Transportation Impact Assessment – Step 4: Strategy

81 Slater Street

Prepared for 10819697 Canada Inc.
by IBI Group
March 28, 2019

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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 29nd day of March, 2019.
(City)

Name: David Hook, P.Eng.

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

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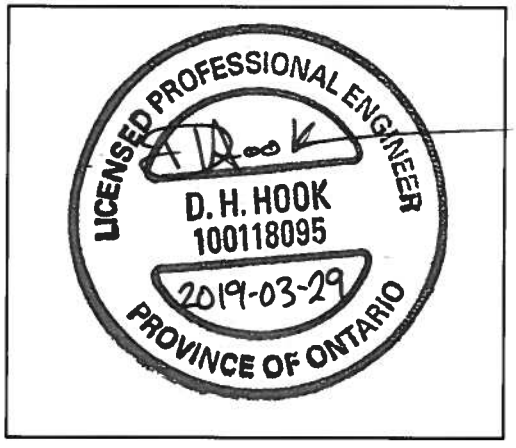

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1 Introduction

IBI Group (IBI) was retained by 10819697 Canada Inc. to undertake a Transportation Impact Assessment (TIA) in support of Site Plan Control application for a proposed 24-storey apartment building to be located at 81 Slater Street, Ottawa.

In accordance with the City of Ottawa's Transportation Impact Assessment Guidelines, published in June 2017, an initial screening was completed which confirmed the need to undertake a Transportation Impact Assessment based on the following triggers: Trip Generation, Location and Safety. A copy of the Screening Form is provided in **Appendix A**.

The following report is divided into three major components:

Scoping – This component of the TIA report describes both the existing and planned conditions in the vicinity of the development and defines such study parameters as the study area, analysis periods and horizon 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 but not relevant to the development proposal, based on consultation with City staff.

Forecasting – The Forecasting component of the TIA summarizes the development-generated travel demand. As the development-generated travel demand is negligible determining background network travel demand and demand rationalization was not required.

Strategy – 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.

Dependent on the findings of this report, the complete submission of this Transportation Impact Assessment may also require Functional Design Drawings of recommended roadway improvements to support a Roadway Modification Application (RMA). The submission may also require a post-development Monitoring Plan to track performance of the planned TIA Strategy. The need for these two elements will be confirmed through the analysis undertaken for this report.

2 Scope of Study

2.1 Description of Proposed Development

2.1.1 Site Location

The proposed development will be located on the southern portion of 88 Albert Street in Ottawa's central business district and will replace the parking structure associated with the Capital Hill Hotel and Suites immediately to the north. The site is located on the north side of Slater Street mid-block between Metcalfe Street and Elgin Street. To permit the necessary change in land use, the site will be severed and the southern portion will become 81 Slater.

The site is located within several planning areas:

- Central Area Design Priority Area
- Ottawa's Central Business District
- Future Parliament Station (LRT) Transit-Oriented Development Node
- Downtown Moves study area

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

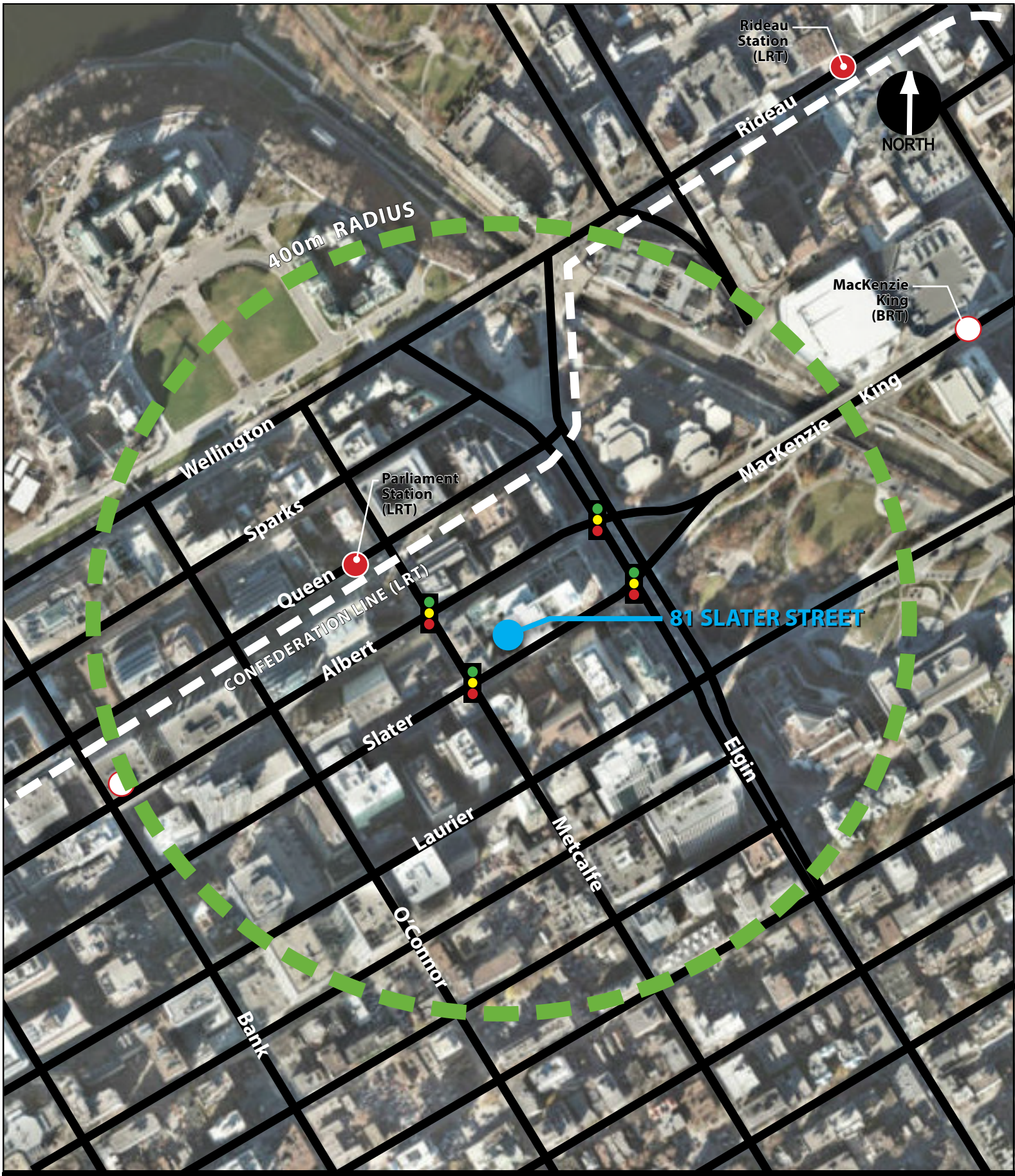
2.1.2 Land Use Details

The lot size is approximately 908 square meters and is presently zoned as Mixed-Use Downtown (MD S46) and is within a Mature Neighbourhood Overlay. The site is presently occupied by a parking garage associated with the Capital Hill Hotel and Suites. The redevelopment of this site will include a total of 196 apartment units.

Details of the proposed development are provided in **Exhibit 2**.

2.1.3 Development Phasing & Date of Occupancy

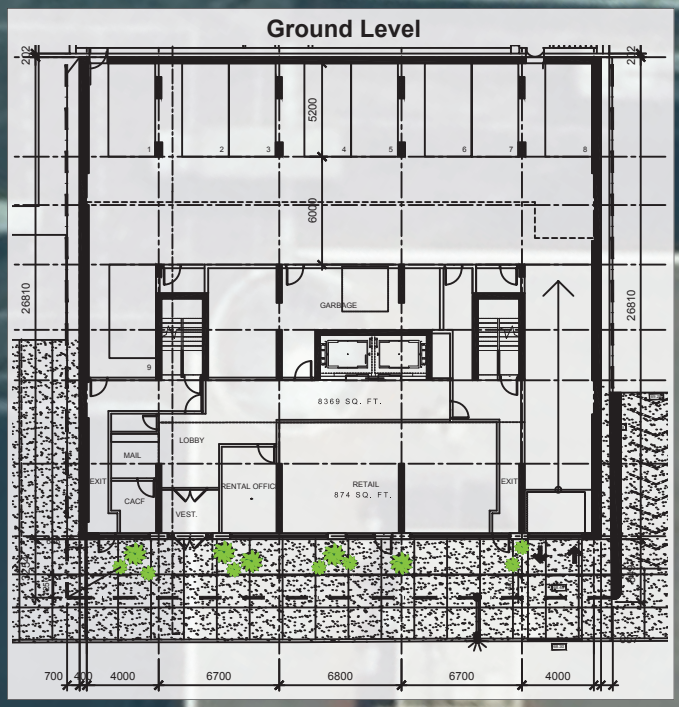
The proposed development will be constructed in a single phase. It is anticipated that the development will fully occupied by 2021.

