-	-	-	-	375	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	801	-	80	589
Mov Cap-2 Maneuver	-	-	-	-	80	-
Stage 1	-	-	-	-	391	-
Stage 2	-	-	-	-	358	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	33.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	146	-	-	801	-
HCM Lane V/C Ratio	0.144	-	-	0.046	-
HCM Control Delay (s)	33.8	-	-	9.7	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	847	1615	16	0	12
Future Vol, veh/h	0	847	1615	16	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	8
Mvmt Flow	0	847	1615	16	0	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	808
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.06
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.38
Pot Cap-1 Maneuver	0	-	-	-	0	312
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	312
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	312
HCM Lane V/C Ratio	-	-	-	0.038
HCM Control Delay (s)	-	-	-	17
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.1

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	22	62	592	171	9	734	1343	54	221	213	213	48
Future Volume (vph)	22	62	592	171	9	734	1343	54	221	213	213	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		55.0		130.0		115.0		0.0	75.0		0.0	45.0
Storage Lanes		1		1		1		0	1		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98		0.94		0.96	0.99		0.98	0.98		
Frt				0.850			0.994			0.925		
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1729	3390	1532	0	3321	3381	0	1729	1624	0	1729
Flt Permitted		0.950				0.950			0.462			0.223
Satd. Flow (perm)	0	1699	3390	1438	0	3200	3381	0	822	1624	0	406
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				171			4			49		
Link Speed (k/h)			60				60			50		
Link Distance (m)			447.3				309.6			300.2		
Travel Time (s)			26.8				18.6			21.6		
Confl. Peds. (#/hr)		36		25		25		36	20		15	15
Confl. Bikes (#/hr)								2				
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	1%	0%	1%	1%	4%	0%	0%	3%	0%
Adj. Flow (vph)	22	62	592	171	9	734	1343	54	221	213	213	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	592	171	0	743	1397	0	221	426	0	48
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases				4					2			6
Detector Phase	7	7	4	4	3	3	8		2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		10.0	10.0		10.0
Minimum Split (s)	10.9	10.9	23.9	23.9	10.9	10.9	23.9		24.8	24.8		24.8
Total Split (s)	11.0	11.0	33.0	33.0	37.0	37.0	59.0		50.0	50.0		50.0
Total Split (%)	9.2%	9.2%	27.5%	27.5%	30.8%	30.8%	49.2%		41.7%	41.7%		41.7%
Maximum Green (s)	5.1	5.1	27.1	27.1	31.1	31.1	53.1		43.2	43.2		43.2
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.2		3.5	3.5		3.5
Lost Time Adjust (s)		-1.9	-1.9	-1.9		-1.9	-1.9		-2.8	-2.8		-2.8
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0		4.0	4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None	C-Max	C-Max	None	None	C-Max		None	None		None
Walk Time (s)			7.0	7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)			25	25			36		15	15		20
Act Effct Green (s)		10.4	38.1	38.1		32.1	59.7		37.9	37.9		37.9
Actuated g/C Ratio		0.09	0.32	0.32		0.27	0.50		0.32	0.32		0.32

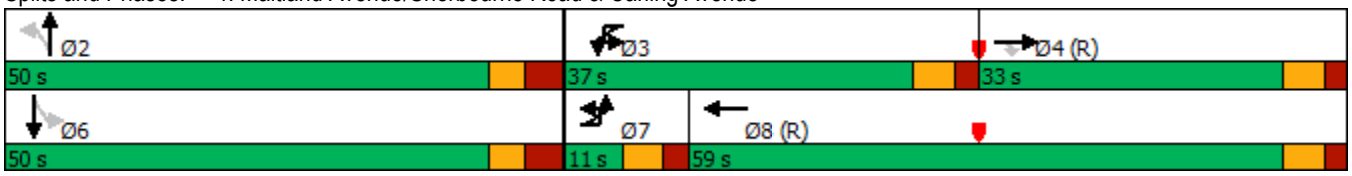
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	201	45
Future Volume (vph)	201	45
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.99	
Frt	0.973	
Flt Protected		
Satd. Flow (prot)	1748	0
Flt Permitted		
Satd. Flow (perm)	1748	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	11	
Link Speed (k/h)	50	
Link Distance (m)	301.0	
Travel Time (s)	21.7	
Confl. Peds. (#/hr)		20
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	2%
Adj. Flow (vph)	201	45
Shared Lane Traffic (%)		
Lane Group Flow (vph)	246	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	24.8	
Total Split (s)	50.0	
Total Split (%)	41.7%	
Maximum Green (s)	43.2	
Yellow Time (s)	3.3	
All-Red Time (s)	3.5	
Lost Time Adjust (s)	-2.8	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	7.0	
Flash Dont Walk (s)	11.0	
Pedestrian Calls (#/hr)	20	
Act Effct Green (s)	37.9	
Actuated g/C Ratio	0.32	

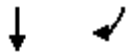
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.56	0.55	0.30		0.84	0.83		0.85	0.78		0.38
Control Delay		68.2	38.8	7.1		50.9	32.4		66.1	42.6		38.4
Queue Delay		0.0	0.0	0.0		0.0	0.0		0.0	0.0		0.0
Total Delay		68.2	38.8	7.1		50.9	32.4		66.1	42.6		38.4
LOS		E	D	A		D	C		E	D		D
Approach Delay			35.3				38.8			50.6		
Approach LOS			D				D			D		
Queue Length 50th (m)		18.6	64.0	0.6		82.9	155.6		47.7	79.8		8.6
Queue Length 95th (m)		m#48.5	m88.2	m16.9		107.1	#192.0		#77.2	108.3		18.8
Internal Link Dist (m)			423.3				285.6			276.2		
Turn Bay Length (m)		55.0		130.0		115.0			75.0			45.0
Base Capacity (vph)		150	1075	573		930	1683		315	652		155
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		0.56	0.55	0.30		0.80	0.83		0.70	0.65		0.31

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 103 (86%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 39.6 Intersection LOS: D
Intersection Capacity Utilization 94.0% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Maitland Avenue/Sherbourne Road & Carling Avenue

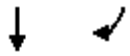




Lane Group	SBT	SBR
v/c Ratio	0.44	
Control Delay	32.4	
Queue Delay	0.0	
Total Delay	32.4	
LOS	C	
Approach Delay	33.4	
Approach LOS	C	
Queue Length 50th (m)	43.0	
Queue Length 95th (m)	60.3	
Internal Link Dist (m)	277.0	
Turn Bay Length (m)		
Base Capacity (vph)	676	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.36	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	19	1588	5	25	7	365	60	3	24	30	75
Future Volume (vph)	1	19	1588	5	25	7	365	60	3	24	30	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0		40.0		20.0		85.0	0.0		0.0	50.0
Storage Lanes		1		1		1		1	0		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97		0.94				0.94		0.99		0.99
Frt				0.850				0.850		0.929		
Flt Protected		0.950				0.950				0.997		0.950
Satd. Flow (prot)	0	1729	3390	1547	0	1729	4687	1502	0	1635	0	1679
Flt Permitted		0.485				0.135				0.990		0.717
Satd. Flow (perm)	0	860	3390	1461	0	246	4687	1406	0	1623	0	1254
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				95				95		30		
Link Speed (k/h)			60				60			50		
Link Distance (m)			305.5				136.9			297.2		
Travel Time (s)			18.3				8.2			21.4		
Confl. Peds. (#/hr)		15		12		12		15	13		12	12
Confl. Bikes (#/hr)				1				1			4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	3%	0%	4%	0%	3%
Adj. Flow (vph)	1	19	1588	5	25	7	365	60	3	24	30	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	20	1588	5	0	32	365	60	0	57	0	75
Turn Type	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases	4	4		4	8	8		8	2			6
Detector Phase	7	7	4	4	3	3	8	8	2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0
Minimum Split (s)	12.0	12.0	28.3	28.3	12.0	12.0	28.3	28.3	47.3	47.3		47.3
Total Split (s)	14.0	14.0	69.0	69.0	14.0	14.0	69.0	69.0	47.0	47.0		47.0
Total Split (%)	10.8%	10.8%	53.1%	53.1%	10.8%	10.8%	53.1%	53.1%	36.2%	36.2%		36.2%
Maximum Green (s)	7.0	7.0	62.7	62.7	7.0	7.0	62.7	62.7	39.7	39.7		39.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3
All-Red Time (s)	3.3	3.3	2.6	2.6	3.3	3.3	2.6	2.6	4.0	4.0		4.0
Lost Time Adjust (s)		-3.0	-2.3	-2.3		-3.0	-2.3	-2.3		-3.3		-3.3
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	Max	Max	C-Max	C-Max	None	None	C-Max	C-Max	None	None		None
Walk Time (s)			10.0	10.0			10.0	10.0	27.0	27.0		27.0
Flash Dont Walk (s)			12.0	12.0			12.0	12.0	13.0	13.0		13.0
Pedestrian Calls (#/hr)			12	12			15	15	12	12		13
Act Effct Green (s)		98.0	92.2	92.2		74.2	65.0	65.0		25.9		25.9
Actuated g/C Ratio		0.75	0.71	0.71		0.57	0.50	0.50		0.20		0.20



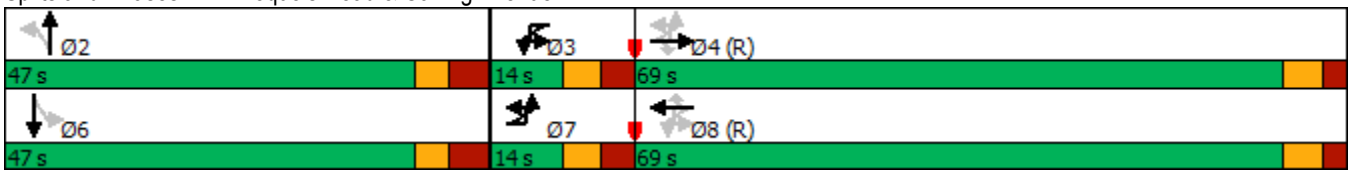
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	7	27
Future Volume (vph)	7	27
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.98	
Frt	0.881	
Flt Protected		
Satd. Flow (prot)	1490	0
Flt Permitted		
Satd. Flow (perm)	1490	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	27	
Link Speed (k/h)	50	
Link Distance (m)	304.9	
Travel Time (s)	22.0	
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	7%
Adj. Flow (vph)	7	27
Shared Lane Traffic (%)		
Lane Group Flow (vph)	34	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	47.3	
Total Split (s)	47.0	
Total Split (%)	36.2%	
Maximum Green (s)	39.7	
Yellow Time (s)	3.3	
All-Red Time (s)	4.0	
Lost Time Adjust (s)	-3.3	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	27.0	
Flash Dont Walk (s)	13.0	
Pedestrian Calls (#/hr)	13	
Act Effct Green (s)	25.9	
Actuated g/C Ratio	0.20	

