

# 289 Carling Avenue

## Transportation Impact Assessment

### Step 2 Scoping Report

Prepared for:

The John Howard Society  
c/o PBC Development and Construction Management Group Inc.  
105-485 Bank Street  
Ottawa, ON K2P 1Z2

Prepared by:



13 Markham Avenue  
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August 2019

PN: 2019-10

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## 1 Screening

This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for TIA Study PM. As shown in the Screening Form, a TIA is required including the Design Review component as the trip generation and safety triggers are not met.

## 2 Existing and Planned Conditions

### 2.1 Proposed Development

The proposed development, located at 289 Carling Avenue, is within the Carling Avenue Arterial Main Street Design Priority Area, at the corner of Carling Avenue at Bell Street South. The site is currently zoned AM10, permitting select residential and non-residential units. The proposed development is for a residential building including 40 units with office support spaces totalling 1000 square metres of gross floor area. The site will access Bell Street South via two full movements driveways. The anticipated full build-out and occupancy horizon is 2022. Figure 1 illustrates the Study Area Context. Figure 2 illustrates the proposed concept plan.

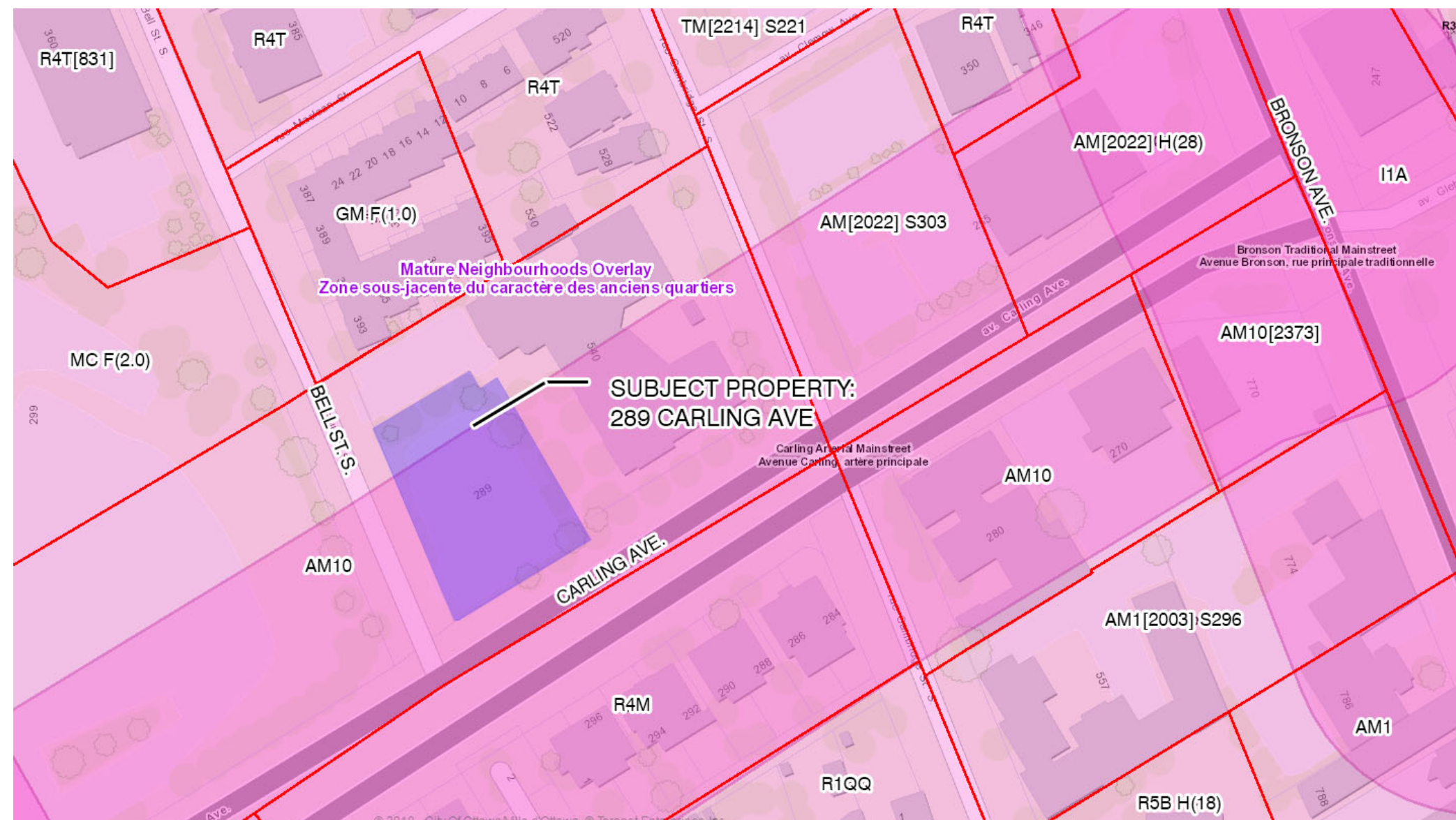
*Figure 1: Area Context Plan*



Municipality: City of Ottawa  
Municipal Address: 289 Carling Avenue  
Registered Owner: John Howard Society of Ottawa  
Lot Area: 1270.526 m<sup>2</sup>

Zoning Analysis  
Ottawa  
Zoning By-Law: 2008-250  
Zone: AM 10  
Proposed Use: Mixed-Use Office and Apartment Building

BUILDING AREA (OUT TO OUT)	
Level	Area
L0 LOWER PARKING/ BASEMENT MAIN ENTRANCES AND OFFICE	988 m <sup>2</sup>
L1 UPPER PARKING	961 m <sup>2</sup>
L2 OFFICES	949 m <sup>2</sup>
L3 OFFICES AND RESIDENTIAL	547 m <sup>2</sup>
L4 RESIDENTIAL UNITS	547 m <sup>2</sup>
L5 RESIDENTIAL UNITS	547 m <sup>2</sup>
L6 RESIDENTIAL UNITS	547 m <sup>2</sup>