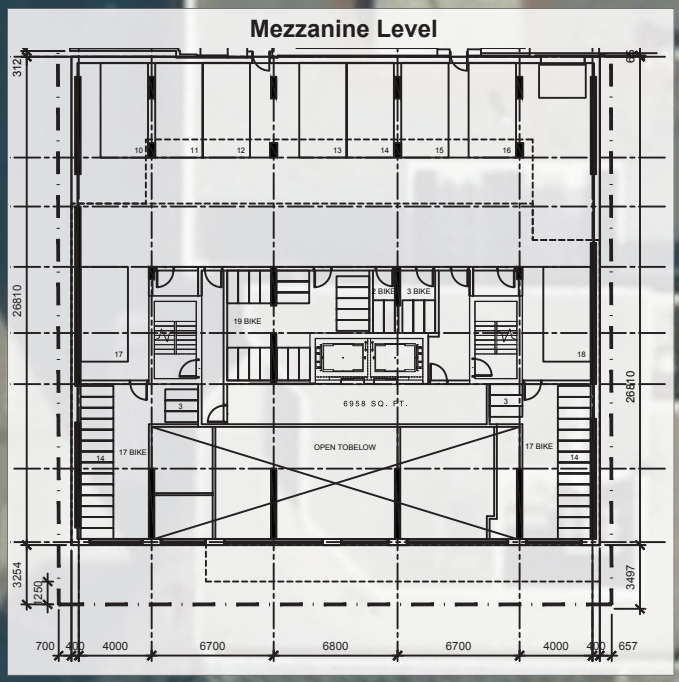


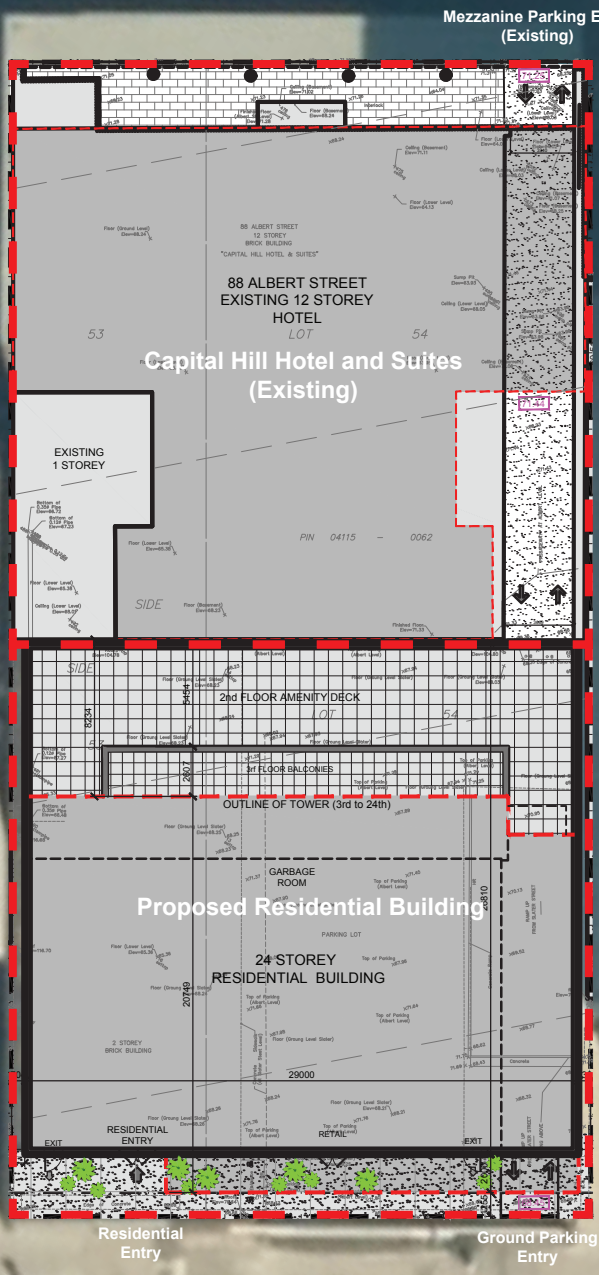
81 Slater Street
Transportation Impact Assessment

EXHIBIT 1: Site Location

PROJECT No. 119385
DATE: March 2019
SCALE:
0m 100m 200m







81 Slater Street
Transportation Impact Assessment

EXHIBIT 2: Proposed Development

PROJECT No. 118787
DATE: March 2019
SCALE:
0m 5m 10m

2.2 Existing Conditions

2.2.1 Road Network

The proposed development is bound by the following street:

- **Slater Street** is oriented east-west from Empress Avenue North to Mackenzie King Bridge. Slater Street is designated as a 3-lane one-way (eastbound) urban arterial road with a speed limit of 50 km/h. The right-of-way (ROW) is designated as Variable in the Official Plan with a maximum potential land requirement of 1.25 metres for properties abutting the existing ROW. Therefore, any new development may be subject to an additional 1.25m set back from the existing right-of-way. The southern-most lane forms part of the Transitway network and is for exclusive use by transit vehicles.

Other streets within the vicinity of the site are as follows:

- **Albert Street** is oriented east-west from Bayview Road to Mackenzie King Bridge. Albert Street is the pair to Slater Street, together providing east-west connectivity through the urban core. Albert is also designated as a 3-lane one-way (westbound) urban arterial road with a speed limit of 50 km/h. The ROW is designated as Variable in the Official Plan, also with a maximum potential land requirement of 1.25 metres. The northern-most lane is for exclusive use by transit vehicles.
- **Elgin Street** is oriented north-south from Wellington Street to Queen Elizabeth Drive. Elgin Street is designated as an urban arterial road with a speed limit of 50 km/h. From Wellington Street to Laurier Avenue, it has a 40m a ROW and a maximum potential land requirement of 2.4m for property abutting the existing ROW.
- **Metcalfe Street** is oriented north-south from Wellington Street to Monkland Avenue. Metcalfe Street is designated as an urban arterial road with a speed limit of 50 km/h and a 3-lane cross-section, providing one-way (northbound) flow. It has a 20m ROW and a maximum potential land requirement of 0.9m.

2.2.2 Intersections

The following signalized intersections are located within the immediate vicinity of the proposed development.

- Slater Street and Elgin Street
- Slater Street and Metcalfe Street
- Albert Street and Elgin Street
- Albert Street and Metcalfe Street

2.2.3 Existing Transit Service

Slater Street and Albert Street are currently part of Ottawa's Transitway network providing Bus Rapid Transit (BRT) service through the downtown core. As discussed in subsequent sections of this report, the introduction of Light Rail Transit (LRT) in 2019 will significantly change the function of this corridor.

2.2.4 Existing Pedestrian Facilities

Concrete sidewalks are provided on both sides of all streets within the immediate vicinity of the site and pedestrian crossings are provided on all four legs of each intersection described previously.

2.2.5 Existing Bicycle Facilities

The nearest dedicated cycling facilities to the proposed development are on the Mackenzie King Bridge as well as along Laurier Avenue. Mackenzie King Bridge has bicycle lanes in both directions located to the left of vehicular traffic and Laurier Street has uni-directional cycle tracks on both sides of the road. There is an eastbound bike pocket and two-stage left-turn bike box at the Slater & Elgin intersection and a bike box at the Albert & Elgin intersection.

Figure 1 shows the existing cycling network in the vicinity of the proposed development.

Figure 1 - Existing Cycling Network

Source: GeoOttawa

2.2.6 Existing Traffic Volumes

Preliminary site-generated trip estimations indicate that, depending on the mode share assumptions used, the proposed development will likely generate between 15 and 45 two-way vehicular trips during the weekday morning and afternoon peak hours. Given that only 18 on-site parking spaces are proposed it is expected that the number of trips generated by the site will be in the lower end of this range. As the site will provide access to both Albert Street and Slater Street, this volume of traffic will have a negligible impact on the adjacent roadways. Intersection capacity analyses are therefore not necessary, negating the need for traffic volume data.

Details of the vehicular trip generation will discussed in further detail in the Forecasting section of this report.

2.2.7 Traffic Management Measures

Slater Street, Albert Street and Metcalfe Street each have 'no stopping' restrictions from 7am to 9am and 3pm to 5pm, and 'no parking' restrictions from 9am to 3pm. Along both Slater Street and Albert Street, bus lanes are for exclusive use of transit vehicles between 6am to 6pm, while taxis are permitted between 9am and 3pm. Outside of 6am to 6pm, the bus lanes are available to general traffic.

In addition, the following intersection traffic management measures have been implemented:

- Albert Street and Metcalfe Street
    - Westbound left turns are prohibited – 6am to 6pm
- Albert Street and Elgin Street
    - Southbound U-turns are prohibited.

2.2.8 Collision History

The TIA Guidelines require a 5-year review of historical collision data on the boundary streets adjacent a proposed development. If it is found that there have been at least six collisions for any one movement of a discernible pattern over this time period, additional analysis may be warranted. Collision History details are provided in **Appendix B**.

Table 1 summarizes all reported collisions between January 1, 2013 and January 1, 2018.

Table 1 - Summary of Reported Collisions within the Study Area

LOCATION	# OF REPORTED COLLISIONS	RE-OCCURING EVENTS
Slater Street & Elgin Street	59	• Eastbound Sideswipe: 10 similar events
Slater Street & Metcalfe Street	27	• Eastbound/Northbound Angle: 6 similar events
Slater Street, between Elgin Street and Metcalfe Street	13	• No reoccurring events
Albert Street & Elgin Street	50	• Westbound/Westbound Turning Movement: 8 similar events
Albert Street & Metcalfe Street	14	• No reoccurring events
Albert Street, between Elgin Street and Metcalfe Street	11	• Westbound Sideswipe: 6 similar events

2.3 Planned Conditions

2.3.1 Future Road Network

The 2013 Transportation Master Plan (TMP) outlines future road network modifications required in the 2031 'Affordable Road Network.' Based on the 2031 'Affordable Road Network', no major future road network modifications were identified within the project area at that time.