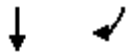
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.02	0.66	0.00		0.13	0.16	0.08		0.16		0.30
Control Delay		8.3	19.1	0.0		10.5	17.8	1.1		20.4		43.3
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0
Total Delay		8.3	19.1	0.0		10.5	17.8	1.1		20.4		43.3
LOS		A	B	A		B	B	A		C		D
Approach Delay			18.9				15.1			20.4		
Approach LOS			B				B			C		
Queue Length 50th (m)		0.8	103.3	0.0		1.8	18.0	0.0		6.2		18.2
Queue Length 95th (m)		5.2	#250.0	0.0		7.2	24.2	2.4		14.4		25.9
Internal Link Dist (m)			281.5				112.9			273.2		
Turn Bay Length (m)		25.0		40.0		20.0		85.0				50.0
Base Capacity (vph)		852	2405	1064		256	2343	750		556		414
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		0.02	0.66	0.00		0.13	0.16	0.08		0.10		0.18

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 6 (5%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 18.9 Intersection LOS: B
Intersection Capacity Utilization 71.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Iroquois Road & Carling Avenue





Lane Group	SBT	SBR
v/c Ratio	0.11	
Control Delay	14.5	
Queue Delay	0.0	
Total Delay	14.5	
LOS	B	
Approach Delay	34.3	
Approach LOS	C	
Queue Length 50th (m)	1.6	
Queue Length 95th (m)	8.7	
Internal Link Dist (m)	280.9	
Turn Bay Length (m)		
Base Capacity (vph)	510	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.07	

Intersection Summary

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1706	7	13	447	7	15
Future Vol, veh/h	1706	7	13	447	7	15
Conflicting Peds, #/hr	0	2	2	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	350	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	14	0	0	0	7
Mvmt Flow	1706	7	13	447	7	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1715	0	1960	855
Stage 1	-	-	-	-	1708	-
Stage 2	-	-	-	-	252	-
Critical Hdwy	-	-	4.1	-	6.8	7.04
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.37
Pot Cap-1 Maneuver	-	-	375	-	57	292
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	773	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	374	-	55	291
Mov Cap-2 Maneuver	-	-	-	-	55	-
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	744	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	40.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	123	-	-	374	-
HCM Lane V/C Ratio	0.179	-	-	0.035	-
HCM Control Delay (s)	40.5	-	-	15	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1720	446	5	0	13
Future Vol, veh/h	0	1720	446	5	0	13
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	1720	446	5	0	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	231
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	777
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	771
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	771
HCM Lane V/C Ratio	-	-	-	0.017
HCM Control Delay (s)	-	-	-	9.7
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.1

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	16	28	1423	253	6	294	291	16	128	97	396	66
Future Volume (vph)	16	28	1423	253	6	294	291	16	128	97	396	66
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		55.0		130.0		115.0		0.0	75.0		0.0	45.0
Storage Lanes		1		1		2		0	1		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95		0.96		0.99	0.99		0.99	0.97		
Frt				0.850			0.992			0.880		
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1655	3390	1532	0	3228	3228	0	1679	1508	0	1679
Flt Permitted		0.950				0.950			0.357			0.142
Satd. Flow (perm)	0	1565	3390	1465	0	3204	3228	0	624	1508	0	251
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				250			6			91		
Link Speed (k/h)			60				60			50		
Link Distance (m)			447.3				309.6			300.2		
Travel Time (s)			26.8				18.6			21.6		
Confl. Peds. (#/hr)		25		16		16		25	13		15	15
Confl. Bikes (#/hr)								1			2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	7%	2%	1%	0%	4%	6%	0%	3%	5%	2%	3%
Adj. Flow (vph)	16	28	1423	253	6	294	291	16	128	97	396	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	1423	253	0	300	307	0	128	493	0	66
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases				4					2			6
Detector Phase	7	7	4	4	3	3	8		2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		10.0	10.0		10.0
Minimum Split (s)	10.9	10.9	23.9	23.9	10.9	10.9	23.9		24.8	24.8		24.8
Total Split (s)	13.2	13.2	59.0	59.0	17.0	17.0	62.8		44.0	44.0		44.0
Total Split (%)	11.0%	11.0%	49.2%	49.2%	14.2%	14.2%	52.3%		36.7%	36.7%		36.7%
Maximum Green (s)	7.3	7.3	53.1	53.1	11.1	11.1	56.9		37.2	37.2		37.2
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.2		3.5	3.5		3.5
Lost Time Adjust (s)		-1.9	-1.9	-1.9		-1.9	-1.9		-2.8	-2.8		-2.8
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0		4.0	4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None	C-Max	C-Max	None	None	C-Max		None	None		None
Walk Time (s)			7.0	7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)			16	16			25		15	15		13
Act Effct Green (s)		8.8	56.4	56.4		13.5	63.4		38.1	38.1		38.1
Actuated g/C Ratio		0.07	0.47	0.47		0.11	0.53		0.32	0.32		0.32

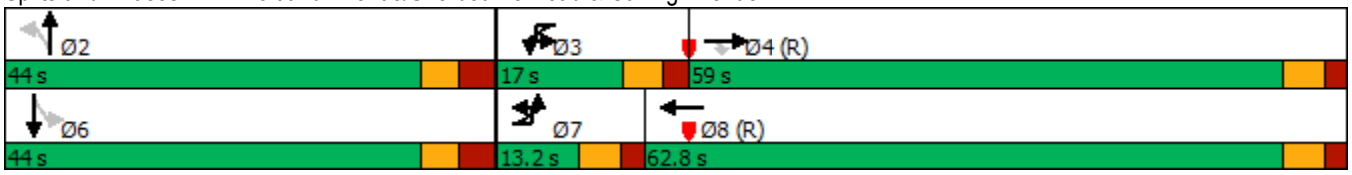
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	308	16
Future Volume (vph)	308	16
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	1.00	
Frt	0.993	
Flt Protected		
Satd. Flow (prot)	1765	0
Flt Permitted		
Satd. Flow (perm)	1765	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	2	
Link Speed (k/h)	50	
Link Distance (m)	301.0	
Travel Time (s)	21.7	
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	2%	6%
Adj. Flow (vph)	308	16
Shared Lane Traffic (%)		
Lane Group Flow (vph)	324	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	24.8	
Total Split (s)	44.0	
Total Split (%)	36.7%	
Maximum Green (s)	37.2	
Yellow Time (s)	3.3	
All-Red Time (s)	3.5	
Lost Time Adjust (s)	-2.8	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	7.0	
Flash Dont Walk (s)	11.0	
Pedestrian Calls (#/hr)	13	
Act Effct Green (s)	38.1	
Actuated g/C Ratio	0.32	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.36	0.89	0.31		0.83	0.18		0.65	0.91		0.84
Control Delay		61.6	38.0	3.5		71.9	16.0		51.3	54.3		103.0
Queue Delay		0.0	0.0	0.0		0.0	0.0		0.0	0.0		0.0
Total Delay		61.6	38.0	3.5		71.9	16.0		51.3	54.3		103.0
LOS		E	D	A		E	B		D	D		F
Approach Delay			33.6				43.7			53.7		
Approach LOS			C				D			D		
Queue Length 50th (m)		10.0	160.8	0.4		36.3	20.3		25.2	91.6		14.0
Queue Length 95th (m)		22.1	#208.9	14.2		#59.3	29.0		48.4	#152.9		#40.8
Internal Link Dist (m)			423.3				285.6			276.2		
Turn Bay Length (m)		55.0		130.0		115.0			75.0			45.0
Base Capacity (vph)		126	1593	820		362	1707		208	563		83
Starvation Cap Reductn		0	0	0		0	0		0	0		0
Spillback Cap Reductn		0	0	0		0	0		0	0		0
Storage Cap Reductn		0	0	0		0	0		0	0		0
Reduced v/c Ratio		0.35	0.89	0.31		0.83	0.18		0.62	0.88		0.80

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 41.0 Intersection LOS: D
Intersection Capacity Utilization 104.6% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

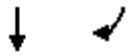
Splits and Phases: 4: Maitland Avenue/Sherbourne Road & Carling Avenue



Lane Group	SBT	SBR
v/c Ratio	0.58	
Control Delay	38.3	
Queue Delay	0.0	
Total Delay	38.3	
LOS	D	
Approach Delay	49.2	
Approach LOS	D	
Queue Length 50th (m)	61.6	
Queue Length 95th (m)	90.3	
Internal Link Dist (m)	277.0	
Turn Bay Length (m)		
Base Capacity (vph)	589	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.55	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	2	41	671	4	32	17	1412	107	13	20	10	117
Future Volume (vph)	2	41	671	4	32	17	1412	107	13	20	10	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0		40.0		20.0		85.0	0.0		0.0	50.0
Storage Lanes		1		1		1		1	0		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.92		0.98		0.90		0.99		0.98
Frt				0.850				0.850		0.969		
Flt Protected		0.950				0.950				0.985		0.950
Satd. Flow (prot)	0	1729	3390	1547	0	1694	4919	1547	0	1726	0	1712
Flt Permitted		0.115				0.397				0.921		0.761
Satd. Flow (perm)	0	208	3390	1425	0	696	4919	1391	0	1602	0	1350
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				95				107		10		
Link Speed (k/h)			60				60			50		
Link Distance (m)			305.5				137.5			297.2		
Travel Time (s)			18.3				8.3			21.4		
Confl. Peds. (#/hr)		28		19		19		28	28		17	17
Confl. Bikes (#/hr)				6								
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	6%	1%	0%	0%	0%	0%	1%
Adj. Flow (vph)	2	41	671	4	32	17	1412	107	13	20	10	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	671	4	0	49	1412	107	0	43	0	117
Turn Type	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases	4	4		4	8	8		8	2			6
Detector Phase	7	7	4	4	3	3	8	8	2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0
Minimum Split (s)	12.0	12.0	28.3	28.3	12.0	12.0	28.3	28.3	47.3	47.3		47.3
Total Split (s)	12.0	12.0	71.0	71.0	12.0	12.0	71.0	71.0	47.0	47.0		47.0
Total Split (%)	9.2%	9.2%	54.6%	54.6%	9.2%	9.2%	54.6%	54.6%	36.2%	36.2%		36.2%
Maximum Green (s)	5.0	5.0	64.7	64.7	5.0	5.0	64.7	64.7	39.7	39.7		39.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3
All-Red Time (s)	3.3	3.3	2.6	2.6	3.3	3.3	2.6	2.6	4.0	4.0		4.0
Lost Time Adjust (s)		-3.0	-2.3	-2.3		-3.0	-2.3	-2.3		-3.3		-3.3
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	Max	Max	C-Max	C-Max	None	None	C-Max	C-Max	None	None		None
Walk Time (s)			10.0	10.0			10.0	10.0	27.0	27.0		27.0
Flash Dont Walk (s)			12.0	12.0			12.0	12.0	13.0	13.0		13.0
Pedestrian Calls (#/hr)			19	19			28	28	17	17		28
Act Effct Green (s)		87.7	80.3	80.3		75.3	67.0	67.0		31.9		31.9
Actuated g/C Ratio		0.67	0.62	0.62		0.58	0.52	0.52		0.25		0.25