LEGAL DESCRIPTION:  
LOT 10 AND PART OF LOTS 8, 9  
AND 11 (CARLING AVENUE)  
REGISTERED PLAN 31326



**PBC**  
Development & Construction  
Management Group Inc.

**PROJECT MANAGER:**  
**PBC DEVELOPMENT & CONSTRUCTION**  
**MANAGEMENT GROUP INC.**  
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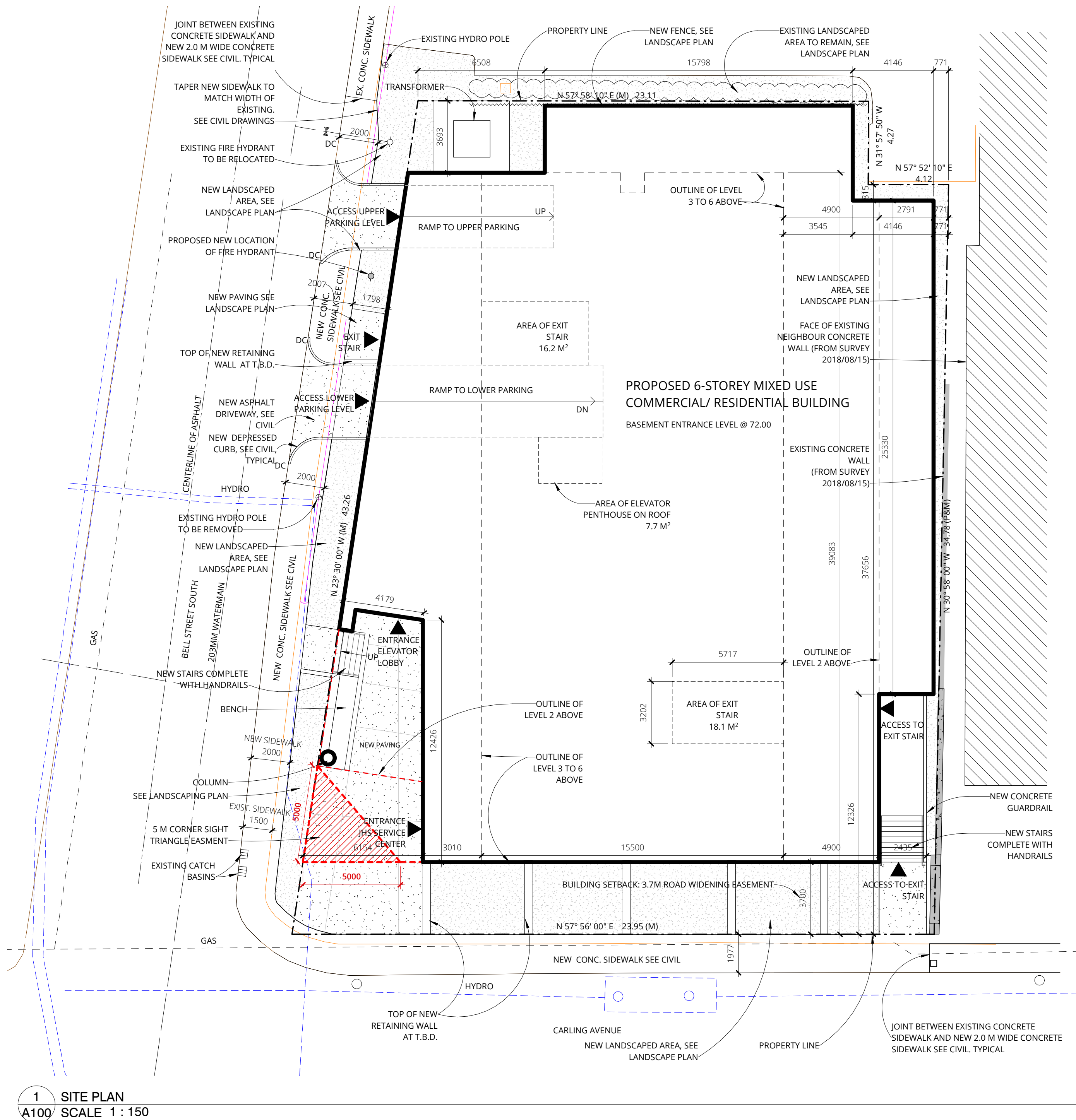
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CGH TRANSPORTATION

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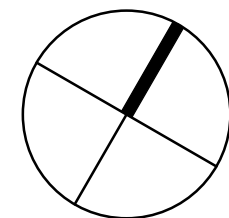
1 SITE PLAN  
A100 SCALE 1 : 150

LOT 10 AND PART OF LOTS 8, 9 AND 11 (CARLING AVENUE), REGISTERED PLAN 31326, CITY OF OTTAWA

Based on Survey by Fairhall Moffatt & Woodland LTD, dated 2018/08/16

Contractor shall check and verify all dimensions on site and report any discrepancies to the Architect before proceeding

4	ISSUED FOR SITE PLAN COORDINATION	9 AUG 2019
3	ISSUED FOR CONSULTANT COORDINATION	18 JULY 2019
2	ISSUED FOR CONSULTANT COORDINATION	2 July 2019
1	ISSUED FOR COSTING	19 JUNE 2019
no.	revision	date




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detail no.		détail no.
sheet no.		feuille no.

projec  
projet

**JHS - 289 CARLING AVENUE**

**JOHN HOWARD SOCIETY  
289 CARLING AVE, OTTAWA**

designed by  
conçu par

KWC

approved by  
approuvé par

RZ

drawn by dessiné par	EI	project no. no. du projet	1850
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date	scale	as noted
2019-MAY-09		

drawing / dessin

## SITE PLAN

revision sheet no. **A100**  
révision no. de la feuille

# A100

plot scale 1:1

SHEET SIZE: ARCH D (24"x36")

## 2.2 Existing Conditions

### 2.2.1 Area Road Network

#### *Carling Avenue*

Carling Avenue is a City of Ottawa arterial road with a six-lane divided urban cross-section. The outer lanes in each direction are signed and painted as a dedicated transit and cycling lane. The posted speed limit is 60 km/h. The Ottawa Official Plan reserves a 44.5 metre right of way in the Study Area.