The Downtown Moves study was approved by Council on March 27, 2013. The study laid out a plan and vision for the downtown following the opening of the Confederation Line to reallocate the right-of-way (ROW) currently used by the bus rapid transit network towards other street uses and functions. From this plan a functional design was developed for Slater Street, Albert Street and the Mackenzie King Bridge. An ultimate configuration for the corridor was developed for the

segments of Slater Street and Albert Street between Empress Avenue and Bay Street. East of Bay Street an interim configuration was developed. Within the study area, the bus lanes are expected to be removed, allowing space for cycle tracks along both Slater Street and Albert Street as well as modifications to on-street parking.

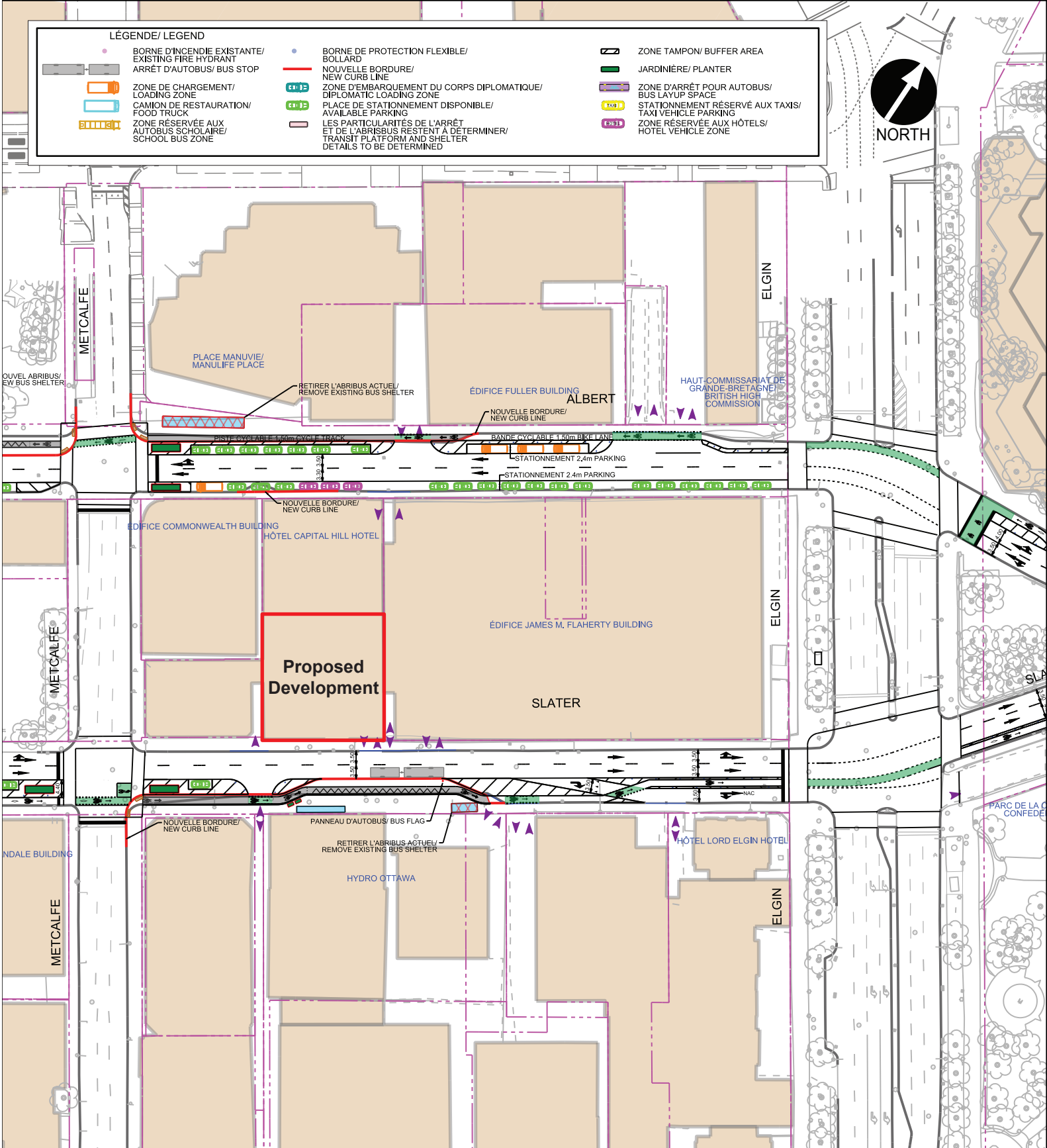
The functional design plan for the study area is shown in **Exhibit 3**. City staff anticipate that the reconstruction of Albert Street and Slater Street may occur in 2020, however as the detailed design of these plans is not yet underway, a specific implementation timeline has not yet been established. As the extent of these modifications will span the entire width of the downtown core, it is expected that the construction of each street will be offset to minimize impacts to east-west mobility through the downtown core.

As the Functional Plan includes a Complete Street design, Module 4.3 of the TIA Guidelines indicates that the following tasks must be completed:

- Identify the design at the interface of the street and the subject development.
- Assess the potential impact of the subject development on the design.
    - If changes to the design are required, develop an interim design concept for the boundary street.

These tasks will be completed and discussed in the Strategy section of this report. As a Complete Street concept has already been established, the following items do not require review in this study:

- Multi-Modal Level of Service (MMLOS) analysis
- Detailed collision analysis
- Neighbourhood Traffic Management (NTM)



Preliminary Recommended Plan
Albert Street & Slater Street Corridor
Empress Avenue to Waller Street

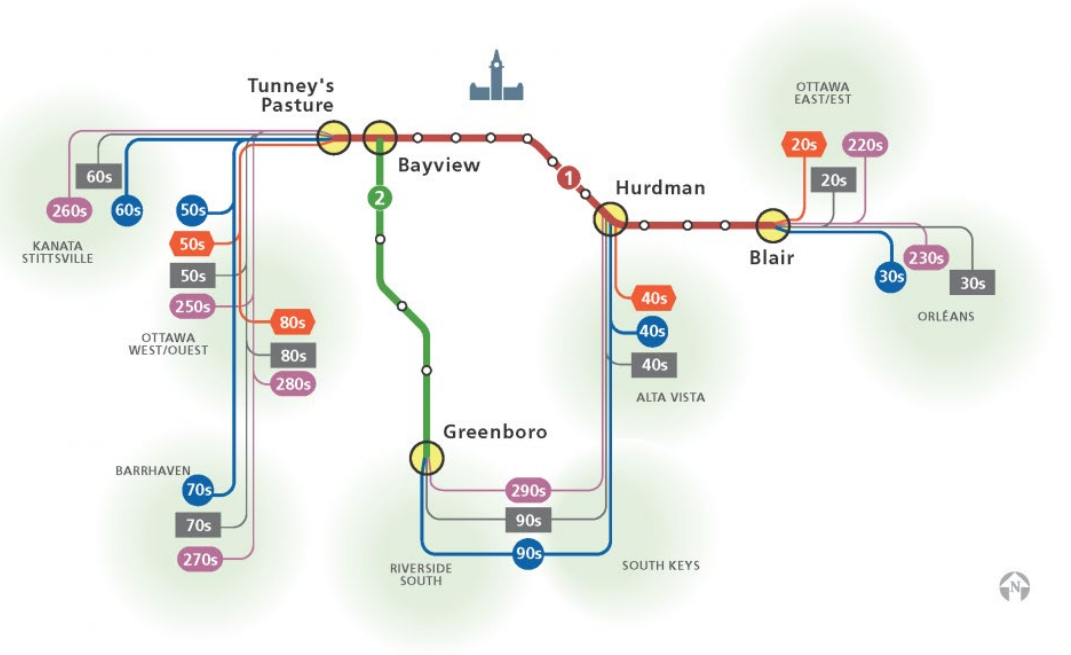
Source: https://ottawa.ca/en/city-hall/public-engagement/projects/albert-and-slater-streets-post-light-rail-transit-lrt-repurposing-functional-design-study-and-slater-street-realignment-environmental-assessment-study

2.3.2 Future Transit Facilities and Services

The 2013 TMP outlines the future rapid transit and transit priority (RTTP) network. The Confederation Line is expected to begin full revenue service by mid-2019 and will provide Light Rail Transit (LRT) service within close proximity to the subject site.

The Confederation Line will replace many of the bus routes that currently operate along Slater Street and Albert Street and rapid transit service will be provided via three downtown stations: Lyon, Parliament and Rideau. The majority of bus routes will be rerouted to intermodal transit hubs which will provide connections to the Confederation Line, primarily at Tunney's Pasture, Hurdman and Blair, as shown below in **Figure 2**.