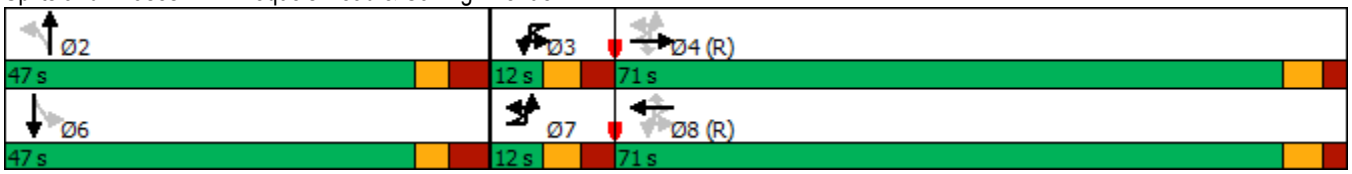
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	23	60
Future Volume (vph)	23	60
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.97	
Frt	0.892	
Flt Protected		
Satd. Flow (prot)	1554	0
Flt Permitted		
Satd. Flow (perm)	1554	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	32	
Link Speed (k/h)	50	
Link Distance (m)	304.9	
Travel Time (s)	22.0	
Confl. Peds. (#/hr)		28
Confl. Bikes (#/hr)		2
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	2%
Adj. Flow (vph)	23	60
Shared Lane Traffic (%)		
Lane Group Flow (vph)	83	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	47.3	
Total Split (s)	47.0	
Total Split (%)	36.2%	
Maximum Green (s)	39.7	
Yellow Time (s)	3.3	
All-Red Time (s)	4.0	
Lost Time Adjust (s)	-3.3	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	27.0	
Flash Dont Walk (s)	13.0	
Pedestrian Calls (#/hr)	28	
Act Effct Green (s)	31.9	
Actuated g/C Ratio	0.25	

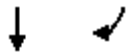
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.12	0.32	0.00		0.11	0.56	0.14		0.11		0.35
Control Delay		10.2	15.2	0.0		10.4	22.5	3.3		26.5		40.4
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0
Total Delay		10.2	15.2	0.0		10.4	22.5	3.3		26.5		40.4
LOS		B	B	A		B	C	A		C		D
Approach Delay			14.8				20.8			26.5		
Approach LOS			B				C			C		
Queue Length 50th (m)		4.2	53.0	0.0		4.8	87.2	0.0		5.8		21.9
Queue Length 95th (m)		9.0	67.0	0.0		10.0	100.9	8.9		14.4		37.8
Internal Link Dist (m)			281.5				113.5			273.2		
Turn Bay Length (m)		25.0		40.0		20.0		85.0				50.0
Base Capacity (vph)		364	2095	917		466	2535	768		536		446
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		0.12	0.32	0.00		0.11	0.56	0.14		0.08		0.26

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 20.1 Intersection LOS: C
Intersection Capacity Utilization 68.5% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Iroquois Road & Carling Avenue





Lane Group	SBT	SBR
v/c Ratio	0.20	
Control Delay	22.0	
Queue Delay	0.0	
Total Delay	22.0	
LOS	C	
Approach Delay	32.8	
Approach LOS	C	
Queue Length 50th (m)	9.0	
Queue Length 95th (m)	21.1	
Internal Link Dist (m)	280.9	
Turn Bay Length (m)		
Base Capacity (vph)	535	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.16	

Intersection Summary

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	817	8	37	1553	10	11
Future Vol, veh/h	817	8	37	1553	10	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	350	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	817	8	37	1553	10	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	825	0	1668	409
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	851	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	814	-	89	597
Stage 1	-	-	-	-	400	-
Stage 2	-	-	-	-	384	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	814	-	85	597
Mov Cap-2 Maneuver	-	-	-	-	85	-
Stage 1	-	-	-	-	400	-
Stage 2	-	-	-	-	367	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	32
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	154	-	-	814	-
HCM Lane V/C Ratio	0.136	-	-	0.045	-
HCM Control Delay (s)	32	-	-	9.6	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	826	1576	16	0	12
Future Vol, veh/h	0	826	1576	16	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	8
Mvmt Flow	0	826	1576	16	0	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	788
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.06
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.38
Pot Cap-1 Maneuver	0	-	-	-	0	321
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	321
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.7
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	321
HCM Lane V/C Ratio	-	-	-	0.037
HCM Control Delay (s)	-	-	-	16.7
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.1

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	22	60	578	167	8	715	1309	53	216	208	208	47
Future Volume (vph)	22	60	578	167	8	715	1309	53	216	208	208	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		55.0		130.0		115.0		0.0	75.0		0.0	45.0
Storage Lanes		1		1		1		0	1		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98		0.94		0.96	0.99		0.98	0.98		
Frt				0.850			0.994			0.925		
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1729	3390	1532	0	3321	3381	0	1729	1624	0	1729
Flt Permitted		0.950				0.950			0.466			0.226
Satd. Flow (perm)	0	1698	3390	1438	0	3197	3381	0	829	1624	0	411
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				167			4			49		
Link Speed (k/h)			60				60			50		
Link Distance (m)			447.3				309.6			300.2		
Travel Time (s)			26.8				18.6			21.6		
Confl. Peds. (#/hr)		36		25		25		36	20		15	15
Confl. Bikes (#/hr)								2				
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	1%	0%	1%	1%	4%	0%	0%	3%	0%
Adj. Flow (vph)	22	60	578	167	8	715	1309	53	216	208	208	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	82	578	167	0	723	1362	0	216	416	0	47
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases				4					2			6
Detector Phase	7	7	4	4	3	3	8		2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		10.0	10.0		10.0
Minimum Split (s)	10.9	10.9	23.9	23.9	10.9	10.9	23.9		24.8	24.8		24.8
Total Split (s)	11.0	11.0	33.0	33.0	37.0	37.0	59.0		50.0	50.0		50.0
Total Split (%)	9.2%	9.2%	27.5%	27.5%	30.8%	30.8%	49.2%		41.7%	41.7%		41.7%
Maximum Green (s)	5.1	5.1	27.1	27.1	31.1	31.1	53.1		43.2	43.2		43.2
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.2		3.5	3.5		3.5
Lost Time Adjust (s)		-1.9	-1.9	-1.9		-1.9	-1.9		-2.8	-2.8		-2.8
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0		4.0	4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None	C-Max	C-Max	None	None	C-Max		None	None		None
Walk Time (s)			7.0	7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)			25	25			36		15	15		20
Act Effct Green (s)		10.6	39.3	39.3		31.6	60.3		37.1	37.1		37.1
Actuated g/C Ratio		0.09	0.33	0.33		0.26	0.50		0.31	0.31		0.31

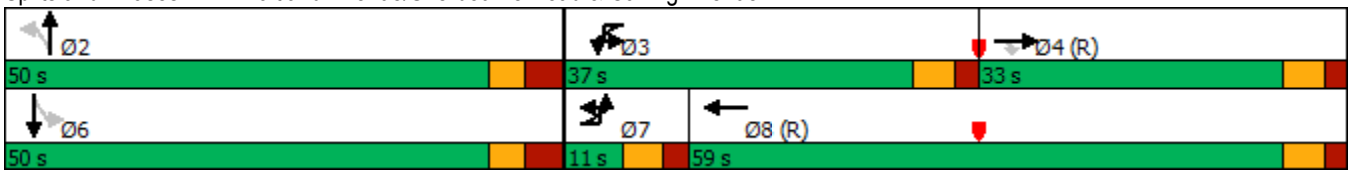
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	196	44
Future Volume (vph)	196	44
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.99	
Frt	0.972	
Flt Protected		
Satd. Flow (prot)	1746	0
Flt Permitted		
Satd. Flow (perm)	1746	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	11	
Link Speed (k/h)	50	
Link Distance (m)	301.0	
Travel Time (s)	21.7	
Confl. Peds. (#/hr)		20
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	2%
Adj. Flow (vph)	196	44
Shared Lane Traffic (%)		
Lane Group Flow (vph)	240	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	24.8	
Total Split (s)	50.0	
Total Split (%)	41.7%	
Maximum Green (s)	43.2	
Yellow Time (s)	3.3	
All-Red Time (s)	3.5	
Lost Time Adjust (s)	-2.8	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	7.0	
Flash Dont Walk (s)	11.0	
Pedestrian Calls (#/hr)	20	
Act Effct Green (s)	37.1	
Actuated g/C Ratio	0.31	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.54	0.52	0.29		0.83	0.80		0.84	0.78		0.37
Control Delay		66.6	37.2	6.9		50.3	30.6		65.6	42.8		38.6
Queue Delay		0.0	0.0	0.0		0.0	0.0		0.0	0.0		0.0
Total Delay		66.6	37.2	6.9		50.3	30.6		65.6	42.8		38.6
LOS		E	D	A		D	C		E	D		D
Approach Delay			34.0				37.4			50.6		
Approach LOS			C				D			D		
Queue Length 50th (m)		18.2	59.2	0.0		81.6	146.1		47.1	78.8		8.6
Queue Length 95th (m)		#47.8	85.7	16.8		103.8	181.8		72.2	104.7		18.5
Internal Link Dist (m)			423.3				285.6			276.2		
Turn Bay Length (m)		55.0		130.0		115.0			75.0			45.0
Base Capacity (vph)		152	1110	583		928	1701		317	652		157
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		0.54	0.52	0.29		0.78	0.80		0.68	0.64		0.30

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 103 (86%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 38.6 Intersection LOS: D
Intersection Capacity Utilization 92.3% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Maitland Avenue/Sherbourne Road & Carling Avenue