#### *Bell Street South*

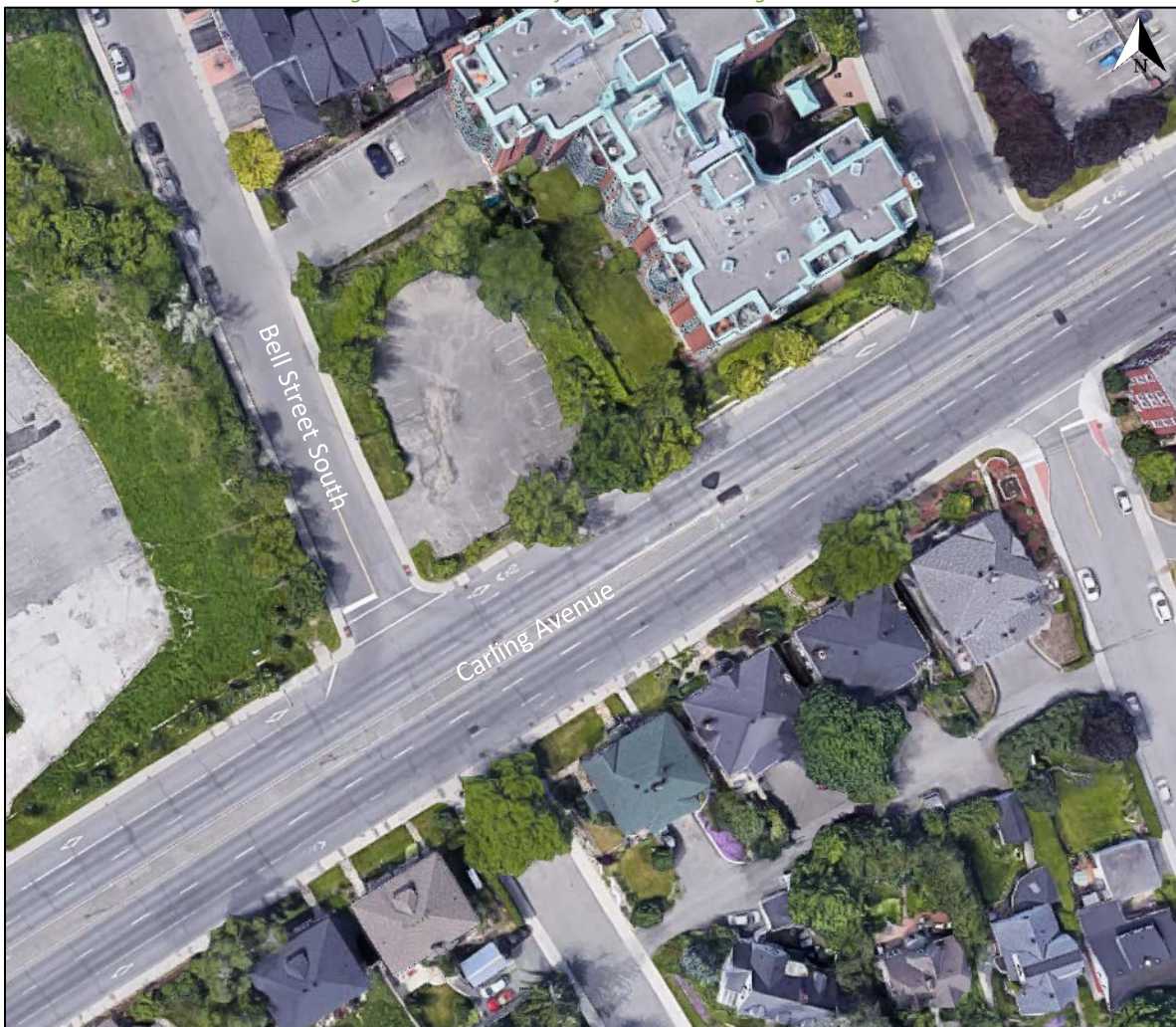
Bell Street South is a City of Ottawa local road with a two-lane undivided urban cross-section. The unposted speed limit is 50 km/h.

### 2.2.2 Existing Intersections

#### *Bell Street South at Carling Avenue*

The intersection of Bell Street South at Carling Avenue is an unsignalized three-legged intersection that only allows right turns to and from Carling Avenue due to a centreline median. No auxiliary lanes are provided on any leg of the intersection. Figure 3 is an aerial photograph of the subject intersection.

*Figure 3: Intersection of Bell Street at Carling Avenue:*



### 2.2.3 Existing Driveways

The adjacent property, north of 289 Carling Avenue has a driveway directly onto Bell Street South, approximately 1.5 metres north of the property line. This driveway provides access to the rear of the residential tower located at 540 Cambridge Street South.

### 2.2.4 Cycling and Pedestrian Facilities

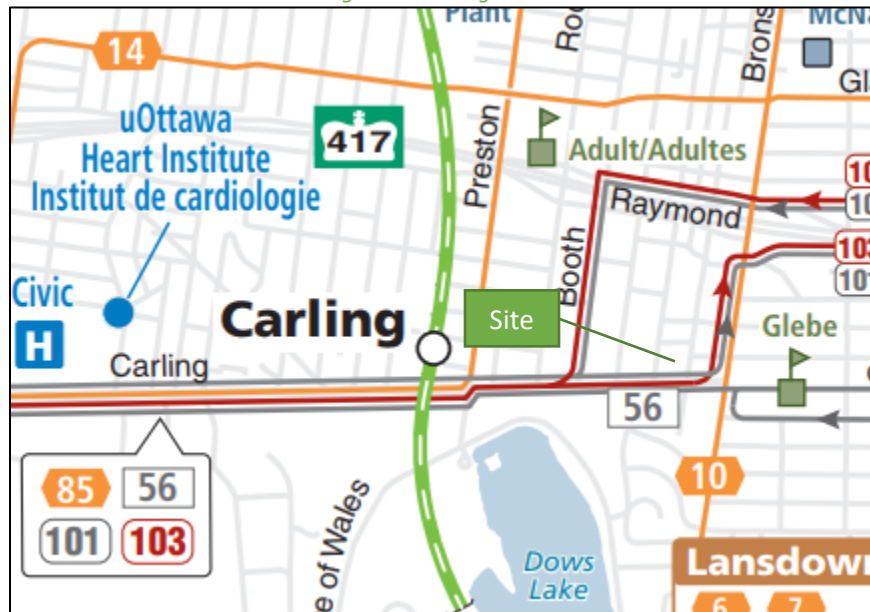
Both Carling Avenue and Bell Street South have sidewalks on both sides of the road, providing pedestrian connections to the proposed development along both frontages.

While not included on the City of Ottawa's Cycling Plan, accessed via geoOttawa.com, there are HOV / cycling / transit lanes along the curbside lanes eastbound and westbound on Carling Avenue. There are no cycling facilities along Bell Street South.

### 2.2.5 Existing Transit

The proposed development would be served by existing routes 56, 101, and 103 along Carling Avenue. The nearest transit stops, located at the intersection of Booth Street and Carling Avenue, are approximately 275 metres west of the site on Carling Avenue. Additionally, the O-Train Carling Station is approximately 700 metres west of the subject site.

Figure 4: Existing Transit



### 2.2.6 Existing Area Traffic Management Measures

There are no existing area traffic management measures within the Study Area.

### 2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were not available from the City of Ottawa for the existing Study Area intersection, therefore a new turning movement count has been undertaken. Table 1 summarizes the intersection count date.