Figure 2 - Post-LRT Rapid Transit Network

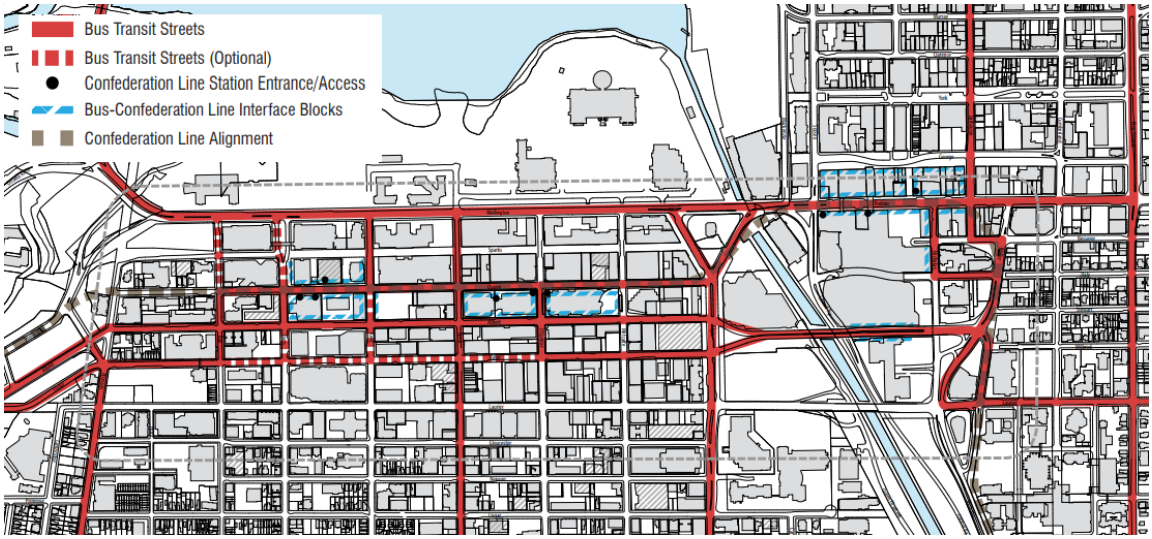


Source: OCTranspo

According to the Downtown Moves study the number of buses operating daily in the downtown will reduce from 2,600 to 600, and all bus routes operating in downtown Ottawa will connect to at least one Confederation Line station. It is expected that the reduction in bus transit service will decrease in the months following the opening of the Confederation Line.

The Downtown Moves study indicates that Slater Street and Albert Street will remain part of the overall transit network providing local service but will not be part of the rapid transit network, as shown in **Figure 3**.

Figure 3 - Future Downtown Transit Network



Source: Downtown Moves

2.3.3 Future Cycling and Pedestrian Facilities

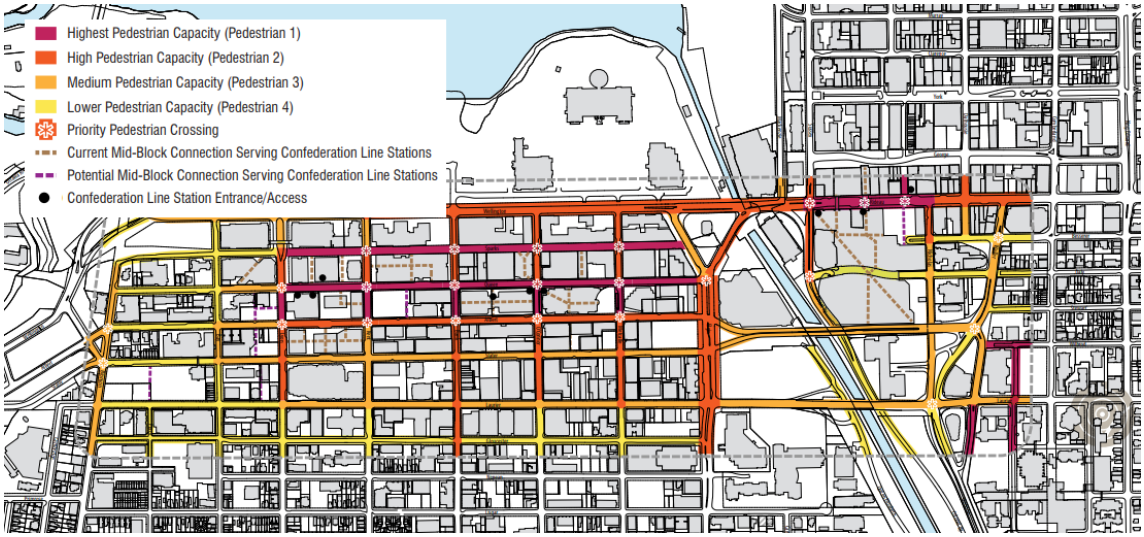
The TMP and the Ottawa Cycling Plan (OCP) designate all study area roadways as 'Spine Routes', as shown in **Figure 4**. No specific cycling infrastructure projects were identified in the TMP or OCP for any of the study area roadways however the Downtown Moves study indicates that separated cycling facilities will be implemented on all study area roadways. As shown previously on **Exhibit 3**, it has been proposed that cycle tracks be implemented along Albert Street and Slater Street, that a two-stage eastbound left-turn bike box be implemented at Slater / Metcalfe, that a bike box be implemented on the westbound approach of Albert / Elgin and that the bike lanes on Mackenzie King Bridge be relocated to the right of vehicular traffic.

Figure 4 - Ultimate Cycling Network

Source: GeoOttawa

Future enhancements to pedestrian facilities have been proposed within the study area as part of the Albert Street and Slater Street functional design. The Downtown Moves study classifies each roadway in the downtown based on the expected volume of pedestrian traffic and identifies priority pedestrian crossings, as shown below in **Figure 5**. These classifications are meant to guide designers in their allocation of right-of-way for pedestrians and may influence future roadway designs, however there are no specific plans for changes to the pedestrian infrastructure in the study area.

Figure 5 - Future Pedestrian Infrastructure Plan



Source: Downtown Moves

2.3.4 Future Adjacent Development

As required by the City of Ottawa TIA Guidelines, all significant developments within the study area which are likely to occur within the horizon year of the subject development must be identified. **Table 2** below summarizes the key details of all significant developments within the study area.

Table 2 - Future Adjacent Developments

LOCATION	DESCRIPTION	EXPECTED BUILDOUT
180 Metcalfe Street	• 303 apartment units • 5,277 square feet commercial space	2021[1]
96 Nepean Street	• 199 residential condominium units • 2 stacked townhouses	2021[2]

Notes:
1- Buildout data is unknown. Assumed build-out to coincide with subject development.
2- The 2011 Community Transportation Study by Novatech indicated that the site would be built by 2013 however the development has not yet begun construction.

2.4 Study Area

Based on the information presented above, a study area bounded by Albert Street to the north, Elgin Street to the east, Slater Street to the south and Metcalfe Street to the west will provide a sufficient assessment of the proposed development's impact on the adjacent transportation network with respect to all modes of transportation provided for in the surrounding area.

2.5 Analysis Periods

Not Applicable – As discussed in Section 2.2.6, due to the low volume of traffic that is expected to be generated by the proposed development, intersection capacity analyses will not be conducted and therefore there are no analysis periods to consider.

2.6 Study Horizon Years

Not Applicable – For the same reasons stated above there are no study horizon years to consider for this study.

2.7 Exemptions Review

The TIA Guidelines provide exemption considerations for both the Design Review and Network Impact components. **Table 3** identifies the components of the TIA that are not required.

Table 3 - 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	✗

3 Forecasting

3.1 Development-Generated Traffic

3.1.1 Base Trip Generation

The base trip generation for the proposed development was calculated using trip generation rates published in the 2009 TRANS Trip Generation Residential Trip Rates Study Report.

Table 4 below summarizes the results of the base trip generation calculations.

Table 4 - Base Trip Generation

LAND USE	UNITS / SQ FT	AM PEAK			PM PEAK		
		IN	OUT	TOTAL	IN	OUT	TOTAL
222 – High-rise Apartments (Core, Base Rate)	196	8	26	**34**	19	12	**31**

The relevant extracts from the TRANS Trip Generation Study are provided in **Appendix C**.

3.1.2 Person-Trips

The City's TIA Guidelines require trip generation to be expressed in terms of 'person-trips' rather than automobile trips in order to clearly identify the multi-modal demands of a development on the adjacent transportation network.

Table 3.13 of the TRANS Trip Generation Study provides automobile, transit and non-motorized mode shares for each geographic area, subdivided by residential type and peak period. Equivalent person-trips can be obtained by dividing vehicle-trips by the vehicle mode share of its respective geographic area, residential land use type and peak period. The TRANS study indicates that the vehicular mode share for apartments in the core area is 27% and 23% for the weekday morning and afternoon peak hours, respectively.

3.1.3 Mode Share

3.1.3.1 Existing Mode Share

The 2011 TRANS Origin-Destination Survey provides approximations of the existing modal share within the Ottawa Centre Traffic Assessment Zone (TAZ). The relevant mode shares for this TAZ have been listed below in **Table 5** along with the 2031 city-wide mode share targets from the TMP.

Table 5 - Existing Mode Share

MODE	EXISTING MODE SHARE WITHIN THE TAZ				2031 CITY-WIDE TARGET*
	AM – Within District	PM – Within District	AM – From District	PM – To District	AM
Auto Driver	12%	12%	52%	37%	50%
Auto Passenger	0%	4%	5%	13%	9%
Transit	11%	14%	24%	31%	26%
Bicycle	1%	3%	1%	2%	5%
Walk	74%	64%	17%	15%	10%
Other	2%	2%	1%	1%	n/a

** Source: Transportation Master Plan (November 2013)*

3.1.3.2 Targeted Mode Share for the Development

As discussed in Section 2.2.6, preliminary trip generation results indicated that the proposed development may generate peak hour trips ranging from approximately 15 to 45 trips per hour, depending on the mode share assumed. A 65% transit modal share has been considered appropriate for residential developments within proximity to the City's rapid transit network. Given that this site is within a 250 metre walking distance of Parliament Station, a 65% transit modal share has been assumed for this study. This increase in transit share has been balanced with an equal reduction in pedestrian mode share while the auto mode is assumed to remain fixed.