Lane Group	SBT	SBR
v/c Ratio	0.44	
Control Delay	32.8	
Queue Delay	0.0	
Total Delay	32.8	
LOS	C	
Approach Delay	33.8	
Approach LOS	C	
Queue Length 50th (m)	42.7	
Queue Length 95th (m)	59.0	
Internal Link Dist (m)	277.0	
Turn Bay Length (m)		
Base Capacity (vph)	676	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.36	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	19	1630	5	39	7	400	60	3	24	30	75
Future Volume (vph)	1	19	1630	5	39	7	400	60	3	24	30	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0		40.0		20.0		85.0	0.0		0.0	50.0
Storage Lanes		1		1		1		1	0		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98		0.94				0.94		0.99		0.99
Frt				0.850				0.850		0.929		
Flt Protected		0.950				0.950				0.997		0.950
Satd. Flow (prot)	0	1729	3390	1547	0	1729	4687	1502	0	1635	0	1679
Flt Permitted		0.464				0.119				0.990		0.717
Satd. Flow (perm)	0	824	3390	1461	0	217	4687	1406	0	1623	0	1254
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				95				95		30		
Link Speed (k/h)			60				60			50		
Link Distance (m)			305.5				136.9			297.2		
Travel Time (s)			18.3				8.2			21.4		
Confl. Peds. (#/hr)		15		12		12		15	13		12	12
Confl. Bikes (#/hr)				1				1			4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	3%	0%	4%	0%	3%
Adj. Flow (vph)	1	19	1630	5	39	7	400	60	3	24	30	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	20	1630	5	0	46	400	60	0	57	0	75
Turn Type	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases	4	4		4	8	8		8	2			6
Detector Phase	7	7	4	4	3	3	8	8	2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0
Minimum Split (s)	12.0	12.0	28.3	28.3	12.0	12.0	28.3	28.3	47.3	47.3		47.3
Total Split (s)	14.0	14.0	69.0	69.0	14.0	14.0	69.0	69.0	47.0	47.0		47.0
Total Split (%)	10.8%	10.8%	53.1%	53.1%	10.8%	10.8%	53.1%	53.1%	36.2%	36.2%		36.2%
Maximum Green (s)	7.0	7.0	62.7	62.7	7.0	7.0	62.7	62.7	39.7	39.7		39.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3
All-Red Time (s)	3.3	3.3	2.6	2.6	3.3	3.3	2.6	2.6	4.0	4.0		4.0
Lost Time Adjust (s)		-3.0	-2.3	-2.3		-3.0	-2.3	-2.3		-3.3		-3.3
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	Max	Max	C-Max	C-Max	None	None	C-Max	C-Max	None	None		None
Walk Time (s)			10.0	10.0			10.0	10.0	27.0	27.0		27.0
Flash Dont Walk (s)			12.0	12.0			12.0	12.0	13.0	13.0		13.0
Pedestrian Calls (#/hr)			12	12			15	15	12	12		13
Act Effct Green (s)		98.0	89.6	89.6		74.3	65.0	65.0		25.9		25.9
Actuated g/C Ratio		0.75	0.69	0.69		0.57	0.50	0.50		0.20		0.20

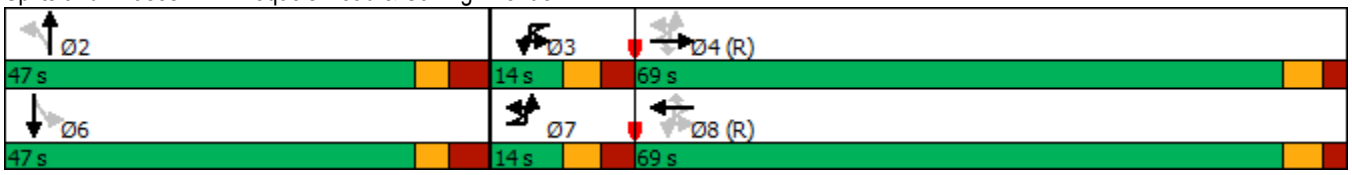
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	7	27
Future Volume (vph)	7	27
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.98	
Frt	0.881	
Flt Protected		
Satd. Flow (prot)	1490	0
Flt Permitted		
Satd. Flow (perm)	1490	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	27	
Link Speed (k/h)	50	
Link Distance (m)	304.9	
Travel Time (s)	22.0	
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	7%
Adj. Flow (vph)	7	27
Shared Lane Traffic (%)		
Lane Group Flow (vph)	34	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	47.3	
Total Split (s)	47.0	
Total Split (%)	36.2%	
Maximum Green (s)	39.7	
Yellow Time (s)	3.3	
All-Red Time (s)	4.0	
Lost Time Adjust (s)	-3.3	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	27.0	
Flash Dont Walk (s)	13.0	
Pedestrian Calls (#/hr)	13	
Act Effct Green (s)	25.9	
Actuated g/C Ratio	0.20	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.02	0.70	0.00		0.20	0.17	0.08		0.16		0.30
Control Delay		8.3	20.8	0.0		11.4	18.0	1.1		20.4		43.3
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0
Total Delay		8.3	20.8	0.0		11.4	18.0	1.1		20.4		43.3
LOS		A	C	A		B	B	A		C		D
Approach Delay			20.5				15.4			20.4		
Approach LOS			C				B			C		
Queue Length 50th (m)		0.8	109.3	0.0		2.6	19.9	0.0		6.2		18.2
Queue Length 95th (m)		5.2	#261.4	0.0		9.6	26.4	2.4		14.4		25.9
Internal Link Dist (m)			281.5				112.9			273.2		
Turn Bay Length (m)		25.0		40.0		20.0		85.0				50.0
Base Capacity (vph)		834	2337	1037		241	2343	750		556		414
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		0.02	0.70	0.00		0.19	0.17	0.08		0.10		0.18

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 6 (5%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 20.1 Intersection LOS: C
Intersection Capacity Utilization 73.1% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Iroquois Road & Carling Avenue



Lane Group	SBT	SBR
v/c Ratio	0.11	
Control Delay	14.5	
Queue Delay	0.0	
Total Delay	14.5	
LOS	B	
Approach Delay	34.3	
Approach LOS	C	
Queue Length 50th (m)	1.6	
Queue Length 95th (m)	8.7	
Internal Link Dist (m)	280.9	
Turn Bay Length (m)		
Base Capacity (vph)	510	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.07	

Intersection Summary

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1765	7	13	498	7	15
Future Vol, veh/h	1765	7	13	498	7	15
Conflicting Peds, #/hr	0	2	2	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	350	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	14	0	0	0	7
Mvmt Flow	1765	7	13	498	7	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1774	0	2044	885
Stage 1	-	-	-	-	1767	-
Stage 2	-	-	-	-	277	-
Critical Hdwy	-	-	4.1	-	6.8	7.04
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.37
Pot Cap-1 Maneuver	-	-	355	-	50	278
Stage 1	-	-	-	-	125	-
Stage 2	-	-	-	-	751	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	354	-	48	277
Mov Cap-2 Maneuver	-	-	-	-	48	-
Stage 1	-	-	-	-	125	-
Stage 2	-	-	-	-	722	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	45.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	110	-	-	354	-
HCM Lane V/C Ratio	0.2	-	-	0.037	-
HCM Control Delay (s)	45.7	-	-	15.6	-
HCM Lane LOS	E	-	-	C	-
HCM 95th %tile Q(veh)	0.7	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1779	457	18	0	53
Future Vol, veh/h	0	1779	457	18	0	53
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	1779	457	18	0	53

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	237
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	771
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	765
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	765
HCM Lane V/C Ratio	-	-	-	0.069
HCM Control Delay (s)	-	-	-	10.1
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	17	29	1461	272	6	302	299	16	142	99	406	68
Future Volume (vph)	17	29	1461	272	6	302	299	16	142	99	406	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		55.0		130.0		115.0		0.0	75.0		0.0	45.0
Storage Lanes		1		1		2		0	1		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95		0.96		0.99	0.99		0.99	0.97		
Frt				0.850			0.992			0.879		
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1656	3390	1532	0	3228	3229	0	1679	1506	0	1679
Flt Permitted		0.950				0.950			0.351			0.134
Satd. Flow (perm)	0	1567	3390	1465	0	3205	3229	0	614	1506	0	237
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				242			6			90		
Link Speed (k/h)			60				60			50		
Link Distance (m)			447.3				309.6			300.2		
Travel Time (s)			26.8				18.6			21.6		
Confl. Peds. (#/hr)		25		16		16		25	13		15	15
Confl. Bikes (#/hr)								1			2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	7%	2%	1%	0%	4%	6%	0%	3%	5%	2%	3%
Adj. Flow (vph)	17	29	1461	272	6	302	299	16	142	99	406	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	46	1461	272	0	308	315	0	142	505	0	68
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases				4					2			6
Detector Phase	7	7	4	4	3	3	8		2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		10.0	10.0		10.0
Minimum Split (s)	10.9	10.9	23.9	23.9	10.9	10.9	23.9		24.8	24.8		24.8
Total Split (s)	13.2	13.2	59.0	59.0	17.0	17.0	62.8		44.0	44.0		44.0
Total Split (%)	11.0%	11.0%	49.2%	49.2%	14.2%	14.2%	52.3%		36.7%	36.7%		36.7%
Maximum Green (s)	7.3	7.3	53.1	53.1	11.1	11.1	56.9		37.2	37.2		37.2
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.2		3.5	3.5		3.5
Lost Time Adjust (s)		-1.9	-1.9	-1.9		-1.9	-1.9		-2.8	-2.8		-2.8
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0		4.0	4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None	C-Max	C-Max	None	None	C-Max		None	None		None
Walk Time (s)			7.0	7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)			16	16			25		15	15		13
Act Effct Green (s)		8.8	56.0	56.0		13.4	62.9		38.6	38.6		38.6
Actuated g/C Ratio		0.07	0.47	0.47		0.11	0.52		0.32	0.32		0.32