Table 1: Intersection Count Date

Intersection	Count Date
Bell Street South @ Carling Avenue	Thursday May 16, 2019

Detailed turning movement count data is included in Appendix B. Figure 5 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service is based on the HCM criteria for average delay at unsignalized intersections. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 5: Existing Traffic Counts

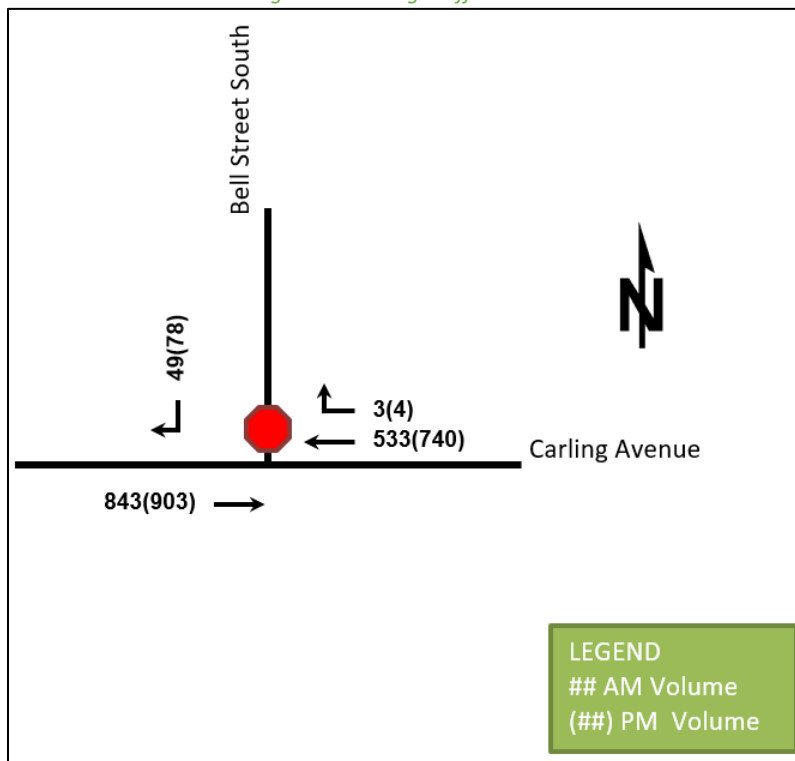


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour			PM Peak Hour		
		LOS	Delay	V/C	LOS	Delay	V/C
<b>Carling Avenue &amp; Bell Street South</b> <i>Unsignalized</i>	SB	B	12	0.09	B	14	0.17

Overall, the right-in/right-out only intersection of Carling Avenue and Bell Street South operates well during the AM and PM peak hours with low delays and v/c ratios.

### 2.2.8 Collision Analysis

Collision data has been requested from the City of Ottawa for five years (2013-2017) prior to the commencement of this TIA at the Study Area intersection. No collisions have been reported at the intersection of Bell Street South and Carling Avenue in the period of 2013-2017.

## 2.3 Planned Conditions

### 2.3.1 Changes to the Area Transportation Network

There are no major changes to the immediate Study Area Transportation Network.

### 2.3.2 Other Study Area Developments

The following developments are listed on the City's Development Application Search tool:

- 265 Carling Avenue – 149 high-rise condominium/apartment units, 11 live/work townhomes, and an 88 s.m. commercial unit.
- 770 Bronson Avenue – 48 apartment units and 3,093 s.f. of ground level retail.

The traffic studies for both of these developments has been reviewed and each of these developments would contribute less than 10 vehicles per hour during the peak hour, through the intersection of Bell Street South at Carling Avenue. These developments and the associated traffic will have a minimal impact on the subject intersection.

## 3 Study Area and Time Periods

### 3.1 Study Area

The Study Area will include the intersection of Bell Street South at Carling Avenue.

### 3.2 Time Periods

As the proposed development is a small residential development with some support spaces.

### 3.3 Horizon Years

The anticipated build-out year is 2022. As a result, the full build-out plus five years horizon year is 2027.

## 4 Exemption Review

Table 3 summarizes the exemptions for this TIA.

*Table 3: Exemption Review*

Module	Element	Explanation	Exempt/Required
<b>Design Review Component</b>			
<b>4.1 Development Design</b>	4.1.2 Circulation and Access	Only required for site plans	Required
	4.2.3 New Street Networks	Only required for plans of subdivision	Exempt
<b>4.2 Parking</b>	4.2.1 Parking Supply	Only required for site plans	Required
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
<b>Network Impact Component</b>			
<b>4.5 Transportation Demand Management</b>	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Exempt
<b>4.6 Neighbourhood Traffic Management</b>	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	Exempt
<b>4.8 Network Concept</b>		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt

In addition to the above TIA requirements and exemptions, the following exemptions in Table 4 are also recommended for this TIA.

*Table 4: Recommended Additional Exemptions*

Module	Element	Explanation
<b>Forecasting</b>		
<b>3.1 Development Generated Travel Demand</b>	All Elements	Trip generation trigger was not met, therefore trip and mode share forecasting is not required for the subject site. An estimation of the on-site activity is approximately 45 person trips per hour, of which 30 are anticipated to be vehicle trips.
<b>3.2 Background Network Travel Demand</b>	All Elements	No intersection constraints were noted for the existing volumes and the background growth would continue to be accommodated within the network.
<b>3.3 Demand Rationalization</b>	All Elements	Subject to the trip generation trigger not being met, no demand rationalization is required as part of this TIA.  The existing conditions summarized in Section 2.2.7 illustrate residual capacity in the existing road network and the network can support the anticipated trip generation of the proposed development.
<b>Design Review Component</b>		
<b>4.3 Boundary Street Design</b>	All Elements	Along Carling Avenue, the ROW is designated as a design priority area. This street will be upgraded as a whole corridor. The frontage of the subject site along Carling Avenue is also very short and any MMLOS upgrades would not be continuous. A ROW widening has been taken along the Carling Avenue frontage to allow for future upgrades to the entire corridor.
<b>4.4 Access Intersection Design</b>	4.4.2 Intersection Control 4.4.3 Intersection Design	The access intersection is anticipated to be a typical private approach design, completed as per City standards and operational requirements for site vehicles.  Therefore, the need for a TIA to review the intersection control or operational characteristics is not required and can be completed as part of the site plan review process within the existing submission.
<b>Network Impact Components</b>		
<b>4.7 Transit</b>	All Elements	Subject to the trip generation trigger not being met, no demand rationalization is required as part of this TIA as there will not be a significant increase in the number of transit riders as a result of this development.
<b>4.9 Network Intersections</b>	All Elements	As outlined previously in this table, the low traffic generation will have minimal impact on network intersections and sufficient capacity if currently provided to accommodate an increase in line with background growth.

## 5 Design Review Component

### 5.1 Development Design

#### 5.1.1 Circulation and Access Location / Design

The proposed site plan includes two access points, each of which will provide access to fewer than 20 parking stalls and therefore a three-metre-wide access at a minimum is required for two-way traffic. One access will be at a grade of 9.5% up to the upper level of parking and the other will be at a grade of 15% down to the lower level of parking. These ramp grades are needed due to the narrow width of the proposed property. By providing these steep grades, the remainder of the parking lot can adhere to the zoning by-law for parking lots, with respect to parking stall size and drive aisle width. When the vehicle leaves the underground access there is adequate space for the vehicle to reach a level position and see both ways on Bell Street South.

Figure 6 illustrates the distance between the two driveways, the approximate distance to the driveway for the adjacent property, the clear throat length, the access widths, and the distance to the adjacent intersection of Bell Street South and Carling Avenue. Additionally, as requested by City of Ottawa Staff, it has been shown that a passenger vehicle can fit between the two accesses. The interior parking area provides drive aisles and parking stall dimensions that are consistent with City of Ottawa By-laws.