The proposed development site plan indicates that a total of 18 parking spaces will be provided on-site, all of which will be reserved for visitor parking. As on-site parking is expected to have a low turnover rate, it is expected that traffic generation to and from the proposed development will not exceed 18 two-way trips during peak hours.

Table 6 summarizes the target mode share values that will be used in the analysis.

Table 6 - Target Mode Shares

MODE	DEVELOPMENT MODE SHARE TARGETS
Auto Driver	12%
Auto Passenger	0%
Transit	65%
Bicycle	1%
Walk	20%
Other	2%

3.1.4 Trip Reduction Factors

3.1.4.1 Deduction of Existing Development Trips

The site is presently occupied by a parking garage associated with the Capital Hill Hotel and Suites. It is expected that with the redevelopment of the site the existing parking demand will relocate to nearby parking structures. A traffic count of the parking garage was conducted on December 6, 2018. **Table 7** summarizes the trips generated from the existing parking structure that will be deducted from the new site-generated vehicular trips.

Table 7 - Existing Site-Generated Trips

PERIOD	ALBERT STREET ACCESS		SLATER STREET ACCESS	
	INBOUND	OUTBOUND	INBOUND	OUTBOUND
AM Peak Hour	0	2	2	0
PM Peak Hour	2	1	6	2

3.1.4.2 Pass-By Traffic

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

3.1.4.3 Synergy/Internalization

Not Applicable. Given that the proposed development is residential only, no internalization reductions can be applied.

3.1.5 Trip Generation Summary

Table 8 summarizes the net number of person-trips per travel mode the proposed development is expected to generate during the weekday morning and weekday afternoon peak hours of adjacent traffic:

Table 8 - Net Trip Generation

MODE	AM PEAK			PM PEAK		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Total Person-Trips	30	95	**125**	85	53	**138**
Auto Driver	4	11	**15**	10	6	**16**
➢ Deduction of Existing Trips	-2	-2	**-4**	-8	-3	**-11**
Auto Passenger	0	0	**0**	0	0	**0**
Transit	19	62	**81**	55	35	**90**
Walk	6	19	**25**	17	11	**28**
Bicycle	0	1	**1**	1	1	**2**
Other	1	2	**3**	2	1	**3**
TOTAL NET AUTO TRIPS	**2**	**9**	**11**	**2**	**3**	**5**

As **Table 8** demonstrates, the site is expected to generate a net increase of 11 and 5 vehicular trips during the weekday morning and afternoon peak hours, respectively. Given the low net total of trips generated by the proposed development, the impact on the adjacent roadways will be negligible and, as indicated in the Scoping section of this report, no assessment of traffic volumes or intersection capacity has been undertaken for this study.

It should be noted however that the site is expected to generate a significant volume of transit and pedestrian trips, acknowledging that all transit trips begin and end as pedestrian trips. Other than the site access, there are no other intersections within the defined study area. The Strategy section of this report will therefore provide a review the proposed development's interface with the adjacent road network as well as both existing and planned roadway infrastructure along the boundary street segments.

3.1.6 Trip Distribution

Due to the one-way configuration of the boundary streets, both the Albert Street and Slater Street accesses will be restricted to left-in/left-out.

3.1.7 Trip Assignment

Site generated traffic will be split evenly amongst the Albert Street and Slater Street access driveways with no internal connection between the two.

3.2 Background Network Traffic

As indicated in the Scoping section of this report, the study area is limited to the proposed development site and its interface with the boundary streets. As such, no traffic volumes were collected for this study as the projected vehicular traffic generation of the site can be considered negligible. By the time the proposed development achieves full occupancy, the site's boundary streets are to undergo a complete rehabilitation including the addition of exclusive bicycle facilities,

wider sidewalks and the removal of bus-only lanes. Two unidirectional travel lanes will be maintained for automobile traffic on Albert Street and on Slater Street.

3.3 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 absorb the additional demand generated by a new development. As there is a negligible amount of site-generated traffic expected, there will be no impact on the capacity of the boundary streets. Rationalization of background travel demand is not relevant for the assessment of the proposed development as planned improvements to rapid transit and improvements to pedestrian and cycling infrastructure are likely to reduce automobile demand on the boundary streets while the vehicular capacity of these streets will be maintained.

4 Strategy

4.1 Development Design

4.1.1 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 site integrates well with the adjacent transportation network by providing convenient access to active transportation facilities and is located within the minimum-prescribed distance of 400 meters to public transportation.

The sidewalk adjacent to the subject development is currently approximately 2.4m wide. The interim configuration for the reconstruction of Albert Street and Slater Street will remove the bus lanes on both streets to implement cycling facilities and localized sidewalk widenings on the northern and southern side of Albert Street and Slater Street, respectively. The sidewalk adjacent to the site will not be modified as part of the reconstruction of Slater Street. With the redevelopment of the site, an additional 3.5m of sidewalk width will be added along the site frontage due to the proposed building setback, thereby locally increasing the total sidewalk width to 5.7m.

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

4.1.2 Circulation and Access

The existing parking garage has two private vehicular approach driveways. There is currently an access and ramp off Albert Street that leads to the mezzanine level of the parking garage while on Slater Street there is an access near the eastern boundary of the site that provides access to the ground level parking. Within the parking garage, a ramp presently connects the ground level parking to the mezzanine level parking.

The proposed site plan will retain two private approach driveways providing access to Slater Street and Albert Street. The existing Albert Street access and the associated ramp will be retained and used to access the mezzanine level parking. The Slater Street access will remain at its current location and will provide access to the ground level parking only. No internal ramp will connect the ground level parking to the mezzanine level parking.

The internal drive aisles on both levels will be 6m wide. The reconstructed Slater Street driveway will be 3.0m wide at the garage door and the existing Albert Street driveway will retain its 2.4m width at the entry. Pedestrian access to the proposed development will be located on Slater Street.

Waste collection, loading and deliveries will occur on Slater Street, adjacent to the site. Such activities will be conducted during off-peak hours to ensure minimal disruption to traffic.

4.1.3 New Street Networks

Not Applicable – As defined in the study scope, this element of the TIA Guidelines is not required for development applications involving site plans.

4.2 Parking

4.2.1 Parking Supply

Bicycle Parking

A total of 105 bicycle parking spaces will be provided, which is in excess of the 98 required by the City by-law. All bicycle parking spaces will be located in a sheltered and secure location on the ground and mezzanine levels of the building with access via Slater Street and Albert Street.

Vehicular Parking

As the site is located within Area Z in Schedule 1A of the zoning by-law there is no minimum requirement to provide parking spaces for residents, however, 18 designated visitor parking spaces must be provided. Furthermore, as the site is within 600m of a rapid transit station there is a maximum of 294 parking spaces that can be provided on-site.

The draft site plan proposes two parking levels providing a combined total of 18 parking spaces and therefore meets the by-law. The ground level parking and mezzanine level parking will each contain 9 parking spaces and will be entirely reserved for visitor parking.

4.2.2 Spillover Parking

As the proposed development will meet or exceed the City's minimum parking requirements for the site, no further review of parking is deemed necessary for the purposes of this study.

4.3 Boundary Streets

4.3.1 Complete Streets

The Preliminary Recommended Plan for the Albert Street and Slater Street Corridor between Empress Avenue and Waller Street identifies the City's complete street concept for Albert Street and Slater Street, as shown previously in **Exhibit 3**. Within the study area, on both Albert Street and Slater Street, the plan proposes to remove the existing bus lanes and replacing them with additional on-street parking and cycle tracks. The overall width of the sidewalks on both sides of the streets will remain the same except for some localized widening. Adjacent to the site, the roadside configuration will be maintained in its present configuration.

Based on the proposed site plan, the subject development will have no impact on the City's complete street concept.

4.4 Access Intersections

4.4.1 Location and Design of Access

The proposed plan is within conformance with the City of Ottawa Private Approach By-law 2003-447, with particular confirmation of the following items:

- Width: As the site is within a Mature Neighbourhood the minimum and maximum width of a private approach is governed by the Zoning By-law. The Zoning By-law states that in the case of a two-way driveway for an apartment building that leads to less than 20 parking spaces the maximum driveway width is 3.6m.
    - The existing two-way private approach on Albert Street will maintain its current configuration with a 3.8m ramp width and 2.4m wide entry. ✓
    - The existing two-way private approach on Slater Street will be 3.0m wide at the entry. ✓

- Distance from Intersecting Road: For a residential development with up to 49 parking spaces, the proposed private approach must be at least 18 metres from the nearest intersecting street line.
    - The proposed access is located approximately 55 metres from the nearest intersecting street line at Metcalfe Street and is therefore in conformance with the by-law. ✓
- Quantity and Spacing of Private Approaches: For sites with frontage between 20 and 34 metres, one (2) two-way 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 both Slater Street and Albert Street is approximately 30 metres and therefore the two proposed two-way private approaches are 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 proposed private approach on Rideau Street will be located approximately 1.7 metres from the eastern property line. ✗
        - The adjacent property to the east has an access near the property line however because the site is a low traffic generator and because of the one-way operation along Slater Street turning conflicts for exiting vehicles are minimized. Since there are no visibility restrictions and the access is already present at this location, it is not expected to present a safety concern with respect to the operations of the adjacent driveway, an exception should be granted.
- Grade of Private Approach: The grade of a private approach serving a parking area of less than 50 spaces must not exceed 2% within the private property for a distance of 6m from the highway/curb line.
    - The proposed grade of the private approach will be less than 2% within 6m of the curb line. ✓

The proposed private approach on Slater Street will be constructed with a depressed curb and continuous sidewalk. The existing private approach on Albert Street will maintain its existing configuration.