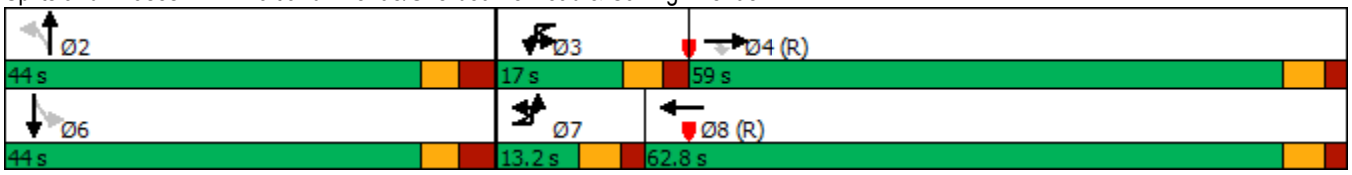
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	316	16
Future Volume (vph)	316	16
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	1.00	
Frt	0.993	
Flt Protected		
Satd. Flow (prot)	1765	0
Flt Permitted		
Satd. Flow (perm)	1765	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	2	
Link Speed (k/h)	50	
Link Distance (m)	301.0	
Travel Time (s)	21.7	
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	2%	6%
Adj. Flow (vph)	316	16
Shared Lane Traffic (%)		
Lane Group Flow (vph)	332	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	24.8	
Total Split (s)	44.0	
Total Split (%)	36.7%	
Maximum Green (s)	37.2	
Yellow Time (s)	3.3	
All-Red Time (s)	3.5	
Lost Time Adjust (s)	-2.8	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	7.0	
Flash Dont Walk (s)	11.0	
Pedestrian Calls (#/hr)	13	
Act Effct Green (s)	38.6	
Actuated g/C Ratio	0.32	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.38	0.92	0.33		0.85	0.19		0.72	0.93		0.89
Control Delay		62.2	41.4	4.7		74.7	16.2		57.7	56.6		118.7
Queue Delay		0.0	0.0	0.0		0.0	0.0		0.0	0.0		0.0
Total Delay		62.2	41.4	4.7		74.7	16.2		57.7	56.6		118.7
LOS		E	D	A		E	B		E	E		F
Approach Delay			36.3				45.1			56.9		
Approach LOS			D				D			E		
Queue Length 50th (m)		10.5	168.4	3.8		37.4	20.9		28.9	95.9		14.9
Queue Length 95th (m)		22.6	#218.7	18.8		#61.6	29.7		#59.6	#159.4		#43.4
Internal Link Dist (m)			423.3				285.6			276.2		
Turn Bay Length (m)		55.0		130.0		115.0			75.0			45.0
Base Capacity (vph)		126	1581	812		361	1694		204	562		79
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		0.37	0.92	0.33		0.85	0.19		0.70	0.90		0.86

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 43.6 Intersection LOS: D
Intersection Capacity Utilization 106.7% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

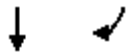
Splits and Phases: 4: Maitland Avenue/Sherbourne Road & Carling Avenue



Lane Group	SBT	SBR
v/c Ratio	0.58	
Control Delay	38.3	
Queue Delay	0.0	
Total Delay	38.3	
LOS	D	
Approach Delay	51.9	
Approach LOS	D	
Queue Length 50th (m)	63.5	
Queue Length 95th (m)	92.8	
Internal Link Dist (m)	277.0	
Turn Bay Length (m)		
Base Capacity (vph)	589	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.56	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	2	41	692	4	40	17	1463	107	13	20	10	117
Future Volume (vph)	2	41	692	4	40	17	1463	107	13	20	10	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0		40.0		20.0		85.0	0.0		0.0	50.0
Storage Lanes		1		1		1		1	0		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.92		0.98		0.90		0.99		0.98
Frt				0.850				0.850		0.969		
Flt Protected		0.950				0.950				0.985		0.950
Satd. Flow (prot)	0	1729	3390	1547	0	1699	4919	1547	0	1726	0	1712
Flt Permitted		0.106				0.389				0.921		0.761
Satd. Flow (perm)	0	193	3390	1425	0	685	4919	1391	0	1602	0	1350
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				95				107		10		
Link Speed (k/h)			60				60			50		
Link Distance (m)			305.5				137.5			297.2		
Travel Time (s)			18.3				8.3			21.4		
Confl. Peds. (#/hr)		28		19		19		28	28		17	17
Confl. Bikes (#/hr)				6								
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	6%	1%	0%	0%	0%	0%	1%
Adj. Flow (vph)	2	41	692	4	40	17	1463	107	13	20	10	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	692	4	0	57	1463	107	0	43	0	117
Turn Type	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases	4	4		4	8	8		8	2			6
Detector Phase	7	7	4	4	3	3	8	8	2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0
Minimum Split (s)	12.0	12.0	28.3	28.3	12.0	12.0	28.3	28.3	47.3	47.3		47.3
Total Split (s)	12.0	12.0	71.0	71.0	12.0	12.0	71.0	71.0	47.0	47.0		47.0
Total Split (%)	9.2%	9.2%	54.6%	54.6%	9.2%	9.2%	54.6%	54.6%	36.2%	36.2%		36.2%
Maximum Green (s)	5.0	5.0	64.7	64.7	5.0	5.0	64.7	64.7	39.7	39.7		39.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3
All-Red Time (s)	3.3	3.3	2.6	2.6	3.3	3.3	2.6	2.6	4.0	4.0		4.0
Lost Time Adjust (s)		-3.0	-2.3	-2.3		-3.0	-2.3	-2.3		-3.3		-3.3
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	Max	Max	C-Max	C-Max	None	None	C-Max	C-Max	None	None		None
Walk Time (s)			10.0	10.0			10.0	10.0	27.0	27.0		27.0
Flash Dont Walk (s)			12.0	12.0			12.0	12.0	13.0	13.0		13.0
Pedestrian Calls (#/hr)			19	19			28	28	17	17		28
Act Effct Green (s)		87.7	80.3	80.3		75.3	67.0	67.0		31.9		31.9
Actuated g/C Ratio		0.67	0.62	0.62		0.58	0.52	0.52		0.25		0.25



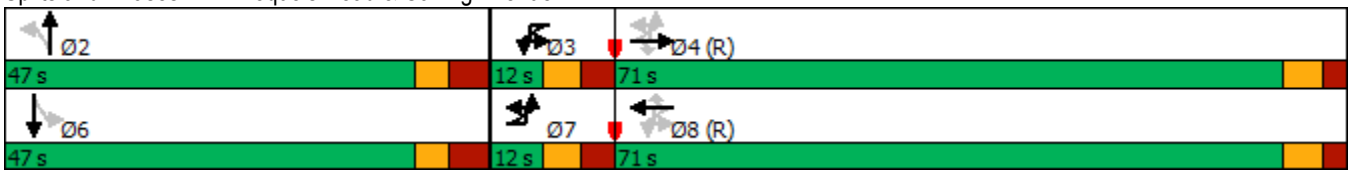
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	23	60
Future Volume (vph)	23	60
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.97	
Frt	0.892	
Flt Protected		
Satd. Flow (prot)	1554	0
Flt Permitted		
Satd. Flow (perm)	1554	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	29	
Link Speed (k/h)	50	
Link Distance (m)	304.9	
Travel Time (s)	22.0	
Confl. Peds. (#/hr)		28
Confl. Bikes (#/hr)		2
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	2%
Adj. Flow (vph)	23	60
Shared Lane Traffic (%)		
Lane Group Flow (vph)	83	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	47.3	
Total Split (s)	47.0	
Total Split (%)	36.2%	
Maximum Green (s)	39.7	
Yellow Time (s)	3.3	
All-Red Time (s)	4.0	
Lost Time Adjust (s)	-3.3	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	27.0	
Flash Dont Walk (s)	13.0	
Pedestrian Calls (#/hr)	28	
Act Effct Green (s)	31.9	
Actuated g/C Ratio	0.25	

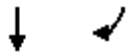
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.12	0.33	0.00		0.12	0.58	0.14		0.11		0.35
Control Delay		10.3	15.3	0.0		10.5	22.9	3.3		26.5		40.4
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0
Total Delay		10.3	15.3	0.0		10.5	22.9	3.3		26.5		40.4
LOS		B	B	A		B	C	A		C		D
Approach Delay			14.9				21.2			26.5		
Approach LOS			B				C			C		
Queue Length 50th (m)		4.2	55.1	0.0		5.6	91.7	0.0		5.8		21.9
Queue Length 95th (m)		9.0	69.4	0.0		11.2	105.9	8.9		14.4		37.8
Internal Link Dist (m)			281.5				113.5			273.2		
Turn Bay Length (m)		25.0		40.0		20.0		85.0				50.0
Base Capacity (vph)		355	2094	916		461	2535	768		536		446
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		0.12	0.33	0.00		0.12	0.58	0.14		0.08		0.26

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 20.4 Intersection LOS: C
Intersection Capacity Utilization 69.5% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Iroquois Road & Carling Avenue





Lane Group	SBT	SBR
v/c Ratio	0.21	
Control Delay	23.1	
Queue Delay	0.0	
Total Delay	23.1	
LOS	C	
Approach Delay	33.2	
Approach LOS	C	
Queue Length 50th (m)	9.6	
Queue Length 95th (m)	21.7	
Internal Link Dist (m)	280.9	
Turn Bay Length (m)		
Base Capacity (vph)	533	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.16	

Intersection Summary

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	848	8	37	1614	10	11
Future Vol, veh/h	848	8	37	1614	10	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	350	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	848	8	37	1614	10	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	856	0	1729	424
Stage 1	-	-	-	-	848	-
Stage 2	-	-	-	-	881	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	793	-	81	584
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	370	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	793	-	77	584
Mov Cap-2 Maneuver	-	-	-	-	77	-
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	353	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	34.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	141	-	-	793	-
HCM Lane V/C Ratio	0.149	-	-	0.047	-
HCM Control Delay (s)	34.9	-	-	9.8	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	859	1615	52	0	35
Future Vol, veh/h	0	859	1615	52	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	8
Mvmt Flow	0	859	1615	52	0	35

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	808
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.06
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.38
Pot Cap-1 Maneuver	0	-	-	-	0	312
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	312
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	18
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	312
HCM Lane V/C Ratio	-	-	-	0.112
HCM Control Delay (s)	-	-	-	18
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.4