Garbage collection will be via curbside pickup at the northern access point (upper level access). The accesses will accommodate passenger vehicles only and therefore no turning templates are required for site circulation of municipal vehicles. Emergency services will access the building from the adjacent streets and will not be required to circulate the proposed site.

### 5.2 Parking Supply

The proposed development will have two levels of parking, one upper and one lower. The upper level will have 14 parking spaces and the lower level will have 15 parking spaces. Table 5 below summarizes the required and provided parking for the proposed development.

*Table 5: Parking Statistic Summary*

Land Use	Units / GFA	Parking Rate	Required Parking	Provided Parking	Surplus / (Deficit)
<b>Residential</b>	40 units	0.5/unit >12	14	16	2
<b>Residential (Visitor)</b>		0.1/unit >12	3	3	-
<b>Office</b>	1000 s.m.	1/100 s.m.	10	10	-
<b>Total</b>			27	29	2

The proposed site plan will include a total of 29 parking stalls, two more than the minimum required under the zoning by-law.

## 6 MMLOS

Intersection MMLOS is only undertaken at signalized intersections. Therefore, this section will examine the segment MMLOS for Carling Avenue and Bell Street South.

### 6.1 Pedestrian MMLOS

Segment MMLOS for pedestrian facilities is evaluated based on a look-up table and the cross-section and roadway characteristics. Along both frontages of the site the existing sidewalks will be maintained, each of which are currently 1.5 metres in width and have no boulevard. Carling Avenue is estimated to have an AADT greater than 3000 and Bell Street South is estimated to have an AADT less than 3000. Table 6 below shows the actual and target PLOS.

*Table 6: Pedestrian LOS*

Segment	PLOS	Target (General Urban Area)
Carling Avenue	F	C
Bell Street South	E	C

Expanding the sidewalks would create a sidewalk that varies in width along both Carling Avenue and Bell Street South. A road widening easement has been taken along the Carling Avenue frontage. At the time that Carling Avenue is reconstructed the PLOS will be improved by constructing upgraded sidewalks and providing a boulevard, if required.

### 6.2 Bicycle MMLOS

Segment MMLOS for bicycle facilities is evaluated based on a look-up table and the cross-section and roadway characteristics. Both Carling Avenue and Bell Street South provide mixed traffic cycling facilities. Table 7 summarizes the actual and target BLOS.

*Table 7: Bicycle LOS*

Segment	BLOS	Target (General Urban Area)
Carling Avenue	D	D
Bell Street South	B	D

Both streets meet the target BLOS for Carling Avenue and Bell Street South. These may be further improved upon as part of the future widening of Carling Avenue.

### 6.3 Transit MMLOS

Segment MMLOS for transit is primarily applied along corridors with existing rapid transit priority measures. Carling Avenue has a curbside cycling / transit lane. The TLOS for Carling Avenue is B and the target TLOS is B.

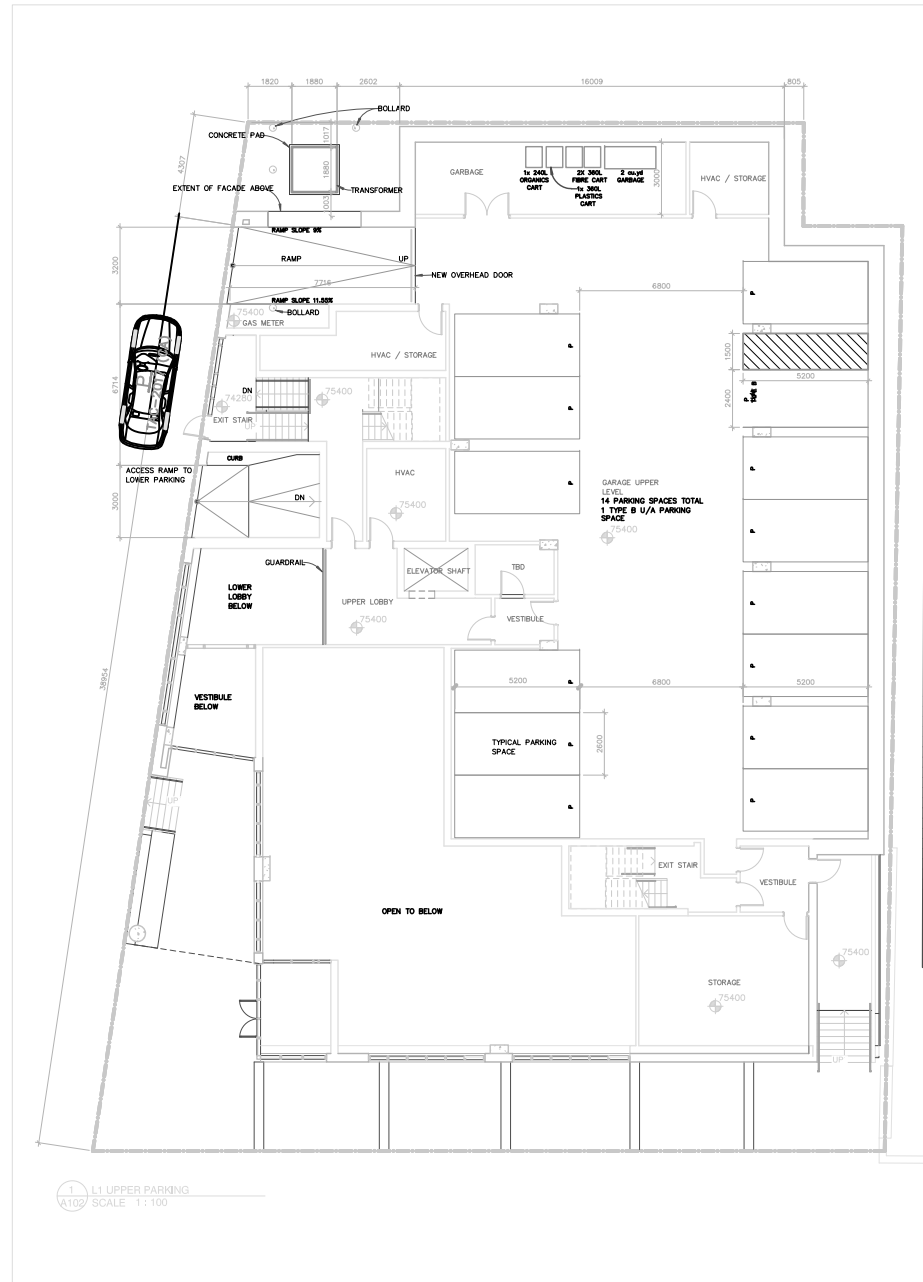
### 6.4 Truck MMLOS

Segment MMLOS for trucks is evaluated based on the curb lane width and the number of travel lanes. Table 8 summarizes the Truck LOS.