4.4.2 Access Intersection Control

The TIA Guidelines require a review of site access control to identify whether the installation of traffic signals or the implementation of a roundabout is warranted at the site access. With consideration of the location of the site accesses neither measure would be appropriate and therefore the proposed private approach driveways on Slater Street and Albert Street will be unsignalized.

The TIA Guidelines also suggest consideration shall be given to the implementation of isolated transit priority measures at the site access intersection, however, given that the intersection will remain unsignalized there are no transit priority measures that can be considered at this location.

4.4.3 Access Intersection Design

As discussed in **Section 3.1.5**, intersection capacity analysis will not be conducted for this study and, as the site accesses will remain unsignalized, multi-modal level of service is not applicable either.

4.5 Transportation Demand Management (TDM)

Not Applicable – As identified in Section 2.7, this section is only required for sites with more than 60 employees or students on location at any given moment.

4.6 Neighbourhood Traffic Management

Not Applicable – As defined in the study scope, this element of the TIA Guidelines is only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds.

4.7 Transit

4.7.1 Route Capacity

The estimated transit passenger demand generated by the proposed development was determined in the Forecasting section of this report. It is anticipated that the proposed development will generate approximately 81 and 90 transit trips during the weekday morning and afternoon peak hours, respectively. This projected volume of additional transit users is not expected to have a significant impact on the capacity of the existing transit routes and should be easily accommodated by the future O-Train Confederation Line.

4.7.2 Transit Priority

The expected increase in transit users as a result of the proposed development is not likely to trigger the need for any isolated transit measures for improvements to existing service or to offset any transit delays.

4.8 Review of Network Concept

Not Applicable - The proposed development is expected to generate less than 200 person-trips during the weekday morning or afternoon peak hours. As indicated in the Scoping of this TIA, the impact of the development will be localized and minor, therefore there is no requirement to undertake a review of the Network Concept.

4.9 Intersection Capacity Analysis

As discussed in **Section 2.4**, there are no intersections included within the study area, therefore, there is no analysis that needs to be completed.

5 Conclusions

The proposed residential apartment development at 81 Slater will generate a very small amount of vehicular traffic during the weekday peak hours of adjacent street traffic. As the impact of the proposed development to the adjacent intersections is expected to be insignificant, intersection capacity analysis was not completed as part of this TIA. No off-site modifications will be required therefore the TIA does not include an RMA component.

Similarly, due to the very small amount of site-generated traffic, no mitigation measures will be required and therefore a post-occupancy Monitoring Plan for this development is not required.

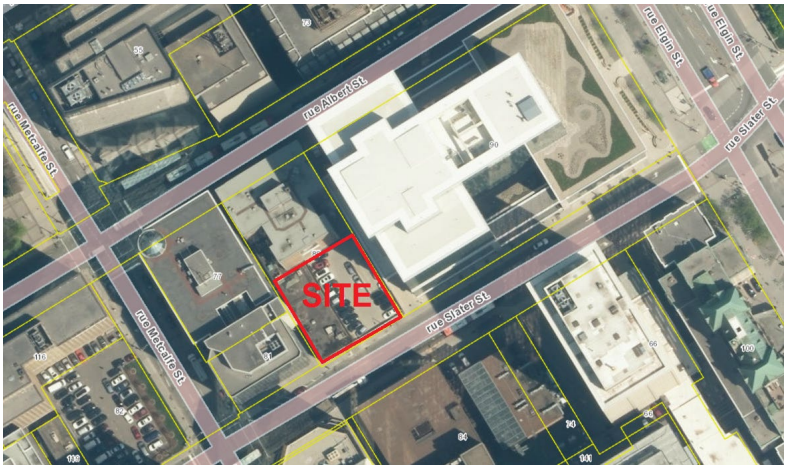
An analysis of the proposed development site plan indicates that the proposed parking supply meets the by-law requirements. The review of the proposed site access concluded that the ground level parking driveway was substandard in terms of its distance to the property line, however, with consideration that no operational issues are foreseen due to its location, it is recommended that the proposed offset to the eastern property line be permitted.

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 – TIA SCREENING FORM

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	**81 Slater Street (88 Albert Street)**
Description of Location	**Located on the north side of Slater Street between Metcalfe Street and Elgin Street** 
Land Use Classification	**Ground Floor Retail and Apartments**
Development Size (units)	**Apartment: 184 units**
Development Size (ft^2)	**Retail: 1,275 square feet**
Number of Accesses and Locations	**Two Access Driveways:** **1) Slater Street – One two-way access for ground level parking** **2) Albert Street – One two-way access for mezzanine level parking**
Phase of Development	**Single Phase**
Buildout Year	**2021**

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).*

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

4. Safety Triggers

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

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

5. Summary

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

Overall, the subject development has been found to satisfy at least one of the triggers for a Transportation Impact Assessment.

APPENDIX B – COLLISION DATA

City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2013 **To:** December 31, 2017

Location: ALBERT ST @ ELGIN ST/MACKENZIE KING BRIDGE

Traffic Control: Traffic signal **Total Collisions:** 50

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-May-25, Sun,17:08	Clear	Turning movement	Non-reportable	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2014-Jun-19, Thu,17:00	Clear	SMV other	P.D. only	Dry	West	Turning left	Automobile, station wagon	Curb	
2014-Jul-20, Sun,04:22	Clear	Approaching	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2014-Jul-14, Mon,16:53	Clear	SMV other	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Curb	
2014-Sep-06, Sat,09:58	Rain	SMV other	P.D. only	Wet	West	Turning left	Automobile, station wagon	Curb	
2014-Oct-16, Thu,19:14	Rain	SMV other	P.D. only	Wet	West	Turning left	Automobile, station wagon	Curb	
2014-Oct-19, Sun,01:26	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

2014-Feb-11, Tue,10:03	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Mar-14, Sat,16:27	Rain	SMV other	P.D. only	Wet	West	Turning left	Automobile, station wagon	Curb
2015-Apr-04, Sat,15:11	Clear	SMV other	P.D. only	Dry	West	Turning left	Automobile, station wagon	Curb
2015-May-01, Fri,15:29	Clear	Turning movement	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Municipal transit bus	Other motor vehicle
2015-Jan-31, Sat,11:16	Clear	Turning movement	P.D. only	Slush	West	Turning right	Pick-up truck	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2015-Jul-04, Sat,14:06	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2015-Sep-12, Sat,00:14	Rain	SMV other	P.D. only	Wet	West	Turning left	Automobile, station wagon	Curb
2015-Sep-20, Sun,06:45	Clear	SMV other	P.D. only	Dry	West	Turning left	Pick-up truck	Curb
2015-Sep-08, Tue,09:59	Clear	Rear end	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle

2015-Oct-01, Thu,17:47	Clear	SMV other	P.D. only	Dry	West	Turning left	Automobile, station wagon	Curb
2016-Feb-06, Sat,19:34	Clear	SMV other	P.D. only	Dry	North	Turning left	Automobile, station wagon	Curb
2016-Feb-17, Wed,15:59	Snow	Sideswipe	P.D. only	Packed snow	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle
2016-Apr-26, Tue,16:11	Clear	SMV other	P.D. only	Dry	West	Turning left	Automobile, station wagon	Curb
2016-May-05, Thu,23:09	Clear	SMV other	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Curb
2016-Feb-19, Fri,14:48	Snow	Sideswipe	P.D. only	Wet	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2016-May-15, Sun,15:58	Clear	Turning movement	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2016-Jul-10, Sun,02:52	Rain	SMV other	P.D. only	Wet	West	Turning left	Automobile, station wagon	Curb
2016-Jul-28, Thu,15:30	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Passenger van	Other motor vehicle

2016-Aug-25, Thu,09:25	Rain	Rear end	Non-fatal injury	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2016-Jul-06, Wed,17:44	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2016-Apr-26, Tue,21:26	Rain	SMV other	P.D. only	Wet	West	Turning left	Automobile, station wagon	Ran off road
2016-Jul-07, Thu,14:00	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Bus (other)	Other motor vehicle
2017-Feb-27, Mon,11:12	Clear	SMV other	P.D. only	Dry	West	Turning left	Automobile, station wagon	Curb
2017-Apr-07, Fri,09:27	Clear	SMV other	P.D. only	Dry	West	Turning left	Automobile, station wagon	Curb
2017-Apr-14, Fri,16:01	Clear	SMV other	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Curb
2017-Apr-16, Sun,01:19	Rain	SMV other	P.D. only	Wet	West	Turning left	Automobile, station wagon	Curb
2017-May-05, Fri,09:55	Rain	Sideswipe	Non-fatal injury	Wet	West	Turning right	Pick-up truck	Other motor vehicle
					West	Turning right	Municipal transit bus	Other motor vehicle

2017-Oct-15, Sun,12:00	Rain	Sideswipe	P.D. only	Wet	North	Unknown	Unknown	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle
2017-Jan-27, Fri,10:07	Clear	Rear end	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2017-Oct-28, Sat,21:18	Rain	SMV other	P.D. only	Wet	West	Turning left	Automobile, station wagon	Curb
2017-Oct-15, Sun,11:58	Clear	Turning movement	Non-fatal injury	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Motorcycle	Other motor vehicle
2017-Nov-10, Fri,11:48	Clear	SMV other	P.D. only	Dry	West	Turning left	Automobile, station wagon	Curb
2017-Nov-22, Wed,20:28	Clear	Turning movement	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2013-Jan-07, Mon,08:25	Clear	Rear end	P.D. only	Loose snow	North	Turning left	Police vehicle	Other motor vehicle
					North	Turning left	Pick-up truck	Other motor vehicle
2013-Mar-13, Wed,11:30	Clear	Sideswipe	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Turning left	Truck - closed	Other motor vehicle