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	26	62	593	178	9	734	1345	54	251	213	213	48
Future Volume (vph)	26	62	593	178	9	734	1345	54	251	213	213	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		55.0		130.0		115.0		0.0	75.0		0.0	45.0
Storage Lanes		1		1		1		0	1		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98		0.94		0.96	0.99		0.98	0.98		
Frt				0.850			0.994			0.925		
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1729	3390	1532	0	3321	3381	0	1729	1624	0	1729
Flt Permitted		0.950				0.950			0.476			0.249
Satd. Flow (perm)	0	1699	3390	1438	0	3200	3381	0	847	1624	0	453
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				178			4			49		
Link Speed (k/h)			60				60			50		
Link Distance (m)			447.3				309.6			300.2		
Travel Time (s)			26.8				18.6			21.6		
Confl. Peds. (#/hr)		36		25		25		36	20		15	15
Confl. Bikes (#/hr)								2				
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	1%	0%	1%	1%	4%	0%	0%	3%	0%
Adj. Flow (vph)	26	62	593	178	9	734	1345	54	251	213	213	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	88	593	178	0	743	1399	0	251	426	0	48
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases				4					2			6
Detector Phase	7	7	4	4	3	3	8		2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		10.0	10.0		10.0
Minimum Split (s)	10.9	10.9	23.9	23.9	10.9	10.9	23.9		24.8	24.8		24.8
Total Split (s)	12.0	12.0	33.0	33.0	36.0	36.0	57.0		51.0	51.0		51.0
Total Split (%)	10.0%	10.0%	27.5%	27.5%	30.0%	30.0%	47.5%		42.5%	42.5%		42.5%
Maximum Green (s)	6.1	6.1	27.1	27.1	30.1	30.1	51.1		44.2	44.2		44.2
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.2		3.5	3.5		3.5
Lost Time Adjust (s)		-1.9	-1.9	-1.9		-1.9	-1.9		-2.8	-2.8		-2.8
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0		4.0	4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None	C-Max	C-Max	None	None	C-Max		None	None		None
Walk Time (s)			7.0	7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)			25	25			36		15	15		20
Act Effct Green (s)		10.0	36.3	36.3		31.4	57.8		40.2	40.2		40.2
Actuated g/C Ratio		0.08	0.30	0.30		0.26	0.48		0.34	0.34		0.34

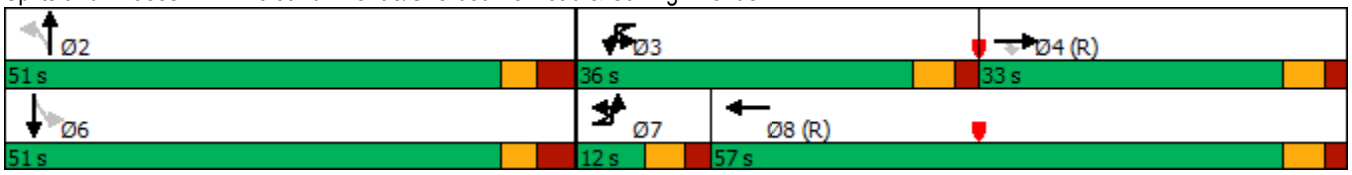
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	201	45
Future Volume (vph)	201	45
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.99	
Frt	0.973	
Flt Protected		
Satd. Flow (prot)	1748	0
Flt Permitted		
Satd. Flow (perm)	1748	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	11	
Link Speed (k/h)	50	
Link Distance (m)	301.0	
Travel Time (s)	21.7	
Confl. Peds. (#/hr)		20
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	2%
Adj. Flow (vph)	201	45
Shared Lane Traffic (%)		
Lane Group Flow (vph)	246	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	24.8	
Total Split (s)	51.0	
Total Split (%)	42.5%	
Maximum Green (s)	44.2	
Yellow Time (s)	3.3	
All-Red Time (s)	3.5	
Lost Time Adjust (s)	-2.8	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	7.0	
Flash Dont Walk (s)	11.0	
Pedestrian Calls (#/hr)	20	
Act Effct Green (s)	40.2	
Actuated g/C Ratio	0.34	

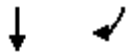
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.61	0.58	0.32		0.85	0.86		0.89	0.74		0.32
Control Delay		72.3	40.1	6.9		52.7	35.3		68.0	38.4		33.2
Queue Delay		0.0	0.0	0.0		0.0	0.0		0.0	0.0		0.0
Total Delay		72.3	40.1	6.9		52.7	35.3		68.0	38.4		33.2
LOS		E	D	A		D	D		E	D		C
Approach Delay			36.5				41.4			49.4		
Approach LOS			D				D			D		
Queue Length 50th (m)		20.0	66.7	0.0		82.8	161.3		53.4	75.7		8.1
Queue Length 95th (m)		#48.2	88.1	17.3		#109.3	#210.0		#92.7	106.6		17.9
Internal Link Dist (m)			423.3				285.6			276.2		
Turn Bay Length (m)		55.0		130.0		115.0			75.0			45.0
Base Capacity (vph)		144	1026	559		899	1630		331	665		177
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		0.61	0.58	0.32		0.83	0.86		0.76	0.64		0.27

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 103 (86%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 40.9 Intersection LOS: D
Intersection Capacity Utilization 94.3% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Maitland Avenue/Sherbourne Road & Carling Avenue

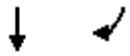




Lane Group	SBT	SBR
v/c Ratio	0.41	
Control Delay	30.3	
Queue Delay	0.0	
Total Delay	30.3	
LOS	C	
Approach Delay	30.8	
Approach LOS	C	
Queue Length 50th (m)	40.8	
Queue Length 95th (m)	59.3	
Internal Link Dist (m)	277.0	
Turn Bay Length (m)		
Base Capacity (vph)	691	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.36	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	19	1589	5	39	7	391	60	3	24	30	75
Future Volume (vph)	1	19	1589	5	39	7	391	60	3	24	30	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0		40.0		20.0		85.0	0.0		0.0	50.0
Storage Lanes		1		1		1		1	0		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98		0.94				0.94		0.99		0.99
Frt				0.850				0.850		0.929		
Flt Protected		0.950				0.950				0.997		0.950
Satd. Flow (prot)	0	1729	3390	1547	0	1729	4687	1502	0	1635	0	1679
Flt Permitted		0.469				0.129				0.990		0.717
Satd. Flow (perm)	0	832	3390	1461	0	235	4687	1406	0	1623	0	1254
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				95				95		30		
Link Speed (k/h)			60				60			50		
Link Distance (m)			305.5				136.9			297.2		
Travel Time (s)			18.3				8.2			21.4		
Confl. Peds. (#/hr)		15		12		12		15	13		12	12
Confl. Bikes (#/hr)				1				1			4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	6%	3%	0%	4%	0%	3%
Adj. Flow (vph)	1	19	1589	5	39	7	391	60	3	24	30	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	20	1589	5	0	46	391	60	0	57	0	75
Turn Type	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases	4	4		4	8	8		8	2			6
Detector Phase	7	7	4	4	3	3	8	8	2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0
Minimum Split (s)	12.0	12.0	28.3	28.3	12.0	12.0	28.3	28.3	47.3	47.3		47.3
Total Split (s)	14.0	14.0	69.0	69.0	14.0	14.0	69.0	69.0	47.0	47.0		47.0
Total Split (%)	10.8%	10.8%	53.1%	53.1%	10.8%	10.8%	53.1%	53.1%	36.2%	36.2%		36.2%
Maximum Green (s)	7.0	7.0	62.7	62.7	7.0	7.0	62.7	62.7	39.7	39.7		39.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3
All-Red Time (s)	3.3	3.3	2.6	2.6	3.3	3.3	2.6	2.6	4.0	4.0		4.0
Lost Time Adjust (s)		-3.0	-2.3	-2.3		-3.0	-2.3	-2.3		-3.3		-3.3
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	Max	Max	C-Max	C-Max	None	None	C-Max	C-Max	None	None		None
Walk Time (s)			10.0	10.0			10.0	10.0	27.0	27.0		27.0
Flash Dont Walk (s)			12.0	12.0			12.0	12.0	13.0	13.0		13.0
Pedestrian Calls (#/hr)			12	12			15	15	12	12		13
Act Effct Green (s)		98.0	89.6	89.6		74.3	65.0	65.0		25.9		25.9
Actuated g/C Ratio		0.75	0.69	0.69		0.57	0.50	0.50		0.20		0.20



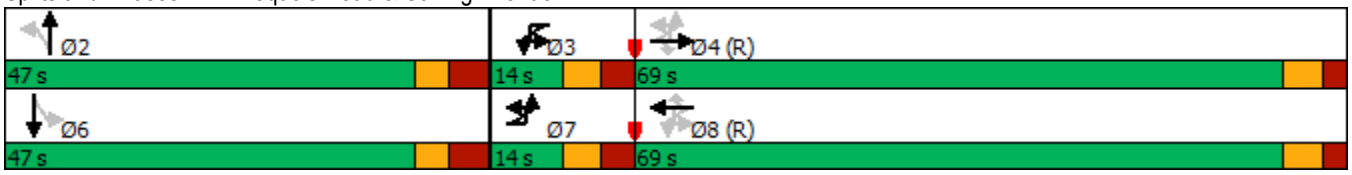
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	7	27
Future Volume (vph)	7	27
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.98	
Frt	0.881	
Flt Protected		
Satd. Flow (prot)	1490	0
Flt Permitted		
Satd. Flow (perm)	1490	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	27	
Link Speed (k/h)	50	
Link Distance (m)	304.9	
Travel Time (s)	22.0	
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	7%
Adj. Flow (vph)	7	27
Shared Lane Traffic (%)		
Lane Group Flow (vph)	34	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	47.3	
Total Split (s)	47.0	
Total Split (%)	36.2%	
Maximum Green (s)	39.7	
Yellow Time (s)	3.3	
All-Red Time (s)	4.0	
Lost Time Adjust (s)	-3.3	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	27.0	
Flash Dont Walk (s)	13.0	
Pedestrian Calls (#/hr)	13	
Act Effct Green (s)	25.9	
Actuated g/C Ratio	0.20	

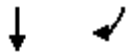
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.02	0.68	0.00		0.19	0.17	0.08		0.16		0.30
Control Delay		8.3	20.3	0.0		11.2	18.0	1.1		20.4		43.3
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0
Total Delay		8.3	20.3	0.0		11.2	18.0	1.1		20.4		43.3
LOS		A	C	A		B	B	A		C		D
Approach Delay			20.1				15.3			20.4		
Approach LOS			C				B			C		
Queue Length 50th (m)		0.8	104.2	0.0		2.6	19.4	0.0		6.2		18.2
Queue Length 95th (m)		5.2	#250.2	0.0		9.6	25.8	2.4		14.4		25.9
Internal Link Dist (m)			281.5				112.9			273.2		
Turn Bay Length (m)		25.0		40.0		20.0		85.0				50.0
Base Capacity (vph)		838	2337	1037		250	2343	750		556		414
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		0.02	0.68	0.00		0.18	0.17	0.08		0.10		0.18

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 6 (5%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 19.7 Intersection LOS: B
Intersection Capacity Utilization 71.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Iroquois Road & Carling Avenue