*Table 8: Truck LOS*

Segment	TkLOS	Target (General Urban Area)
Carling Avenue	A	D
Bell Street South	B	D

Both road segments meet the Truck LOS target for the area.



NOTES:

Contractor shall check and verify all dimensions on site and report any discrepancies to the Architect before proceeding.

no.	revision	date
6	ISSUED FOR SITE PLAN COORDINATION	9 AUG 2019
5	ISSUED FOR CONSULTATION COORDINATION	28 AUG 2019
4	ISSUED FOR CONSULTATION COORDINATION	26 JUL 2019
3	ISSUED FOR CONSULTATION COORDINATION	15 JUL 2019
2	ISSUED FOR CONSULTATION COORDINATION	7 JUL 2019
1	ISSUED FOR CONING	19 JUNE 2019



north	not	
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trial no. 1 trial no.  
 sheet no. A1 page no.

JHS - 289 CARLING AVENUE

JOHN HOWARD SOCIETY  
289 CARLING AVE, OTTAWA

Designed by:  KWC  RZ

**Initial job** \_\_\_\_\_ **EI** \_\_\_\_\_ **Final project** \_\_\_\_\_ **1850**

diving / design

LEVEL 1 UPPER PARKING  
PLAN

A102

## 7 Summary and Conclusion

Based on the foregoing TIA, the following transportation related conclusions can be offered.

- A. The proposed development at 289 Carling Avenue will include 40 residential units and 1000 square metres of office space.
- B. The proposed development will trigger the Design Review component of the TIA Guidelines, based on the Design Priority Area criteria, as the section of Carling Avenue adjacent to the site is designated as part of the Carling Arterial Mainstreet.
- C. The operational analysis of the intersection of Bell Street South at Carling Avenue illustrated that the intersection is operating well and there is residual capacity to accommodate additional vehicular traffic.
- D. No collisions have been reported at the intersection of Bell Street South and Carling Avenue within a five-year period prior to this report.
- E. The MMLOS review has shown that the road segments adjacent to the subject development meet the criteria for general urban area, with the exception of the pedestrian LOS, which is limited by the existing sidewalk width.
- F. The site design characteristics have been reviewed and it has been determined that intersection location and design is appropriate for the proposed land use and will allow access to and from the proposed parking lots.
- G. The proposed 29 parking spaces are adequate to support the proposed development.

Given the above, it is the recommendation of this Screening/Scoping Report that the TIA requirements for the proposed development have been met and no further review or assessment of the development is required.

Prepared By:



Mark Crockford, P.Eng.

Senior Transportation Engineer

Reviewed By:



Christopher Gordon, P.Eng.

Senior Transportation Engineer

# Appendix A

TIA Screening Form and PM Certification Form

City of Ottawa 2017 TIA Guidelines  
Step 1 - Screening Form

Date: 03-Apr-19  
Project Number: 2019-10  
Project Reference: 289 Carling Avenue

1.1 Description of Proposed Development	
Municipal Address	289 Carling Avenue
Description of Location	PLAN 31326 LOT 10 PT LOTS 8;9 AND 11 RP 5R4231 PA
Land Use Classification	Residential
Development Size	40 residential units; ~1100 s.m. office space
Accesses	Two accesses onto Bell St. South
Phase of Development	Single phase
Buildout Year	2022
TIA Requirement	Design Review Component

1.2 Trip Generation Trigger	
Land Use Type	See attached. Does not meet Trip Gen Trigger.
Development Size	G.F.A.
Trip Generation Trigger	Enter Size

1.3 Location Triggers	
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?	No
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	Yes
Location Trigger	Yes

1.4. Safety Triggers	
Are posted speed limits on a boundary street are 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
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)?	No
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	No

Land Use Type	Min. Dev. S	Units/m <sup>2</sup>	Development	
Single-family homes	40	Units		
Townhomes or apartments	90	Units	40	44%
Office	3500	m <sup>2</sup>	1000	29%
Industrial	500	m <sup>2</sup>		
Fast-food restaurant or coffee shop	100	m <sup>2</sup>		
Destination retail	1000	m <sup>2</sup>		
Gas station or convenience market	75	m <sup>2</sup>		
			Total	73%



## **TIA Plan Reports**

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

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

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

### **CERTIFICATION**

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

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

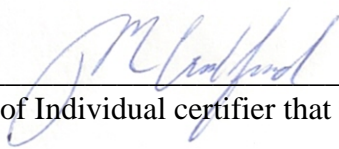
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Sustainability  
Planning and Growth Management  
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Fax: 613-560-6006

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Services d'infrastructure et Viabilité des  
collectivités  
Urbanisme et Gestion de la croissance  
110, avenue Laurier Ouest  
Ottawa (Ontario) K1P 1J1  
Tél. : 613-580-2424  
Télécopieur: 613-560-6006

Dated at Newmarket this 03 day of December, 2018.  
(City)

Name: Mark Crockford  
(Please Print)

Professional Title: Professional Engineer

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

<b>Office Contact Information (Please Print)</b>
Address: 628 Haines Road
City / Postal Code: Newmarket / L3Y 6V5
Telephone / Extension: (905) 251-4070
E-Mail Address: Mark.Crockford@CGHTransportation.com



# Appendix B

Turning Movement Counts



# Turning Movement Count Bicycle Summary Flow Diagram



Bell Street South & Carling Avenue

Ottawa, ON

## Bicycles

(Including electric bicycles and electric scooters)

### Note:

Bicycle volumes are **NOT** included in vehicle totals.

Carling Ave.

Bell St. (S)

Thursday, 16 May 2019

0700-0900 & 1600-1800

4 Hour Survey

City of Ottawa Ward 17

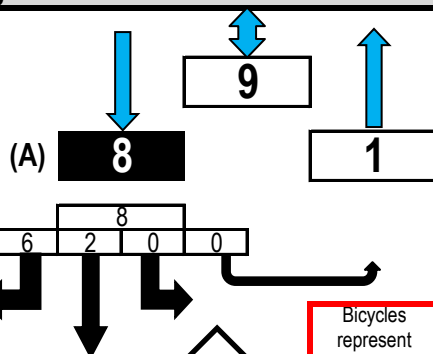
Carling Ave.

50

103

53 (B)

53  
0  
52  
0



Bicycles represent  
1.77%  
of total traffic

Total Bicycle Volume

105

Approaching Intersection  
(A+B+C+D)

(D) 43

95

52

All Pedestrian Crossings

135

15

14

Total

164

N/A

Carling Ave.  
Eastbound

Carling Ave.  
Westbound

Charles Jackson Ave.  
Northbound

Bell St. (S)  
Southbound

Time Period	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.Tot.
0700-0800	0	12	0	0	12	0	9	0	0	9	0	0	0	0	0	0	0	1	0	1	22
0800-0900	0	27	0	0	27	0	12	0	0	12	0	0	0	0	0	0	1	3	0	4	43
1600-1700	0	6	0	1	7	0	14	0	0	14	0	1	0	0	1	0	1	0	0	1	23
1700-1800	0	7	0	0	7	0	8	0	0	8	0	0	0	0	0	0	0	2	0	2	17
Totals	0	52	0	1	53	0	43	0	0	43	0	1	0	0	1	0	2	6	0	8	105

Charles Jackson Avenue is closed at Carling Avenue and is accessible only by pedestrians and cyclists.