2013-Feb-16, Sat,16:57	Clear	Turning movement	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Municipal transit bus	Other motor vehicle
2013-Mar-30, Sat,13:30	Clear	SMV other	P.D. only	Dry	West	Turning left	Automobile, station wagon	Curb
2013-Mar-25, Mon,15:23	Clear	SMV other	P.D. only	Dry	West	Turning left	Automobile, station wagon	Curb
2013-Feb-06, Wed,18:04	Clear	Turning movement	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2013-Mar-10, Sun,16:01	Clear	Turning movement	P.D. only	Dry	West	Going ahead	Municipal transit bus	Other motor vehicle
					West	Turning right	Passenger van	Other motor vehicle
2013-May-10, Fri,23:01	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2013-Sep-09, Mon,02:37	Clear	SMV other	P.D. only	Dry	West	Turning left	Automobile, station wagon	Curb
2013-Oct-31, Thu,17:28	Rain	SMV other	P.D. only	Dry	North	Turning left	Automobile, station wagon	Curb

Location: ALBERT ST @ METCALFE ST

Traffic Control: Traffic signal

Total Collisions: 14

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jun-15, Sun,17:58	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Municipal transit bus	Other motor vehicle	
2014-Oct-10, Fri,11:32	Clear	Turning movement	P.D. only	Dry	West	Turning right	Delivery van	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2014-Sep-07, Sun,00:20	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Bicycle	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Cyclist	
2015-Jan-26, Mon,10:05	Clear	Rear end	P.D. only	Dry	West	Unknown	Automobile, station wagon	Other motor vehicle	
					West	Unknown	Delivery van	Other motor vehicle	
2015-May-20, Wed,21:25	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-Apr-15, Fri,09:11	Clear	Turning movement	P.D. only	Dry	West	Turning right	Truck - closed	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2016-May-31, Tue,07:48	Clear	SMV other	Non-fatal injury	Dry	West	Turning right	Automobile, station wagon	Pedestrian	1

2016-Mar-17, Thu,12:52	Rain	SMV other	Non-fatal injury	Wet	North	Turning left	Automobile, station wagon	Pedestrian	1
2017-Feb-08, Wed,09:30	Clear	Sideswipe	P.D. only	Slush	West	Going ahead	Tow truck	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Oct-25, Wed,13:13	Clear	Sideswipe	P.D. only	Dry	East	Pulling away from shoulder or curb	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Dec-04, Mon,16:56	Clear	SMV other	Non-fatal injury	Dry	North	Turning left	Pick-up truck	Pedestrian	1
2017-Dec-27, Wed,17:15	Freezing Rain	Turning movement	Non-fatal injury	Ice	West	Turning right	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2013-Nov-12, Tue,17:39	Clear	Angle	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Sep-29, Fri,13:21	Clear	SMV other	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Pedestrian	1

Location: ALBERT ST btwn METCALFE ST & ELGIN ST

Traffic Control: No control

Total Collisions: 11

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Sep-17, Wed,17:11	Clear	Sideswipe	P.D. only	Dry	West	Going ahead	Municipal transit bus	Other motor vehicle	

					West	Stopped	Delivery van	Other motor vehicle	
2015-Feb-02, Mon,09:19	Snow	Rear end	Non-fatal injury	Packed snow	West	Going ahead	Municipal transit bus	Other motor vehicle	
					West	Stopped	Municipal transit bus	Other motor vehicle	
2015-Feb-02, Mon,08:56	Snow	Rear end	P.D. only	Loose snow	West	Slowing or stopping	Municipal transit bus	Other motor vehicle	
					West	Stopped	Municipal transit bus	Other motor vehicle	
2015-Feb-19, Thu,19:47	Snow	Sideswipe	P.D. only	Packed snow	West	Changing lanes	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2015-Jun-23, Tue,18:56	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2016-Jan-22, Fri,09:07	Clear	Sideswipe	P.D. only	Dry	West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2017-Nov-14, Tue,22:17	Clear	Rear end	Non-fatal injury	Dry	West	Slowing or stopping	Municipal transit bus	Other motor vehicle	
					West	Slowing or stopping	Municipal transit bus	Other motor vehicle	
2013-May-28, Tue,14:38	Clear	SMV other	Non-fatal injury	Dry	West	Going ahead	Municipal transit bus	Pedestrian	1

2013-Jun-06, Thu,16:21	Rain	Sideswipe	P.D. only	Wet	West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2013-Sep-24, Tue,15:31	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2017-Oct-24, Tue,08:41	Rain	SMV other	Non-fatal injury	Wet	East	Going ahead	Passenger van	Pedestrian	1

Location: ELGIN ST @ SLATER ST

Traffic Control: Traffic signal

Total Collisions: 59

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Mar-14, Fri,15:26	Clear	Rear end	Non-reportable	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Jun-29, Sun,15:54	Clear	SMV other	P.D. only	Dry	East	Changing lanes	Pick-up truck	Ran off road	
2014-Nov-10, Mon,19:24	Clear	Angle	P.D. only	Wet	South	Going ahead	Passenger van	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Oct-01, Wed,16:35	Clear	Rear end	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Pick-up truck	Other motor vehicle	
2014-Aug-27, Wed,01:30	Clear	SMV other	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Curb	

2014-Dec-02, Tue,22:27	Snow	SMV other	P.D. only	Loose snow	South	Turning left	Municipal transit bus	Skidding/sliding	
2014-Dec-17, Wed,11:38	Freezing Rain	SMV other	P.D. only	Wet	East	Unknown	Unknown	Pole (utility, power)	
2015-Jan-26, Mon,03:04	Clear	SMV other	P.D. only	Dry	East	Turning right	Pick-up truck	Skidding/sliding	
2014-Feb-02, Sun,22:33	Clear	Angle	P.D. only	Wet	East	Turning right	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	
2014-Feb-15, Sat,12:14	Clear	Angle	P.D. only	Dry	East	Going ahead	Passenger van	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-May-14, Wed,14:52	Clear	SMV other	Non-fatal injury	Dry	West	Reversing	Automobile, station wagon	Pedestrian	1
2015-Feb-14, Sat,15:00	Snow	Rear end	P.D. only	Packed snow	North	Slowing or stopping	Pick-up truck	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
2015-Apr-24, Fri,23:35	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jul-07, Tue,17:22	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Bicycle	Other motor vehicle	

					East	Going ahead	Municipal transit bus	Cyclist	
2015-May-10, Sun,15:21	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-Sep-13, Sun,00:04	Rain	Angle	Non-fatal injury	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Aug-25, Tue,10:44	Clear	Rear end	P.D. only	Dry	South	Turning left	Unknown	Other motor vehicle	
					South	Turning left	Pick-up truck	Other motor vehicle	
2015-Nov-12, Thu,13:21	Rain	Angle	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Oct-16, Fri,23:13	Rain	SMV other	P.D. only	Wet	South	Turning left	Automobile, station wagon	Curb	
2015-Sep-03, Thu,02:38	Clear	SMV other	Non-fatal injury	Dry	East	Turning left	Municipal transit bus	Pedestrian	1
2015-Oct-30, Fri,17:24	Clear	Turning movement	P.D. only	Dry	South	Turning left	Municipal transit bus	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	

2015-Dec-10, Thu,09:31	Clear	Angle	P.D. only	Wet	East	Turning right	Truck - closed	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Dec-04, Fri,16:31	Clear	Sideswipe	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Changing lanes	Automobile, station wagon	Other motor vehicle
2016-Mar-17, Thu,23:27	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Passenger van	Other motor vehicle
					East	Going ahead	Municipal transit bus	Other motor vehicle
2016-Mar-14, Mon,14:28	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Municipal transit bus	Other motor vehicle
2016-Apr-06, Wed,19:00	Snow	Sideswipe	P.D. only	Loose snow	East	Going ahead	Municipal transit bus	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2016-Apr-14, Thu,06:47	Clear	SMV other	P.D. only	Dry	East	Turning left	Automobile, station wagon	Curb
2016-Mar-02, Wed,08:37	Snow	Rear end	P.D. only	Slush	East	Turning right	Unknown	Other motor vehicle
					East	Turning right	Delivery van	Other motor vehicle
2016-Jun-16, Thu,13:43	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle

					East	Going ahead	Municipal transit bus	Other motor vehicle
2016-Jun-19, Sun,14:06	Clear	Rear end	P.D. only	Dry	North	Going ahead	Municipal transit bus	Other motor vehicle
					North	Turning right	Automobile, station wagon	Other motor vehicle
2016-Jun-22, Wed,17:49	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Truck - open	Other motor vehicle
2016-Jul-11, Mon,07:41	Clear	Sideswipe	Non-fatal injury	Dry	South	Unknown	Pick-up truck	Other motor vehicle
					South	Unknown	Automobile, station wagon	Other motor vehicle
2016-Sep-04, Sun,15:30	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Municipal transit bus	Other motor vehicle
					East	Turning right	Pick-up truck	Other motor vehicle
2016-Aug-27, Sat,11:55	Clear	Angle	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Oct-20, Thu,23:31	Rain	SMV other	P.D. only	Wet	East	Turning left	Automobile, station wagon	Curb
2016-Dec-08, Thu,17:25	Snow	SMV other	P.D. only	Wet	South	Turning left	Police vehicle	Curb
2016-Dec-16, Fri,17:19	Clear	Rear end	P.D. only	Slush	North	Going ahead	Pick-up truck	Other motor vehicle