Lane Group	SBT	SBR
v/c Ratio	0.11	
Control Delay	14.5	
Queue Delay	0.0	
Total Delay	14.5	
LOS	B	
Approach Delay	34.3	
Approach LOS	C	
Queue Length 50th (m)	1.6	
Queue Length 95th (m)	8.7	
Internal Link Dist (m)	280.9	
Turn Bay Length (m)		
Base Capacity (vph)	510	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.07	

Intersection Summary

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1721	7	13	487	7	15
Future Vol, veh/h	1721	7	13	487	7	15
Conflicting Peds, #/hr	0	2	2	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	350	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	14	0	0	0	7
Mvmt Flow	1721	7	13	487	7	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1730	0	1995	863
Stage 1	-	-	-	-	1723	-
Stage 2	-	-	-	-	272	-
Critical Hdwy	-	-	4.1	-	6.8	7.04
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.37
Pot Cap-1 Maneuver	-	-	370	-	54	288
Stage 1	-	-	-	-	132	-
Stage 2	-	-	-	-	755	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	369	-	52	287
Mov Cap-2 Maneuver	-	-	-	-	52	-
Stage 1	-	-	-	-	132	-
Stage 2	-	-	-	-	727	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	42.4
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	118	-	-	369	-
HCM Lane V/C Ratio	0.186	-	-	0.035	-
HCM Control Delay (s)	42.4	-	-	15.1	-
HCM Lane LOS	E	-	-	C	-
HCM 95th %tile Q(veh)	0.7	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

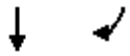
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1735	446	18	0	53
Future Vol, veh/h	0	1735	446	18	0	53
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	1735	446	18	0	53

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	231
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	777
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	771
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	771
HCM Lane V/C Ratio	-	-	-	0.069
HCM Control Delay (s)	-	-	-	10
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	17	28	1425	265	6	294	292	16	139	97	396	66
Future Volume (vph)	17	28	1425	265	6	294	292	16	139	97	396	66
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		55.0		130.0		115.0		0.0	75.0		0.0	45.0
Storage Lanes		1		1		2		0	1		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95		0.96		0.99	0.99		0.99	0.97		
Frt				0.850			0.992			0.880		
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1657	3390	1532	0	3228	3228	0	1679	1508	0	1679
Flt Permitted		0.950				0.950			0.357			0.142
Satd. Flow (perm)	0	1567	3390	1465	0	3204	3228	0	624	1508	0	251
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				250			6			91		
Link Speed (k/h)			60				60			50		
Link Distance (m)			447.3				309.6			300.2		
Travel Time (s)			26.8				18.6			21.6		
Confl. Peds. (#/hr)		25		16		16		25	13		15	15
Confl. Bikes (#/hr)								1			2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	7%	2%	1%	0%	4%	6%	0%	3%	5%	2%	3%
Adj. Flow (vph)	17	28	1425	265	6	294	292	16	139	97	396	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	45	1425	265	0	300	308	0	139	493	0	66
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases				4					2			6
Detector Phase	7	7	4	4	3	3	8		2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		10.0	10.0		10.0
Minimum Split (s)	10.9	10.9	23.9	23.9	10.9	10.9	23.9		24.8	24.8		24.8
Total Split (s)	13.2	13.2	59.0	59.0	17.0	17.0	62.8		44.0	44.0		44.0
Total Split (%)	11.0%	11.0%	49.2%	49.2%	14.2%	14.2%	52.3%		36.7%	36.7%		36.7%
Maximum Green (s)	7.3	7.3	53.1	53.1	11.1	11.1	56.9		37.2	37.2		37.2
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.2		3.5	3.5		3.5
Lost Time Adjust (s)		-1.9	-1.9	-1.9		-1.9	-1.9		-2.8	-2.8		-2.8
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0		4.0	4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None	C-Max	C-Max	None	None	C-Max		None	None		None
Walk Time (s)			7.0	7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)			16	16			25		15	15		13
Act Effct Green (s)		8.8	56.4	56.4		13.5	63.3		38.1	38.1		38.1
Actuated g/C Ratio		0.07	0.47	0.47		0.11	0.53		0.32	0.32		0.32



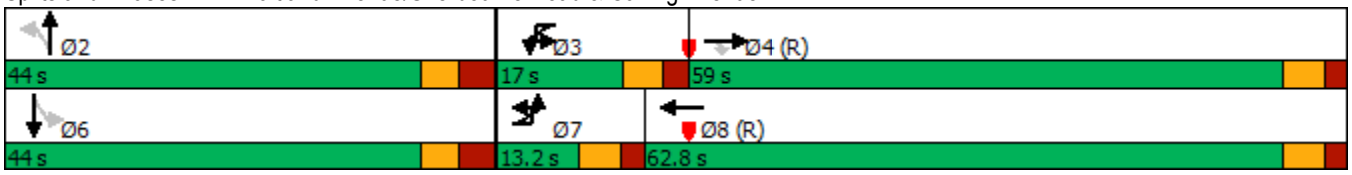
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	308	16
Future Volume (vph)	308	16
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	1.00	
Frt	0.993	
Flt Protected		
Satd. Flow (prot)	1765	0
Flt Permitted		
Satd. Flow (perm)	1765	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	2	
Link Speed (k/h)	50	
Link Distance (m)	301.0	
Travel Time (s)	21.7	
Confl. Peds. (#/hr)		13
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	2%	6%
Adj. Flow (vph)	308	16
Shared Lane Traffic (%)		
Lane Group Flow (vph)	324	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	24.8	
Total Split (s)	44.0	
Total Split (%)	36.7%	
Maximum Green (s)	37.2	
Yellow Time (s)	3.3	
All-Red Time (s)	3.5	
Lost Time Adjust (s)	-2.8	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	7.0	
Flash Dont Walk (s)	11.0	
Pedestrian Calls (#/hr)	13	
Act Effct Green (s)	38.1	
Actuated g/C Ratio	0.32	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.37	0.89	0.32		0.83	0.18		0.70	0.91		0.84
Control Delay		61.7	38.2	4.0		71.9	16.1		55.8	54.3		103.0
Queue Delay		0.0	0.0	0.0		0.0	0.0		0.0	0.0		0.0
Total Delay		61.7	38.2	4.0		71.9	16.1		55.8	54.3		103.0
LOS		E	D	A		E	B		E	D		F
Approach Delay			33.6				43.6			54.6		
Approach LOS			C				D			D		
Queue Length 50th (m)		10.2	161.2	1.9		36.3	20.4		28.0	91.6		14.0
Queue Length 95th (m)		22.3	#209.4	16.4		#59.3	29.0		#57.3	#152.9		#40.8
Internal Link Dist (m)			423.3				285.6			276.2		
Turn Bay Length (m)		55.0		130.0		115.0			75.0			45.0
Base Capacity (vph)		127	1593	820		362	1706		208	563		83
Starvation Cap Reductn		0	0	0		0	0		0	0		0
Spillback Cap Reductn		0	0	0		0	0		0	0		0
Storage Cap Reductn		0	0	0		0	0		0	0		0
Reduced v/c Ratio		0.35	0.89	0.32		0.83	0.18		0.67	0.88		0.80

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 41.1 Intersection LOS: D
Intersection Capacity Utilization 104.6% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

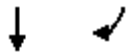
Splits and Phases: 4: Maitland Avenue/Sherbourne Road & Carling Avenue



Lane Group	SBT	SBR
v/c Ratio	0.58	
Control Delay	38.3	
Queue Delay	0.0	
Total Delay	38.3	
LOS	D	
Approach Delay	49.2	
Approach LOS	D	
Queue Length 50th (m)	61.6	
Queue Length 95th (m)	90.3	
Internal Link Dist (m)	277.0	
Turn Bay Length (m)		
Base Capacity (vph)	589	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.55	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	2	41	675	4	40	17	1427	107	13	20	10	117
Future Volume (vph)	2	41	675	4	40	17	1427	107	13	20	10	117
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		25.0		40.0		20.0		85.0	0.0		0.0	50.0
Storage Lanes		1		1		1		1	0		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.92		0.98		0.90		0.99		0.98
Frt				0.850				0.850		0.969		
Flt Protected		0.950				0.950				0.985		0.950
Satd. Flow (prot)	0	1729	3390	1547	0	1699	4919	1547	0	1726	0	1712
Flt Permitted		0.112				0.395				0.921		0.761
Satd. Flow (perm)	0	203	3390	1425	0	695	4919	1391	0	1602	0	1350
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				95				107		10		
Link Speed (k/h)			60				60			50		
Link Distance (m)			305.5				137.5			297.2		
Travel Time (s)			18.3				8.3			21.4		
Confl. Peds. (#/hr)		28		19		19		28	28		17	17
Confl. Bikes (#/hr)				6								
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	6%	1%	0%	0%	0%	0%	1%
Adj. Flow (vph)	2	41	675	4	40	17	1427	107	13	20	10	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	675	4	0	57	1427	107	0	43	0	117
Turn Type	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt	NA	Perm	Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases	4	4		4	8	8		8	2			6
Detector Phase	7	7	4	4	3	3	8	8	2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0
Minimum Split (s)	12.0	12.0	28.3	28.3	12.0	12.0	28.3	28.3	47.3	47.3		47.3
Total Split (s)	12.0	12.0	71.0	71.0	12.0	12.0	71.0	71.0	47.0	47.0		47.0
Total Split (%)	9.2%	9.2%	54.6%	54.6%	9.2%	9.2%	54.6%	54.6%	36.2%	36.2%		36.2%
Maximum Green (s)	5.0	5.0	64.7	64.7	5.0	5.0	64.7	64.7	39.7	39.7		39.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3
All-Red Time (s)	3.3	3.3	2.6	2.6	3.3	3.3	2.6	2.6	4.0	4.0		4.0
Lost Time Adjust (s)		-3.0	-2.3	-2.3		-3.0	-2.3	-2.3		-3.3		-3.3
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0	4.0		4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	Max	Max	C-Max	C-Max	None	None	C-Max	C-Max	None	None		None
Walk Time (s)			10.0	10.0			10.0	10.0	27.0	27.0		27.0
Flash Dont Walk (s)			12.0	12.0			12.0	12.0	13.0	13.0		13.0
Pedestrian Calls (#/hr)			19	19			28	28	17	17		28
Act Effct Green (s)		87.7	80.3	80.3		75.3	67.0	67.0		31.9		31.9
Actuated g/C Ratio		0.67	0.62	0.62		0.58	0.52	0.52		0.25		0.25