## Comments:

Charles Jackson Avenue is closed at Carling Avenue and is accessible only by bicycles and pedestrians. Traffic backs up eastbound in the south curb lane on Carling Avenue from Bronson Avenue to beyond Charles Jackson Avenue occasionally between 1600 & 1800H.



# Turning Movement Count Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

Bell Street South & Carling Avenue

Ottawa, ON

## All Vehicles

(Except Bicycles & Electric Scooters)

Thursday, 16 May 2019

0700-0900 & 1600-1800

4 Hour Survey

City of Ottawa Ward 17

Carling Ave.

Carling Ave.

Total Volume

5820

Approaching Intersection

(A+B+C+D)

Charles Jackson Avenue is closed at Carling Avenue and is accessible only by pedestrians and cyclists.

All Pedestrian Crossings

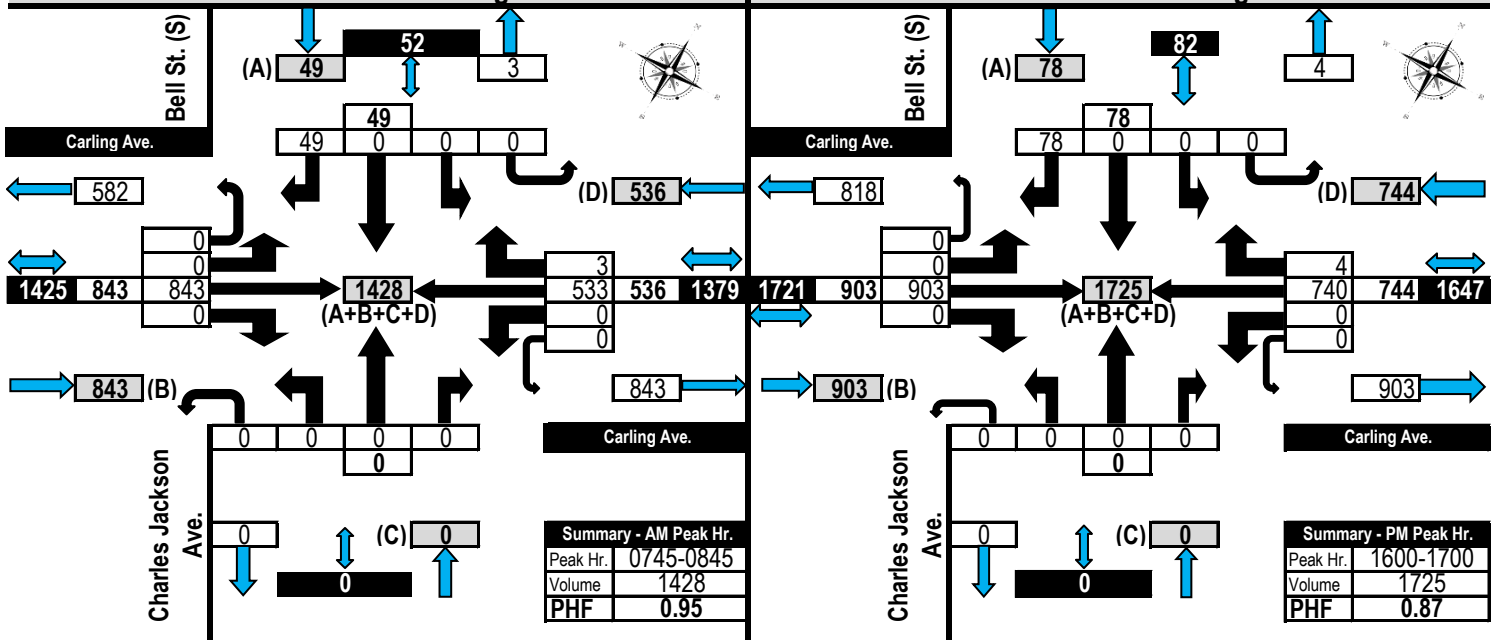
Total

164

N/A

AM Peak Hour Flow Diagram

PM Peak Hour Flow Diagram







# Turning Movement Count Pedestrian Crossings Summary and Flow Diagram



Bell Street South & Carling Avenue

Ottawa, ON

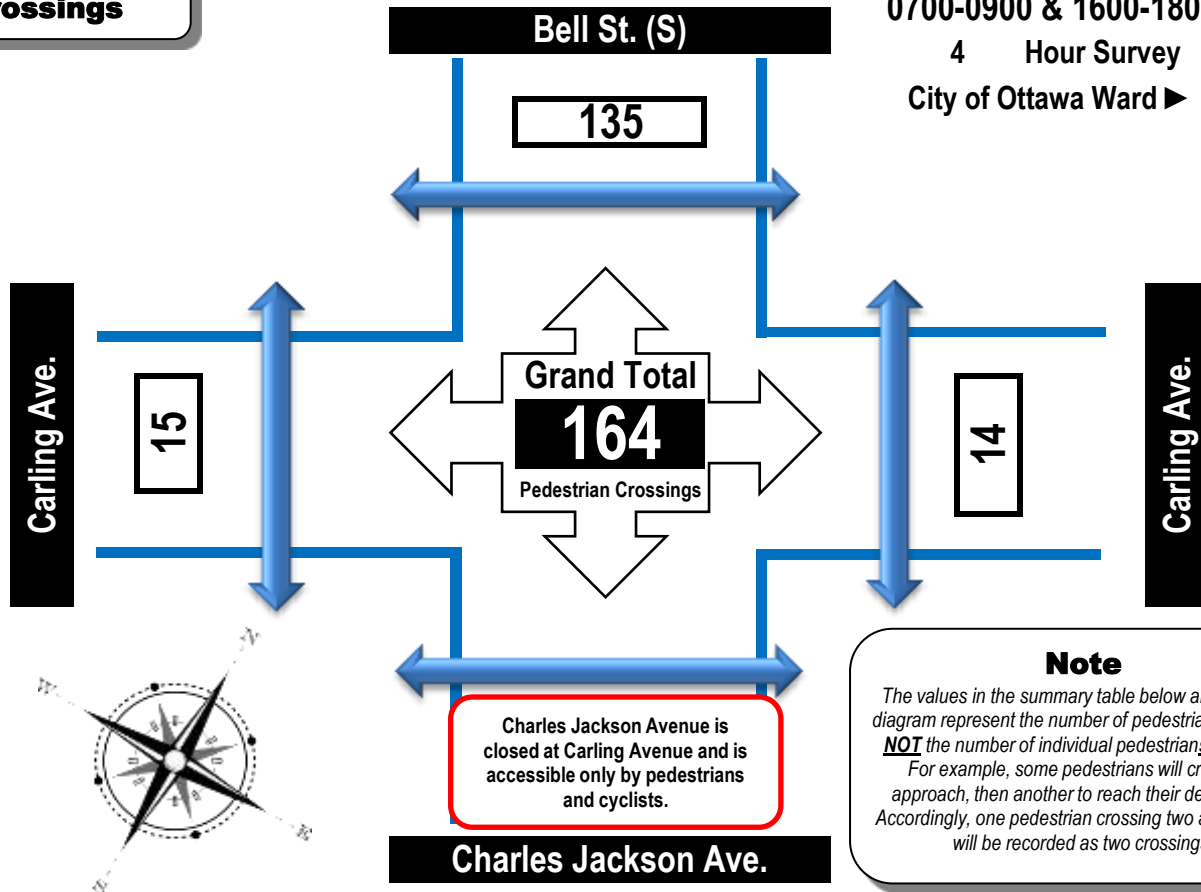
## Pedestrian Crossings

Thursday, 16 May 2019

0700-0900 & 1600-1800

4 Hour Survey

City of Ottawa Ward ► 17



### Note

The values in the summary table below and the flow diagram represent the number of pedestrian crossings NOT the number of individual pedestrians crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.

Time Period	West Side Crossing Carling Ave.	East Side Crossing Carling Ave.	Street Total	South Side Crossing Charles Jackson Ave.	North Side Crossing Bell St. (S)	Street Total	Grand Total
0700-0800	3	1	4	0	17	17	21
0800-0900	3	2	5	0	48	48	53
1600-1700	2	4	6	0	39	39	45
1700-1800	7	7	14	0	31	31	45
Totals	15	14	29	0	135	135	164

### Comments:

Charles Jackson Avenue is closed at Carling Avenue and is accessible only by bicycles and pedestrians. Traffic backs up eastbound in the south curb lane on Carling Avenue from Bronson Avenue to beyond Charles Jackson Avenue occasionally between 1600 & 1800H.



# Turning Movement Count

## Summary Report

### AADT and Expansion Factors

Automobiles, Taxis,  
Light Trucks, Vans,  
SUV's, Motorcycles,  
Heavy Trucks, Buses,  
and School Buses

#### Bell Street South & Carling Avenue

Ottawa, ON

Survey Date: Thursday, 16 May 2019

Start Time: 0700

AADT Factor: 0.9

Weather AM: Partly Cloudy +5°C

Survey Duration: 4 Hrs.

Survey Hours: 0700-0900 & 1600-1800

Weather PM: Partly Cloudy +13°C

Surveyor(s): Carmody

#### Carling Ave.

#### Carling Ave.

#### Charles Jackson Ave.

#### Bell St. (S)

#### Eastbound

#### Westbound

#### Northbound

#### Southbound

Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	0	666	0	0	666	0	516	8	0	524	1190	0	0	0	0	0	0	0	29	0	29	29	1219
0800-0900	0	869	0	0	869	0	506	2	0	508	1377	0	0	0	0	0	0	0	49	0	49	49	1426
1600-1700	0	903	0	0	903	0	740	4	0	744	1647	0	0	0	0	0	0	0	78	0	78	78	1725
1700-1800	0	753	0	0	753	0	604	6	0	610	1363	0	0	0	0	0	0	0	87	0	87	87	1450
Totals	0	3191	0	0	3191	0	2366	20	0	2386	5577	0	0	0	0	0	0	0	243	0	243	243	5820

**Equivalent 12 & 24-hour Vehicle Volumes Including the Annual Average Daily Traffic (AADT) Factor**  
**Applicable to the Day and Month of the Turning Movement Count**

**Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h**

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 → 12 expansion factor of 1.39

Equ. 12 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 0.9