					North	Stopped	Automobile, station wagon	Other motor vehicle
2016-Dec-07, Wed,15:25	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Pick-up truck	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2017-Feb-15, Wed,16:17	Snow	Sideswipe	P.D. only	Loose snow	East	Unknown	Unknown	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2017-Feb-17, Fri,23:37	Clear	Sideswipe	Non-reportable	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2017-Aug-02, Wed,15:00	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Apr-21, Fri,22:04	Rain	Angle	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2017-May-02, Tue,10:04	Clear	Turning movement	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Municipal transit bus	Other motor vehicle
2017-May-26, Fri,09:37	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Municipal transit bus	Other motor vehicle

					East	Going ahead	Delivery van	Other motor vehicle
2017-Jul-03, Mon,20:14	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Municipal transit bus	Other motor vehicle
2017-Jun-24, Sat,15:24	Clear	Angle	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jul-04, Tue,16:50	Clear	Sideswipe	P.D. only	Dry	East	Merging	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Truck - tank	Other motor vehicle
2013-Jan-22, Tue,15:20	Clear	Rear end	Non-reportable	Dry	South	Slowing or stopping	Delivery van	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2013-Jan-24, Thu,15:01	Clear	Sideswipe	P.D. only	Dry	East	Turning right	Truck and trailer	Other motor vehicle
					East	Stopped	Municipal transit bus	Other motor vehicle
2013-Feb-18, Mon,14:50	Clear	Angle	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Feb-19, Tue,16:15	Snow	Rear end	P.D. only	Loose snow	South	Slowing or stopping	Pick-up truck	Skidding/sliding

					South	Stopped	Passenger van	Other motor vehicle	
2013-Feb-19, Tue,18:01	Snow	Sideswipe	P.D. only	Loose snow	East	Going ahead	Municipal transit bus	Other motor vehicle	
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2013-Feb-12, Tue,18:30	Snow	SMV other	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other	
2013-Feb-08, Fri,18:00	Snow	Angle	P.D. only	Loose snow	North	Slowing or stopping	Pick-up truck	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2013-Feb-06, Wed,20:33	Clear	SMV other	P.D. only	Dry	East	Going ahead	Municipal transit bus	Pole (utility, power)	
2013-Apr-24, Wed,23:13	Clear	SMV other	P.D. only	Wet	East	Turning left	Automobile, station wagon	Pole (sign, parking meter)	
2013-May-10, Fri,18:16	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2013-Sep-25, Wed,18:53	Clear	SMV other	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Pedestrian	1
2013-Dec-07, Sat,13:05	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Passenger van	Other motor vehicle	

Location: METCALFE ST @ SLATER ST

Traffic Control: Traffic signal

Total Collisions: 27

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Mar-14, Fri,19:33	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Aug-10, Sun,22:23	Clear	SMV other	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other	
2014-Oct-28, Tue,02:27	Rain	Angle	P.D. only	Wet	East	Going ahead	Municipal transit bus	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Jun-19, Thu,14:30	Clear	SMV other	Non-fatal injury	Dry	East	Turning left	Pick-up truck	Pedestrian	1
2014-May-27, Tue,10:52	Clear	Angle	Non-fatal injury	Dry	North	Turning right	Bicycle	Other motor vehicle	
					East	Going ahead	Municipal transit bus	Cyclist	
2014-Dec-09, Tue,15:12	Clear	Rear end	P.D. only	Dry	East	Unknown	Automobile, station wagon	Other motor vehicle	
					East	Unknown	Delivery van	Other motor vehicle	
2015-Jan-03, Sat,20:45	Snow	Turning movement	P.D. only	Ice	East	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Pick-up truck	Other motor vehicle	

2015-Feb-23, Mon,16:00	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Pick-up truck	Other motor vehicle	
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Jan-24, Sat,19:15	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Mar-03, Tue,14:23	Clear	Sideswipe	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Changing lanes	Pick-up truck	Other motor vehicle	
2015-Jun-18, Thu,15:56	Clear	SMV other	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Pedestrian	1
2015-Nov-30, Mon,22:20	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-May-25, Wed,15:33	Clear	SMV other	Non-fatal injury	Dry	North	Turning right	Pick-up truck	Pedestrian	1
2016-Jun-19, Sun,23:07	Clear	Angle	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	
2016-Dec-15, Thu,12:58	Clear	Sideswipe	P.D. only	Wet	East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

2017-Jan-11, Wed,06:30	Rain	Angle	P.D. only	Slush	East	Slowing or stopping	Pick-up truck	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Mar-14, Tue,15:53	Snow	SMV other	Non-fatal injury	Loose snow	East	Turning left	Passenger van	Pedestrian	1
2017-Jan-19, Thu,08:14	Clear	Sideswipe	P.D. only	Wet	East	Going ahead	Truck-other	Other motor vehicle	
					East	Stopped	Municipal transit bus	Other motor vehicle	
2017-Nov-02, Thu,21:45	Rain	SMV other	Non-fatal injury	Wet	East	Turning left	Automobile, station wagon	Pedestrian	1
2013-May-28, Tue,12:47	Clear	Sideswipe	Non-fatal injury	Dry	North	Stopped	Automobile, station wagon	Cyclist	
					North	Going ahead	Bicycle	Other motor vehicle	
2013-Jul-02, Tue,12:08	Clear	Sideswipe	P.D. only	Dry	North	Pulling away from shoulder or curb	Delivery van	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Nov-10, Sun,03:36	Clear	Angle	P.D. only	Wet	North	Going ahead	Pick-up truck	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2013-Nov-02, Sat,17:50	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Passenger van	Other motor vehicle	

2013-Nov-30, Sat,08:23	Snow	Angle	P.D. only	Slush	East	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Dec-14, Sat,19:08	Snow	Angle	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Dec-18, Wed,15:24	Clear	Sideswipe	P.D. only	Slush	North	Pulling away from shoulder or curb	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Dec-21, Sat,10:30	Clear	Sideswipe	Non-reportable	Slush	East	Changing lanes	Delivery van	Other motor vehicle
					East	Going ahead	Passenger van	Other motor vehicle

Location: SLATER ST btwn METCALFE ST & ELGIN ST

Traffic Control: No control

Total Collisions: 13

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-May-23, Fri,11:54	Clear	Rear end	Non-reportable	Dry	East	Going ahead	Municipal transit bus	Other motor vehicle	
					East	Turning right	Passenger van	Other motor vehicle	
2014-Jun-10, Tue,10:40	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	
					East	Going ahead	Municipal transit bus	Other motor vehicle	
2015-Sep-30, Wed,09:31	Clear	Other	P.D. only	Dry	West	Reversing	Delivery van	Other motor vehicle	

					East	Changing lanes	Automobile, station wagon	Other motor vehicle	
2015-Dec-18, Fri,17:23	Snow	Rear end	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Municipal transit bus	Other motor vehicle	
2016-Sep-13, Tue,16:59	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Oct-13, Thu,10:33	Clear	SMV other	P.D. only	Dry	East	Going ahead	Pick-up truck	Pole (sign, parking meter)	
2016-Nov-15, Tue,06:40	Clear	Turning movement	P.D. only	Dry	West	Turning left	Truck - tractor	Other motor vehicle	
					West	Overtaking	Automobile, station wagon	Other motor vehicle	
2016-Aug-25, Thu,18:14	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Pedestrian	1
2013-Jan-08, Tue,09:05	Clear	Sideswipe	P.D. only	Wet	East	Going ahead	Pick-up truck	Other motor vehicle	
					East	Stopped	Municipal transit bus	Other motor vehicle	
2013-Feb-20, Wed,16:30	Snow	Sideswipe	Non-reportable	Loose snow	East	Overtaking	Automobile, station wagon	Other motor vehicle	
					East	Pulling away from shoulder or curb	Municipal transit bus	Other motor vehicle	

2013-Aug-02, Fri,07:07	Clear	Angle	P.D. only	Dry	East	Going ahead	Municipal transit bus	Other motor vehicle
					North	Turning right	Automobile, station wagon	Other motor vehicle
2013-Oct-25, Fri,05:50	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Construction equipment	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Oct-21, Mon,20:16	Rain	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Municipal transit bus	Other motor vehicle

APPENDIX C – 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.

APPENDIX D – TDM-SUPPORTIVE DEVELOPMENT DESIGN & INFRASTRUCTURE CHECKLIST

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

Legend

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

	TDM-supportive design & infrastructure measures: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑ SP. 1
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑ SP. 1
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑ SP. 1 & A101
	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)*	☑ SP. 1
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)*	☑ SP. 1

	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)*	☑ SP.1
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)*	☑ SP.1
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)*	☐ N/A
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐ N/A
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐ N/A
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	☐ N/A
	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	☑ SP.1
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)	☑ SP.1

		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)*	☑ A-01
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)*	☑ SP.1 & A-01
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)*	☑ A-01
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	☑ A-01
	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)*	☑ A-01
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	☐ N/A
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	☐ N/A
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐ N/A

		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	☐ N/A
	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)*	☐ N/A
	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	☐ N/A
	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	☑ SP-1 & A-01
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	☑ SP-1 & A-01
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)*	☐ N/A
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)*	☐ N/A
	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)	☐ N/A