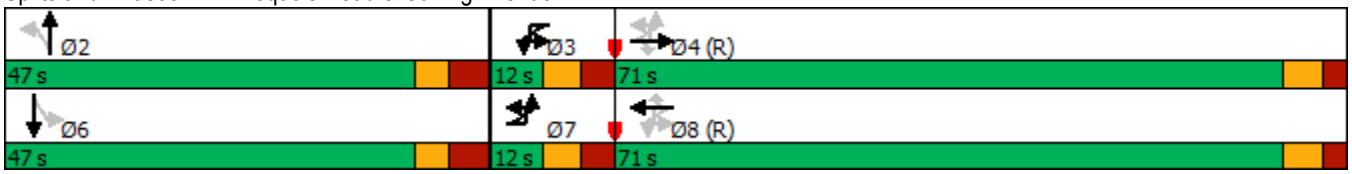
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	23	60
Future Volume (vph)	23	60
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.97	
Frt	0.892	
Flt Protected		
Satd. Flow (prot)	1554	0
Flt Permitted		
Satd. Flow (perm)	1554	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	31	
Link Speed (k/h)	50	
Link Distance (m)	304.9	
Travel Time (s)	22.0	
Confl. Peds. (#/hr)		28
Confl. Bikes (#/hr)		2
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	2%
Adj. Flow (vph)	23	60
Shared Lane Traffic (%)		
Lane Group Flow (vph)	83	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	47.3	
Total Split (s)	47.0	
Total Split (%)	36.2%	
Maximum Green (s)	39.7	
Yellow Time (s)	3.3	
All-Red Time (s)	4.0	
Lost Time Adjust (s)	-3.3	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	27.0	
Flash Dont Walk (s)	13.0	
Pedestrian Calls (#/hr)	28	
Act Effct Green (s)	31.9	
Actuated g/C Ratio	0.25	

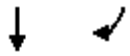
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.12	0.32	0.00		0.12	0.56	0.14		0.11		0.35
Control Delay		10.3	15.2	0.0		10.4	22.6	3.3		26.5		40.4
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0
Total Delay		10.3	15.2	0.0		10.4	22.6	3.3		26.5		40.4
LOS		B	B	A		B	C	A		C		D
Approach Delay			14.8				20.9			26.5		
Approach LOS			B				C			C		
Queue Length 50th (m)		4.2	53.3	0.0		5.6	88.6	0.0		5.8		21.9
Queue Length 95th (m)		9.0	67.3	0.0		11.2	102.5	8.9		14.4		37.8
Internal Link Dist (m)			281.5				113.5			273.2		
Turn Bay Length (m)		25.0		40.0		20.0		85.0				50.0
Base Capacity (vph)		361	2094	916		466	2535	768		536		446
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		0.12	0.32	0.00		0.12	0.56	0.14		0.08		0.26

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 20.2 Intersection LOS: C
Intersection Capacity Utilization 68.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Iroquois Road & Carling Avenue





Lane Group	SBT	SBR
v/c Ratio	0.21	
Control Delay	22.4	
Queue Delay	0.0	
Total Delay	22.4	
LOS	C	
Approach Delay	32.9	
Approach LOS	C	
Queue Length 50th (m)	9.2	
Queue Length 95th (m)	21.3	
Internal Link Dist (m)	280.9	
Turn Bay Length (m)		
Base Capacity (vph)	534	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.16	

Intersection Summary

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	829	8	37	1576	10	11
Future Vol, veh/h	829	8	37	1576	10	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	350	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	829	8	37	1576	10	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	837	0	1691	415
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	862	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	806	-	86	592
Stage 1	-	-	-	-	394	-
Stage 2	-	-	-	-	379	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	806	-	82	592
Mov Cap-2 Maneuver	-	-	-	-	82	-
Stage 1	-	-	-	-	394	-
Stage 2	-	-	-	-	362	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	33.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	149	-	-	806	-
HCM Lane V/C Ratio	0.141	-	-	0.046	-
HCM Control Delay (s)	33.1	-	-	9.7	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

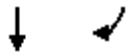
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	838	1576	52	0	35
Future Vol, veh/h	0	838	1576	52	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	8
Mvmt Flow	0	838	1576	52	0	35

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	788
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.06
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.38
Pot Cap-1 Maneuver	0	-	-	-	0	321
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	321
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17.6
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	321
HCM Lane V/C Ratio	-	-	-	0.109
HCM Control Delay (s)	-	-	-	17.6
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.4

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	26	60	579	174	8	715	1311	53	246	208	208	47
Future Volume (vph)	26	60	579	174	8	715	1311	53	246	208	208	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		55.0		130.0		115.0		0.0	75.0		0.0	45.0
Storage Lanes		1		1		1		0	1		0	1
Taper Length (m)		7.5				7.5			7.5			7.5
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98		0.94		0.96	0.99		0.98	0.98		0.99
Frt				0.850			0.994			0.925		
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1729	3390	1532	0	3321	3381	0	1729	1624	0	1729
Flt Permitted		0.950				0.950			0.482			0.258
Satd. Flow (perm)	0	1698	3390	1438	0	3198	3381	0	857	1624	0	465
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				174			4			51		
Link Speed (k/h)			60				60			50		
Link Distance (m)			447.3				309.6			300.2		
Travel Time (s)			26.8				18.6			21.6		
Confl. Peds. (#/hr)		36		25		25		36	20		15	15
Confl. Bikes (#/hr)								2				
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	1%	0%	1%	1%	4%	0%	0%	3%	0%
Adj. Flow (vph)	26	60	579	174	8	715	1311	53	246	208	208	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	579	174	0	723	1364	0	246	416	0	47
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases				4					2			6
Detector Phase	7	7	4	4	3	3	8		2	2		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0		10.0	10.0		10.0
Minimum Split (s)	10.9	10.9	23.9	23.9	10.9	10.9	23.9		24.8	24.8		24.8
Total Split (s)	11.0	11.0	32.0	32.0	34.0	34.0	55.0		54.0	54.0		54.0
Total Split (%)	9.2%	9.2%	26.7%	26.7%	28.3%	28.3%	45.8%		45.0%	45.0%		45.0%
Maximum Green (s)	5.1	5.1	26.1	26.1	28.1	28.1	49.1		47.2	47.2		47.2
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.3	3.3		3.3
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.2		3.5	3.5		3.5
Lost Time Adjust (s)		-1.9	-1.9	-1.9		-1.9	-1.9		-2.8	-2.8		-2.8
Total Lost Time (s)		4.0	4.0	4.0		4.0	4.0		4.0	4.0		4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Recall Mode	None	None	C-Max	C-Max	None	None	C-Max		None	None		None
Walk Time (s)			7.0	7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)			25	25			36		15	15		20
Act Effct Green (s)		11.1	37.2	37.2		30.9	57.0		39.9	39.9		39.9
Actuated g/C Ratio		0.09	0.31	0.31		0.26	0.48		0.33	0.33		0.33



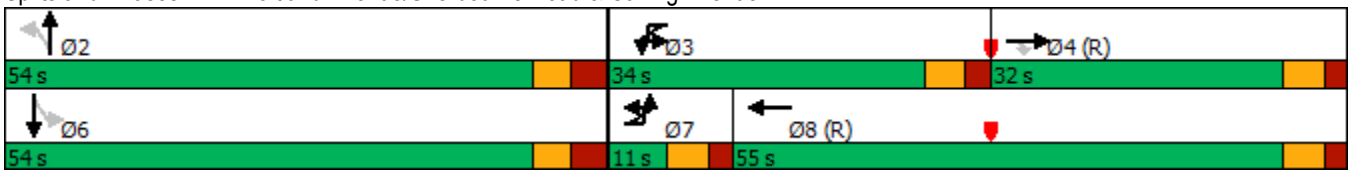
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	196	44
Future Volume (vph)	196	44
Ideal Flow (vphpl)	1800	1800
Storage Length (m)		0.0
Storage Lanes		0
Taper Length (m)		
Lane Util. Factor	1.00	1.00
Ped Bike Factor	0.99	
Frt	0.972	
Flt Protected		
Satd. Flow (prot)	1746	0
Flt Permitted		
Satd. Flow (perm)	1746	0
Right Turn on Red		Yes
Satd. Flow (RTOR)	12	
Link Speed (k/h)	50	
Link Distance (m)	301.0	
Travel Time (s)	21.7	
Confl. Peds. (#/hr)		20
Confl. Bikes (#/hr)		
Peak Hour Factor	1.00	1.00
Heavy Vehicles (%)	0%	2%
Adj. Flow (vph)	196	44
Shared Lane Traffic (%)		
Lane Group Flow (vph)	240	0
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	10.0	
Minimum Split (s)	24.8	
Total Split (s)	54.0	
Total Split (%)	45.0%	
Maximum Green (s)	47.2	
Yellow Time (s)	3.3	
All-Red Time (s)	3.5	
Lost Time Adjust (s)	-2.8	
Total Lost Time (s)	4.0	
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	
Recall Mode	None	
Walk Time (s)	7.0	
Flash Dont Walk (s)	11.0	
Pedestrian Calls (#/hr)	20	
Act Effct Green (s)	39.9	
Actuated g/C Ratio	0.33	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
v/c Ratio		0.54	0.55	0.31		0.85	0.85		0.86	0.72		0.31
Control Delay		65.9	39.2	7.1		52.7	35.4		64.0	37.2		32.1
Queue Delay		0.0	0.0	0.0		0.0	0.0		0.0	0.0		0.0
Total Delay		65.9	39.2	7.1		52.7	35.4		64.0	37.2		32.1
LOS		E	D	A		D	D		E	D		C
Approach Delay			35.3				41.4			47.2		
Approach LOS			D				D			D		
Queue Length 50th (m)		19.0	62.7	0.0		81.1	157.5		52.7	74.2		8.0
Queue Length 95th (m)		#50.3	86.7	17.4		#114.6	#208.3		79.2	98.0		16.8
Internal Link Dist (m)			423.3				285.6			276.2		
Turn Bay Length (m)		55.0		130.0		115.0			75.0			45.0
Base Capacity (vph)		159	1051	565		870	1607		357	706		193
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		0.54	0.55	0.31		0.83	0.85		0.69	0.59		0.24

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 103 (86%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 40.2 Intersection LOS: D
Intersection Capacity Utilization 92.6% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Maitland Avenue/Sherbourne Road & Carling Avenue



Lane Group	SBT	SBR
v/c Ratio	0.41	
Control Delay	29.8	
Queue Delay	0.0	
Total Delay	29.8	
LOS	C	
Approach Delay	30.2	
Approach LOS	C	
Queue Length 50th (m)	40.3	
Queue Length 95th (m)	55.3	
Internal Link Dist (m)	277.0	
Turn Bay Length (m)		
Base Capacity (vph)	734	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.33	

Intersection Summary