AADT 12-hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 → 24 expansion factor of 1.31

AADT 24 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

#### AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor → 0.95

Highest Hourly Vehicle Volume Between 0700h & 0900h

AM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.TOT
0745-0845	0	843	0	0	843	0	533	3	0	536	1379	0	0	0	0	0	0	0	49	0	49	49	1428

PM Peak Hour Factor → 0.87

Highest Hourly Vehicle Volume Between 1600h & 1800h

PM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.TOT
1600-1700	0	903	0	0	903	0	740	4	0	744	1647	0	0	0	0	0	0	0	78	0	78	78	1725

#### Comments:

Charles Jackson Avenue is closed at Carling Avenue and is accessible only by bicycles and pedestrians. Traffic backs up eastbound in the south curb lane on Carling Avenue from Bronson Avenue to beyond Charles Jackson Avenue occasionally between 1600 & 1800H.

#### Notes:

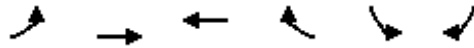
1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

# Appendix C

Synchro Worksheets – Existing Conditions

Lanes, Volumes, Timings  
4: Carling Avenue & Bell Street South

2019 Existing AM  
289 Carling Avenue



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑↑	↑↑↑↑			↑
Traffic Volume (vph)	0	843	533	3	0	49
Future Volume (vph)	0	843	533	3	0	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	4818	4813	0	0	1526
Flt Permitted						
Satd. Flow (perm)	0	4818	4813	0	0	1526
Link Speed (k/h)		50	50		50	
Link Distance (m)		200.0	200.0		200.0	
Travel Time (s)		14.4	14.4		14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	916	579	3	0	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	916	582	0	0	53
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.9%
Analysis Period (min)	15
	ICU Level of Service A

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↑
Traffic Vol, veh/h	0	843	533	3	0	49
Future Vol, veh/h	0	843	533	3	0	49
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	916	579	3	0	53

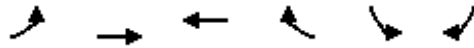
Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver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

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	602
HCM Lane V/C Ratio	-	-	-	0.088
HCM Control Delay (s)	-	-	-	11.6
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.3

Lanes, Volumes, Timings  
4: Carling Avenue & Bell Street South

2019 Existing PM  
289 Carling Avenue



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑↑	↑↑↑↓			↗
Traffic Volume (vph)	0	903	740	4	0	78
Future Volume (vph)	0	903	740	4	0	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	4818	4813	0	0	1526
Flt Permitted						
Satd. Flow (perm)	0	4818	4813	0	0	1526
Link Speed (k/h)		50	50		50	
Link Distance (m)		200.0	200.0		200.0	
Travel Time (s)		14.4	14.4		14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	982	804	4	0	85
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	982	808	0	0	85
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 27.0%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↑
Traffic Vol, veh/h	0	903	740	4	0	78
Future Vol, veh/h	0	903	740	4	0	78
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	982	804	4	0	85

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

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

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	509
HCM Lane V/C Ratio	-	-	-	0.167
HCM Control Delay (s)	-	-	-	13.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.6